

THE EGGS
of
EUROPEAN
BIRDS

JOURDAIN

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OF

EUROPEAN BIRDS,

BY THE

REV. FRANCIS C. R. JOURDAIN,

M. A., M. B. O. U.

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FR. EUGEN KÖHLER.

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Notice to Subscribers.

[N the present work the author, after much consideration, has decided to follow the recommendations of the Fifth International Zoological Congress with regard to nomenclature. While fully aware of the inconvenience caused to those who have become accustomed to the names most commonly in use among English naturalists, he is convinced that this drawback is outweighed by the advantage of adopting the same system of nomenclature which is in use among almost all other civilized nations. After all, the main use of scientific nomenclature is to provide a common language for scientists of all nations, and this can only be done by all agreeing to accept one code of rules. For this reason the Tenth Edition of Linnæus has been adopted as the original standpoint instead of the Twelfth, although the writer's personal preference would be for the latter work, as embodying the matured judgment of the great Swedish naturalist.

With regard to the recognition of geographical races, now that the various forms of all the Palearctic species are being worked out by Dr. Hartert in his work on the Birds of the Palearctic Fauna, it becomes for the first time possible to extend this study to the Oology of the Birds of Europe. Hitherto the usual practice among British naturalists has been to elevate our local races to the rank of species (as in the case the *Motacille* and *Pari*), while at the same time entirely ignoring many equally well marked continental races. For the nomenclature of these forms the trinomial system has been adopted, as clearer and less open to confusion than the binomial systems of Dr. Sharpe and Mr. Dresser. Possibly some of the forms mentioned in this work may be thought scarcely sufficiently well defined to require subdivision, and this may eventually prove to be the case; but great care has been taken to avoid the lumping together of statistics which apply to distinct races.

For purposes of measurement the millimetre has been adopted as the unit, in order to facilitate comparison with the statistics in continental works, and as being now in general use for scientific purposes. It should be noted that the breadth of an egg is usually subject to much less variation than the length, and is therefore a more reliable test. Where sufficient material has been accessible a series of not fewer than 100 eggs

Measure-
ments
and
Weights.

of each form has been measured by the writer, or statistics compiled from thoroughly reliable sources. The weight, though a very variable factor, is useful in combination with statistics of size, and its value has been underrated by English naturalists. In this connection Göbel's tables in the *Zeitschr. f. Ool.* are important, though unfortunately misprints are not unknown. At present the statistics on the weight of the full egg are too scanty for us to estimate their value.

It is with much pleasure that the author is able to announce that arrangements have been made to figure thoroughly identified specimens of many rare eggs. Among these we may mention Whitehead's Nuthatch, Rüppell's Warbler, La Marmora's Warbler, the Knot, etc.

Addenda et Corrigenda to Part I.

p. 5. *C. corax laurencei* Hume has been shown by O. Reiser (*Ornis Balcanica*, III, p. 255) to occur in the eastern part of the Greek archipelago.

p. 20. *P. pica mauritanica* Malh. The breeding season extends from March to May.

p. 23. *Nucifraga caryocatactes* (L.). Reiser has recorded a single clutch of 5 eggs from Bosnia, Mar. 22, 1904 (*Zeitschr. f. Ool.* 1904, p. 13). For notes on the nesting of this bird in Hungary see *Aquila* 1894, p. 48.

p. 31, l. 11 from below. For 'Sicily' read 'Brittany'. In Sicily the Chough only breeds on the mountains inland.

CORVIDAE.

1. Raven, *Corvus corax* L.

Plate 1, fig. 1 (Kiev, Russia, 13 Mar. 77), 2 (Pomerania, 5 Apr. 92), 3 (Kiev), 4, 5 (Peltroumi, 16 Apr. 91), 7 (Karló, 13 Apr. 89), 8 (Kiev). Plate 26, fig. 1 (N. Cornwall, Mar.).

Eggs: Thienemann, Fortpfl., Tab. XXXIX, fig. 1, a—e. Hewitson, I. Ed. I, pl. LXIX; II. Ed. I, pl. XLVIII; III. Ed. I, pl. LVII. Baedeker, Tab. 34, fig. 3, 4. Taczanowski, Tab. XXXVII, fig. 1. Seebohm, Brit. Birds, pl. 16; id. Col. Fig., pl. 55. Frohawk, Brit. Birds, II, pl. VII, fig. 229—232.

British Local Names: *Corbie Crow*, *Great Corbie Crow*. Welsh: *Cigfran*. Manx: *Feeagh*. Erse: *Feach dhuv*, *Bran*. Scotland: *Corbie*. Gaelic: *Fitheach*, *Biadhtach*. Orkneys: *Corbie*, *Kroot*.

Foreign Names: Bosnia: *Gavran*. Bohemia: *Krkavec*. Denmark: *Ravn*. Finland: *Korppi*, *Kaarne*. France: *Corbeau*, *Grand Corbeau*, *Crô*, *Croc*. Germany: *Kolkrabe*, *Steinrabe*, *Rabe*. Greece: *Kórax*, *Kórkorax*. Helgoland: *Groot Roab*. Holland: *Raaf*. Hungary: *Holló*. Italy: *Corvo imperiale*, *Corvo maggiore*, *Corbatt*. Lapland: *Pultokas*, *Karanas*, *Bolffan*. Luxemburg: *Ramm*, *Rôf*, *Remmkuob*, *Schaak*. Norway: *Ravn*, *Korp*. Poland: *Kruk wlaściwy*. Russia: *Woron*, *Kernesh*. Sweden: *Korp*, *Ravn*, *Ram*.

Corvus corax L. Dresser, Birds of Europe, IV, p. 567; Newton, ed. Yarrell, II, p. 259; Saunders, Manual, p. 241; Dresser, Man. Pal. Birds, p. 423. *C. corax corax* L. Hartert, Vög. Pal. Fauna, p. 2.

Breeding Range: North and Middle Europe: Norway, Sweden, Denmark, Russia, the British Isles, France, Holland, Germany, Switzerland, Austro-Hungary, Italy and the Balkan peninsula. (Hartert regards the Ravens of the Færøes, the Iberian peninsula, North-west Africa, the Canaries and Sardinia as subspecifically distinct, while the Greek forms have not yet been thoroughly investigated and the Iceland birds belong to the form *C. corax principalis* Ridgw.)

In England the Raven is now almost exterminated, although fairly numerous 50 or 60 years ago, except on those parts of the coast where high cliffs are to be found, such as the Cornwall and Devon coast, and in mountainous districts, such as the Cumbrian Hills and some spots in the

British
Isles.

Pennine range. In Wales perhaps some sixty pairs still breed; and in the Isle of Man, Scotland, the Hebrides, Orkneys, Shetlands and St. Kilda it is not uncommon and in some districts plentiful. In Ireland it has now become scarce, except on the west coast. Formerly it was generally distributed over the British Isles, breeding not only in rocks and cliffs where available, but also in lofty trees. At the present time nearly all our resident birds nest in rocks, but interesting details of tree-breeding birds in Suffolk and Essex will be found in *Ootheca Wolleyana*, p. 518 and the *Zoologist*, 1867, p. 599.

Con-
tinental
Europe.

On the Continent a few pairs still breed in Holland where large timber exists. In Germany the Raven has become rare, and is now chiefly found in the forests of the North German plain, especially in Schleswig-Holstein, Hannover, Oldenburg, Rhein-Hessen, Nassau, Westphalia, Pomerania and East Prussia. It nests in the forests of Jutland and is not uncommon in Austro-Hungary. In Scandinavia it is found breeding both on rocks and in trees, and is numerous in some parts, flocks of 20 to 50 and even 70 being occasionally met with on the northern coasts: in Russia it is also widely distributed, but commonest near the sea-shore. In the Balkan peninsula it is numerous, even haunting the towns, and is generally distributed in the Alps, breeding in lofty pines as well as rocks: as also in the Apennines.

Nest.

Where the nest is placed among crags, a site is usually chosen which is well overhung by rock and in consequence is generally difficult of access. In many cases alternative sites are used, but sometimes the same spot is occupied year after year. On sea cliffs or rocks inland the nest is a very bulky structure, built of good sized sticks, heather or furze stems etc., well lined with wool, cow or deer hair and grass (*Scirpus*), while old rags and bits of paper are sometimes used. The cup is about 10 inches across and 5 or 6 inches deep. After the young have been some time in the nest, it becomes very conspicuous from the whitewash which covers it. In flat countries high trees are usually chosen and the nest is decidedly smaller and more compact. In rare instances ruinous buildings have been utilized (See Ussher, *Birds of Ireland*, p. 93; *Ootheca Wolleyana*, p. 514; Clarke and Roebuck, *Vert. Fauna of Yorks.*, p. 36; Hancock, *Birds of Northumberland and Durham*, p. 32). In Russia it is said to nest frequently in church towers and even on houses.

Eggs.

The eggs, which are laid on consecutive days, are usually 4 to 6 or 7 in number. Complete clutches consisting of 3 eggs only are probably the produce of old hens whose reproductive powers are failing. If the first clutch is taken, another is deposited after an interval of 10 days and this has been known to take place three or four times: but the Raven is naturally single-brooded. The usual types of colouring are illustrated in

the Plate: but eggs with a clear blue ground (as in *C. corone* and *C. cornix*) are not infrequently found, sometimes almost without markings, at other times boldly blotched with very dark brown, almost black. Professor Newton has a very remarkable clutch of 4 eggs, received from Unst (Shetlands) in 1854, which have "a cream-coloured or pale flesh-coloured ground, blotched with reddish brown or pale lavender".

The time of laying is remarkably early: in the south of England from the last week in February to about March 15 is the usual time. In Wales the shore breeding birds nest decidedly earlier than those in the hills — full clutches from mid-February to early March on the coast, while in the hills about the middle of March is the best time. On the Irish coast Ussher has found young as early as March 16 and in the Shetlands most eggs are laid in mid-April (Saxby). The eggs are hatched 18 or 19 days from laying of last egg (Evans).

Breeding
Season.

On the Continent the breeding season varies with the latitude and elevation. In Germany eggs may be obtained from mid-March to early April (exceptionally as early as March 4): in northern Scandinavia from mid-April to early May. In the Balkan peninsula from mid-March to the end of April.

British and Scandinavian eggs are larger than those from the plains of mid-Europe. Average of 79 British eggs 49.8×33.5 mm., of 44 Scandinavian eggs 48.8×34.3 mm., 31 eggs from Germany and mid Russia average 48.16×33.48 mm. Mean average of 154 eggs, 49.19×33.73 mm., Max. 63×34.5 (Sutherland) and 44×40 mm. (Sweden, C. A. Westerlund), Min. 42.5×29 mm. (Russia, Göbel). A dwarf egg from Norway measures 39×29 mm. (Newton coll.).

Measure-
ments.

Average weight of 13 British eggs 1.893 g. (Jourdain); of 17 Norwegian 2.171 g., varying from 1.75 to 2.48 g. (Lilliestierna). Mean average (30 eggs) 2.051 g. Göbel gives as average of 6 full eggs 27.08 g.

Geographical Races.

a. N. European Raven, *C. corax corax* L. (See above).

b. Færøe Raven, *C. corax varius* Brünn.

Local Names: the Færøes: *Ravnur*, *Korpur*, *Avujtravnur*. Partial albino: *Qvujtravnur*.

C. corax varius Brünn. Hartert, Vög. Pal. Fauna, p. 4.

Breeding Range: the Færøes, where it is resident, breeding in the sea cliffs. The eggs appear to vary considerably in size: average of 5 eggs 50.12×34.64 mm., Max. 54×35.5 and 48×36 mm., Min. 46×33 mm.

c. Iceland Raven, *C. corax principalis* Ridgw.

Plate 1, Fig. 6 (Greenland).

Local Names: *Hrafn*, *Krummi*.

Breeding Range: Iceland. [Also Greenland and Labrador to Alaska.]

In Iceland the eggs, usually 4—5 in number, sometimes 3 only in second layings, are deposited late in March or more frequently in April (Hantzsch). The nest is usually built on the sea cliffs.

Average of 18 Icelandic eggs 51.75×34.8 mm., Max. 57×32.3 and 54.2×36.3 mm., Min. 47.5×35 and 57×32.3 mm. Bendire gives 49.53×34.54 mm. as the average of 39 eggs. Average weight (of 4 eggs) 1.96 g. (Hantzsch).

d. Spanish Raven, *C. corax hispanus* Hart. & Kleinsch.

Local Names: Portugal: *Corvo*. Spain: *Cuervo*, *Grajo*.

C. corax hispanus H. & Kl. Hartert, Vög. Pal. Fauna, p. 5.

Breeding Range: the Iberian peninsula, where it is a generally distributed resident. It breeds indiscriminately in rocks or trees according to the district. Eggs 3—7. The time of laying appears to vary considerably. Saunders saw large young on March 18 at Baza (Granada) and describes it as nesting near Malaga in mid-February while Irby says that laying begins about mid-March; but in the pine woods of Andalusia, where it is common, the great majority of eggs are laid in the last week of April or the first week in May. Average (32 eggs) 47.64×33.14 mm., Max. 54.2×35.2 mm., Min. 44×33 and 46.3×32.2 mm. Average weight (12 eggs) 1.935 g., Max. 2.39 g.

e. Sardinian Raven, *C. corax sardus* Kleinsch.

Local Name: *Corvo*.

C. corvus sardus Kl. Hartert, Vög. Pal. Fauna, p. 6.

Breeding Range: Sardinia, where it is very common, Corsica and probably elsewhere in the Mediterranean. Nests chiefly in cliffs, but also in the forests and lays 4—6 eggs, which are deposited about the end of March and early in April (Whitehead).

Average of 16 eggs from S. Corsica in Tring Museum 46.55×32.78 mm., Max. 59.3×36.5 mm., Min. 44×30.5 mm.

f. Tangier or Irby's Raven, *C. corax tingitanus* Irby.

Local Names: Algeria: *l'Höráhb*. Marocco: *Gráb*. Spain: *Cuervo*.

Corvus tingitanus Irby. Dresser, Birds of Europe, IV, p. 563. *Corvus leptonyx* Peale. Id. Man. Pal. Birds, p. 425. *C. corax tingitanus* Irby. Hartert, Vög. Pal. Fauna, p. 6.

Breeding Range: Possibly a pair or two nest on the coast of southern Spain. (Cf. Irby, Ornith. of the Straits of Gibraltar, 2nd Ed., p. 85.) [In Africa: Marocco, Algeria, Tunis.]

Breeds amongst rocks, also on trees and bushes; near Mazagan usually on date palms. The nests, sometimes built close to one another, are constructed of sticks, neatly lined with grass and small roots. Eggs 3—7: usually laid in the first half of April near Mazagan (Hartert); April 20 near Tangier (Irby), but Erlanger and Spatz obtained clutches in Tunis on March 19 and April 8—9. The eggs are smaller than those of typical *C. corax*, more elongated in form, and the ground colour is rather brighter. Average of 76 eggs from Marocco, Algeria and Tunis (Erlanger 21, König 7 and 48 measured by the author) 47.34×32.36 mm., Max. 54×35.6 and 49×36 mm., Min. 42.5×33.1 and 44×30 mm. Average weight of 11 eggs (König 7 and 4 by author) 1.707 g.

[Notes. In the Sahara, Egypt, southern Palestine, Persia, etc., is found the Brown necked Raven, *C. corax umbrinus* Sund. Eggs from Egypt are decidedly paler and bluer than typical eggs of *C. corax*. Average of 12 eggs 44.05×31.26 mm. (Feb. 2—Mar. 26). The Canarian Raven, *C. corax canariensis* H. & K. is closely allied to *C. c. tingitanus*. (See *Journ. f. Ornith.* 1890, Tab. VIII, fig. 10.) Average (19 eggs) 48.05×32.17 mm.

The Fantail Raven, *Corvus affinis* Rüpp. occurs in Palestine, south Arabia, Middle and Upper Egypt etc. Eggs as yet undescribed.]

2. Hooded Crow, *Corvus cornix* L.

Plate 2, fig. 1—7 (Pomerania).

Eggs: Thienemann, Fortpfl., Tab. XL, fig. 1, a—g (*C. cornix* and *C. corone*). Hewitson, 1st Ed. I, pl. XCVII; 2nd Ed. I, pl. XLIX, fig. 2; 3rd Ed. I, pl. LVIII, fig. 2. Baedeker, Tab. 34, fig. 2. Taczanowski, Tab. XXVII, fig. 2. Seebohm, Br. Birds, pl. 16; Col. Fig., pl. 55. Frohawk, Br. Birds, pl. VII, fig. 237—240.

Nest: Oswin Lee, III, p. 66.

British Local Names: England: *Royston Crow*, *Dun-*, *Norway-*, *Kentish-*, *Bunting-*, *Scare-* or *Grey Crow*. Isle of Man: *Greyback*. Manx: *Fannag*. Welsh: *Bran Hedlyd*. Ireland: *Grey-backed Crow*, *Scald Crow*. Erse: *Finnoge*, *Fanoge* (phonetic). Scotland: *Hoodie Crow*, *Hoodie*, *Huddie*, *Grey Crow*, *Saddleback Crow* or *Crow*. Gaelic: *Franngag*. Shetlands and Orkneys: *Craa*, *Hoodie Craa*.

Foreign Names: Bohemia: *Vrána*. Bosnia and Herzegovina: *Gavran*. Denmark: *Krage*, *Graa Krage*. Færöes: *Kråaka* (♂), *Kråka* (♀). Finland: *Varis*. France: *Corbeau mantelé*, *Corneille mantelée* or *grise*. Friesland: *Schiere-krie*. Germany: *Nebelkrähe*, *Mantel-* or *Graue Krähe*. Greece:

Korone. Helgoland: *Kreih*. Holland: *Bonte Kraai*, *Grijze- or Lummel-Kraai*. Hungary: *Dolmanyos Varjú*, *Varju*. Iceland: *Krâka*. Italy: *Cornacchia bigia*, *Cornacchia*, *Taccola*, *Corronca*, *Mulacchia*. Lapland: *Vuoracás*, *Vuoras*. Luxemburg: *Grove knob*. Norway: *Kraake*. Poland: *Kruk wrona*. Russia: *Seraja worona*, *Woroka*. Sweden: *Krâka*, *Grå Krâka*, *Kajsa*.

Corvus cornix L. Dresser, *Birds of Europe*, IV, p. 543; Newton, ed. Yarrell, II, p. 275; Saunders, *Man.*, p. 245; Dresser, *Man. Pal. Birds*, p. 421. *C. cornix cornix* L., Hartert, *Vög. Pal. Fauna*, p. 9.

Breeding Range: Common in Norway, Sweden, the whole of European Russia, but least numerous in the south-east, the Færöes, Scotland, Ireland, Denmark, eastern Germany, Austro-Hungary, Majorca and Minorca, Sicily, Italy, the Balkan peninsula and the Cyclades (Naxos).

[West Siberia as far as the Lena, Crete, Cyprus and the countries bordering on the eastern Mediterranean are also inhabited by this species, and the Sardinian and Persian races are mentioned below.]

British
Isles.

In England a few instances of the breeding of this bird are on record, mostly from the east coast counties (Northumberland, Yorkshire, Lincolnshire, Norfolk, Suffolk and perhaps Essex), but occasionally inland, as in Warwickshire in 1887. It is a well known resident in the Isle of Man, and is generally distributed throughout Ireland and the adjacent islands, being especially common in the south-west. In Scotland is frequently interbreeds with *C. corone*, but tends to replace it in the north and is found in the Hebrides, Orkneys, Shetlands and St. Kilda. Along the coast the nest is frequently built on the cliffs, and is as a rule easy of access and not overhung by rock like that of *C. corax*. In treeless districts such as North Uist, the nest is often placed on the ground, among heather: while low bushes are also utilized where trees are not available, and instances are on record where it has been placed on a building (*Zool.* 1899, p. 73) or on a crofter's hut (Gray).

The Con-
tinent.

In Scandinavia and the greater part of Russia as far as the forest limit, it is plentiful, breeding in the pine or birch woods, and is also common in Jutland and the Danish Islands, often nesting close to the farms. It has once or twice bred in Holland and I have seen a pair on Texel at the end of May. In Germany the distribution of this species has been carefully worked out and is well shown on the map which illustrates Matschie's paper in the *Journal für Ornithologie* for 1887, p. 617—648 (Tab. III). Roughly the western limit of *C. cornix* may be defined by a line drawn from the mouth of the Eider, by Neumünster, Lüneburg, Helmstadt, Naumburg and Chemnitz to Pirna. A second line from Rostock by Wusterhausen, Brandenburg, Luckenwalde and Görlitz to Zittau defines the eastern limit of *C. corone*, while the space between the two lines is occupied by both species in varying proportions. In Switzerland this species

is reported to have bred occasionally, but confirmation is needed. In Austro-Hungary it breeds in Bohemia, Austria and Hungary, is common in Transylvania and very plentiful and tame in Slavonia. Over the greater part of the Balkan peninsula it is generally distributed, chiefly breeding in the hills up to 5400 feet, and becoming scarce in Greece, while it has been found nesting on Naxos and the neighbouring islets. In Italy, Sicily and the Balearic Isles it is a common resident.

Very similar in construction to that of *C. corax*, but of course smaller. Nest.
Nests among rocks are as a rule more bulky and contain more material than those in trees. Besides the usual sticks, twigs, furze or heather stems, large seaweed stalks are often utilized on the coast, and Saxby mentions cases where the foundation of the nest consisted of bones of ponies and sheep. Turf is frequently used to fill up interstices, and wool, feathers, paper, moss and hair are used as lining material; while the whole is compactly built, with the usual warm and deep cup. Over the greater part of its range this species is a tree-breeding bird, but along rocky coasts the nest is usually placed on a ledge or crevice of the cliff. At Thorshavn (Færöes) it is said to breed on the houses, and where neither trees nor rocks are available it nests on the ground among heather, generally close to a stone. Pearson found a nest off the Norwegian coast, in a circular iron cage, used as a beacon, $1\frac{1}{2}$ miles from the land! and Naumann records nests on a beam under a bridge, on a dunghill and on the high chimney of an old house.

Usually 4 to 5 or 6 in number, rarely 7, except in Central Hungary Eggs.
(F. C. Selous), and resembling those of *C. corone* in character, though the ground colour is often of a more decided green and in a large series the average size is seen to be rather less. As in the case of *C. corax* and *C. corone*, the type with a distinct blue ground occurs, often when the rest of the clutch are normal in colour. In a series from the Færöes the proportion of blue eggs is larger than usual. Occasionally blue eggs are found without any markings, but this variety is scarce. A clutch of red eggs of this species was taken near Gothenburg, Sweden, on May 12, 1889, and is now in Mr. Ramberg's collection.

In Ireland the eggs are usually laid in April, but in west Cork they have been taken as early as March 15 (Ussher); in Scotland from about April 20 onwards, but in the Shetlands seldom before mid-May (Saxby). In Germany and Denmark eggs may be found from early April, and this appears to be the case also in Italy, Greece, Asia Minor etc.; in Montenegro from April 14 to 24; but individual birds vary a good deal in this respect and though the Hooded Crow is single-brooded it is not uncommon to find fresh eggs and well grown young on the same day, even where undisturbed. In northern Scandinavia the eggs are frequently not laid till the middle Breeding Season.

or end of May, and on the lower Petschora Seebohm received the first eggs on May 30. Period of incubation about 18 or 19 days.

Measur-
ments.

Average size of 100 typical examples 41.2×29 mm. (Rey). Abnormally long eggs measure 52.7×30.2 mm. (Lapland, Newton coll.) and 52×32 mm. (N. Uist, A. W. Johnson coll.); Max. breadth 42.2×33 mm. Dwarf eggs measure 34×26.5 (Tring Museum) and 35×24.3 mm. (J. Sandman) but the Minima of 100 eggs are 38.2×28.7 and 40.5×27.5 mm. (Rey). Average weight 1.224 g. (Rey).

Geographical Races.

a. European Hooded Crow, *C. cornix cornix* L. (See above).

b. Sardinian Hooded Crow, *C. cornix sardonius* Kleinsch.

Local Names: Sardinia: *Corroga braxia* or *barza*, *Corronca*.

C. cornix sardonius Kleinsch. Hartert, Vög. Pal. Fauna, p. 10.

Breeding Range: Sardinia and Corsica.

Wharton found this race very common in Corsica, nesting in low trees near swamps. First eggs taken on April 12. Whitehead found many nests after April 26. Eggs 4—6 in number, rather dark in colour, some markings being almost black. Average (12 eggs) 44.34×29.58 mm., Max. 48.5×30.7 mm., Min. 40.9×28.2 mm.

[In west Siberia *C. c. sharpii* Oates replaces the typical race, and in Persia and Mesopotamia *C. c. capellanus* Scl. 9 eggs of the latter subspecies average 43.68×29.17 mm. (Fao, Feb. and Mar.)]

3. Carrion Crow, *Corvus corone* L.

Plate 3, fig. 1—10 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XL, fig. 1 a—g (*C. cornix* and *C. corone*). Hewitson, I. Ed. I, pl. XCI; II. Ed. I, pl. XLIX, fig. 1; III. Ed. I, pl. LVIII, fig. 1. Baedeker, Tab. 34, fig. 1. Taczanowski, Tab. XXVII. Seebohm, Br. Birds, pl. 16; Col. Fig., pl. 55. Frohawk, Br. Birds, pl. VII, fig. 233—236.

British Local Names: England: *Crow*, *Black-*, *Corbie-*, *Gor-* or *Midden-Crow*. Welsh: *Bran*. Scotland: *Black Huddie* or *Hoodie*, *Blackneb*. Gaelic: *Frannag*.

Foreign Names: Bohemia: *Vrána černá*. Denmark: *Sort*, *Holsteensk* or *Ravne Krage*. Færöes: *Hjaltlands Kraoaka*. France: *Corneille noire*, *Corbeau*. Friesland: *Krie*. Germany: *Raben-* or *Schwarze Krähe*, *Rabe*, *Kräge*, *Kröe*. Helgoland: *Swart Kreih*. Holland: *Kraai*. Hungary: *Fekete Varjú*. Italy: *Corneilla nera*, *Corbatt*, *Cornacchia nera*. Iceland: *Kráka*. Luxemburg: *Knob*. Poland: *Kruk wroniec*. Portugal: *Gralha*, *Corvo*. Russia:

Tschernaja Worona. Spain: *Corneja negra, Graja, Corbatilla.* Sweden: *Svart Kråka.*

Corvus corone L. Dresser, Birds of Europe, IV, p. 531; Newton, ed. Yarrell, II, p. 274; Saunders, Man. p. 243; Dresser, Man. of Pal. Birds, p. 421. *C. corone corone* L. Hartert, Vög. Pal. Fauna, p. 11.

Breeding Range: England, southern Scotland, France, Portugal, Spain, Italy, Switzerland, Belgium, Holland, western Germany, Bohemia, parts of Austria and European Russia.

Except where kept down in numbers by strict game preservation, this bird is still tolerably plentiful in England, and even more so in the wilder parts of Wales. Its distribution in Scotland is peculiar and has not been thoroughly worked out. Though commoner in the south, it occurs locally over the greater part of the country, a few pairs nesting even in West Ross. In the Isle of Man, the Hebrides, Orkneys and Shetlands it is however replaced by *C. cornix*. On the mainland interbreeding between the two species frequently takes place. In Ireland this species only occurs very rarely. The nest is generally built high up in trees, but among the Welsh hills it is not uncommonly found in mere bushes on the hill sides. On the Yorkshire, Somerset, and Devon coasts it is occasionally met with on the cliffs, and on the rocky and treeless coasts of north Anglesea and Cornwall this appears to be the usual site (*Zool.* 1904, p. 11). A pair nested on the ground in the Farnes in 1832 according to Hewitson.

British
Isles.

In southern Spain it is decidedly rare, but even here a few pairs breed in the sierras, while in Portugal and northern Spain it is more numerous. Throughout France and the Low Countries it is generally distributed, and in some parts of Friesland is extraordinarily common. Von Homeyer records a nest from Majorca (*Journ. f. Ornith.* 1862, p. 252) and Wharton from Corsica (*Ibis* 1876, p. 24). For the distribution of this species in Germany see article on *C. cornix*, p. 6. (Cf. also Diederich, *Jahresber. d. Gesellsch. von Freund. d. Naturwissensch. in Gera*, 1884—1888). J. Thiene-mann states however that *C. corone* is the prevalent species in west Schleswig, the north Frisian islands and the greater part of Holstein, excepting the Oldenburg district and Fehmern. It is a common resident in Switzerland and is found in north Italy, breeding in the highlands of Piedmont, Liguria, Lombardy and Venetia, but rarely south of the Apennines. The accounts of its distribution in Austro-Hungary and the Balkan peninsula are conflicting and there appears to have been some confusion between this species and *C. frugilegus*. It probably occurs in Bohemia, Moravia, Lower Austria and abundantly in the Tyrol, but was not recorded with certainty from Hungary till 1896, and Reiser regards it as absent from the Balkan peninsula, though found in certain districts of European Russia (Orel, Kazan, Kiev and the Caucasus.)

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- Nest. Over the greater part of its range the Carrion Crow is a tree-breeding bird, but Fatio describes it as nesting in fissures of rock and holes in old walls in the Alps. On the other hand it certainly nests occasionally on the ground in the sand dunes of Holland, and Albarda mentions a nest in a ruinous chimney. The nest is well and strongly built of sticks and twigs or heather stems, compacted with earth or turf and moss, and warmly and neatly lined with wool, roots, rags or hair. Occasionally dead leaves or feathers are found in the lining of the cup, which is rather deep and about 8 inches across. Frequently the nest is placed high up among the thinner boughs of some isolated deciduous tree and is then very conspicuous, but where much persecuted, many nests are to be found built close to the main stem at the junction of one of the larger branches and often well concealed with ivy.
- Eggs. These are usually 4—5 in number, but 6 are sometimes found and occasionally birds are found incubating 3, 2 or even a single egg. One hen (probably a very old bird) which only laid two eggs in 1898, hatched off a single young one in the following year. In England the Crow is single brooded (although Naumann says that they sometimes breed twice in the year). When the first laying has been taken another is deposited about a fortnight afterwards, and even a third if necessary, but usually with fewer eggs. They are generally laid about 3 pm. and the period of incubation is about 18 or 19 days. In colouring they resemble the eggs of the other *Corvi*, but have as a rule a rather less decided green tint than eggs of *C. cornix*. It is not unusual to find one egg in a clutch much more lightly marked than the rest, often with a blue ground; while entirely blue eggs, without any markings, have been taken in Great Britain and on the Continent. Some eggs on the other hand are very heavily marked with bold blotches of olive brown, but never with black, as in the case of *C. corax*.
- Breeding Season. In England eggs may be found from April 6 onwards: in the Midlands April 17—27 is about the best time (about a fortnight later than *C. frugilegus*). In Germany, according to Rey, full clutches may be found from the beginning of April. Chapman found 5 eggs on March 23 in the Sierra de las Cabras, which seems to indicate rather earlier breeding in Spain.
- Measurements. Average of 100 typical eggs 43.5×30.1 mm. (Rey), Max. 49×32.5 mm. (coll. Blagg), but an abnormally long egg measures 50.5×29 mm. (coll. A. W. Johnson); Min. 38.2×26.3 mm. (Rey). Average weight 1.279 g. A dwarf egg measures 30×25.5 mm. and weighs 720 mg. (Rey), and R. H. Read has one 27.3×22.1 mm.

4. Rook, *Corvus frugilegus* L.

Plate 4, fig. 1—7 (Germany); Plate 41, fig. 3 (Red var., Glücksburg April 1896, von Wangelin).

Eggs: Thienemann, Fortpfl., Tab. XL, fig. 2, a—e. Hewitson, I. Ed. I, pl. LXXI; II. Ed. I, pl. L, fig. 1; III. Ed. I, pl. LIX. Baedeker, Tab. 28, fig. 5. Seebohm, Br. Birds, pl. 16; id. Col. Fig., pl. 55. Frohawk, Br. Birds, pl. VII, fig. 241—244.

Nest: O. Lee, III. p. 90, 92.

British Local Names: England: *Crow*, *Bare-* or *Bald-faced Crow*. Welsh: *Ydfran* or *Ydfrun*. Gaelic: *Greumhach-Rocus*. Shetlands: *Scotch Craa*. Erse: *Pray-ach-aun* (phonetic).

Foreign Names: Bohemia: *Havran polní*. Bosnia: *Gavran*. Denmark: *Kornkrage*, *Blaaraage*. Færøes: *Hjaltlandskråka* (♂), *Hjaltlandskråka* (♀). Finland: *Pieni korppi*, *Peltovaris*. France: *Corbeau Freux*, *Freux*, *Graille*. Germany: *Saat-*, *Feld-* or *Steinkröhe*, *Nacktschnabel*, *Röck*. Greece: *Chabarōni*. Helgoland: *Groot swart Kauk*. Holland: *Roek*, *Korenkraai*, *Zaadkraai*. Hungary: *Vetési varjú*. Italy: *Corvo reale* or *nero*, *Corbatt*. Luxemburg: *Hierschtkuob*. Malta: *Corvu*. Norway: *Blaakraake*. Poland: *Krukawron*. Portugal: *Gralha calva*. Russia: *Gratsch*. Sardinia: *Coroga niedda*, *Corbu*. Spain: *Corneja calva*, *Graula*, *Grajo*. Sweden: *Råka*, *Svartråka*, *Rauk*.

Corvus frugilegus L. Dresser, Birds of Europe, IV, p. 551; Newton, ed. Yarrell, II, p. 289; Saunders, Manual, p. 247; Dresser, Man. Pal. Birds, p. 426. *C. frugilegus frugilegus* L. Hartert, Vög. Pal. Fauna, p. 13.

Breeding Range: The British Isles, Orkney, South Sweden, Denmark, South Finland and Russia generally from Archangel to the Caucasus, Germany, Holland, Belgium, France, Austro-Hungary, North Italy and the Danube valley. [In North Persia, Turkestan and southwest Siberia it is replaced by *C. f. tschusii*.]

Rookeries are to be found in plenty in all wooded districts of Eng-
land, Wales, the Isle of Man, Ireland, and Scotland: but those in Sutherland,
West Ross and Cromarty have only been formed within the last forty
years. In the Orkneys colonies have been established since 1848, but a
lodgment has not yet been effected on the Shetlands. On the west coast,
Islay has been inhabited since 1820, while Eigg (1886), Skye (circa 1870)
and the Outer Hebrides (1895) have been colonized of late years.

Where tall trees are available, even in large towns, they are generally
used for nesting places. No particular preference appears to be shown
for any one species of tree, but the majority of English rookeries are
naturally built in deciduous trees, although evergreens, such as the Scotch
fir and spruce, are also occasionally utilized. In treeless districts, such as
the West of Ireland, many rookeries are built on low bushes on islets in

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the loughs; and where all the timber is small, nests may be found only a few feet from the ground. Exceptional cases of rookeries in pollarded willows, holly bushes, hedges, and even in lauristinus bushes, Portugal laurels and an apple tree, are on record, while in 1865 a nest was built on the ground in a meadow near Longnor, Staffordshire (*Zool.* 1865, p. 9626).

The nests are generally placed close together and sometimes large numbers are to be found in the same tree. Single nests, built apart from the main colony, are usually destroyed by the other rooks. Numerous cases of twenty nests and upwards in one tree have been recorded, while an entire rookery, consisting of about 100 nests is said to have been built in a single ash tree at Barton-on-Humber (*Yarrell*, II, p. 296). It is no uncommon occurrence to find a flourishing rookery in the midst of a large town. (For notes on London rookeries see *Zool.* 1878, p. 193 and 441.) Instances where nests have been built on houses, church-towers, spires, chimneys, vanes, etc., are too numerous to specify. Besides the well-known cases usually quoted, the same habit has been observed in the Isle of Man (*Zool.* 1892, p. 96), Ireland (Ussher, *Birds of Ireland*, p. 98) and the Orkneys (Buckley and Harvie-Brown, p. 127).

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In France the rook, though rather local, is more numerous in the north than in the south, where it is scarce, but a colony exists as far south as Biarritz, although it is not known to breed south of the Pyrenees.

It is also plentiful in the Low Countries, but the great majority of continental birds are summer migrants and not residents, like their British relatives. There are a few large rookeries in Denmark, near Aalborg, Veile and other places. For particulars of the principal German rookeries, some of which are of enormous size, containing over 20,000 nests, see Matschie's article in the *Journ. f. Ornith.* 1887, p. 617. In Würtemberg and Bavaria rooks are decidedly less numerous and remain through the winter, but in Switzerland they are only known as winter visitors or met with on passage. Colonies exist in Lombardy, Venetia and near Modena, but not in south Italy. Though local it is on the whole widely distributed in Austro-Hungary, but absent from some districts. It has however been recorded as breeding in Bohemia, the "Auwälder" of Vienna (Lower Austria), Carinthia, Slavonia, Hungary (see map and article in *Aquila* for 1904), Galicia and one or two localities in Transylvania, where it is said to have been introduced. In the Balkan peninsula there are large rookeries in the Danube valley and in the Dobrudscha, and colonies may possibly exist in Macedonia. In Russia it is found in the Caucasus and is plentiful in the Crimea, while its northern range extends to Finland south of lat. 63° N., the Kola peninsula, where it was observed in 1903, and the lower Petschora. It breeds plentifully near Gothenburg, but is chiefly found in the southern part of Sweden south of lat. 60° N., though occurring as

far north as Ångermanland, and is common on Bornholm, Öland and Gottland. To Norway it is principally a visitor on migration, but a few remain to breed.

Both in the British Isles and on the Continent many rookeries are built in the immediate neighbourhood of heronries, and though sometimes both species remain on good terms with one another, this is by no means always the case, and one large heronry in east Suffolk has been decimated by persistent egg stealing on the part of the rooks.

These vary considerably in size, those built by young birds being more slight in construction than those of older birds, which are frequently built on the foundation of the old nest of the previous year, repaired at intervals in winter and early spring. They are about 2 feet across and are built of sticks and twigs, mixed with clay in order to give stability, and bits of turf. The lining material varies a good deal; roots, dead grass, straw, hair, wool, dead leaves and occasionally feathers, are to be met with, while in the Orkneys fish bones and dry tangle are used (Saunders). The cup is not so deep as in the nest of the Hooded and Carrion Crows. Nests.

The clutch varies from 3 to 6, but the latter number is rarely met with and the usual number is 3 to 5. In type they are distinctly corvine and much resemble some varieties of Carrion and Hooded Crows' eggs, but they are never found entirely without markings, as is sometimes the case in the species previously treated of. The single egg with an decided blue ground in a normally coloured set, so often found in the crows, does not occur, or at any rate very rarely. On comparing a large series, a decided tendency to olive brown markings and a less decided blue ground is seen to be characteristic of the Rook's eggs. Mr. R. H. Read has almost spotless eggs from Yorkshire. Baron König-Warthausen obtained 3 clutches of the red variety of this egg in 1893 and 1894, probably the produce of a single hen, and in 1896 von Wangelin obtained two eggs from the Oberförsterei Glücksburg, one of which is illustrated on Pl. 41, fig. 3. It is interesting to notice that the normal eggs of the South African *Corvus capensis* Licht. are of a similar type of colouring. As the rook sits at night after the first egg has been laid, there is often a considerable difference in the state of incubation of a clutch of 5 or 6 eggs. Eggs placed in an incubator were hatched on the 17th and 18th days (Evans), which corresponds with results obtained by watching. Eggs.

As an interval of over a month often elapses between the laying of the first and last eggs in a rookery, it is difficult to give exact data, but in the south of England full clutches may be taken from mid-March and occasionally in February, while in the Midlands the last week in March and the first few days in April is the best time, and further north the first half of April. In mild autumns the rook occasionally makes premature Breeding Season.

attempts to breed, and eggs have been laid and even young hatched in October and November in Northants, Warwick, Oxford, Suffolk, Hants, Sussex, Cornwall and Devon (*Zool.* 1904, p. 422 etc.). In Germany Dr. Rey found full clutches usually between April 10—15, and Almásy observed fledged young at the month of the Pruth on May 24, while in Denmark Kjærbølling gives the second half of April as the usual time.*

Measurements. Average of 100 eggs (Germany) 40.7×27 mm. (Rey), Max. 48×30.2 mm. (coll. Blagg), Min. 35×28 and 35.3×24.2 mm. An abnormally long egg measures 48.3×25.2 mm. and weighs 1.12 g. (Rey). Average weight 1.034 g. (Rey). Dwarf eggs are also occasionally met with, 23×18.7 mm., etc. Average weight of 8 full eggs 15.97 g. (N. H. Foster).

5. Jackdaw, *Coloeus monedula spermologus* (Vieill.).

Plate 5, fig. 7—14 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XL, fig. 4, a—d. Hewitson, I. Ed. I, pl. XLIV; II. Ed. I, pl. L, fig. 2; III. Ed. I, pl. LX, fig. 2. Baedeker, Tab. 24, fig. 4. Taczanowski, Tab. XXX. Seebohm, Br. Birds, pl. 16; id. Col. Fig., pl. 55. Frohawk, Br. Birds, II, pl. VI, fig. 222—228.

Nest: O. Lee, I, p. 160.

British Local Names: England: *Daw, Kae, Jack*. Welsh: *Coeg fran*. Scotland: *Kae, Ka-wattie*. Orkneys: *Kae*. Gaelic: *Cathag, Corrachan*. Erse: *Cawg, Cawdhoge* (phonetic).

Foreign Names: Bohemia: *Kavka*. Denmark: *Allike, Kaa*. Færøes: *Hetlands kraaka*. France: *Choucas, Corbeau choucas, Choucas grise, Petite corneille*. Germany: *Dohle, Duhle, Thule*. Helgoland: *Kauk*. Holland: *Kerk-kauw, Toren-kraai* or *Ka, Kauw*. Hungary: *Csóka*. Italy: *Taccola, Corbatell, Monachia*. Luxemburg: *Klènge Metzkerkuob*. Malta: *Ciaula, Cola*. Poland: *Kruk kawka*. Portugal: *Cuneta, Choia*. Sardinia: *Corroga, Taccula*. Spain: *Grája, Grajo, Cornella blanca*.

Corvus monedula L. Dresser, Birds of Europe, IV, p. 523; Newton, ed. Yarrell II, p. 305; Saunders, Man. p. 239; Dresser, Man. of Pal. Birds, p. 419. *Coloeus monedula spermologus* (Vieill.). Hartert, Vög. Pal. Fauna, p. 16.

Breeding Range: The west-European race of the Jackdaw inhabits the British Isles and the whole of the European Continent, with the exception of Scandinavia, where it is replaced by the typical race, and Russia and the Balkan peninsula, where *C. m. collaris* Drumm. is the prevalent form. The exact limits of each race are however as yet imperfectly known. [Occurs locally also in N. W. Africa.]

* But Ottosson says that in Scandinavia the eggs are laid in March, three weeks earlier than those of *C. cornix*, unless the weather is very severe.

Although the Jackdaw is generally distributed over the British Isles with the exception of the barren moorlands, yet there are certain districts in Scotland and Ireland where it is absent without any apparent cause. It is only a visitor to the Shetlands, but there are several colonies in the Orkneys and a few have bred in Skye since 1897, although as yet it is absent from the Outer Hebrides and St. Kilda. In West Ross it is rare, but is reported as increasing in numbers in the Inner Hebrides. In many of the islands off the Irish coast and on some parts of the mainland, it is replaced by the Chough. It is abundant in the Isle of Man. The nesting sites adopted by this species are of the most varied character. Where high cliffs are found, whether on the coast or inland, it usually breeds in holes and crevices of the rock. Hollows in the roofs of natural caves, such as the Peak Cavern in Derbyshire, are also tenanted by many pairs, as are also the sides of 'water-swallows' and quarries. The Jackdaw nests readily in buildings: old castles, church towers, chimneys of houses and dovecotes being frequently occupied. In the wooded plains the nest is frequently placed in a hollow tree, but where timber is absent or small, it is not uncommon to find Jackdaws breeding in rabbit holes, especially in Ireland. More exceptional sites are among ivy on walls, in old Magpie-nests, among the foundations of Herons' nests, or old and bulky masses of nests in a Rookery. Occasionally the Jackdaw builds a nest for itself at the junction of a bough with the trunk of a tree. Instances have been reported from Northampton, Staffordshire, Salop, Worcestershire, Lanark and Fifeshire. A nest in the rigging of a training ship at Gareloch was noticed in the *Annals of Scott. Nat. Hist.* 1892, p. 43.

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No Jackdaws breed in the Færöes or Iceland, but in France, Belgium, Holland and Germany it is commonly found in suitable localities. In the Iberian peninsula it is very local, but Tait found a colony breeding under rocks in islands in Vigo Bay, Galicia, and it is locally common in some of the Cotos of the Guadalquivir, etc. In Switzerland it is distributed through the low-lying plain, but is not found in the Alps. In Austro-Hungary it is common in the 'Auen' near Vienna, and though absent from some districts is found locally throughout the greater part of the country; while it has been observed breeding in Italy, Sardinia, Sicily and Malta. The eastern limit of this race has not been exactly determined.

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[In Marocco it is common at Tetuan and Dixon described it as numerous in the province of Constantine, but König failed to meet with it there and von Erlanger omits it from his list of Tunisian birds.]

The Jackdaw is a sociable bird, and where nesting sites are available, breeds gregariously; but it is not uncommon to find single pairs breeding by themselves. Where the nest is built in a hole, the amount of material used depends upon the size of the hole. In small holes of trees I have

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seen eggs laid upon a mere handful of sheep's wool, but instances are on record where sticks have been piled up to the height of 10 or 12 feet in order to provide a foundation for the nest (See *Yarrell*, II, p. 308).

The lining consists chiefly of wool; but other materials are also used at times, such as dead leaves, straw, paper, shavings, rags, dung, fur, feathers and cow-hair. Sometimes a little clay is also found.

Nests built in the open vary in type. Some which I examined in Shropshire in 1901 were very bulky structures, built in spruce firs. The older nests were placed on the foundation of a previous year's nest and were not domed, but had a high circular wall of sticks built up round them a foot or more high. Other nests have been described (*North Staff. Field Club Report*, 1901) as 27 in. deep and 24 in. in diameter, domed with twigs (not thorns), with only one entrance. Newly built nests are much shallower and more flimsy in construction than those which have been used for two or three years.

Eggs. The usual clutch is 4 to 6 in number, but in some districts 7 eggs are not uncommon, and in dry seasons 3 are said to constitute a full clutch. They differ from those of the genus *Corvus* in their very pale greenish blue ground colour and more sparse markings. Some eggs are so finely freckled that they might almost pass for those of *Nucifraga*, while others are very boldly blotched with dark olive brown with underlying patches of ash-grey. In a few cases they have been found almost without markings. The eggs of this species (and also of *C. frugilegus*) are sometimes found smeared with clay, possibly intentionally, and occasionally the eggs are covered up with the nest lining.

Breeding Season. In England the eggs are laid from about April 20 to May 5, but from April 25 to May 1 is the best time, and when the first laying is taken a second is deposited ten days later. In Ireland the latter half of April is the usual time (Ussher). Rey gives April 16—29 as the usual date for the Halle à Saale district, and curiously enough in south Spain the laying season is if anything rather later, full clutches being found about April 26.

Measurements. British eggs appear to be slightly larger than continental. 50 Continental eggs average 33.7×25.2 mm. (Rey), 50 British eggs, 35.47×25.32 mm. Mean average (100 eggs) 34.58×25.27 mm., Max. 40.6×25.5 and 33×29.7 mm., Min. 30×22.3 mm. An abnormally long egg measures 45.7×21 mm. (Carlisle, R. H. Read). Average weight (50 eggs), 763 mg. (Rey). 4 full eggs average 12.26 g. (Foster).

Geographical Races.

a. Swedish Jackdaw, *Coloeus monedula monedula* (L.).

Local Names: Norway: *Kaje*, *Kaa*, *Ravnkate*. Sweden: *Käja*, *Kyrk-käja*, *Allika*, *Tornkråka*, *Svartfågel*.

C. monedula monedula (L.). Hartert, Vög. Pal. Fauna, p. 15.

Breeding Range: Norway and Sweden south of Trondhjem Fjord. Common in the towns and villages of south Sweden. The eastern limits of this race are not yet clearly defined.

In breeding habits and eggs it does not appear to differ from the west European form, and the few eggs examined show no departure from the western type. Number of eggs usually 5—6, less commonly 4 or 7.

Average measurements (7 eggs), 35.44×24.8 mm.

b. West European Jackdaw, *C. monedula spermologus* (Vieill.). See antea p. 13.

c. East European Jackdaw, *C. monedula collaris* (Drumm.).

Local Names: Bohemia: *Kavka*. Bulgaria: *Cavka*. Finland: *Naakka*, *Hakkinen*. Greece: *Kaliakoûnda*, *Koloios*, *Karyâ*. Russia: *Galka*.

C. monedula collaris (Drumm.). Hartert, Vög. Pal. Fauna, p. 17.

Breeding Range: European Russia (except in the extreme north), locally in Transylvania, the Balkan Peninsula. [Also the Caucasus, Armenia, Mesopotamia, N. W. Persia, Turkestan, Afghanistan and Kashmir.]

13 eggs of this race from Transylvania in Mr. F. C. Selous' collection and 8 from Turkey average 35.26×25.67 mm., Max. 39.2×26 and 36.4×27 mm., Min. 31.5×26 and 36×24.2 mm., and do not appear to differ from those of the western race. Krüper describes these birds as nesting in holes of rocks and trees, as well as under the roofs and in the scaffold holes of houses in Macedonia. Eggs 5—7 in number, laid in April; in the hills till late in May (Krüper); in Montenegro Führer took 34 sets between April 23 and May 15.

6. Magpie, *Pica pica* (L.).

Plate 3, fig. 1—10 (Germany); Pl. 41, fig. 11 (Glücksburg, von Wangelin).

Eggs: Thienemann, Fortpfl., Tab. XL, fig. 3, a—e. Hewitson, I. Ed. I, pl. LXV; II. Ed. I, pl. LI, fig. 1—2; III. Ed. I, pl. LX, fig. 3. Baedeker, Tab. 28, fig. 1. Taczanowski, Tab. XXX, fig. 1. Seebohm, Brit. Birds, pl. 16; id. Col. Fig., pl. 55. Frohawk, Br. Birds, II, pl. VI, fig. 218—221.

Nest: O. Lee, III, p. 136.

British Local Names: England: *Pie*, *Chatterpie*, *Pyet*, *Pyanet*, *Ninut*, *Nanpie*, *Madge*. Welsh: *Pioden*. Scotland: *Pyot*. Gaelic: *Pioghaid*. Ireland: *Mag*.

Foreign Names: Bohemia: *Straka*. Bosnia: *Gavran*. Denmark: *Almindelig Skade*, *Heister*. Finland: *Harakka*. France: *Pie ordinaire*, *Margot*, *Agasse*. Germany: *Elster*, *Alster*, *Ägerst*, *Schalaster*, *Langstiel*. Greece: *Karakáza*. Holland: *Ekster*, *Bonte Ekster*, *Atzel*. Hungary: *Szarka*. Italy: *Gazza*, *Cecca*, *Gazzera*. Lapland: *Reios' a-karanas*. Luxem-

burg: *Kré, Krék, Jelster*. Malta: *Ciarula baida*. Norway: *Skjere, Skjor, Skjur, Tunfugl*. Poland: *Kruk sroka, Sroka zwycajna*. Russia: *Soroka*. Sweden: *Skata, Skjura, Skära, Skamsfugel*. Sicily: *Carcarazza*.

Pica rustica (Scop.). Dresser, Birds of Europe, IV, p. 509; Newton, ed. Yarrell, II, p. 312; Saunders, Man. p. 237; Dresser, Man. of Pal. Birds. p. 417. *P. pica pica* (L.). Hartert, Vög. Pal. Fauna, p. 19.

Breeding Range: The whole of Europe with the exception of the Iberian peninsula, where it is replaced by a form intermediate between the typical and the Moorish race. [Also Asia Minor, Persia and Transcaspia.]

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Common in all the wooded districts of England and Wales, except where it has been exterminated by game preserving, as in Norfolk and Suffolk, and nesting not only in tall trees but also in thick thorny hedges, sometimes only a few feet from the ground. In Ireland it is now common and increasing, breeding in every county, though less numerous in the extreme west (Ussher). It breeds on the Aran Islands and Rathlin, nesting in the ivy on rocks where trees are absent, and also in low bushes, sometimes only two feet from the ground, on islets in the loughs. It is common in the Isle of Man, and also locally in parts of the south of Scotland, where however it appears to be decreasing or stationary in numbers. It does not breed in the Shetlands, Orkneys, Outer Hebrides or S. Kilda; is rare in Skye and north Scotland, and unknown in Iceland and the Færöes.

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In the plains of central Europe the Magpie is everywhere conspicuous, and there are few parts of the continent, except in the alpine regions of the principal mountain ranges, where it is not represented. In Scandinavia it is found commonly as far as the North Cape, enjoying a certain amount of protection and in consequence becoming very tame and familiar. Here, as in the treeless parts of Jutland, the nests are frequently built under the eaves of the houses and several have been seen in a single tree; while in the far North instances have occurred of nests being built on the ground. In European Russia Witherby records it from the Kola peninsula and Pearson from Kanin. Towards the south Krüper describes it as common in Acarnania and the plain of Parnassus, and it is generally distributed throughout Italy. In Sicily Lilford found nests in the papyrus swamps near Syracuse, but curiously enough it is not met with in Sardinia, Elba or Corsica, and Lilford did not observe it in the islands of the western Mediterranean.

Nest.

This is an elaborate piece of architecture, consisting of a strongly built foundation of sticks, with earth or turf intermingled, carefully plastered internally with a neat cup of clay or mud: while a large dome of black-thorns is built over the top of the whole, and when the cup is thoroughly dry, a lining of fibrous roots is added.* Where the usual materials are not available, as in the islands off the west coast of Ireland, the Magpie will

* On rare occasions replaced by dry grass.

make use of briar stems and hay (Ussher). In at least two instances which have come under my notice the parent birds have been dispossessed after the completion of their nest, in one case by a pair of Squirrels, and in the other by Long eared Owls. In warm springs the work of building is often commenced in February or early March, and the construction is entirely the work of the hen, the cock providing material.

The usual number is 6—7, but occasionally sets of 5 are found incubated, while clutches of 8 are not uncommon and 9 eggs are occasionally met with.* As a rule they do not show any great variation in colour. The ground colour varies from pale blue with a greenish tinge to greenish yellow and buff, generally finely spotted with olive brown, especially towards the blunt end, and showing underlying spots of pale inky violet. Some eggs show a very distinct cap or zone of brown spots, while others have been found quite devoid of markings and almost white or light bluish green in ground colour. Kricheldorff (*Zeitschr. f. Ool.* 1903, p. 10) describes erythristic varieties of the eggs both of this race and of *P. p. mauritanica* Malh.

In England eggs are generally laid from mid April to early May, April 24—May 1 being the best time in the midlands. In Ireland most birds breed in April, while in Germany eggs may be found from the second week in April, but most eggs are laid late in April or early in May, and from the latter date to June in N. Russia. Krüper took full clutches in Acarnania on April 18, and Führer in Montenegro from April 16 to May 8. The period of incubation is 18 days and the hens sit as soon as laying has begun.

100 normal eggs average 32.9×23 mm., Max. 37×25 mm., Min. 28×22.5 mm. (Rey). R. H. Read has a clutch of very large eggs, almost without markings: Max. 39.4×27.6 and 37.5×28 mm. (Somerset). An abnormal egg in Tring Museum measures 44.9×26.5 mm. (Hartert). Average weight 565 mg. A dwarf egg measures 23.9×18.7 mm. and weighs 250 mg. (Rey); another from N. Brabant is 22.4×16.2 mm. Average weight of 13 unblown eggs 10.517 g. (Foster).

As is frequently the case in species of wide distribution, eggs from the northern limit of the breeding range are distinctly larger than those from the middle and south. Thus 10 eggs from W. Bothnia (coll. Newton) average 40×24.25 mm.

Geographical Races.

a. European Magpie, *P. pica pica* (L.). See above.

b. Spanish Magpie, *P. pica melanotos* Brehm.

Local Names: Portugal: *Pega*. Spain: *Urráca*, *Marica*.

P. p. melanotos Brehm. Hartert, Vög. Pal. Fauna, p. 21.

* Hager (*II. Ornith. Jahresber. f. S.*, p. 80) mentions an instance where 10 were laid.

Eggs.

Breeding Season.

Measurements.

Breeding Range: Probably the whole of the Iberian peninsula, but possibly the birds which are found north of the Sierra Guadarrama belong to the typical race. Hartert has examined specimens from Madrid, Toledo and Portugal as well as from southern Spain.

This race (intermediate between the European and Moorish birds) is very plentiful in some districts in Spain and Portugal, but entirely absent from others. Near Aranjuez it is very common, and this is also the case in some parts of Andalucia. It frequently acts as foster parent to the Great Spotted Cuckoo.

Nest. The nests are sometimes placed at a considerable height, but are also frequently only a few feet from the ground; and have been found in thick bramble bushes. Noble says that nests in brambles are often not roofed in, and I have found several of this type in big poplars by the Tajo. One, found on May 2, 1905, was actually built in a patch of thick reeds, about 6 feet above the water!

Eggs. The clutch varies in number from 5 to 8, and the eggs are similar in appearance to those of the typical race. An abnormally coloured egg in the British Museum is pale blue with a cap of very dark sepia at the small end.

Measurements. Average of 50 eggs 33.7×23.8 mm., Max. 38.5×26 mm., Min. 29.8×23.3 and 32.5×23 mm. Average weight of 19 eggs 575 mg.

[The Moorish Magpie, *P. pica mauritanica* Malh. is the resident species in Morocco, Algeria and Tunis. Breeding Season early in May. Average of 50 eggs (König 27, Erlanger 4 and 19 in Brit. Mus. etc.) 32.8×23.27 mm., Max. 38×23.7 and 31.2×25 mm., Min. 30×23 and 31×22 mm. Average weight of 26 eggs 560 mg. (König). In appearance the eggs do not differ from those of the other race.

The eggs of the North Asiatic race, *P. pica bactriana* Bp. are considerably larger than those of the European form. According to Taczanowski they range in size from 33×23 to 38×25 and 37×25.4 mm.]

7. Azure winged Magpie, *Cyanopica cyana cooki* Bp.

Plate 41, fig. 12—15 (near Madrid).

Eggs: Thienemann, Fortpfl., Tab. XLI, fig. 8. Baedeker, Tab. 50, fig. 15. Ibis 1866, pl. X, fig. 3—8.*

Foreign Names: Portugal: *Rabilongo*, *Charneco*. Spain: *Mohino*, *Rabilargo*, *Garrula*; in Leon, *Ruipego*.

Cyanopica cooki Bp. Dresser, Birds of Europe, IV, p. 503; id. Man. Pal. Birds, p. 416. *C. cyanus cooki* Bp. Hartert, Vög. Pal. Fauna, p. 24.

* The egg of the E. Siberian form, *C. cyana cyana* (Pall.) is figured in the *J. f. O.* 1873, Tab. II, fig. 19.

Breeding Range: South and mid-Spain, but absent from the eastern provinces; Portugal south of Lisbon.

A very local species, breeding in colonies, many nests being found at a short distance from one another. In Spain it is plentiful in wooded districts in New Castile, such as the Casa del Campo near Madrid, Aranjuez, Talavera, etc., also in Estremadura and in parts of Andalucía (Coria del Rio, the Coto del Rey and locally between Sevilla and Córdoba). In Portugal Dr. Rey found it plentiful near Barreiro in Estremadura and Tait describes it as abundant in Algarve and also met with it in spring in Alemtejo.

Colonies frequently consist of 5 or 6 to 20 pairs, and the nests are built at varying heights, sometimes only 5 ft. from the ground, but more often about 15 ft. up, and occasionally as high as 30 ft. In construction they have been compared to those of the Jay and Great Grey Shrike. The foundation is made of small twigs, lichens and green moss, compacted with mud, upon which a superstructure of stalks, roots, moss and flowering plants is built, and the flattened cup is lined with goats' hair and sheep's wool.

Usually 5—6 in number, but 7 are occasionally found, and clutches of 8 and even 9 are said to have occurred in Spain. The ground colour is usually pale brownish yellow, sometimes shading into a bluish, greenish or warm reddish tone. They are sparsely marked with brownish spots with underlying flecks of violet grey.

Rey found fresh eggs in Portugal throughout the month of May; in Andalucía Noble took a full clutch on April 24, but general laying did not begin till May 4.

400 eggs measured by Rey give the following results: average 26.7 × 19.5 mm., Max. 30.2 × 22 mm., Min. 24 × 19.7 and 24.5 × 18 mm. Average weight 407 mg., varying from 260 to 500 mg.

8. Nutcracker, *Nucifraga caryocatactes* (L.).

Plate 5, fig. 1—2 (Sarajevo, 3. IV. 94), 3 (Rafus Planina, 6. IV. 98), 4—5 (Bosnia, 3. IV. 96), 6 (Palé, Bosnia, 28. III. 98).

Eggs: Thienemann, Fortpfl., Tab. XLI, fig. 4, a—c (unrecognizable). Baedeker, Tab. 50, fig. 14; Tab. 76, fig. 4. Journ. f. Ornith. 1856, Tab. I, fig. 1. Taczanowski, Tab. XXXII, fig. 1. Proc. Zool. Soc. Lond. 1867, pl. XV (Aves), fig. 2. Seebohm, Br. Birds, pl. 16; id. Col. Fig. pl. 55.

Foreign Names: Bohemia: *Sojka turecká*, *Ořesník*. Denmark: *Nöddekrige*, *Pletfugl*. Finland: *Pähkinähakkinen*. France: *Casse-noix*, *Alognier*. Germany: *Tannenhäher*, *Nusshäher*. Holland: *Notenkraker*. Hungary: *Magtörö*. Italy: *Nocciolaja*, *Gai d' montagna*, *Rompa-nòs*. Norway: *Nöddekraake*, *Blaakraake*. Poland: *Orzechówka stryżek*. Russia: *Kédrofka*. Sweden: *Nötråka*, *Nötgubbe*. Transylvania: *Havasi Mátyás*.

Nucifraga caryocatactes (L.). Dresser, Birds of Europe, IV, p. 451; Newton, ed. Yarrell, II, p. 330; Saunders, Manual, p. 233; Dresser, Man. Pal. Birds, p. 409. *N. caryocatactes caryocatactes* (L.). Hartert, Vög. Pal. Fauna, p. 25.

Breeding Range: Norway, Sweden, Gothland, Bornholm, S. W. Finland, the Russian Baltic Provinces, Poland, Germany (East Prussia, Harz, Schwarz and Böhmer Wald, probably also Thüringer Wald), Jura and the whole Alpine district, including the French, Swiss, Austrian and Italian Alps, Austro-Hungary (Lilienfeld district, Tatra, Carpathian Mts., Transylvania, Styria, Bosnia, etc.).

In Norway the Nutcracker inhabits the forests up to about lat. $64\frac{1}{2}^{\circ}$ N. but is nowhere numerous, while it has been found breeding in Sweden in Götarike and Svearika. In Bornholm nests were found in 1862—3, and in March 1864 three nests with fresh eggs were taken (*Proc. Zool. Soc.* 1867, p. 163). It occurs in S. W. Finland, and has probably bred near Åbo, while nests have also been taken at Raumo (61°) and Forssa, as well as on Åland (Wasenius). In East Prussia Hartert found nests in 1882 and 1884, and one is said to have been found in Pomerania in 1860. Schütt obtained three nests on the Kandel Berg in the Schwarz Wald and others have been taken there subsequently; while in 1868 eggs were obtained in Anhalt (Harz), where it still breeds. In Austro-Hungary a nest with young is said to have been found on the Höllgebirge in 1858, and on the Hochanger Alp eggs have been taken from 1867 onwards. Five nests were obtained in the Tyrol by Franz in 1864 and Pfanni took eggs in the highlands of Lilienfeld in 1887. Perhaps the first nest seen by any naturalist was an empty one found by Thienemann on the Riesen-Gebirge, but the bird has not been found there since. In Transylvania it is common on the higher mountain ranges, descending in autumn. Of late years large numbers of eggs have been taken in Bosnia, in the neighbourhood of Sarajevo, and according to Reiser (*Orn. Balc.* II, p. 86) it is common in the pine-forests of the Rilo planina and has been observed in the Rhodope Mountains, on the borders of Bulgaria and Rumelia. In the Alpine valleys it is generally distributed and fairly common up to the forest limit, as a rule from about 3000 to 6000 ft. in summer, but sometimes as low as 2100 ft. in some parts of Valais, and on the other hand up to 7500 ft. in the Haute Engadine (Fatio). It is also found more or less commonly in the Jura and in the Départements on the Italian and Swiss borders of France, whence the Abbé Caire obtained the first authenticated eggs in 1846. It has been observed in spring in the subalpine valleys of Piedmont, Venetia and North Lombardy and no doubt breeds there. It was formerly supposed to occur in the Pyrenees, but has not been observed by Messrs. Saunders, Backhouse, Clarke or Wallis, and proof of its breeding there is still wanting.

This is, as far as we know, almost invariably built in coniferous woods, usually at a considerable elevation but not necessarily so, as is shown by the fact that it has been found in East Prussia, Bornholm and parts of Sweden where there are no hills of any magnitude. It is commonly placed close to the trunk of a pine, fir, or larch tree at a height of about 15 to 18 ft. but sometimes as much as 30 ft. and is about 1 ft. in diameter externally, $5\frac{1}{2}$ in. in depth, with a depression of about 4 in. in diameter and $1\frac{3}{4}$ to $2\frac{1}{2}$ in. in depth. The foundation is formed of sticks and twigs from various trees (larch, birch, spruce, bird-cherry etc.) recently plucked, mixed with moss, leaves and lichens, and occasionally earth or rotten wood is found underneath the lining, which consists of a thick layer of dry grass stalks, and hair-like lichens (*Usnea barbata*) with one or two feathers from the sitting bird. Nest.

These are usually 3 or 4 in number, and in many districts 3 is the normal clutch; but instances are on record of 2 eggs having been found much incubated, and several sets of 5 are said to have been taken in the Jura. In colour they are a very pale bluish green, sometimes almost white, finely but generally speckled with olive brown and grey spots. In some eggs the markings are chiefly confined to the blunt end, but do not show any tendency to form a zone or cap, while occasionally they are almost absent. The only eggs with which they can be confused are pale, finely spotted Jackdaw's eggs, but in these the colour of the spots is always darker than in those of the Nutcracker, and the ground colour is more bluish in tint. The shell is fine grained with but little gloss. Eggs.

This is remarkably early, and in conjunction with the retiring habits of the bird at the nesting season, accounts in great measure for the uncertainty which so long prevailed as to the eggs and breeding habits of this bird. In Bornholm young birds were found on April 9, 1863 and fresh eggs on March 23, 1864, but not till April 10 (incubated) in the following year; while in E. Prussia Hartert found half-fledged young on April 19, and nearly fresh eggs on Mar. 21. A clutch from Finland is dated April 27. Eggs from the Schwarzwald were taken Mar. 12—29. In Switzerland the time varies from Mar. 10 to Apr. 15, but generally about Mar. 20, while clutches from Austro-Hungary have been taken between Mar. 20 (5 days incubated) and April 18, and in Bosnia from Mar. 21 to April 30. Breeding Season.

The period of incubation is stated to be 18 days, and the sitting hen frequently does not leave the nest until the tree is struck. The eggs are laid at intervals, according to Schütt, of three days.

Average measurements of 100 eggs (23 by Bau, 16 Johnson, 11 Rey, and 50 by the author) 33.95×25.03 mm., Max. 37.5×24.7 and 33×26 mm., Min. 30.3×24.6 and 34×21.5 mm. Average weight 590 mg. (Rey), Measurements.

varying from 530 to 700 mg. Unblown eggs according to Vogel weigh from 8.5 to 11.5 g., while Schütt gives 10.27 to 11.15 g. as the weight.

Geographical Races.

a. Thick-billed Nutcracker, *N. caryocatactes caryocatactes* (L.) See antea, p. 21.

b. Thin-billed Nutcracker, *N. caryocatactes macrorhynchos* Brehm.

N. caryocatactes macrorhynchos Brehm. Hartert, Vög. Pal. Fauna, p. 26.

Breeding Range: Siberia, except Kamtschatka, where it is replaced by *N. c. kamchatkensis* Barrett-Ham. This form, which is resident in the forest country east of the Urals, is the bird which periodically occurs on autumn and winter on migration, both on the continent and in the British Isles. In breeding habits it probably does not differ from the western race, but nothing is definitely known on the subject. Seebohm's statement that it retires into the forests in June for breeding purposes has been shown to be erroneous, as some of the birds that he secured were birds of the year.

9b. British Jay, *Garrulus glandarius rufitergum* Hart.

Eggs: Hewitson, I. Ed. I, pl. CXII, fig. 2; II. Ed. I, pl. LI, fig. 3; III. Ed. I, pl. LX, fig. 1. Seebohm, Brit. Birds, pl. 16; id. Col. Fig., pl. 55. Frohawk, Br. Birds, pl. VI, fig. 216—217. [The eggs figured are most probably those of this race, which are however indistinguishable from eggs of typical *G. glandarius* L.]

Nest: O. Lee, IV, p. 78.

British Local Names: England: *Jay-pie*, *Jay-pyot*, *Jay bird*. Welsh: *Screch-y-coed*.

Garrulus glandarius (L.). Dresser, Birds of Europe, IV, p. 481; Newton, ed. Yarrell, II, p. 323; Saunders, Manual, p. 235; Dresser, Man. Pal. Birds, p. 411 [partim]. *G. glandarius rufitergum* Hart. Hartert, Vög. Pal. Fauna, p. 30.

Breeding Range: Great Britain and Ireland.

This handsome bird is generally distributed throughout all the wooded districts of England and Wales: its silent and skulking habits during the breeding season enabling it to hold its own even in those counties where game preservation is extensively carried on. From treeless districts, such as west Cornwall, and moorlands it is naturally absent, and is not found on the Isle of Man. In Ireland Ussher records it as breeding in Leinster and the adjoining part of Munster (i. e. the basins of the Rivers Suir, Nore and Barrow), while in other parts of Ireland it is either an irregular visitor or altogether unknown. In Scotland it is found in wooded

districts on the southern slopes of the Grampians from Dumbarton to Forfar, and occurs in suitable localities south of this line, but to the north and west it is decidedly rare and has only been recorded from a few localities as a resident, such as Glengarry, Inverness, Benderloch, west Kintyre, etc. Unlike the Rook and the Starling, it does not appear to be extending its range, but rather to be stationary or even decreasing in numbers in the north. In the Hebrides and northern islands it is unknown.

The sites used for this purpose vary considerably. Perhaps the most usual situation is among the thick foliage of undergrowth in woods, such as hazel, blackthorn, holly or evergreens, as a rule not more than 20 ft. from the ground and frequently half that height, or even less. Another favourite site is among the outgrowth which sprouts where a bough has been sawn off. The leafy lower boughs of oak trees are also sometimes chosen, as are also plantations of thick young spruce, and in Derbyshire I have seen two or three nests in tall larches or Scotch firs, within a yard or two of the top, and not less than 60 ft. from the ground. An even more remarkable site is recorded in the *Zoologist* for 1863, p. 8720, where a nest was found within a foot of the ground in tall ling, on Witley Common, Surrey. The foundation of the nest consists of sticks and twigs, with sometimes a little earth, while the cup is neatly and thickly lined with fine roots and occasionally dry grasses. Horsehair is also said to be occasionally found in the lining. The nest distinctly recalls that of the Bullfinch, but of course is built on a much larger scale.

Usually 5 or 6 in number, but 4 are not uncommon, and 3 young have been found in a nest, while clutches of 7 are occasionally found. The ground colour is generally pale sage green or olive buff, finely mottled with rather darker markings of olive or liver brown, which sometimes tend to form a zone at the big end; while a hair line or streak of very dark brown (almost black) is often present at the same end. Some eggs show a strong tendency to the rufous type of colouring found in other species of *Corvidae*, and others are almost devoid of markings and show only the bluish green ground.

Rather variable, but usually in the south of England between April 25 and May 20, and about a week later in the north-midland counties.

The period of incubation is said to be 16 days, and the sitting bird often does not leave the nest until almost touched.

Average of 100 eggs from England 31.73×22.85 mm., Max. 34.3×24 and 34×24.6 mm., Min. 28.2×22 and 32.1×21.1 mm. Average weight of 6 eggs 562 mg. English eggs appear to be slightly longer and not so rounded in form as continental specimens, but the eggs of all the races of *G. glandarius* are practically indistinguishable.

Geographical Races.

a. Continental Jay, *G. glandarius glandarius* (L.).

Plate 7, fig. 1 and 3—6 (Germany), 2 (Switzerland).

Eggs: Thienemann, Fortpfl., Tab. XLI, fig. 6, a—f. Baedeker, Tab. 50, fig. 17. Taczanowski, Tab. XXXI, fig. 2.

Foreign Names: Bohemia: *Sojka*. Denmark: *Skovskade*. Finland: *Närhi*. France: *Geai ordinaire*, *Zé*. Germany: *Häher*, *Eichelhäher*, *Nusshäher*, *Hägert*, *Markolf*. Helgoland: *Häüger*. Holland: *Vlaamsche Gaai*, *Meerkolf*. Hungary: *Szajkó*. Italy: *Ghiandaja*, *Berta*, *Gagia*. Norway: *Skovskrika*. Poland: *Sójka polska*. Russia; *Soika*. Sweden: *Nötskrika*, *Ällonskrika*, *Kornskrika*, *Skogskata*.

G. glandarius (L.). Dresser, l. c. [partim]. *G. glandarius glandarius* (L.). Hartert, Vög. Pal. Fauna, p. 29.

Breeding Range: The whole of Europe with the exception of the British Isles, the Iberian peninsula (where it is replaced by *G. g. fasciatus* A. E. Brehm), south-eastern Russia (*G. g. caspius* Seeb.) and the eastern part of the Balkan peninsula (*G. g. krynicki* Kal.), while other forms inhabit Sardinia and Cyprus.

Wherever woods and plantations occur the Jay is usually found throughout the great European plain. It appears to be absent from Bornholm, and has not been recorded from the Scandinavian forests north of the Arctic circle, but in Russia Göbel mentions it in his list from north-west Russian Lapland, and Wolley obtained one at Muunioniska in autumn, while it is found throughout Finland. In the higher Alpine forests it is replaced by the Nutcracker, though plentiful in the lower valleys of Switzerland. The exact range of the typical race and of *G. g. krynicki* in the Balkan peninsula is as yet undetermined, but Krüper records *glandarius* as resident throughout Greece and common on Olympus, and it is the resident form in Montenegro, the greater part of Bulgaria and is the only form found in the Dobrudscha.

Nest. In nesting habits this race closely resembles that already described, but Kleinschmidt mentions an instance of a nest having been found built on the ground in the side of a hollow way, and von Wangelin records another on a heap of brushwood, scarcely a yard from the ground. A nest is also said to have been found in a hole of a tree (*Journ. f. Ornith.* 1861, p. 470).

Eggs. Usually the number of eggs in the same as that of *G. g. rufitergum*. (According to Kleinschmidt exceptional cases have occurred of 8, 9 and even 10 eggs being found.)

Breeding Season. In Greece the end of April or the beginning of May (Krüper); in Switzerland in April or May, while Rey found clutches in Germany from

the end of April to the end of May, and second layings of 4 eggs to the end of June.

Average of 100 eggs 31.6×23 mm., Max. 36×24.5 and 32.3×25 mm., Min. 29×21 mm. Average weight 566 mg. A dwarf egg measures 21.8×17.2 mm and weighs 350 mg. (Rey). Measurements.

b. British Jay, *G. glandarius rufitergum* Hart. See p. 24.

e. Spanish Jay, *G. glandarius fasciatus* A. E. Brehm.

Local Names: Portugal: *Gaio*. Spain: *Arrendájo*.

G. glandarius kleinschmidti Hart. Hartert, Vög. Pal. Fauna, p. 30.

Breeding Range: The Iberian peninsula.

Irby describes this form as very plentiful in the cork wood of Almoraima and in the valleys and hill sides, up to a considerable height, though rather local. It also breeds freely near Granada (Saunders). Jays are also found in small numbers in S. Portugal, and are abundant in wooded parts of northern Spain and Portugal. Near Gibraltar the eggs are laid early in May (Irby).

d. Sardinian Jay, *G. glandarius ichnusae* Kleinschm.

G. glandarius ichnusae Kleinschm. Hartert, Vög. Pal. Fauna, p. 30.

Breeding Range: Sardinia, also Corsica and probably other islands.

Brooke found this race very numerous in the forests on the mountains of Sardinia, and Whitehead describes Jays as fairly common in Corsica. 6 Eggs taken there average 30.2×22.6 mm. and are light in colour.

e. Cyprian Jay, *G. glandarius glasznerei* Mad.

G. glandarius glasznerei Mad. Hartert, Vög. Pal. Fauna, p. 31.

Breeding Range: Cyprus.

Guillemard met with this bird in pine woods near Kikko (in the extreme west of the island), and also on Troödos (6600 ft.), where Glaszner also found it very common.

f. Caspian Jay, *G. glandarius caspius* Seeb.

G. glandarius caspius Seeb. Hartert, Vög. Pal. Fauna, p. 31.

Breeding Range: The steppes of south-east Russia from Lenkoran to the Caspian Sea.

An egg from Lenkoran, taken on May 6 measures 32×22.6 mm.

g. Black headed Jay, *G. glandarius krynicki* Kalen.

G. krynicki Kal. Dresser, Birds of Europe, IV, p. 495; Man. Pal. Birds, p. 414. *G. glandarius krynicki* Kal. Hartert, Vög. Pal. Fauna, p. 32.

Breeding Range: East European Turkey. [Also Asia Minor and the Caucasus.]

Robson found nests in the forest of Belgrade, near Constantinople, and in Asia Minor it is not uncommon locally, both in the plains and in the hills, nesting in the olive and pomegranate woods (Krüper). The breeding season begins early in May, and full clutches have been taken near Smyrna from May 8 to early in June. The number of eggs varies from 4 to 7. They are rather dark coloured, and 42 eggs average 30×23.07 mm., Max. 33×24 and 30.2×24.5 mm., Min. 26×22 mm.

[In north Africa three forms of Jay are found: *G. glandarius minor* Verr. (*G. oenops* Whit.) from parts of the Moroccan Atlas and south Algeria; *G. glandarius whitakeri* Hart. from north Morocco, Tangier, etc., and *G. glandarius cervicalis* Bp. from the cork-oak woods of north Algeria. Eggs of the last named race are figured in the *J. f. O.* 1896, Taf. VI, fig. 5. Average of 12 eggs (König 3 and 9 by the author) 31.8×22.9 mm., Max. 33.5×23.5 and 32.5×24 mm., Min. 30×22 mm. Two eggs weighed 480 and 550 mg. (König). Breeding season, early May.

In western Asia besides *G. g. krynicki*, another race, *G. g. atricapillus* Geoff. is found in Palestine and Syria. Tristram describes it as common in olive groves from Lebanon to Hebron and in the forests of Gilead and Bashan. It is an early breeder, and young were found hatched in April. An egg from Tyre measures 32×22.6 mm. East of the Urals, *G. g. brandtii* Eversm. is the resident form. An egg taken on May 11 measures 30.5×22.4 mm.

10. Siberian Jay, *Perisoreus infaustus* (L.).

Plate 7, fig. 7, 8, 10, 12 (Muonio, 15. IV. 89), 9, 11 (Lapland), 13 (Lapland, 19. VI. 89).

Eggs: Baedeker, Tab. 77, fig. 5. Bree, Birds of Europe, Ed. I, I, pl. Ootheca Wolleyana, Tab. XIII, fig. 1—16.

Foreign Names: Bohemia: *Sojka zlověstna*. Denmark: *Lavskrige*. Finland: *Kuusanka*, *Kuukkehi*, *Kulkainen*, *Hephorakka*, *Kuuskilainen*. Germany: *Unglückshäher*, *Rotschwanzhäher*, *sibirischer Häher*. Hungary: *Északi szajkó*. Lapland: *Kuossak*, *Kuoska*. Norway: *Gjertrudsfugl*, *Ulykkesfugl*, *Lavskrike*, *Rofuhre*. Poland: *Sójka zlowroga*. Russia: *Rousta*. Sweden: *Lafskrika*, *Telltjuxa*, *Rodtjuxa*.

Perisoreus infaustus (L.). Dresser, Birds of Europe, IV, p. 471; Man. of Pal. Birds, p. 410. Hartert, Vög. Pal. Fauna, p. 34.

Breeding Range: Scandinavia, the Baltic provinces and north of Russia.

In Norway this birds breeds commonly in East Finmark up to the limit of the pine region, and more sparingly in the Tromsö and Trondhjem

Amter, while according to Collett it has also been found as far south as Kristiania and south Telemark ($59\frac{1}{2}^{\circ}$ N. lat.). In Sweden Hennicke has recorded it in August from Stöllet in Wernmland (south of $60\frac{1}{2}^{\circ}$ N. lat.), but it is absent from Gotarike, though distributed over the country N. of Lat. 60° — 61° . In Lapland it is found wherever conifers exist, and in Finland is most numerous on the eastern border (Sandman). In the forests of eastern Esthonia and Livonia it is also a resident, and is common in the Kola peninsula. [East of the Urals it is replaced by *P. infaustus sibericus* (Bodd.).]

Like those of the Nutcracker, the eggs of this species were unknown to science half a century ago, and for the same reasons. Many interesting details as to its nidification may be found in *Ootheca wolleyana*, part II, p. 478. Most of Wolley's nests were found in Scotch firs and spruce, and were as a rule placed about 12 ft. from the ground, though sometimes as low as 7 ft., or as high as 20 ft. The nest is constructed of bleached sticks, sometimes covered with black lichens, but mostly without bark, then lighter coloured lichens and a thick layer of feathers,* lichens (*Usnea barbata*, *Everina sarmentosa*, *Parmelia saxatilis*, etc.) reindeer hair, hare's down, spider's nests, leaves and portions of wasps' nests, as well as the down of *Eriophorum*, grass stalks, moss and bits of bark. Dimensions: diameter 5.5 to 8 in., depth 2.75 to 4.75 in., diameter of cup 2.35 to 3.4 in., depth of cup 1.6 to 2 in. (Collett and Benzon). Nest.

The nest is sometimes very conspicuous, but is often placed in a thick, bushy tree, and is easily overlooked on account of the vast extent of the forests and the silent and retiring habits of the bird during the nesting season. It is usually built close to the stem and often on the outskirts of a wood or close to a track.

Three or four in number, but occasionally five have been found. Eggs.

These are somewhat variable both in ground colour and in distribution of markings. The ground colour varies from dirty white to pale greenish, but some eggs have a decidedly warmer tint. The surface spots are of dark or light yellowish brown, sometimes evenly distributed, but more often congregated at the big end, sometimes forming a zone or cap. Occasionally they are found chiefly at the small end. The underlying blotches are violet grey in colour.

The nest is built early in the year, when snow is deep on the ground and the cold very severe, and most eggs appear to be laid in Lapland towards the end of April, but full clutches may be obtained from April 6 onward to about May 10. Perhaps April 24 may be taken as the average date. In mid-Sweden fledged young have been met with on May 20, and Breeding Season.

* Chiefly from the Willow Grouse, Capercaillie and Lapp Owl.

Middendorff found naked young of the Siberian form, *P. infaustus sibericus* (Bodd.), on April 16, so that the eggs must have been laid at the end of March. Incubation begins as soon as the first egg is laid, and the bird sits so closely that she is frequently lifted from the eggs by the Lapps. The young leave the nest at the end of May or early in June. There is some evidence that a second brood is occasionally reared, and Printz found small young on July 15.

Measure-
ments.

Average size of 100 eggs (42 Rey, 34 Jourdain and 24 Sandman) 30.04×21.84 mm., Max. 34×21.6 and 30.6×23.6 mm., Min. 27×26 mm. Average weight (42 eggs) 400 mg. (Rey); of 16 eggs, 381.5 mg., varying from 350 to 440 mg. (Westerlund).

11. Chough, *Pyrrhocorax pyrrhocorax* (L.).

Plate 2, fig. 8—11 (Granada, 1. V. 1894); Plate 26, fig. 2 (Galway, 21. V. 92), fig. 3 (Waterford, 21. V. 83).

Eggs: Thienemann, Fortpfl., Tab. XLI, fig. 3. Hewitson, I. Ed. I, pl. CXII; II. Ed. I, pl. XLVII, fig. 2; III. Ed. I, pl. LVI. Baedeker, Tab. 28, fig. 2. Seebohm, Br. Birds, pl. 16; id. Col. Fig., pl. 55. Frohawk, Br. Birds, pl. VI, fig. 214—215.

British Local Names: England: *Cornish Chough* or *Daw*, *Red-legged Crow* or *Chough*, *Cornwall Kae*, *Market-jew Crow*, *Chauk Daw*. Cornish: *Palores*. Welsh: *Bran big coch*. Manx: *Caag*. Ireland: *Red legged Jackdaw* (North), *Cliff Daw* (South). Erse: *Cawg*, *Cawdhoge*. Scotland: *St. Columba's Bird* (Iona). Gaelic: *Caag*.

Foreign Names: Bohemia: *Kavče švatlavé*. France: *Crave ordinaire*, *Choucas rouge*, *Corneille royale* or *imperiale*. Germany: *Steinkrähne*, *Alpenkrähne*. Hungary: *Havasi Hollo*. Italy: *Gracchio corallino*, *Coracia di montagna*, *Gracco*, *Taccola del bech ross*. Poland: *Wrónczyk czerwodzioby*, *Tyz*. Portugal: *Gralha di bico vermelho*. Russia: *Kluschitza*, *Bortevschik*. Spain: *Graja*, *Chova*, *Jucala*, *Gralla de bech vermell*. Tyrol: *Cornagia del piz cotocteu*.

P. graculus L. Dresser, Birds of Europe, IV, p. 437; Newton, ed. Yarrell, II, p. 252; Saunders, Man., p. 231; Dresser, Man. Pal. Birds, p. 405. *P. pyrrhocorax* (L.). Hartert, Vög. Pal. Fauna, p. 35.

Breeding Range; On the islands in the Mediterranean, and parts of Spain, Portugal, Brittany, the Channel Isles, S. W. England, Wales, W. Scotland, Ireland, the principal mountain ranges of Europe (Alps, Pyrenees, Apennines, Caucasus, etc.), Italy and the Balkan peninsula. [Also N. Africa, and Asia from Asia Minor to E. Siberia.]

British
Isles.

In England and Wales there has been a marked diminution in the numbers of this species of late years, and many well-known breeding haunts are now deserted. The only part of England where it still breeds is the

rocky coast of Devon and Cornwall, while perhaps a few pairs still exist in Dorset. On Lundy it is now scarce, though formerly plentiful, but is not found on the Scillies. Along the Welsh coast scattered pairs nest in the sea cliffs, or occasionally in a quarry close to the sea. It still survives in the Isle of Man, but in nothing like the numbers of former years. At the present time the chief strongholds of this species are the west coast of Ireland and some of the Scottish Islands. Ussher describes it as breeding in Antrim, Donegal, Down (rare), Leitrim (?), Sligo (rare), Mayo, Galway, Clare, Kerry, Cork and Waterford, usually on the coast and adjacent islands, but sometimes also on mountain ranges inland. In Scotland it is local, but in certain localities common, on Islay, Jura, Gigha and other islands, of the Inner Hebrides as far as Skye. Possibly a few pairs may still nest on the western mainland, but on the Outer Hebrides it is unknown.

In France the Chough breeds locally on the coast of Brittany, and is not uncommon on Sark. Rey found a colony of 40 to 50 pairs nesting in the face of a precipice in Portugal, and it is plentiful locally in the Pyrenees, though less numerous than *P. graculus* (L.), and is also found in Navarre, in the Cantabrian Mountains and in considerable numbers in the Sierras of the south (Sierra Nevada, S. de Ubrique, etc.). In Corsica and Sardinia its haunts are the mountain ranges, but in Sicily it breeds in the sea cliffs: it is found also in the Basses-Alpes, and in pairs or small colonies in the Alps of Ticino, Valais, Vaud, Berne, Uri, Glarus, Appenzell. Grisons and the Engadine (Fatio), and on the Italian side in Piedmont and Lombardy as well as in the Apennines. Further north it has occurred rarely in the Vosges, and in the mountain ranges of Bavaria, as well as in Styria, Carinthia, and the Tyrol. Records from the Bukowina require confirmation. In the Balkan peninsula it appears to be confined to the southern part (Pindus range, Parnassus, etc.), but is a resident on Crete (Mt. Ida) though absent from Cyprus. Eastward it has been recorded from the Caucasus in large colonies, and the southern Urals. [In the Canaries it is confined to Palma, and has not been recorded from Palestine.]

The Con-
tinent.

In some parts of its range, such as the British Isles, Portugal, Sicily, etc., the nest is usually placed in a cave or crevice of cliff along the sea coast, or else in a quarry within sight of the sea. In other districts, such as Sardinia, Greece and the great mountain ranges of Europe, it is found in gorges and lofty ranges of cliff, often at a considerable altitude and far inland. Fatio says that in Switzerland church towers and walls of old castles are also utilized for nesting purposes. On the west coast of Ireland a favourite spot is a crevice in the roof of a sea cave, often quite inaccessible. The nest is usually large and somewhat like that of the Jackdaw in construction. The foundation consists of sticks, furze stems and heather stalks, sometimes only withered plants, roots and a little grass or

Nest.

moss, warmly and neatly lined with wool, or cow and goat hair. Approximate diameter of nest 10 in., the height depending on the size of the crevice or shelf. The same site is occupied year after year, and a second clutch is sometimes deposited in the same nest after the first has been taken. Ussher mentions an instance of a breeding place occupied for over 40 years consecutively.

Eggs. Usually 4—5, but 3 are not uncommon, and Ussher records instances of 2 only, while 6 have been known to occur. The Chough is single brooded, but second and third layings are deposited when the first clutches are taken. Incubation appears to begin after the laying of the first egg, and as the eggs in a clutch are often in different stages of development, it is probable that they are not always laid on consecutive days. The yolk is of an extraordinarily deep, rich, red colour.

The ground colour varies from creamy white (rare) to very pale yellowish green and pale brownish yellow, while some eggs have a bluish cast. The underlying blotches and spots are pale lilac, while the surface markings vary from sepia to reddish brown, but are most frequently yellowish brown, and vary much in depth of colour. The character of the markings is very variable: sometimes a few bold blotches and spots, sometimes numerous fine speckles, at one time evenly distributed over the surface, at another forming a distinct zone or cap, generally at the big end. About 10 per cent, show traces of a black streak at the blunt end. The shell is somewhat glossy with numerous minute projections and occasionally small lumps of calcareous matter are found on the surface.

**Breeding
Season.**

The earliest Irish date for a full clutch is April 10, but most eggs are laid there in the last week of April and May 1—8. On the Cornish and Welsh coasts the breeding time is perhaps rather later — earliest date April 19 — and most eggs in the first fortnight of May. In the Alps eggs are found from the end of April onward, but in south Spain clutches may be obtained at the beginning of April, and on Palma in the last week of March, and probably about the same time in Greece.

**Measure-
ments.**

Average of 100 eggs from Cornwall and Ireland 39.46×27.94 mm., Max. 42.6×29 and 41×29.5 mm., Min. 34×26 and 36.9×24.6 mm. Spanish eggs appear to be larger and perhaps warmer in colour. Average of 19 eggs (9 by E. Rey and 10 by author) 41.05×28.26 mm., Max. 44.1×28.5 and 42.1×29.5 mm., Min. 36.5×27.8 and 40×21.1 mm. Average weight of 45 Irish eggs 994 mg., but 9 Spanish eggs average 1.020 g., varying from 0.910 to 1.150 g. (Rey).

12. Alpine Chough, *Pyrrhocorax graculus* (L.).

Plate 4, fig. 8 (Pyrenees), 9—11 (Parnassus).

Eggs: Thienemann, Fortpfl., Tab. XLI, fig. 2, a—d. Baedeker, Tab. 28, fig. 3. Seebohm, Brit. Birds, pl. 16; id. Col. Fig., pl. 55.

Foreign Names: Bohemia: *Kavče podhorní*. Croatia: *Čolica, Čapka*. France: *Choquard, Choucas des Alpes*. Germany: *Alpendohle*. Hungary: *Havasi csóka*. Italy: *Gracchio*. Poland: *Wronczyk żółtodzioby, Tyz*. Russia: *Kluschiza*. Spain: *Gralla de bech groch, Graja, Grajilla*.

Pyrrhocorax alpinus Vieill. Dresser, Birds of Europe, IV, p. 445; id. Man. Pal. Birds, p. 406. *P. graculus* (L.). Hartert, Vög. Pal. Fauna, p. 36.

Breeding Range: Mountain ranges in Spain and Portugal, Pyrenees, Alps, Apennines, Balkan peninsula and Caucasus. [In Asia, Palestine and Asia Minor to the Himalayas.]

In the Iberian peninsula the Alpine Chough is not uncommon locally in the higher mountain ranges, such as the Sierra Nevada, S. de Grédos, etc., and has been recorded from Portugal (Rey), breeding as a rule at a greater elevation than its congener. Colonies are also to be met with at various points in the Pyrenees, sometimes together with *P. pyrrhocorax* (L.) as in the gorges of Corsavi, but usually higher. It is met with on both the French and Spanish sides and is much the commoner species of the two. A colony exists on the Brèche de Roland at a height of 9500 ft. (Wallis). In the Alpine region it is generally distributed throughout the Alps proper, between the forest limit and the snow line, but is absent from the Jura, and occurs in small numbers in the adjacent mountain districts of France, S. Germany, Austria and Italy. In the last named country its range extends southward to the Apuan Alps and the northern Apennines. Whitehead saw large flocks in Corsica, but it appears to be absent from Sicily* and Sardinia. In Austro-Hungary it is found in the Tatra Mts. (Wodzicki and Scherfel), on the Rax-Alpe (Lower Austria) and locally in the Tyrol, southward to the Dinaric Alps. Along the mountain ranges of Bosnia, Montenegro, Servia and western Bulgaria (Rilo and Stara-Planina) it is generally distributed and in many districts plentiful, and probably further research will prove that it is present on all the principal ranges of the peninsula. In Greece it is resident in all the mountains and is very numerous on Parnassus, the Taygetos Mts., etc., and it has been observed in Albania. Bogdanow records it from the Caucasus and Sabanaeff from the Urals.

Usually built in some natural hole or fissure in the vast precipices Nest. or gorges, which abound in the great mountain systems, and therefore difficult of access even where the birds are plentiful. Unlike the Red-billed Chough, this species is not littoral in its habits during the breeding season

* But see Whitaker, *Birds of Tunisia*, II, p. 8.

at any part of its range. The foundation of the nest consists of dead sticks, upon which is a superstructure of fir twigs, heather, dry roots, grass, etc., the interior lining consisting in some cases of dry grass, in others of hair and wool, with a few feathers of the bird. Diameter of nest about 11 in., of cup 6 in.

Eggs.

In Spain, the Alps and the Balkan peninsula the number of eggs is 4 or 5, but Neweklowsky and Reiser found 3 the maximum on the Ötscherhöhlen, while broods of 2 only were common. The ground colour varies as in the case of *P. pyrrhonorax* (L.), and the markings are also similar in character and equally variable. The brown markings however are never quite so rufous as in some varieties of Chough's eggs, and there appears to be less tendency to form a zone at the big end, while some eggs are almost devoid of surface markings, and only show a few violet-grey underlying blotches on a whitish ground. A black streak is also sometimes but rarely present.

Breeding Season.

Reliable data as to the breeding season are rather scanty. In Spain eggs have been taken in May; in Switzerland from the end of April to mid-June (Fatio), while the young leave the nest by the end of June. On the Ötscherhöhlen Reiser gives May 11 as the average date, but some (probably older) birds have eggs by the end of April, while a nest on the Balkans contained young a few days old on June 5. In Greece the breeding season is perhaps earlier. Krüper surmised that the laying time was the beginning of April or even the end of March, but fresh clutches have been taken on Parnassus as late as May 20.

Measurements.

Average of 45 eggs (28 by the author, 8 by Rey, 5 by Reiser and 4 by König-Warthausen) 38.29×26.44 mm., Max. 41.8×26.4 and 38×28.5 mm., Min. 34.3×25.3 and 39.5×21.5 mm. Average weight of 8 eggs 847 mg., varying from 650 to 960 mg. (Rey).

STURNIDAE.

13. Common Starling, *Sturnus vulgaris* L.

Eggs: Thienemann, Fortpfl., Tab. XXXVIII, fig. 1, a—b. Hewitson, I. Ed. I, pl. IX; II. Ed. I, pl. XLVII, fig. 1; III. Ed. I, pl. LV, fig. 1. Baedeker, Tab. 50, fig. 12. Taczanowski, Tab. XXXIII, fig. 2. Seebohm, Brit. Birds, pl. 11; id. Col. Fig., pl. 54. Frohawk, Br. Birds, II, pl. VI, fig. 210—213.

British Local Names: England: *Stare*, *Shepster* or *Sheepstare*, *Starnel*, *Gyp*; *Brown Starling* (juv.). Welsh: *Drudwy*. Scotland: *Stirlin'*. Shetland: *Starn*. Erse: *Dridh* or *Drid-yogue*.

Foreign Names: Bohemia: *Spáček*. Denmark: *Staer, Star*. Finland: *Mustakottarainen*. France: *Etourneau*. Germany: *Gemeiner Star* or *Sprehe*. Holland: *Spreeuw*. Helgoland: *Spriën*. Hungary: *Seregély*. Italy: *Storno*. Norway: *Staer, Star*. Poland: *Szpak skorzec*. Portugal: *Estorninho*. Russia: *Skvoretz*. Sweden: *Star, Starr, Staer*. Spain: *Estornino*.

Sturnus vulgaris L. Newton, ed. Yarrell, II, p. 228; Dresser, Birds of Europe, IV, p. 405; Saunders, Manual, p. 227; Dresser, Man. Pal. Birds, p. 399. *S. vulgaris vulgaris* L. Hartert, Vög. Pal. Fauna, p. 41.

Breeding Range: Europe from the North Cape, but absent from Lapland, northern Sweden, E. Finland and the Archangel Government; and replaced by other forms in the Iberian and Balkan peninsulas and S. Russia.

Here the Starling is a resident, and not a bird of passage as on the greater part of the Continent. It is now generally distributed throughout England and Wales, except on the bare moorlands and mountain tops, and in some parts is extraordinarily plentiful. In Northumberland, Cumberland, Wales and Cornwall it was formerly only a winter visitor, but within the last 40 years has become established as a breeding species. The history of its distribution in Scotland is remarkable. It appears to have been a resident in the Shetlands and Orkneys for a century or more; in the Outer Hebrides it was abundant in 1841, and in St. Kilda in 1830. The mainland appears to have been gradually colonized by migratory waves from two distinct sources; firstly from the northern isles in a S. W. direction, and secondly from the south (See *Annals of Scott. Nat. Hist.* 1895, p. 2 and 92). In the Isle of Man it is common, and in Ireland it now breeds in every county, though still scarce in summer in Donegal, Kerry, W. Cork, Waterford and Wexford (Ussher).

British
Isles.

In Norway this species has increased its range northward of late years and was observed at Vardö by Pearson in 1903, but as yet is only thinly distributed in the extreme north, and is still absent from northern Sweden. Göbel also records it from N. W. Russian Lapland, but it is not known in N. E. Finland, though v. Wright says it occurs near Uleåborg. In the Archangel Government it was not observed at Archangel by Harvie-Brown or on the Petschora by Seebohm, and is still rare north of lat. 60° to 64°. Over the rest of Europe it is generally distributed except in certain districts, such as Montenegro, while in S. Russia and the Balkan peninsula it is replaced by *S. v. purpurascens* Gould, *S. v. caucasicus* Lor., *S. v. tauricus* But., etc. On the other hand it is found throughout Italy, with the exception of Calabria; but in Sicily and Sardinia its place is taken by *S. unicolor* Temm., and it is only known as a winter visitor to Corsica and the Iberian peninsula.

Con-
tinental
Europe.

The nesting sites of this species are very varied. Where there is plenty of old timber, a hole in a tree is perhaps the most favoured spot,

Nest.

but great numbers of nests are built in holes of walls or buildings, under eaves and in chimneys, while on rocky coasts or where cliffs are met with, a natural crevice or hole in the rock is often utilized. Thus in the Hebrides the Starling nests in the sea-caves in common with the Shag and the Rock Dove, quite independently of man. On the other hand in cultivated districts the nests are generally either in, or close to, dwelling houses; and should a slate come off the roof or the spouting be left uncovered, a starling is sure to take advantage of the vacancy. Nesting boxes are readily adopted, and in Jutland I have seen wooden cases affixed to the walls, divided into compartments capable of accomodating 100 pairs, which appeared to be well patronized. An unfortunate feature in the character of this species is the readiness with which it ejects other interesting birds, such as the Green and Great Spotted Woodpeckers, and the Swift, from their nesting holes and takes possession of them. Among the more unusual sites used for breeding purposes may be mentioned: old Sandmartins' holes, in thick ivy against walls or trees, against the side of a haystack, in holes in the ground (St. Kilda) and among stone heaps or boulders on the beach (Shetlands), in old Magpies' and Wood Pigeons' nests, occasionally in open nests among the branches of thick trees, both in England (see Yarrell, II, p. 232; *Zool.* 1837, p. 347, 1899, p. 370) and Denmark, in rabbit warrens (Anglesea), etc. The nest itself is a carelessly built structure, varying in size according to the situation and composed chiefly of straw, with occasionally a few dead leaves, dry grass and moss, and a scanty lining of feathers, or wool and hair. Some birds have been observed to decorate their nests with blossoms of flowers, green leaves, etc.

Eggs.

The clutch varies from 4 to 7, but on several occasions I have met with 8 eggs in a nest, which there is every reason to believe were the produce of one hen. The somewhat glossy pale blue, sometimes white or almost white, eggs are familiar to all. Occasionally an egg shows traces of reddish brown spots.

In the British Isles the vast majority of birds rear only a single brood, but occasionally a second is hatched off. It has however been asserted that this is not really the case, and that what appear to be second broods are in reality only the late hatches of those birds which have hitherto failed to find nesting holes. (See the *Naturalist* 1889, p. 112, 366, etc., *Zool.* 1903, p. 390, etc.) It seems more natural to suppose that, as in the case of the Spotted Flycatcher, some birds breed twice. Saxby speaks of this as the rule in Unst, and in the western part of the Continent and southern Germany it usually takes place, whereas in Scandinavia, Denmark and N. E. Germany the reverse is the case. Time of incubation 14 days.

Breeding
Season.

In the British Isles the usual breeding season is from mid-April to early May, but occasionally nests have been found in December, January and

February. Where two broods are reared the eggs of the second hatch may be met with in the first week of June, usually 3 or 4 days only elapsing between the flight of the young and the cleaning out of the nest for the second brood. A few instances are on record of three broods having been reared (*Nat.* 1891, p. 49, etc.). Rey gives the second half of April as the usual time for full clutches in Germany, while in Finland the eggs are laid early in May.

English eggs appear to be larger than Continental. 51 from Germany only average 28.83×20.84 mm. (Rey), while 50 English eggs average 30.33×21.4 mm. Mean average of 100 eggs 29.57×21.11 mm., Max. 34.1×22.4 and 31.2×22.8 mm., Min. 27×20.4 and 28.6×20 mm. A dwarf egg measures 25.2×19.5 mm. (R. H. Read coll.). Irregular longitudinal grooves are frequently found on eggs of this species. Average weight of 51 German eggs 431 mg. (Rey).

Measure-
ments.

Geographical Races.

a. Common Starling, *S. vulgaris vulgaris* L. See above.

b. Færøe Starling, *S. vulgaris faroensis* Feild.

Local Name: Færøes: *Steari*.

S. vulgaris faroensis Feild. Hartert, Vög. Pal. Fauna, p. 44.

Breeding Range: the Færøes.

This easily recognized race is a common resident in the Færøes, breeding in colonies in the rocks and also in the walls of stone outhouses. Feilden found well-feathered young on Sandö on May 22, but also obtained clutches of 5—6 fresh eggs on May 23 and from June 2 to 23. The eggs are similar to those of other races, but as might be expected, average somewhat larger.

Average of 27 eggs 30.9×21.56 mm., Max. 33.5×22.6 and 32.3×23 mm., Min. 29×21.1 and 32.1×20 mm.

c. Caucasian Starling, *S. vulgaris caucasicus* Lorenz.

Local Name: Russia: *Blestyastche-skvoretz*.

S. caucasicus Lor. Dresser, Birds of Europe, IX, p. 234; Man. Pal. Birds, p. 400. *S. v. caucasicus* Lor. Hartert, Vög. Pal. Fauna, p. 46.

Breeding Range: The Caucasus. [Also in N. Persia and in the highlands of the S. W.]

Rey gives measurements of 5 eggs, which average 28.1×21.16 mm., Max. 29.6×22.6 mm., Min. 27.1×20 and 29.1×19.3 mm. Average weight 365 mg.

d. Purple winged Starling, *S. vulgaris purpurascens* Gould.

S. purpurascens Gould. Dresser, Birds of Europe, IV, p. 419; Man. Pal. Birds, p. 400. *S. v. purpurascens* Gould. Hartert, Vög. Pal. Fauna, p. 46.

Breeding Range: The Balkan peninsula, delta of the Danube. (Also Asia Minor, Cyprus, Persia, etc.)

In the Danube valley and the Dobrudscha this race is plentiful. Tschusi and Reiser have recently described the birds from Greece (Thessaly, perhaps also S. Macedonia) under the name of *S. vulgaris graecus* Tsch. & Reis. (*Orn. Jahrb.* 1905, p. 141).

Eggs taken in Turkey are not distinguishable from those of the typical race. Reiser gives the usual measurements as 28.8×21.2 mm. (Bulgaria). Weight 440 mg.

c. Crimean Starling, *Sturnus vulgaris tauricus* Buturl.

Breeding Range: The Crimea.

Recently described by Buturlin as a distinct species, but more probably only a local race of *S. vulgaris*. Irby and Blakiston describe it as common in the Crimea, arriving in mid March, and breeding in holes of cliffs and nesting boxes about the middle of April.

(Buturlin also describes the race inhabiting the district between the Ural and the middle Wolga under the name of *S. vulgaris jirkowi*, and considers the N. Caucasus birds to be a new race of *S. poltoratzkyi* (*S. p. satunini* But.), but Hartert (*in litt.*) doubts the distinctness of the latter form.)

[*S. v. poltaratzkyi* Finsch inhabits Siberia as far as the Baikal Lake and also occurs in Cyprus, while *S. v. granti* Hart. is the resident Starling of the Azores.]

14. Sardinian or Spotless Starling, *Sturnus unicolor* Temm.

Eggs: Thienemann, Fortpfl., Tab. XXXVIII, fig. 2, a—b. Baedeker, Tab. 50, fig. 13.

Foreign Names: Italy: *Storno nero*. Marocco: *Zarzor kahal*. Portugal: *Estorninho preto*. Sardinia: *Sturru nieddu*, *Sturru neru*. Spain: *Tordo*, *Tordo serrano*. Tunis: *Sarsour*.

Sturnus unicolor Temm. Dresser, Birds of Europe, IV, p. 415; Man. of Pal. Birds, p. 401. Hartert, Vög. Pal. Fauna, p. 46.

Breeding Range: The Iberian peninsula, Sardinia, Sicily and the Balearic Isles. [Also in N. Africa from Marocco to Tunis.]

In many towns of southern Spain this species is as familiar as *S. vulgaris* at home, but it is somewhat local in its distribution and is not common near Gibraltar. North of the Straits of Gibraltar it is as a rule only a summer visitor, but Tait records it as resident in Portugal and very common inland, but not numerous near Oporto. In Sardinia it is very plentiful, and breeds in the mountains of Sicily. It is omitted from the lists of Wharton,

Giglioli and Whitehead for Corsica, and is only an occasional visitor to the south of France, Italy and Malta. [On the mainland of Africa it is resident, breeding in the cliffs of Cape Blanco (N.) and other localities on the Maroccan coast. In Algeria it is curiously scarce, but breeds in Tunis in numbers.]

Like *S. vulgaris* this species is sometimes met with nesting singly and sometimes in small or large colonies. All the nests met with by Rey in Portugal were built in crevices of rocks, but in Spain many pairs breed in holes of trees. Pigeon houses and old Moorish towers are also freely used and sometimes 100—150 pairs may be found nesting together. In the towns any hollow in the roofs or hole in the walls of old buildings is occupied. In north west Africa many nests are found in holes of the sea cliffs, and also in the mosques inland, but in Tunis von Erlanger found this species in possession of forsaken nests of Bee-Eaters and Rollers, as well as breeding in crevices of the precipitous sandy cliffs at Oued Kasserine. In Sardinia it breeds chiefly in holes of old buildings.

The clutch varies from 4 to 6 in number, and the eggs do not differ from those of *S. vulgaris*. In south Spain the usual breeding time is about the last week in April, and in Sicily from the second week in April onward, but eggs have been taken in Marocco at the end of March, and according to König the young are hatched in Tunis about mid-April and leave the nest at the beginning of May, but Erlanger took an incubated clutch and a fresh egg there early in June.

60 eggs (50 measured by the writer, 5 by Erlanger and 5 by Rey), average 30.82×21.44 mm., Max. 34.2×22.2 and 33×22.6 mm., Min. 28.1×22 and 29×20.2 mm. Average weight of 5 eggs 396 mg. (Rey).

15. Rose coloured Starling, *Pastor roseus* L.

Eggs: Thienemann, Fortpfl., Tab. XXXVIII, fig. 3, a—c. Hewitson, III. Ed., pl. LV, fig. 2. Baedeker, Tab. 50, fig. 11. Taczanowski, Tab. XXXIV. Seebohm, Brit. Birds, pl. 11; id. Col. Fig., pl. 54.

Foreign Names: Bohemia: *Spáček růžový*. Denmark: *Drossel-staer*, *Rosenstar*. Finland: *Punakottarainen*. France: *Martin roselin*. Germany: *Rosenstar*, *rosenfarbene Drossel*, *Staramsel*. Greece: *Hagion Puli*. Helgoland: *Stuur-Amsel*. Holland: *Rosé Spreeuw*. Hungary: *Pásztor madár*, *Rózsás Rigo*. Italy: *Storno roseo*, *Storno marino*. Poland: *Gniarek różowiy*. Russia: *Rosowiy Skworez*, *Skwornik*. Sweden: *Rosenstare*.

Breeding Range: Breeds at irregular intervals in colonies in S. Russia, E. Hungary, Dobrudscha, Bulgaria, etc. In 1875 in Italy. [Also in Asia from Asia Minor to Turkestan.]

The breeding of this interesting bird appears to be regulated to some extent by the abundance or absence of the *Orthoptera* which form its

staple food. Thus in Italy it is of uncertain and irregular occurrence, but is said to have bred there in some numbers in 1740 (Savi). In 1875, when Verona was infested by *Acridium italicum*, flocks of these birds, ten or twelve thousand in number, arrived on June 3—4 and took possession of the castle of Villafranca, nesting in every hole and cavity (see *Zool.* 1878, p. 16), but on July 14 all migrated southward. In Slavonia, Croatia and Dalmatia it breeds occasionally (Brusina). In Montenegro it has been observed by Führer, and has probably bred in Albania. In Bulgaria and Rumania it is an irregular visitor, sometimes breeding in large numbers, especially in the Dobrudscha, where Elwes and Buckley found a large colony near Milchova (1869) and the brothers Sintenis observed it nesting at Medžidje, Zurilovka, etc., in 1875, while other visits are recorded in 1867, 1871, 1876 and 1889. These breeding places are however rarely occupied for two consecutive years. In Hungary Petényi recorded it as nesting in several places in 1837, and it is said also to have bred in Switzerland, but the evidence is somewhat untrustworthy. According to Erhardt it has bred in the Cyclades. To south Russia (Bessarabia, Kherson, Crimea and the Caucasus district) it is a common visitor and frequently breeds. Von Nordmann describes its nesting habits as observed near Odessa in 1844. [In Asia Minor the discovery of a large colony in the hills above Burnabat by the Marchese O. Antinori and von Gonzenbach was described in *Naumannia* for 1856, and a translation appeared in the *Zool.* 1857, p. 5668, while in 1871 Krüper found colonies in another part of the range.]

Nest. Invariably found in colonies, the nests much resemble those of the Starling, and are placed in almost any kind of hole, but usually in crevices of rocks, among loose stones, in holes of walls, or less commonly in holes in banks and in the ground. The nesting materials consist of twigs, straw, hay, dry grasses and plants; with a lining of roots, leaves, moss and feathers, but frequently eggs are laid upon the bare earth with hardly a vestige of a nest.

Eggs. The usual number appears to be 5 or 6, but near Odessa von Nordmann found 6—7 common, and in some cases met with 8 and 9; and Prince Ferdinand of Bulgaria says the number varies from 3 to 8. In appearance they resemble those of the Starlings, but are decidedly paler in colour, many eggs being almost white with a faint bluish tinge. They have also much more gloss than Starlings' eggs. Herr O. Ottosson has a clutch from Asia Minor with rusty brown spots.

Breeding Season. At Villafranca the first eggs were laid on June 17, about a fortnight after the first arrival of the birds, and the young were fledged by July 10, so that they were able to migrate on the 14th. (The time of incubation must therefore be short and the development of the young very rapid.)

Eggs from the Dobrudscha were taken about mid-June (Hodek). Near Odessa in 1844 nesting began early in May, and in 1856 near Burnabat the young had in many instances left the nest by June 30, but on the other hand Krüper did not meet with fledged young till July 11 in 1871. It is evident that the time of laying varies considerably in different years.

Average of 80 eggs (54 measured by the writer, 23 by Rey and 3 by Reiser) 28.68×21.03 mm., Max. 32×20.8 and 29.8×22 mm., Min. 26×21.3 and 26.5×19.5 mm. Average weight (23 eggs) 408 mg., varying from 350 to 450 mg. (Rey).

Measure-
ments.

ORIOLIDAE.

16. Golden Oriole, *Oriolus oriolus* (L.).

Plate 8, fig. 1—4 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXVII, fig. 11, a—c. Hewitson, I. Ed. I, pl. XIII; II. Ed. I, pl. XX; III. Ed. I, pl. XXVI, fig. 1. Baedeker, Tab. 50, fig. 10. Taczanowski, Tab. XXXII, fig. 1. Seebohm, Br. Birds, pl. 11; id. Col. Fig., pl. 54.

Foreign Names: Bohemia: *Zluva obecna*, *Mathes*. Denmark: *Guldpjrol*, *Gulddrossel*. Finland: *Kuhankaittäjä*. France: *Loriot jaune*. Germany: *Pjrol*, *Kirschpjrol*, *Goldamsel*. Greece: *Sykophagos*, *Kitronpouli*. Helgoland: *Bülow*. Holland: *Wiele-waal*, *Gele goww*, *Goud-merel*. Hungary: *Sárga Rigo*. Italy: *Rigogolo*, *Repéndol*. Poland: *Wilga zółta*. Portugal: *Papafigo*, *Marellante*. Russia: *Ivolga*. Spain: *Oropendola*. Sweden: *Sommargylling*, *Gultrast*.

Oriolus galbula L. Dresser, Birds of Europe, III, p. 365; Newton, ed. Yarrell, I, p. 233; Saunders, Manual, p. 145; Dresser, Man. Pal. Birds, p. 226. *O. oriolus oriolus* (L.). Hartert, Vög. Pal. Fauna, p. 51.

Breeding Range: Continental Europe generally; excepting Norway, Sweden (except possibly in the south), north and west Finland, and Russia north of about 60° N. lat. In the British Isles it has bred occasionally in the south of England. [Also in Asia; Persia, Turkestan, and S. Siberia to the Altai range; as well as in Tunis, Algeria (?) and Marocco.]

The Oriole is a tolerably frequent migrant to the south of England, and has nested, or attempted to do so, in Norfolk, Suffolk, Essex, Northants, Herts, Devon, Surrey, and several times in Kent. For particulars of two instances in which a brood was successfully reared see *Zool.* 1874, p. 4232; 1875, p. 4624. It may possibly have nested at Tresco, in the Scillies, where it occurs frequently in spring.

British
Isles.

Con-
tinental
Europe.

In Sweden it occurs in the south, and occasionally as far north as Dalarne and Westerbotten; it is also said to have bred in Kalmar län 50 years ago. On the other hand it is not uncommon over a great part of south eastern Finland, from Lojo in the south-west to Idensalmi (about $63\frac{3}{4}^{\circ}$ N. lat.) and eastward to Onega, but does not appear to be found north of lat. 60° in east Russia. A few pairs nest in the Danish islands and Schleswig Holstein, and it is common in the wooded districts of France, the Low Countries, N. Germany, Austro-Hungary and Russia. In the mountainous parts of Middle Europe it is less numerous, and in Switzerland does not as a rule breed above 3000 ft. In the Iberian peninsula it becomes scarce in the south; and though plentiful in north Italy, is only found nesting in wooded mountains in the southern provinces, and it is doubtful whether it breeds at all in Sardinia. In the Balkan peninsula it is generally distributed except in the south, but some breed on Corfu. In the Caucasus it nests, according to Radde, up to 6000 ft.

Nest.

The very remarkable nest is to be found in many kinds of trees, preferably oaks or planes, but occasionally elm, white poplar, alder, apple, birch or pine, not only on the outskirts of woods and in small plantations, but also in wooded gardens, parks etc., even in large towns. It is usually built far out on a horizontal bough at a considerable distance from the main stem, often at a height of 10 to 30 or even 60 ft. from the ground, but sometimes, though less commonly, within 6 ft. of it.* The nest is always placed at the fork of a bough, and is slung like a cradle between the two branches, to each of which it is firmly attached, close to the angle. The materials consist of grass stems, leaves of sedges and grass, roots, strips of bark and wool, intermixed with a little moss and sometimes strips of paper, or feathers, and is smoothly lined with flowering heads of grasses. Approximate size: diameter $4\frac{3}{4}$ — $5\frac{1}{4}$ in., depth $3\frac{3}{4}$ — $5\frac{1}{2}$ in. When placed high the nest is often difficult to see, and even harder to get at, without sawing off the bough.

Eggs.

Usually 4 in number, sometimes 5. The ground colour varies from pure white to a warm creamy tone, rather sparsely marked with spots and a few fine specks of very deep purplish brown, almost black. Round the larger spots are generally faint traces of paler purple red, forming a slight penumbra. As a rule most spots are congregated towards the large end. Occasionally eggs are met with almost without markings, while others have one or two big blotches. The shell is tolerably glossy, but when closely examined shows numerous fine irregular ridges running transversely and a few longitudinal grooves.

* A nest was found in Silesia by Prof. Augustin only 3 ft. from the ground.

The Oriole is a late breeder, and only rears one brood in the season.* Harting took a nest between Paris and Orleans on June 3 with young birds, but this appears to be an unusually early date. In Holland many clutches are taken in the last week of May and the beginning of June. Rey gives the first half of June as the usual time in north Germany, but on one occasion found a nest with 3 eggs on May 17. In the south of Europe the breeding season is earlier. Chapman gives May 20 as the usual date for Andalusia; in Italy it is said to breed from the end of April to the beginning of June (Arrigoni), and a nest found in Bulgaria on May 30 contained hard-set eggs (Reiser).

Breeding
Season.

Average of 100 eggs (20 measured by Rey, 11 by Blasius and 69 by the writer) 30.87×21.3 mm., Max. 36×22.2 (Newton coll.) and 32×23.5 mm., Min. 28×20.3 and 31×20 mm. Average weight (20 eggs) 386 mg. (Rey). A dwarf egg in the Rey collection measures 19.7×15 mm. and weighs 165 mg.

Measure-
ments.

[ICTERIDAE.]

Note. Although several species of this American family have occurred in Europe, it is probable that all were either escaped birds or 'assisted passengers'.

Bobolink, *Dolichonyx oryzivorus* (L.).

Plate 25, fig. 23, 24 (United States).

Eggs: Thienemann, Fortpfl., Tab. XXXIII, fig. 2, a, b. Bendire, II, Pl. VI, fig. 1, 2.

Breeding Range: Canada from S. British Columbia to lat. 47° on the east coast, the northern United States to about 115° w. lon., but rarely south of lat. 39° — 40° . (Recorded twice from Helgoland.) Eggs 5—7 in number, very variable, almost every set being differently marked (see Bendire, II, p. 433). Average of 77 eggs in the U. S. Nat. Mus., 21.08×15.71 mm., Max. 22.35×16.26 mm., Min. 17.53×15.24 mm. (Bendire). Weight 150—170 mg. (Rey).

Cassin's Cowbird, *Molothrus cabanisii* Cass.

Plate 15, fig. 10—18 (Venezuela, H. Rolle).

Breeding Range: W. Venezuela and the adjacent parts of Columbia. (Recorded from Helgoland, 1. X. 99). Parasitic upon other birds (see Rey, p. 353). 14 examples average 22.56×17.79 mm., Max. 23.2×19.2 mm. (fig. 18), Min. 21.2×17 mm. (fig. 10). Average weight 300 mg. (Rey).

Red winged Blackbird, *Agelaius phoeniceus* (L.).

Eggs: Seebohm, Br. Birds, pl. 11; id. Col. Fig., pl. 54. Bendire, pl. VI fig. 13—15.

* Saxby (*Zool.* 1861, p. 7540) reports unfledged young in August in Belgium.

Breeding Range: Canada from Great Slave Lake to 49° N. lat., and the United States. (Recorded from the British Isles and Italy.) Eggs 3—5, rarely 6. (See Bendire, II, p. 452.) Average 24.8×17.55 mm., Max. 27.94×19.05 mm., Min. 20.57×15.75 mm. (Bendire).

Other American species which are said to have occurred are the Meadowlark, *Sturnella magna* (L.),* the Baltimore Oriole, *Icterus galbula* (L.),† and the Rusty Grackle, *Scolecophagus carolinus* (Müll.)**]

FRINGILLIDAE.

17. Hawfinch, *Coccothraustes coccothraustes* (L.).

Plate 9, fig. 18—22 (Saxony).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 2, a—c. Hewitson, I. Ed. I, pl. XLIII; II. Ed. I, pl. XLIII, fig. 2; III. Ed. I, pl. LII, fig. 2, 3. Baedeker, Tab. 12, fig. 1. Taczanowski, Tab. LXIX, fig. 1. Seebohm, Br. Birds, pl. 13; id. Col. Fig., pl. 56. Frohawk, Br. Birds, I, pl. IV, fig. 126—128.

British Local Names: England: *Grosbeak*, *French* or *Haw Grosbeak*, *Berry-Breaker*. Isle of Wight: *Cow-bird*.

Foreign Names: Bohemia: *Dlask*. Denmark: *Kirsebaerfugl*, *Kjaerne-bider*. Finland: *Nokkavarpunen*. France: *Gros-bec*. Germany: *Kirschkerne-beisser*. Holland: *Dikbek*, *Appelvink*, *Kersebitter*. Hungary: *Meggyvágó*, *Madár*. Italy: *Frosone*. Norway: *Kirsebaerfugl*. Poland: *Luszczak grubodziób*. Portugal: *Bico grossudo*. Russia: *Dubonos*. Spain: *Piñónero*, *Cascanueces*. Sweden: *Stenknäck*.

Coccothraustes vulgaris Pall. Dresser, Birds of Europe, III, p. 575; Newton, ed. Yarrell, II, p. 98; Saunders, Man. p. 171; Dresser, Man. Pal. Birds, p. 287. *C. coccothraustes coccothraustes* (L.). Hartert, Vög. Pal. Fauna, p. 55.

Breeding Range: Europe generally, excepting Ireland, the greater part of Scotland, northern Scandinavia and Russia north of lat. 60°. [Also Asia Minor, N. Persia etc.; replaced in N. W. Africa by *C. c. buvryi* Cab.]

British
Isles.

Although formerly supposed to be only a winter visitor, the Hawfinch is now known to have bred in suitable localities in every county of England except Cornwall; but it is still decidedly rare as a breeding species in Northumberland, the Lake district and North Devon, and is perhaps most plentiful in the midland and south-eastern counties. In Wales it is extending its range westward, but is still absent from the coast of Cardigan Bay, Anglesea and Carnarvon, and only known as a casual

* Eggs: Seebohm, Br. Birds, pl. 11; id. Col. Fig., pl. 54. Bendire, II, pl. VI, fig. 20, 21.

† See *Zool.* 1890, p. 487. Eggs: Bendire, II, pl. VII, fig. 6—9.

** Eggs: Seebohm, Br. Birds, pl. 11. Bendire, II, pl. VII, fig. 14—16.

visitor in many districts, though not uncommon in the valleys of Brecon. In Scotland it appears to be slowly colonizing the south-eastern district, and has been definitely recorded as breeding in Fife (*Ann. Scott. Nat. Hist.* 1904, p. 11), while there is reason to believe that it has nested in Perth and Midlothian.

In Norway the Hawfinch has not been proved to breed, but in Sweden it nests occasionally in Skåne, Blekinge, Halland and Småland, and has occurred as far north as $64\frac{1}{2}^{\circ}$ N. lat. In Denmark it is chiefly found on the islands, especially Zealand, and in Finland the nest has been found at Helsingfors. From S. Petersburg southward it is generally distributed over the wooded parts of the European plain and in the lower valleys of the hilly districts, becoming more numerous in the south of Europe. In Portugal it is found from Evora to Beira and the Alto Douro, but is not common and chiefly met with on higher ground. In Spain it is common in the wooded sierras, and a few nest in the cork wood near Gibraltar. It is fairly numerous in Corsica, but local, and rare on the west coast; while in Sardinia it breeds plentifully in the orchards, and is not uncommon in Sicily. It is chiefly known in Italy on passage, but some are sedentary both in the north and in the south. In the Balkan peninsula it appears to be generally distributed, though not very numerous, and breeds in suitable localities from Ætolia and the Taygetos Mts. northward. [East of the Urals the limits of this race and *C. c. japonicus* Temm. & Schl. are not exactly known.]

Con-
tinental
Europe.

The Hawfinch often breeds in gardens and orchards, generally nesting on a horizontal bough of some lichen grown fruit tree, or else in a free standing hawthorn. In such situations the nest is seldom built at any great height, sometimes only 6 or 8 ft. from the ground. At other times it prefers the outskirts of the woodlands, or isolated trees in hedgerows; breeding indifferently in elms, sycamores, beeches, limes or other trees, on lateral boughs, sometimes as much as 40 ft. or more from the ground, and at other times among the outcrop from the trunk, only a few feet high. Occasionally nests are found in hollies or on pollarded stumps in hedges. The hen is a very close sitter, and as the parents are shy and unobtrusive birds, the ravages of the whole family among the peas, or the fringe of clipped shoots under the yew trees, are often the first intimation that a brood has been hatched off in the vicinity. When built high up in forest trees the nest is not easy to detect, as it is rather small for the size of the bird, and somewhat shallow, but the fringe of small twigs projecting from either side of a horizontal bough when seen from below is very characteristic. In parks, orchards and old gardens several pairs may be found nesting near one another. The foundation of the nest is a layer of small twigs, with a shallow superstructure of bents, bark fibre

Nest.

and coarse roots with sometimes a few lichens; lined with fine roots, hair, fibre, or in some cases entirely with pigs' bristles. Approximate size: diameter $5\frac{1}{2}$ —6 in., depth 2— $2\frac{1}{4}$ in., diameter of cup $3\frac{1}{2}$, depth 1 in.

Eggs. From 4 to 6 in number, but generally 5. They are very characteristic and often exceedingly handsome. The ordinary ground colour is a pale bluish or greyish green, varying to pale slate colour and rarely to pale creamy brown or warm buff. The markings consist of a few bold spots and streaks of lighter or darker olive brown, sometimes almost black, with faint underlying hair lines, blotches and streaks of purplish grey. Occasionally the dark markings are wanting, and sometimes only small spots on a blue ground are met with.

Breeding Season. The Hawfinch is single brooded, and in the south of England eggs may be obtained from the end of April onward, and in the north Midlands usually about the third week in May. Near Leipzig Rey found fresh eggs from April 25 to June 20, but probably the last found nests were second layings. In E. Prussia it nests at the end of May (Hartert). Apparently there is not much difference between the time of breeding in middle and southern Europe, for in Corsica Whitehead found fresh eggs on May 16, and in Andalusia they breed in May, while fresh clutches have been taken in the sierras at the end of the month. In Italy however the breeding season begins towards the end of April. The period of incubation is about 14 days.

Measurements. There is very great variation in size and shape, some eggs being round oval, others elongated ovate or even subpyriform in shape. Average size of 100 eggs (52 measured by Rey and 48 by the author) 23.86×17.24 mm., Max. 27.1×16.7 (Germany, Rey) and 22×19.5 mm. (Dorpat, Br. Mus.), Min. 19.8×15.7 mm. (Epping, Br. Mus.). Average weight (52 eggs) 236 mg. (Rey).

18. Greenfinch, *Chloris chloris* (L.).

Plate 10, fig. 17—21 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 4, a—c. Hewitson, I. Ed. I, pl. XVI; II. Ed. I, pl. XLIII, fig. 1; III. Ed. I, pl. LII, fig. 1. Baedeker, Tab. 20, fig. 1. Taczanowski, Tab. LXIX, fig. 2. Seebohm, Br. Birds, pl. 12; id. Col. Fig., pl. 56. Frohawk, Br. Birds, I, pl. IV, fig. 120—125.

Nest: O. Lee, III, p. 48.

British Local Names: *Green Linnet*, *Greenie*, *Green Olf*. Welsh: *Aderyn Melyn*. Scotland: *Green Lintie*.

Foreign Names: Bohemia: *Zvonek*. Denmark: *Grönirisk*, *Svensker*. Finland: *Vihreäpeipponen*. France: *Verdier*, *Verdun*. Germany: *Grünling*,

Grünfink, *grüner Hänfling*. Greece: *Phiori*. Helgoland: *Kort Güh-Klütjer*. Holland: *Groening*. Hungary: *Zöldike*. Italy: *Verdone*, *Verdello*. Norway: *Svenske*, *Grönfink*, *svensk Irisk*. Poland: *Dzvoniec*. Russia: *Zelemuschka*. Sweden: *Grönhämpling*, *Grönfink*, *Svenska*, *Gröning*.

Coccothraustes chloris (L.). Newton, ed. Yarrell, II, p. 105. *Ligurinus chloris* (L.). Dresser, Birds of Europe, III, p. 567; Saunders, Man., p. 169; Dresser, Man. Pal. Birds, p. 283. *Chloris chloris chloris* (L.). Hartert, Vög. Pal. Fauna, p. 61.

Breeding Range: The cultivated and wooded districts of Europe, except the Iberian peninsula (replaced by *C. c. aurantiiventris*), and the north of Scandinavia and Russia. [Also Asia Minor, N. Persia and N. W. Turkestan.]

Generally distributed over the whole of Great Britain and Ireland, excepting the bare moorlands and mountain ranges; but does not appear to breed on the north west coast district of Ireland, the Outer Hebrides, the north west coast of the Scottish mainland or the Shetlands, though it now breeds freely in the Orkneys. In the Inner Hebrides it nests on the larger wooded islands, such as Mull, Jura, etc.

British
Isles.

In Norway this species ranges up to about 65° N. lat., and has been found breeding at Trondhjem's Fjord; but in Sweden its northern limit appears to be 62° N., and in the Urals about 60°. Over the northern part of its range it is a summer visitor, but in the British Isles and southern Europe it is sedentary as a rule. Southward its range extends to the islands of the Mediterranean and it is common throughout Italy and the Balkan peninsula, breeding not only in the plains but also in the mountains of Greece.

Con-
tinental
Europe.

Highly cultivated and well timbered districts, parks, gardens, etc., are the favoured resorts of the Greenfinch during the breeding season, and here it nests at times in such numbers that it almost appears to be sociable in its breeding habits. I have known 15 to 20 nests in one high, straggling hedgerow, not more than 150 yards in length; and frequently a clump of evergreens in a garden will hold 5 or 6 nests. They are generally to be found in shrubs and tall hedges, but also on the lower boughs of forest trees, and among the outcrop from the trunk, and rarely among ivy or even tall furze. The foundation consists of a few twigs, moss, bents, roots, etc., closely interwoven, sometimes with wool; lined generally with finer roots and hair, but occasionally with a profusion of feathers; and there is much variation in size, as well as in the materials employed.

Nest.

Generally 4—6 in number, but occasionally 7 are found. The ground colour varies from dirty white to pale greenish blue, with rather sparingly distributed small spots of lighter or darker reddish brown, occasionally a streak or scrawl, and with underlying markings of paler violet or reddish

Eggs.

brown. Most of the spots are to be found at the large end, sometimes forming an irregular zone; and occasionally eggs are met with both with bluish and white ground, but entirely without markings. A scarce variety is very thickly freckled with reddish spots. In shape and size they are extremely variable, some being much elongated.

Breeding
Season.

Few eggs are laid in England before the beginning of May, and in the Midlands most are laid between May 20 and the beginning of June. A second brood is frequently found in July, and fresh eggs may occasionally be found late in August. Rey says that in Germany the eggs (5—7) are laid in April, and a second brood (5—6 eggs) in May or June. In the south of Europe the breeding season is rather earlier, beginning in mid-April in Greece. The eggs are hatched early on the 14th day (Evans).

The hen sits very close and frequently does not leave the nest till almost touched.

Measure-
ments.

Average of 101 eggs (77 continental eggs by Rey and 24 British by the writer) 20.25×14.52 mm., Max. 24.1×14.2 and 21×16 mm., Min. 17.2×13.5 and 21.5×12.2 mm. Average weight 123 mg. (Rey). 3 full eggs average 2.122 g. (Foster).

Dwarf eggs measure 15.5×12 (Rey) and 12.5×9.5 mm. (R. H. Read).

Geographical Races.

a. Common Greenfinch, *C. chloris chloris* (L.). See above.

b. Spanish Greenfinch, *C. chloris aurantiiventris* (Cab.).

Foreign Names: Portugal: *Verdilhão*. Spain: *Verdon*, *Verderon*. *C. chloris aurantiiventris* (Cab.). Hartert, Vög. Pal. Fauna, p. 63.

Breeding Range: Southern France, Spain und Portugal. [Also Marocco, Algeria and Tunis.]

Very abundant in Portugal, and common in gardens and wooded districts in Spain. Fresh eggs may be found in Andalucia from the middle of April. [In Marocco, Algeria and Tunis north of the Atlas range it is a common resident; Hartert describes it as very plentiful in the orange groves on the Oum R-biah in middle Marocco, and obtained eggs on April 10.]

In nesting habits and eggs this race closely resembles the common Greenfinch. Average of 22 eggs from S. Spain, Algeria, etc., 20.64×14.56 mm., Max. 21.7×14 and 21.6×15 mm., Min. 19.2×15 and 20×14 mm.

[In Syria and Palestine the resident birds belong to the form *C. chloris chlorotica* (Bp.). In China and Japan various forms of *C. sinica* L. are found. An egg of the Japanese race, *C. sinica minor* (Temm. & Schl.) from Japan is represented on Pl. 15, fig. 4; and one of the Manchurian race, *C. sinica ussuriensis* Hart., from the Amur on Pl. 15, fig. 5. A young bird of *C. sinica* was captured near Copenhagen on Nov. 6, 1892.]

19. British Goldfinch, *Carduelis carduelis britannica* (Hart.).

Eggs: Hewitson, I. Ed. I, pl. CXXXVII; II. Ed. I, pl. XLIV, fig. 1; III. Ed. I, pl. L, fig. 1. Seebohm, Br. Birds, pl. 12; id. Col. Fig., pl. 56. Frohawk, Br. Birds, I, pl. IV, fig. 129—130.

British Local Names: England: *Thistle Finch*, *Proud Tailor*, *Flinch*, *Seven-coloured Linnet*, *King Harry*, *Redcap*, *Goldie*; *Grey Pate* (juv.). Welsh: *Nicol*, *Jacknico*. Scotland: *Goldfinch*. Erse: *Kinyeen ore* (phonetic).

Carduelis elegans Steph. Dresser, Birds of Europe, III, p. 527 (partim); Newton, ed. Yarrell, II, p. 117; Saunders, Man., p. 173; Dresser, Man. Pal. Birds, p. 274 (partim). *Acanthis carduelis britannicus* Hart. Hartert, Vög. Pal. Fauna, p. 68.

Breeding Range: The British Isles, but almost extinct in Scotland except in a few southern localities.

Formerly this species appears to have been very generally distributed throughout the whole of England and Scotland, except on the mountain ranges. Its numbers have however been very greatly reduced by bird-catchers, especially in the neighbourhood of large towns and in thickly populated districts;* but the partial protection afforded by the Wild Birds Protection Act has resulted in a decided increase of late years. At the present time it is perhaps most numerous in the valleys of Wales, and is not uncommon locally in many parts of England (see *Zool.* 1903, p. 23, 70, 104 etc., for fuller details). In Scotland it is now rare, though reported as increasing in the Solway district and other localities in the south, and formerly common locally; but a few isolated instances of breeding have been reported from many districts, even from Skye and Caithness. To the Hebrides and northern islands it is only a rare straggler. In Ireland it is very generally distributed and in some districts common, but has been greatly thinned down in numbers near the towns.

British
Isles.

Very frequently the nest is built in a fruit tree (apple, pear, plum etc.) and in north Staffordshire usually in a damson orchard; but in the south of England a great many nests are placed far out on the spreading branches of the chesnut, sycamore, elm, beech, or other leafy tree. It is met with less commonly in high hedgerows, conifers and evergreens. Where trees are scarce, as in the west of Ireland, it will breed in gooseberry bushes, furze, ivy on walls etc. (Ussher). The nest is very artistically constructed of roots, bents, lichens and a little moss, interwoven with wool; sometimes lined with willow down, at other times with hair and wool, and it is said, feathers. Dimensions: diameter 3 in., depth $2\frac{1}{2}$ —3 in., diameter of cup 2 in., depth of cup $1\frac{1}{8}$ in.

Nest.

* See *Zool.* 1860, p. 7143.

Eggs. Usually 4—5 in number, but occasionally 6 are found. The shell is thin and partly transparent, showing the yolk plainly and looking almost white when unblown, but afterwards acquiring a bluish tinge. The markings generally consist of a few distinct spots or streaks of reddish brown, sometimes almost purplish black, with faint underlying spots or blotches of reddish grey. Some eggs are boldly marked, while others have only a few fine speckles. As a rule they have a character of their own, but some varieties are indistinguishable from those of the Linnet.

Breeding Season. The eggs of the first brood are generally laid between May 9 and June 9, but most eggs are found about May 14—26. When a second brood is reared (as is frequently the case), eggs are laid towards the end of June or later. Fledged young have been found in the nest as late as Oct. 2 in the Dove valley. In Ireland Goldfinches have been known to breed in April; but May and June are the regular breeding months, and July nests are probably second broods. Incubation lasts 14 days.

Measurements. Average of 100 eggs (64 Irish and 36 English) 17.03×12.87 mm., Max. 18.7×13 and 16.3×13.6 mm., Min. 15.5×12.2 mm. Average weight (14 eggs) 79 mg. 8 full eggs average 1.429 g. (Foster).

Geographical Races.

a. Continental Goldfinch, *C. carduelis carduelis* (L.).

Plate 11, fig. 16—20 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 9, a—c. Baedeker, Tab. 20, fig. 3. Taczanowski, Tab. LXXIII.

Foreign Names: Bohemia: *Stehlík*. Denmark: *Stillids*. Finland: *Tikli*. France: *Chardonneret*, *Chardonnet*. Germany: *Stieglitz*, *Distelzeisig*, *Distelfink*. Greece: *Karderina*. Helgoland: *Ziebelitsch*. Holland: *Putter*, *Bloemputter*, *Distelvink*. Hungary: *Tengelicz*. Italy: *Cardellino*, *Cardello*. Norway: *Stillids*. Poland: *Szczygiel*. Russia: *Schtsscheglok*. Sweden: *Steglits*.

Carduelis elegans Steph. (partim). Dresser, Newton and Saunders, l. c. (see p. 49). *A. carduelis carduelis* (L.). Hartert, Vög. Pal. Fauna, p. 67.

Breeding Range: Europe, excepting N. Scandinavia and N. Russia. Replaced by other forms in the British Isles, S. Spain, Sardinia, Corsica etc. [Also Palestine and Asia Minor.]

**Con-
tinenta-
l Europe.** The northern limit of this race in Norway is $64\frac{1}{2}^{\circ}$ N. Lat., and in Sweden to Wermland and Dalarne (61° — 62°). In Finland it occurs in Tavastehus, Kuopio and Messuby, but in the Urals not above 60° . Over the rest of Europe it is generally distributed in suitable country, but is not as a rule very common anywhere, except in the countries bordering on the Mediterranean. In the Balkan peninsula it is common, and breeds

in the Cyclades, Crete, Cyprus, etc., while in Italy it is plentiful, and is found also in Sicily.

In breeding habits it resembles *C. c. britannica*, and its nest and eggs are also similar. Hartert has known two broods reared from the same nest at Wesel. Nest.

In Scandinavia the eggs of the first brood are usually 4 in number; the second brood generally consists of 5—6 (Ottosson), but in Germany the first laying consists of 5, rarely 6, and the second of 5 eggs (Rey). Eggs.

First broods in Germany in April or the beginning of May, second in June (Rey); in Greece from mid April onwards, earlier in the plains than in the hills (Krüper); while in Scandinavia the first eggs are laid in May or early June. Breeding Season.

Average of 22 German eggs (12 by Rey and 10 by the writer), 17.3 × 12.65 mm., Max. 18 × 13.2 and 17 × 13.5 mm., Min. 15.6 × 12.7 and 17.3 × 12.3 mm. Average weight (12 eggs) 85 mg. (Rey). Eggs from Greece are decidedly smaller: 23 from Parnassus average 15.9 × 12.4 mm., Max. 17 × 12.3 and 16.6 × 13.5 mm., Min. 15.1 × 12 and 15.5 × 11.7 mm. Measurements.

b. British Goldfinch, *C. carduelis britannica* (Hart.). See p. 49.

c. Sardinian Goldfinch, *C. carduelis tschusii* Arrig.

Local Names: Sardinia: *Cardanera*, *Cardellina*.

A. carduelis tschusii (Arrig.). Hartert, Vög. Pal. Fauna, p. 68.

Breeding Range: Sardinia and Corsica.

Common and resident in Corsica, where Whitehead found many nests, some of which contained young, in the beginning of April, and obtained eggs up to June 10. In Sardinia it is the commonest Finch on the island and begins to pair in the first week of April (Brooke). The eggs are rather small: 5 in the Tring Museum average 16.3 × 12.36 mm., Max. 16.8 × 12.3 and 16.6 × 13 mm., Min. 15.8 × 12 mm.

d. Barbary Goldfinch, *C. carduelis africana* (Hart.).

Local Names: Portugal: *Pintasilgo*. Spain: *Gilguéro*.

A. carduelis africanus Hart. Hartert, Vög. Pal. Fauna, p. 69.

Breeding Range: Southern Spain. [Also Morocco, Algeria and Tunis.]

Goldfinches are among the commonest birds of southern Spain, and appear to rear at least two broods; for fresh eggs are to be found from the middle of April to the end of May, while the young of the first brood are on the wing by mid-May. Many pairs breed in the orange groves, building most beautiful little nests, smaller than those of *C. c. britannica* (diameter of cup $1\frac{5}{8}$ in.), composed almost entirely of white plant down and a little moss, woven together with fine roots and hair. [In the Barbary states it is also very common, breeding in the orange groves and olive

gardens in April and May.] Eggs generally 4—5 in number; slightly smaller and lighter than the average of mid European eggs, but otherwise resembling them. 26 African eggs measured by Erlanger, König and Hartert, and 29 Andalucian eggs by the writer, average 16.22×12.63 mm., Max. 18×13 and 16×14 mm., Min. 15×12 mm. 7 Algerian eggs weigh 63 mg. (König), and 5 Spanish eggs average 73 mg.

[In Madeira and the Canaries a small dark race is found, *C. carduelis parva* Tsch., and east of the Urals a larger form, *C. c. major* Tacz.]

20. Siskin, *Carduelis spinus* (L.).

Plate 11, fig. 21—25.

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 14, a—c. Hewitson, II. Ed. I, pl. XLIV, fig. 2; III. Ed. I, pl. L, fig. 2. Baedeker, Tab. 20, fig. 2. Taczanowski, Tab. LXXII, fig. 2. Seebohm, Br. Birds, pl. 12; id. Col. Fig., pl. 56. Frohawk, Br. Birds, pl. IV, fig. 131.

Nest: O. Lee, II, p. 146; Kearton, Rarer Br. Birds, p. 105. (See also Booth, Rough Notes, part XII.)

British Local Names: *Barley Bird*, *Aberdevine*. Welsh: *Dreiniauw*.

Foreign Names: Bohemia: *Cícek*. Denmark: *Grönsidsken*. Finland: *Kröönsiska*. France: *Tarin*. Germany: *Erlenzeisig*, *Zeisig*. Helgoland: *Ziesk*. Holland: *Sijsje*. Hungary: *Cziz*. Italy: *Lucarino*, *Lugaro*. Norway: *Sisik*. Poland: *Luszczak*, *Cyz*. Portugal: *Lugre*. Russia: *Čiz*, *Čížik*. Spain: *Lugano*. Sweden: *Grönsiska*, *Siska*.

Carduelis spinus (L.). Newton, ed. Yarrell, II, p. 126. *Chrysomitris spinus* (L.). Dresser, Birds of Europe, III, p. 541; Saunders, Man., p. 175; Dresser, Man. Pal. Birds, p. 276. *Acanthis spinus* (L.). Hartert, Vög. Pal. Fauna, p. 71.

Breeding Range: Europe, locally, where coniferous woods exist, except in N. Scandinavia and Russia, the Iberian peninsula, the greater part of Italy and the southern part of the Balkan peninsula. [In Asia from Asia Minor to Japan.]

British
Isles.

Although the Siskin is reported to have bred in some fourteen counties of England, most of the accounts of its nesting are quite at variance with what we know of its breeding habits in the north, and it is probable that in several cases the birds have been wrongly identified. It was however found nesting in Durham in 1848 and also in 1874, and a few pairs bred in the woods of Longtown, Cumberland between 1879 and 1885. In Scotland it has been recorded as breeding in the Solway district, and north of Perthshire its distribution is regulated by the presence or absence of coniferous woods, but it is locally common as far north as Dunrobin (E. Sutherland), though scarce on the western side of the country except per-

haps locally in W. Ross, and absent from the Hebrides, Orkneys, etc. It has however occurred on the Shetlands, Mingalay and in Barra (1897), but does not breed there. It was first found nesting in Ireland by Ussher in 1857, and since then has been found breeding locally in all four provinces.

In Norway, though by no means common, it is known to breed chiefly in the forests of the south and east, as far as Trondhjem's Fjord, and in Sweden appears to be chiefly confined to the middle of the country, but nests in several localities in Skåne, Blekinge and Kronoberg in the south. In Finland its range extends to Uleåborg (Pudasjärvi, Karlö, etc.). A few pairs breed in the large coniferous forests of E. Jutland, and it has also been known to nest on Falster and Bornholm. Throughout middle Europe it is found locally in the larger coniferous woods of France, the low Countries, Germany, Switzerland, Austro-Hungary, N. Italy, Bulgaria (Baba-Planina, Rhodope Mts., etc.), probably Montenegro, and Russia from 58°—60° N. lat. to the Caucasus.

Con-
tinental
Europe.

Appears to be almost always placed in a conifer, Douglas, spruce, silver or Scotch fir, larch and even deodara (Ussher). It has been asserted that the nest is occasionally found in the birch forest, but further confirmation of the statement is desirable. The birds spend most of their time about the tops of the tallest trees and generally build far out on one of the branches, sometimes as much as 12 ft. from the stem. As the usual height from the ground is about 40—50 and even 60 or 70 ft., it may well be imagined that the nest is by no means easy to see.* Ussher (*Birds of Ireland*, p. 57—58) gives many interesting details of the breeding habits of this species in Ireland, and describes the nest as $1\frac{3}{4}$ to 2 in. wide across the cup and $1\frac{1}{4}$ in. deep, less compact than that of the Goldfinch, the light being sometimes visible through it. A number of small dead twigs of fir or heather, often with grey lichens attached, are usually built into the foundation of the nest, which consists chiefly of green moss, with a few dry bents, bound round with wool or horsehair. The lining consists of fine roots and sometimes also a few feathers, rabbit down, cowhair, or thistle down.

Nest.

4—5 in number, but 6 are said to occur. They show great variation in size and also in colouring. The finest eggs I have seen were from Ireland, and were not only larger than any Scotch eggs which have come under my notice, but also more brightly coloured. The ground colour varies from a decided clear pale blue to a fainter tint. It is always clearer and paler than the tint of the eggs of the Lesser Redpoll and the shell is more glossy. The markings consist of pale red or reddish grey spots and streaks, with a few spots of very dark red brown.

Eggs.

* Exceptionally the nest has been found only 12 ft. from the ground (A. Ellison).

Breeding
Season.

It is an early breeder, nesting in Scotland from early in April to the beginning of May, and generally rearing a second brood in June. St. John found well fledged young near Nairn on April 26, and Hancock found young nearly fledged in Elgin on May 2, but it is not unusual to find fresh eggs in the first week of May in Ross. In Ireland Ussher found the first clutches in Waterford and Wicklow early in April, and second broods in June. Young birds have been seen on the wing on April 29. On the Continent eggs are found in April or early May, and again in June.

Measure-
ments.

Average of 72 eggs laid in a wild state, 16.27×12.02 mm., Max. 18.5×12.4 and 18.1×13 mm. (co. Wicklow), Min. 14.7×12 and 16.6×11.1 mm. (Scotland). Of the above 72 eggs, 4 were taken in Ireland, 49 in Scotland and 19 from the Continent (Thuringia, Styria, etc.).

[*Carduelis tristis* (L.) is said to have occurred once on Achill Island (*Zool.* 1894, p. 396).]

21. Linnet, *Carduelis cannabina* (L.).

Plate 11, Fig. 1—5 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 10, a—c. Hewitson, I. Ed. I, pl. XCVI, fig. 1, 2; II. Ed. I, pl. XLV, fig. 1; III. Ed. I, pl. LI, fig. 1. Baedeker, Tab. 20, fig. 13. Taczanowski, Tab. LXXI, fig. 2. Seebohm, Brit. Birds, pl. 13; id. Col. Fig., pl. 57. Frohawk, Br. Birds, II, pl. V, fig. 158—167.

Nest: O. Lee, IV, p. 40.

British Local Names: *Grey, Red, Brown, Rose, Blood, Furze or Whin-Linnet; Grey, Whin-grey, Hemplin.* Welsh: *Llinos.* Scotland: *Lintie, Whin, Grey* or *Rose Lintie.*

Foreign Names: Bohemia: *Jiřice obecna.* Denmark: *Tornirisk, Graa-* or *Rödörisk.* Finland: *Hempponen, Hamppuvarpunen.* France: *Linotte.* Germany: *Bluthänfling, roter* or *grauer Hänfling.* Helgoland: *Irdisk.* Holland: *Kneutje, Vlamsijs.* Hungary: *Kenderike.* Italy: *Fanello, Montanello.* Norway: *Tornirisk.* Poland: *Makolagwa.* Portugal: *Pintarroxo.* Russia: *Repolow.* Spain: *Camacho, Jamas.* Sweden: *Hämpling, Sommarhämpling.*

Linaria cannabina (L.). Dresser, Birds of Europe, IV, p. 31. *Linota cannabina* (L.). Newton, ed. Yarrell, II, p. 153; Dresser, Man. Pal. Birds, p. 312. *Acanthis cannabina* (L.). Saunders, Man., p. 187. *A. c. cannabina* (L.). Hartert, Vög. Pal. Fauna, p. 73.

Breeding Range: Europe, excepting the northern half of Scandinavia and north Russia, but replaced in S. Spain, S. Italy, Dalmatia, etc. by *C. c. mediterranea* (Tsch.).

British
Isles.

Generally distributed throughout the British Isles, but is especially partial to furze covered commons and waste lands, and less numerous in the highly cultivated districts. On the higher mountain ranges it is replaced by the Twite, as also in the Outer Hebrides and Shetlands. In

the Inner Hebrides it is local, but nests in a few localities, and is common in the Orkneys. On the Scottish mainland north of the Great Glen it is scarce and local, and entirely absent from a great part of Ross, Sutherland and Caithness, but is common locally in the Moray Basin. In Ireland it is very common, breeding in all the open districts and many of the islands.

In Norway it is common in the south and breeds sparingly in the Bergen and Trondhjem dioceses up to lat. 63° N., and generally in southern and middle Sweden to about 61°—62°. Wheelwright met with the birds at Quickjock, but failed to find nests, and in E. Russia it is absent from the greater part of the country north of lat. 60°. Over the rest of Europe it is locally common in suitable localities, but the exact limits of the typical and the Mediterranean races are not yet clearly defined.

Con-
tinen-
tental
Europe.

Wherever the ground is overgrown with furze bushes, brambles, black-thorn or low scrub, the Linnet is pretty certain to be found breeding. Plantations of young trees where there is plenty of undergrowth and hedgerows are also favourite sites. Sometimes the nests are found in considerable numbers within a short distance of one another, so that, like the Greenfinch, it may almost be said to breed at times in colonies. As Dr. Rey has pointed out, the Linnet breeds indifferently on the hills and in the plains, in sand dunes or in swamps.

Nest.

The nest is neatly and solidly built of grass stalks, roots, moss, etc., and sometimes a few fine twigs or bits of heath, warmly lined with hair, wool, plant-down or feathers: while Rey mentions cases where strips of cloth, string and even coloured silks have been found interwoven. Dimensions in inches: diameter about $3\frac{1}{2}$, height 2; breadth of cup $2\frac{1}{4}$, depth $1\frac{3}{8}$. It is usually found a yard or two from the ground, less commonly 3—4 yards high, but has been met with in tussocks on sand-dunes, in heather, on the bare earth in Scandinavia (Ottosson), among grass in Germany (Rey), among moss on rocks in the Alps (Bailly) and even in a potato or broccoli plant! In Germany the nest is also frequently found in the 'hedges' of dead branches by which the sand dunes are kept from drifting, as well as in turf stacks and heaps of cut wood (Hartert).

Usually 4—5, sometimes 6, while 7 have occasionally been found. Two (possibly sometimes three) broods are raised in the season. The eggs show considerable variation in size, shape and colouring. Sometimes the ground colour is a clear light blue with a slight tinge of green, at other times it is bluish or French white; while the markings consist generally of spots of purplish red, congregated round the large end, and underlying spots or blotches of paler red or violet. Eggs entirely without markings are found both with white and blue ground; and one variety is profusely speckled with reddish, like the egg of the Spotted Flycatcher. Large specimens exceed the minimum size of Greenfinch eggs.

Eggs.

Breeding
Season.

In England the eggs of the first brood are generally laid from mid-April to early May, and the second in June or even July; while in Ireland Ussher has found eggs from May to July, and in Germany Rey has taken them between April 25 and August 15. In Greece Krüper says they lay from mid-April onwards, but in the south some birds evidently breed very early, as Führer saw fledged young on April 21 in Montenegro. In Finland not before Mid-May. Incubation is chiefly, but not solely, performed by the hen, and the eggs are hatched on the 14th day from the laying of the last egg (Evans).

Measure-
ments.

Average of 100 eggs from England and the Continent (80 by Rey and 20 by the writer) 18.12×13.10 mm., Max. 20.3×14 mm., Min. 14.7×13.4 and 16×12 mm. Average weight (80 eggs) 98 mg. (Rey). 9 full eggs average 1.631 g. (Foster). Fatio has a dwarf egg 9×6.5 mm.

Geographical Races.

a. Common Linnet, *C. cannabina cannabina* (L.). See above.

b. Mediterranean Linnet, *C. cannabina mediterranea* (Tsch.).

Acanthis cannabina mediterranea Tsch. Hartert, Vög. Pal. Fauna, p. 75.

Breeding Range: The northern shores of the Mediterranean, Dalmatia, S. Italy, S. Spain, etc. The exact limits of this and the typical race are not clearly defined. In S. Spain great numbers nest in April.

[In the Canaries, Madeira and N. W. Africa the resident form is *C. c. nana* (Tsch.). 11 eggs from Tenerife average 16.62×12.89 mm., and are decidedly smaller as a rule than eggs of the typical form. From the Caucasus and Asia Minor eastward *C. c. fringillirostris* (Bp. & Schl.) is found. Average of 4 eggs from near Smyrna, 19.5×14.1 mm. (Coll. Selous).]

22. Twite, *Carduelis flavirostris* (L.).

Plate 11, fig. 6—10 (Broadstone, Yorks, 16—20, VI, 80).

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 11, a—c. Hewitson, I. Ed. I, pl. XCVI, fig. 3; II. Ed. I, pl. XLV, fig. 3; III. Ed. I, pl. LI, fig. 3. Baedeker, Tab. 20, fig. 14. Seebohm, Brit. Birds, pl. 13; id. Col. Fig., pl. 57. Frohawk, Br. Birds, II, pl. V, fig. 172—173.

Nest: Kearton, Brit. Birds' Nests, p. 315.

British Local Names: *Mountain, Grey* or *Moor Linnet*. Scotland: *Heather, Hill* or *Yellow neb Lintie*.

Foreign Names: Bohemia: *Jirice horní*. Denmark: *Bjergirisk, Moirisk, Bjergfinke*. Finland: *Keltanokka hemppo*. France: *Linotte de montagne* or *à bec jaune*. Germany: *Berghünfling*. Helgoland: *Road-ejeihssed*. Holland: *Fratertje*. Hungary: *Téli kenderike*. Italy: *Funello nordico*. Nor-

way: *Gulnaebet Irisk, Knötter*. Poland: *Górniczek*. Spain: *Pujarel*. Sweden: *Gulnäbbad Hämpling, Vinterhämpling*.

Linota flavirostris (L.). Dresser, Birds of Europe, IV, p. 59; Newton, ed. Yarrell, II, p. 160; Dresser, Man. Pal. Birds, p. 313. *Acanthis flavirostris* (L.). Saunders, Man., p. 193. *A. f. flavirostris* (L.). Hartert, Vög. Pal. Fauna, p. 76.

Breeding Range: Locally in the north of England, Ireland, Scotland and the adjacent isles (but not on the Færöes), Norway, Lapland and perhaps also Finland.

In England the Twite is chiefly confined to the mountains and moorlands north of lat. 53° 20', although a few instances of its breeding farther south are on record. W. H. Hine found a small colony nesting in N. Devon in 1904, but though it is said to occur locally in N. Wales, definite proofs of its breeding there are still lacking. A few pairs are found on the moorlands of N. Staffordshire, but it is only on the extensive grouse moors of Longdendale (Cheshire), the High Peak (Derbyshire) and W. Yorkshire that it begins to be at all common. In some parts of Yorkshire it is tolerably plentiful; and is found in small colonies locally in many suitable localities in our northern counties, nesting not only on the hills, but in the Lancashire mosses only a few feet above the sea level. In Cumberland and the Lake district it is local and far from common, and though recorded from the Isle of Man 40 years ago, has not been observed there recently. In Scotland it is much more numerous, breeding among the heather, not only on the mainland, but also on the Inner and Outer Hebrides, the Orkneys, Shetlands and also on S. Kilda. On some of the islands on the west coast where the heather is high it is exceedingly common, and on the Orkneys, Fair Isle and Shetlands it is everywhere abundant. In Ireland it is locally common, especially near the coast, but does not breed in the low lying bogs of the midland counties, and not often on the mountain ranges inland.

British
Isles.

In Norway it is found sporadically in colonies in different localities, such as the Dovrefjeld and the Filefjord, in the subalpine region, as well as here and there along the west coast and islands as far as Tromsö (lat. 69° 39' N.); while in Lapland it breeds plentifully near Karesuando (Lillejeborg), and is said to have nested in Finland near Uleåborg. In Sweden it is only known to occur in small numbers in the extreme north, and its presence in N. Russia in the breeding season is very doubtful.

Con-
tinental
Europe.

On English moors, where the heather is usually short, the nest is generally close to, or even on the ground, often close to a sheep track. In some parts of Scotland on the other hand (such as the islets in the Firth of Lorne) it is not uncommon to find nests 3 or 4 ft. above the ground in long, rank heather. In more open and wind swept districts, such as the Outer Hebrides, where there is less cover, the Twite usually breeds on the

Nest.

ground, often under shelter of on upturned sod or in rough pasture, and sometimes among ivy or creepers on walls and rocks.

On the mainland it nests occasionally in trees in preference to the open moors, and in the Orkneys and Shetlands many nests are now built in gooseberry and elder bushes. Almost every kind of site is utilized occasionally in these islands, e. g. in walls, peat stacks, stone heaps, under boulders, in rabbit holes, haystacks, on ledges of cliffs, among young corn or roots, even on cabbage stocks and inside a hollow turnip growing in a field! In Ireland Ussher has found nests in furze, and one has been recorded from under a tuft of rushes (Ellison). The nest is generally neatly built of dry grass, fibrous roots and stalks, with fine twigs of heather sometimes as a foundation and a little moss, and the lining consists generally of hair and wool, with an occasional feather or two. Saxby found rabbit down woven into the lining in Shetland nests, and on one occasion large quill feathers (one 8 in. long) attached to the edge; while Macpherson records one lined with peat fibre. Inside diameter about 2—2½ in., depth 1¼ in.

Eggs. 5—6 in number as a rule, but Ussher has twice found clutches of 7 in Ireland, and 4 eggs are sometimes found. They resemble those of the Linnet, but as a rule the underlying markings are few and there is a decided tendency to streaks instead of spots. Ground colour generally clear pale blue; the rather scanty spots or streaks are of very dark red brown, and generally towards the large end. Saxby found a set of pure white eggs in Unst.

Breeding Season. The Twite is rather a late breeder, and in the north of England usually lays from the middle to the end of May, or early in June. In Scotland the breeding season is very similar, and in the Shetlands fresh eggs may be found from mid-May onwards. In Ireland it is rather earlier, and Ussher has taken full clutches in the first week of May. As fresh eggs have been found both in Ireland and the Shetlands in July and August, it is probable that a second brood is occasionally reared. The hen sits closely, and when flushed flits restlessly about the heather.

Measurements. Average size of 100 eggs from the British Isles (40 measured by Rey and 60 by the writer) 16.89 × 12.6 mm., Max. 18.5 × 12.5 and 17.2 × 13.7 mm., Min. 15.3 × 12.3 and 16.8 × 11.8 mm. Average weight (40 eggs) 73 mg. (Rey). 4 full eggs average 1.474 g. (Foster). A dwarf egg (Yorkshire, R. H. Read) measures 14.2 × 11.3 mm.

[From Asia Minor and the Caucasus eastward a paler form is found, *C. flavirostris brevirostris* (Moore). Clutches of 5—6 eggs from the Kuko-Noor measure 17 × 12.4 and 17.1 × 12.6 mm., and resemble those of the typical race (Hartert, Vög. Pal. Fauna, p. 77).]

23. Mealy Redpoll, *Carduelis flammea* (L.).

Plate 11, fig. 11—15 (Lapland).

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 13, a—c. Hewitson, III. Ed., pl. LI,* fig. 1, 2. Baedeker, Tab. 20, fig. 15. Taczanowski, Tab. LXXII, fig. 1. Seebohm, Br. Birds, pl. 12; id. Col. Fig., pl. 57.

Foreign Names: Bohemia: *Cecatka obecna*. Finland: *Varpunen*, *Punapüü*. Holland: *Barmsijsje*, *Puapje*. Hungary: *Nyirizszese*. Italy: *Sizerino*. Norway: *Gråsisikk*, *Moirisk*. Poland: *Luszczak czeczotka*. Russia: *Tschetschoska*. Sweden: *Kortnäbbad Gråsiska*.

Linota linaria (L.). Dresser, Birds of Europe, IV, p. 37; Newton, ed. Yarrell, II, p. 133; Dresser, Man. Pal. Birds, p. 315. *Acanthis linaria* (L.). Saunders, Man., p. 189. *A. flammea flammea* (L.). Hartert, Vög. Pal. Fauna, p. 77.

Breeding Range: The typical race inhabits the birch and alder region of northern Scandinavia and Russia, but in N. Lapland a long billed race, *C. f. holboëlli* (Brehm), is the prevalent form. [Also in Siberia and arctic America.] (The study of the breeding habits of these birds is attended with peculiar difficulty, owing partly to the diversity of opinion with regard to the validity of the various species and subspecies of Redpolls, and partly to the overlapping of the range of two closely allied species, *C. flammea* and *C. hornemanni*. Moreover not only do intermediate forms between the typical race and Holböll's Redpoll occur, but it is said that in some districts both races are found breeding. See the *Ibis* 1904, p. 445.)

In Norway the Mealy Redpoll is abundant in the Tromsö diocese up to about lat. 69°, and though less numerous in the south, small colonies may be found in the birch woods not infrequently as far as the Dovre- and Langefjeld, and occasionally even in the Kristiansand diocese. In Sweden its range is more limited, and though common in Jemtland it is scarce south of lat. 62°, but a few pairs have been found nesting in Werm-land, Gefle, Kolmorden (1876), and Upsala (1902). In Finland and N. Russia the distribution of the various races and species is very imperfectly known and probably varies from time to time. At Lutni on the Murman coast *C. hornemanni exilipes* was the only species found breeding by Pearson in 1895, but was not met with subsequently. On the other hand *C. flammea* (? *holbölli*) was recorded from Lutni and other localities on the same coast in 1899, 1901 and 1903, and also from Habarova (opposite Waigatch) in 1897*. Seebohm secured a few specimens of *C. flammea* as well as *C. h. exilipes* on the lower Petschora. In South Finland Westerlund says it has bred near Helsingfors; Deichler describes it as nesting in the

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tial
Europe.

* See also Pearson, *Three Summers*, etc., p. 166.

Russian Baltic Provinces, and von Homeyer on Hiddensee, near Rügen in the Baltic; while according to Hartert it breeds in northernmost E. Prussia, near the Baltic.

Nest. Like the Twite, the Mealy Redpoll is a sociable bird; and it is not uncommon to find several nests within a short distance of one another in open glades of birch forest and on the outskirts of thickets of willow. As a rule they are placed in the fork of a bough from one to ten feet high, but nests have been met with on the ground in tufts of grass, and Newton (II, p. 138) mentions one on the hollow top of a birch stump. They are generally very neatly built of bents and roots, with sometimes a few lichens and shreds of bark, on a foundation of a few heather twigs; while the lining consists of willow down or flower-seeds, feathers (usually of gulls, willow grouse or snowy owl), and reindeer hair. Diameter about $3-3\frac{3}{4}$ in., height $2-2\frac{1}{2}$ in.; diameter of cup $1\frac{1}{2}-2$, depth $1-1\frac{2}{3}$ in.

Eggs. Generally 5—6 in number, occasionally 4 only. For purposes of accurate comparison most of the eggs in collections are of little use, owing to the uncertainty as to the distribution of the various forms of Redpoll and absence of authentication. As a rule Redpolls' eggs are distinguishable from those of other allied *Fringillidae* by the deeper blue of their ground colour, duller surface of shell, more profuse and lighter markings and a decided tendency to spots rather than streaks. The ground colour is however very fugitive and individual eggs vary a good deal.

Breeding Season. Somewhat irregular, nests with fresh eggs and young being often found in close proximity. In mid-Norway full clutches may be taken from the last week in May till about the middle of July, but usually in June. On Karlö from the first week in June onwards (Sandman).

Measurements. 100 eggs from Scandinavia and north Russia measured by the writer average 16.98×12.65 mm., Max. 20×12.2 and 17.6×13.6 mm., Min. 14.4×12.2 and 15.5×11.5 mm. Some of these may belong to the next species, but 22 which certainly belong to the typical race average 16.85×12.8 mm. Newton has a dwarf egg measuring about 11×9 mm. Rey gives the average weight of Redpolls' eggs as 71 mg.

Geographical Races.

a. Mealy Redpoll, *C. flammea flammea* (L.). See above.

b. Holböll's Redpoll, *C. flammea holboelli* (Brehm).

Acanthis flammea holboelli (Brehm). Hartert, Vög. Pal. Fauna, p. 79. (Whether Holböll's Redpoll can be regarded as a strict geographical race can hardly be stated with certainty as yet. Wolley observed considerable wearing down of the mandibles of resident birds in Lapland during the winter months, so that it is unsafe to attach too much importance to this

character, especially as some birds regularly migrate southward in winter. Witherby, who has shot both forms in the same little company, is disposed to consider the variation individual. Intermediate forms also occur; and without further investigation no distinctive characters can be given with regard to breeding habits or eggs, but so far the larger billed and longer winged birds have only been found within the most northerly limits of the range of this species in both the Old and New Worlds.)

e. Greater Redpoll, *C. flammea rostrata* (Coes).

A. flammea rostratus (Coes). Hartert, Vög. Pal. Fauna, p. 80.

Breeding Range: Southern Greenland. (Has occurred at Barra, W. Scotland (*Ann. Scott. Nat. Hist.* 1901, p. 131) and Ireland (*Birds of Ireland*, p. 64). Eggs said to be larger than those of the typical race.

d. Lesser Redpoll, *C. flammea cabaret* (P. L. S. Müll.).

Plate 38, fig. 11 (Scotland); 26, fig. 4, 5 (Derbyshire, VI. 04).

Eggs: Hewitson, I. Ed. I, pl. XCVI, fig. 4; II. Ed. I, pl. XLV, fig. 2; III. Ed. I, pl. LI, fig. 2. Seebohm, *Brit. Birds*, pl. 12; *id. Col. Fig.*, pl. 57. Frohawk, *Br. Birds*, pl. V, fig. 168—171.

British Local Names: *Chevy, Chaddy, Grey Bob, French Grey, Banty Hemplin, Red Linnet*. Welsh: *Llinos bengoch*. Scotland: *Dwarf Lintie*.

Foreign Names: France: *Sizerin cabaret*. Holland: *Klein Barmsijsje*. Italy: *Organetto*. Switzerland (German): *Südlicher Leinfink*. Spain: *Volicelo*.

Linota rufescens (Vieill.). Dresser, *Birds of Europe*, IV, p. 47; Newton, ed. Yarrell, II, p. 146; Dresser, *Man. Pal. Birds*, p. 316. *Acanthis rufescens* (Vieill.). Saunders, *Man.*, p. 191. *A. flammea cabaret* (P. L. S. Müll.). Hartert, Vög. Pal. Fauna, p. 80.

Breeding Range: The British Isles and the whole Alpine district, probably also in the Carpathians. Redpolls (? *C. f. cabaret*) are also resident in the Balkans and Caucasus.

In England this bird is commonest in the counties north of about 52° 30', though everywhere rather local. In the south midland and south eastern counties it breeds sporadically in small numbers, but is decidedly scarce along the south coast and practically absent from the Devonian peninsula, though recorded as breeding in Somerset and Dorset. In Wales it is fairly common in the valleys, especially in some parts of the north (e. g. S. Denbigh), but is found also locally in the south, in Pembroke, Cardigan, Brecon, etc. In Scotland it is a local resident or summer visitor in many of the wooded straths of the mainland, and is known to nest in the Orkneys and some of the Inner Hebrides as well as on Barra. In Ireland it is common and widely distributed, nesting in every county except Kerry and on Aranmore Island (Co. Donegal).

British
Isles.

Con-
tinental
Europe.

In the valleys of the French, Swiss, Italian and Austrian Alps it is tolerably common in the breeding season. S. B. Wilson obtained a nest on the Engstlen Alp in 1886 at a height of over 6000 ft., and according to Fatio it is chiefly found in the Alpine cantons up to about 5700 ft., and more rarely in the Jura. Although the nest has not actually been found in the Carpathians, the birds are seen in Hungary in winter and spring. Reiser describes a form of Redpoll as breeding in the Balkans, and Radde mentions it as nesting in the Caucasus, but up to the present no specimens are available for examination. On Helgoland a pair bred in 1872.

Nest.

The sites adopted by these birds vary considerably. In the south of England nests may be found in alders, osier beds, on small fruit trees, on the outskirts of small plantations or shrubberies, and in high straggling hedges. Another not uncommon site is among young conifers, especially larches; and though most nests are built at no great height from the ground there are a few exceptions to the rule on record. In Yorkshire it has been recorded as nesting on the ground among bracken (*Zool.* 1902, p. 194); in Scotland in tall heather, 2 ft. from the ground; among ivy on a tree trunk in Somerset (*Zool.* 1903, p. 457), while on the other hand nests have been found 40 ft. or more from the ground in ashes, elms, chesnuts, larches, etc., and in Ireland it has bred in furze and currant bushes, honeysuckle or briars (Ussher). It is not uncommon to find several nests in tolerably close proximity, and some preference is shown for the neighbourhood of rivers or marshes. The nest is very characteristic, being composed chiefly of coarse stalks and roots, the ends of which project and give it a rough, unfinished look: sometimes on a foundation of a few twigs. At other times moss, wool and lichens are used. Internally the nest is beautifully lined with white vegetable down as a rule, but sometimes with hair or feathers, or even both. Diameter about $2\frac{1}{2}$ in., height 2 in., diameter of cup $1\frac{3}{4}$ in., depth 1 in.

Eggs.

4—6 in number, but usually 5. The blue is of a greener shade, and when fresh is decidedly deeper in tint than that of the other Finches of this genus. The shell is also less glossy, and the markings, which consist of a few spots or small streaks chiefly, at the large end, are dark purplish brown, with underlying paler reddish brown spots or blotches.

Breeding
Season.

In the south of England according to Newton, eggs are known to have been laid by the end of April, but the more usual time seems to be from mid-May to the end of June. In Derbyshire I have found most nests between May 25 and June 15. Ussher gives the latter part of May or the month of June as the usual time for eggs in Ireland.

In the Alps, according to Fatio it nests from the end of April to late in May, and Wilson found fresh eggs on June 8.

100 eggs from Great Britain average 15.97×12.2 mm., Max. Measurements. 17.5×12.3 and 16×13.2 mm., Min. 14.3×10.5 and 15.3×10 mm. A dwarf egg measures 13.5×10.3 mm. (R. H. Read). Average weight of 16 eggs 73 mg. 5 full eggs average 1.315 g. (Foster).

e. Iceland Redpoll, *C. flammea islandica* (Hantzsch).

(Recently described by Hantzsch as a separate race in his *Beitr. z. Kenntn. d. Vogelwelt Islands*, p. 300. Resident in Iceland, where they nest in the scrub, 2 to 6 ft. from the ground, during the first half of June, and lay 5—6 eggs. Average size of 9 eggs, 17.73×12.59 mm., Max. 18.4×13 mm., Min. 17×12.6 and 17.1×12.4 mm. Average weight 65 mg. Full eggs vary from 1.5 to 1.6 g. (Hantzsch). Possibly *C. hornemanni* also breeds on the island. Cf. *Zool.* 1901, p. 407.)

24. Coues' or Hoary Redpoll, *Carduelis hornemanni exilipes* (Coues).

Linota exilipes (Coues). Dresser, Birds of Europe, IV, p. 51; id. Man. Pal. Birds, p. 317. *Acanthis hornemanni exilipes* (Coues). Hartert, Vög. Pal. Fauna, p. 81.

Breeding Range: Lapland and northern Russia. [Also Arctic Siberia and America.]

Apparently this species is somewhat irregular in its breeding range in northern Europe. H. J. Pearson met with no other form in Russian Lapland in 1905, and found it abundant near Lutni; on subsequent journeys however only Mealy Redpolls were met with, except in 1903 near the Tuloma, when two were shot. Witherby's examples from this district were *C. flammea*. Seebohm obtained specimens of both species from the Lower Petschora up to lat. $71\frac{1}{2}^{\circ}$. Pearson describes the nests and eggs as indistinguishable from those of the Mealy Redpoll.

Eggs 4—6 in number, and much incubated on June 20. 9 authentic eggs in H. J. Pearson's collection average 17.35×12.91 mm., Max. 18×12.7 and 17.3×13.2 mm., Min. 16.5×13.1 and 18×12.4 mm.

Geographical Races.

a. Greenland Redpoll, *C. hornemanni hornemanni* (Holb.).

Eggs: Seebohm, Brit. Birds, pl. 12; id. Col. Fig., pl. 57.

Linota hornemanni Holb. Dresser, Birds of Europe, IV, p. 55; id. Man. Pal. Birds, p. 317. *Acanthis hornemanni hornemanni* (Holb.). Hartert, Vög. Pal. Fauna, p. 81.

Breeding Range: Spitzbergen, Jan Mayen; perhaps also in Iceland. [In Greenland to lat. 73° , etc.]

Owing to the fact that *C. flammea rostrata* also breeds in Greenland, there is great uncertainty as to the authenticity of many Greenland eggs in collections. Coburn reports having found this species breeding in Iceland (*Zool.* 1901, p. 407). 7 eggs taken by P. Nielsen at Akureyri certainly appear too large for *C. flammea islandica*, averaging 18.08×13.4 mm. in size (coll. H. J. Pearson). 27 eggs ascribed to this species from Greenland, taken during the latter part of June, average 17.64×13.04 mm., Max. 19×13 and 17.5×14 mm., Min. 15×12 mm.

b. Coues' Redpoll, *C. hornemanni exilipes* (Coues). See p. 63.

25. Citril Finch, *Carduelis citrinella* (L.).

Plate 10, fig. 22—26 (Switzerland).

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 16, a—b. Baedeker, Tab. 20, fig. 4.

Foreign Names: Bohemia: *Penkava citronová*. France: *Venturon alpin*, *Serin de montagne*. Germany: *Zitronenzeisig*, *Zitronenfink*. Italy: *Venturone*, *Legorin de montagna*. Spain: *Verdoncillo*.

Chrysomitris citrinella (L.). Dresser, Birds of Europe, III, p. 535; id. Man. Pal. Birds, p. 278. *Acanthis citrinella citrinella* (L.). Hartert, Vög. Pal. Fauna, p. 81.

Breeding Range: The chief mountain systems of central and south Europe.

In Spain this bird breeds on the spurs of the S. Nevada, and Saunders records a nest from Granada (2200 ft.). It is also found in the Pyrenees up to about 6000 ft., and in the Vosges Mts., while in the upper valleys of the Alps and Jura it is widely distributed and not uncommon from 2700 to 5400 and even 6000 ft. (Fatio). In Germany it breeds in the Schwarzwald, and its range also extends to the Tyrol and Salzburg. According to Arrigoni the resident Italian birds probably belong to the next subspecies, and Reiser does not include it in the *Ornis balcanica* (Vols. II, III, IV). [The older records of this species from Greece and Corfu probably refer to the Serin.]

Nest. The Citril Finch is a mountain haunting bird, and the nest is almost invariably built in a pine or other conifer, sometimes at a considerable height. It is neatly constructed of grass stalks, lichens and moss, with spiders' webs, fine roots or hair interwoven, and lined smoothly with hair, thistle down or feathers. Being usually placed at the extremity of a branch and partly concealed by the pine needles, it is not always easy to find.

Eggs. 4—5 in number, and practically indistinguishable from those of several other species of this genus. The ground colour is perhaps more bluish

than in eggs of the Serin and Goldfinch as a rule, but the markings are very similar.

In Switzerland according to Fatio, the eggs are laid towards the end of April or at the beginning of May; but S. B. Wilson took 3 nests with eggs on May 28 in the Jura, and they may also be obtained till late in June. The nest found by Saunders at the Alhambra contained 3 eggs on April 4.

Breeding
Season.

41 eggs (11 measured by Rey and 30 by the writer), chiefly from Switzerland, average 16.5×12.59 mm., Max. 18.5×12.5 and 16.2×14.1 mm., Min. 15.3×13.4 and 16.1×11.7 mm. Rey gives the average weight of 11 eggs as 74.4 mg.

Measure-
ments.

Geographical Races.

a. Citril Finch, *C. citrinella citrinella* (L.). See above.

b. Corsican Citril Finch, *C. citrinella corsicana* (Kön.).

Chrysomitris corsicana (Kön.). Dresser, Man. Pal. Birds, p. 279.
Acanthis citrinella corsicana (Kön.). Hartert, Vög. Pal. Fauna, p. 82.

Breeding Range: Corsica and Sardinia, where it is an abundant resident, breeding even in the coast districts as well as in the mountains. According to Arrigoni it is probably also this form which breeds in the mountains of N. Italy. In Corsica Whitehead describes it as usually nesting in arbutus trees. The nest is built of grass stems, lined with feathers and is rather rudely constructed. The breeding season appears to vary with the altitude, for Whitehead found young on April 29 on the coast, while in the hills many nests were still empty at the end of May. Average of 4 eggs in Tring Museum: 16.72×12.75 mm., Max. 17.7×13 mm., Min. 16×12.5 mm. (Hartert, *in litt.*).

26. Serin, *Serinus canarius serinus* (L.).

Plate 11, fig. 26, 28, 30 (Moravia); fig. 27, 29 (Switzerland).

Eggs: Thienemann, Fortpfl., Tab. XXXV, fig. 15, a—c. Baedeker, Tab. 20, fig. 5. Seebohm, Brit. Birds, pl. 12; id. Col. Fig., pl. 56.

Foreign Names: Austria: *Hirngrill*. Bohemia: *Zvonohlík*. Denmark: *Guulirisk*. France: *Cini*, *Serin*. Germany: *Girlitz*. Greece: *Spurgitis*. Hungary: *Girlic*, *Csicsörke*. Italy: *Verzellino*. Poland: *Kulczyk*. Portugal: *Serzino*. Spain: *Chamaris*, *Verdecillo*. Sweden: *Gulhämpling*.

Serinus hortulanus Koch. Dresser, Birds of Europe, III, p. 549; Newton, ed. Yarrell, II, p. 111; Saunders, Man., p. 177; Dresser, Man. Pal. Birds, p. 280. *Serinus canaria serinus* (L.). Hartert, Vög. Pal. Fauna, p. 83.

Breeding Range: The greater part of South and Central Europe; is gradually extending its northern range. [Also the Barbary States and Asia Minor.]

Con-
tinental
Europe.

In the Iberian peninsula the Serin is abundant in most wooded districts of Spain and Portugal, nesting in olive and cork-oak trees, in the pine forest, and also on the slopes of the Pyrenees. In France it occurs chiefly in the central and southern provinces, and is abundant in Corsica, nesting in the olive, ilex, and cork trees. It breeds in the hilly parts of northern and central Italy, occasionally in Calabria and Apulia, and is scarce in the south of Sardinia. In Switzerland it is tolerably common in the plain, but occurs in the mountains up to about 3600 ft., and of late years has considerably increased its northern range in Germany (see *Orn. Monatsber.* 1893, p. 1), breeding not uncommonly in Brandenburg, while it has nested in Pomerania and West Prussia and in the Rhine valley at least as far as Köln, as well as in Silesia. In Austro-Hungary it is now found in every province, and is especially common in W. Hungary and Bohemia. In Poland it was first recorded as breeding in 1877. It does not appear to be a common breeding species in the pine forests of the Balkan peninsula, but is found on the wooded mountains of Greece.

Nest.

This nest is as a rule a difficult one to find, though the peculiar sibilant notes of the cock occasionally indicate its neighbourhood. In middle Europe it is built in almost any kind of fruit or forest tree, generally 9 or 10 ft. from the ground, but sometimes as low as 5 ft., in gardens, parks, orchards, vineyards or avenues; sometimes among the small twigs, and at other times at the angle of a stout branch. It is neatly built of grass stalks and roots, often with a few lichens attached, interwoven with spiders' webs, or thread, and is generally smoothly lined with hair, feathers, or down. Approximate measurements: diameter $3\frac{3}{4}$ in., depth of cup $1\frac{1}{4}$ — $1\frac{1}{2}$ in., diameter $1\frac{3}{4}$ —2 in. In N. Africa nests have been found in bushes only 3 ft. high, as well as in olives and cork oaks up to 20 ft.

Eggs.

3—4 in the south, but generally 5 in the north; closely resembling those of the Citril Finch and Goldfinch in colour and markings. They are however generally smaller than those of the latter, and according to Rey, frequently show a bluish tinge, which however soon fades. Occasionally a clutch is marked with big blotches of purple brown.

Breeding
Season.

In Middle Europe generally in May; in Corsica about the second week of April, but much earlier in the south. Thus Rey found fledged young on one occasion in Portugal on March 12, and eggs may be found in Spain from the end of March to mid June. In Tunis Whitaker has seen well grown young in the nest on March 24, but Meade-Waldo found eggs in the Maroccan Atlas in July. In Marocco Hartert found eggs at Mazagan early in April.

Measure-
ments.

Average of 100 eggs (82 by the writer and 18 by Rey) 16.17×11.86 mm., Max. 17.6×12.5 and 16.3×12.7 mm., Min. 14.4×11 mm. Average weight (18 eggs) 70 mg. (Rey).

Geographical Races.

a. Canary, *S. canarius canarius* (L.).

Plate 26, fig. 7 (Tenerife, 16. IV. 91).

Foreign Names: Azores, Canaries, etc.: *Canario*, *Pajaro canario*.

Serinus canarius (L.). Dresser, Birds of Europe, III, p. 557; id. Man. Pal. Birds, p. 281. *S. canaria canaria* (L.). Hartert, Vög. Pal. Fauna, p. 84.

Breeding Range: The Canaries, Azores and Madeira. (Has occurred in the British Isles, Italy, etc.).

This large race of the Serin is abundant in most of the islands in the above named groups. The nest is built not only on orange and cypress trees, 10 to 20 ft. from the ground, but also in the heaths and cistus scrub on the hillsides, sometimes within a few inches of the ground. It is composed of stalks or moss, lined with white hair, down or feathers. The number of eggs is variable: 3 is the usual clutch on the Azores, but 4 are sometimes found; while in the Canaries 5 eggs are not unusual and 6 have been recorded. In the Azores eggs may be found throughout April and May, but in Tenerife along the coast nesting begins in January and at least two broods are reared, although in the high mountains breeding takes place in June and July (Meade-Waldo). In colour the eggs are variable; some are white without markings, but most have spots or streaks of dark purplish red, sometimes only the paler underlying markings, on a pale bluish or even reddish white ground.

62 eggs from the Azores, Tenerife, Palma, etc., average 17.17×13 mm., Max. 19.1×13.3 and 18×14 mm., Min. 15.5×13.1 and 16.6×12 mm. Schmitz has taken eggs 20×13.5 and 17.8×14.5 mm. in Madeira.

b. Serin, *S. canarius serinus* (L.). See p. 65.

[Another species of this genus, *S. syriacus* Bp., occurs locally in the mountain districts of Palestine, nesting in the forks of tall shrubs. Two eggs taken by Tristram on June 16, 1864, measure 16.7×12.4 and 17.1×13 mm. (coll. Newton). It has been recorded from Dalmatia. *S. icterus* (Bonnat.-Vieill.) is said to have occurred in England and Italy, and *S. canicollis* Swains. has been twice taken in the south of England.]

27. Red-fronted Finch, *Serinus pusillus* (Pall.).

Plate 38, fig. 10 (Caucasus).

Foreign Names: Bohemia: *Zvonohlík ruský*. France: *Serin nain*. Germany: *Rotköpfiger Givlitz*. Russia: *Korolkowyi Wjurok*; near Tiflis: *Malinowka*.

Serinus pusillus (Pall.). Dresser, Birds of Europe, III, p. 561; id. Man. Pal. Birds, p. 282; Hartert, Vög. Pal. Fauna, p. 85.

Breeding Range: The Caucasus. [Also Taurus Mts., N. Persia, Afghanistan, Turkestan, Kashmir, etc.].

Little is known of the breeding habits of this bird, which nests in the juniper forests of the mountain ranges of western Asia.

The nest is described as rather larger and better built than that of the Serin, constructed of fine grasses with sometimes a few fine twigs in

Nest.

the foundation, interwoven with lichens, chips of rotten wood, and strips of bark, and warmly and softly lined with feathers, wool, and goats' hair. It is often found low down, but sometimes as much as 20 ft. from the ground in juniper bushes, from 3000 to 3500 ft. or according to Dresser, 5000 ft. above the sea level.

Eggs. 3—5 in number, and have been compared to those of the Serin and Canary. They are thin-shelled, and the markings tend to form a zone of dark rusty brown spots and streaks round the big end on a bluish white ground.

Breeding Season. Danford found fresh eggs in the Taurus Mts. on April 21, but in Afghanistan the breeding season falls early in June (Wardlaw Ramsay), and Biddulph took a nest near Gilgit on July 28.

Measurements. The illustrated egg, obtained through Nehr Korn, measures 17.2×13.2 mm., and weighs 88 mg. (Rey). An egg, taken by Danford (coll. H. E. Dresser), measures 17×13.5 mm. Other eggs ascribed to this bird from Kuldja and the Caucasus average much less (8 specimens) 15.6×12 mm.

28. Desert or Trumpeter Bullfinch, *Erythrospiza githaginea* (Licht.).

Plate 26, fig. 6 (Algeria).

Foreign Name: Italy: *Trombettière*.

Erythrospiza githaginea (Licht.). Dresser, Birds of Europe, IV, p. 85; id. Man. Pal. Birds, p. 329. *E. g. githaginea* (Licht.). Hartert, Vög. Pal. Fauna, p. 88.

Breeding Range: North Africa from Algeria to Egypt. It has occurred at various places along the southern shores of Europe.

Nest. Resident in the hilly and stony country south of the Atlas, nesting under tussocks of grass or other plants on the hill sides. The nest is neatly built of fine bents, lined with fine roots and a little hair, wool, or a few feathers.

Eggs. Usually 4—5, occasionally 6 (Whitaker), are elongated in shape and 'of a delicate sea green colour slightly spotted and streaked at the large end with dark lake and reddish brown' (*Birds of Tunisia*, p. 221). These markings tend to form a zone.

Breeding Season. From the end of February onward through March; latter in the north of the breeding range than in the south. Probably two broods are sometimes reared.

Measurements. Whitaker gives the average size of two clutches as 20×14 mm., Hartert as $18-19 \times 14$ mm. Average of 10 eggs (Erlanger 4 and 6 by the writer) 20.2×14.74 mm.

[The N. African race is replaced in the Canaries by *E. githaginea amantum* Hart. 32 eggs of this subspecies average 18.6×14.1 mm., Max.

20.1 × 13.8 and 18 × 15.2 mm., Min. 17.5 × 13.7 and 19 × 13.3 mm. In colour they resemble eggs from N. Africa. In Palestine another form is found, *E. githaginea crassirostris* Blyth, which ranges through Persia and Afghanistan to the Punjab.]

29. Common Bullfinch, *Pyrrhula pyrrhula europaea* Vieill.

Plate 9, fig. 5—8 (Altenkirchen, Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 3, a—c. Baedeker, Tab. 20, fig. 7. Hewitson, I. Ed. I, pl. XLIII, fig. 3; II. Ed. I, pl. XLVI, fig. 1; III. Ed. I, pl. LIV, fig. 1. Seebohm, Brit. Birds, pl. 12; id. Col. Fig., pl. 56. Frohawk, Br. Birds, II, pl. V, fig. 174—179.

Nest: O. Lee, IV, p. 130.

British Local Names: *Olph*, *Bloodolph*, *Bud-picker*, *Hoop*, *Bullie*. Welsh: *Aderyn-y-Berllan*, *Chwifanydd*. Scotland: *Bullfinch*, *Bullie*.

Foreign Names: Bohemia: *Hýl obecný*. France: *Bouvreuil commun*. Germany: *Kleiner* or *gemeiner Gimpel* or *Dompfaff*. Helgoland: *Doompoap*. Holland: *Goudvink*. Hungary: *Süvöltő madár*. Italy: *Ciuffolotto*. Portugal: *Cardeal*.

Pyrrhula europaea Vieill. Dresser, Birds of Europe, IV, p. 101; Newton, ed. Yarrell, II, p. 166; Saunders, Man., p. 195; Dresser, Man. Pal. Birds, p. 333. *P. pyrrhula europaea* Vieill. Hartert, Vög. Pal. Fauna, p. 94.

Breeding Range: The British Isles and western and middle Europe from the north of the Iberian and Italian peninsulas to West Prussia.

As a rule the Bullfinch is much more familiar and generally distributed in the British Isles than on the continent. Though scarce in some districts, it is not uncommon in most parts of England and Wales. In Scotland it is an increasing species, and is found in the valleys up to the limits of the birch on most parts of the mainland. It occurs in S. E. Skye (Sleat) and has been seen in spring in N. Uist, while it breeds regularly in several of the Inner Hebrides (Eigg, Mull, Islay, Jura, etc.), although not as yet established in the Orkneys or Shetlands. In Ireland it has bred in every county and is not uncommon in the wooded districts.

British
Isles.

Although it must be fairly common in N. Portugal, it appears to be only thinly distributed along the Cantabrian range, but Lilford met with it sparingly in Santander, and Saunders describes it as not uncommon in the Basque provinces and Navarre. Here, as on most parts of the Continent, it haunts the mountain forests, and is found in the wooded parts of the Pyrenees up to 4600 ft. In France it is local, and scarce in the south, but in Switzerland is generally distributed in the Alpine valleys, especially on the northern side. It also breeds in smaller numbers in the beech and pine forests of northern and middle Italy from about 1800 to

Con-
tinental
Europe.

3000 ft. In the pine woods of S. Holland a few pairs also nest; and in Germany it is local, and entirely absent from some districts, while in Pomerania and E. Prussia it is replaced by the larger race. Among other districts where it occurs more or less commonly may be mentioned the Thüringer Wald, the Harz, Silesia, etc., and it is on the whole more numerous in the mountainous districts of S. Germany than in the northern plains. In Austro-Hungary a good deal of confusion exists between the two races, and at present their limits are not definitely known, but probably the smaller form is only found in the west, if indeed it is found there at all.

The Bullfinch which Reiser describes as breeding in the mountain ranges of Bulgaria and Montenegro, is probably the large form, *P. pyrrhula pyrrhula*.

Nest.

In the British Isles the nest is often found in gardens, fir plantations, clumps of evergreens, thickets and thick hedges; very frequently in a box tree (*Buxus sempervirens*) and also commonly in yew trees. On the Continent it is usually built in firs or other trees, in dense forest. Nests in hedges are sometimes only 4 ft. from the ground, but the more usual site is about 5 to 7 ft. high in thick evergreens, while in the forests of the Continent the nest has been found at a height of 15 ft. The nest is very characteristic, consisting of fine twigs and moss, with sometimes a few lichens, neatly lined with very fine roots and hair, and rarely with a few feathers or a little wool. There is considerable variation in the size of nests, some (probably those of young birds) being much smaller and slighter than others. As the Bullfinch is a life-paired bird, the same locality, though not the same spot, is often resorted to for several years in succession. The hen sits very closely when incubating.

Eggs

Usually 4—5, occasionally 6. In colour they are a clear blue with a tinge of green, marked chiefly at the large end with spots and an occasional streak of dark purplish brown, sometimes black or almost black. These markings tend to form a zone. The underlying markings consist of spots and sometimes large blotches of violet grey. A rare variety has red spots on a white ground, and sometimes pure white eggs are found (R. H. Read) or white eggs with faint reddish brown frecklings.

Breeding
Season.

In the south of England the first eggs are laid during the last week of April or early in May, and a second brood in June. In the N. of England the time is decidedly later, and most eggs are laid in the latter half of May or the beginning of June, while second broods may occasionally be found in July. Irish birds breed about the same time. Rey gives May and July as the breeding season in Germany, and in the Alps it nests in May or June according to the season, sometimes breeding a second time in July and early August (Fatio).

100 eggs (13 from the Continent measured by Rey and 87 British eggs by the writer) average 19.50×14.46 mm., Max. 22.1×13.6 and 20.4×15.4 mm., Min. 17×14.2 and 17.2×13 mm. Average weight (13 eggs) 110 mg. (Rey). 6 full eggs average 2.095 g. (Foster). Measurements.

Geographical Races.

a. Northern or Russian Bullfinch, *P. pyrrhula pyrrhula* (L.).

Plate 9, fig. 1—4 (Sweden).

Eggs: Taczanowski, Tab. LXVIII, fig. 1.

Foreign Names: Bohemia: *Hýl velký*. Denmark: *Dompap*. Finland: *Tuunherra*, *Punatulku*. Germany: *Grosser* or *nordischer Dompfaff* or *Gimpel*. Holland: *Groote* or *noordsche Goudvink*. Hungary: *Eszaki süvöltő*. Italy: *Ciuffolotto maggiore*. Norway: *Dompap*. Poland: *Gil własciwy*. Russia: *Snegir*. Sweden: *Domherre*, *Klump*. Transylvania: *Pirók*, *Havasi pinty*.

Pyrrhula major Brehm. Dresser, Birds of Europe, IV, p. 97; id. Man. Pal. Birds, p. 334. *P. pyrrhula pyrrhula* (L.). Hartert, Vög. Pal. Fauna, p. 93.

Breeding Range: Scandinavia, Russia, N. E. Germany, Hungary, etc. [Also in W. Siberia, etc.]

This large race inhabits the forests of middle and southern Sweden, from Småland and Goteborg in the south to about Lat. 67° N., and is also found on Gotland. In Norway it breeds in the south eastern districts and along the west coast, and has occurred even in East Finmark. It is generally distributed over the greater part of Russia, excepting in the high north. In Finland it occurs sparingly, but is not uncommon in the Baltic Provinces and Poland, though scarce near Archangel and only met with sparingly by Seebohm on the lower Petschora. From the Kola peninsula it has only once been recorded. In East Prussia a few pairs breed, and it is said to occur also in Pomerania, but the exact limits of the two races are imperfectly known at present. It is however almost certainly this form which breeds in Galicia, Hungary and Transylvania, and probably also (as recorded by Reiser) sparingly in Montenegro and Bulgaria. Continental Europe.

Similar in construction to that of the western race, but in the north of Europe *Usnea barbata* is often used as lining material, and probably the nest is as a rule rather larger. Average measurements: $2\frac{1}{4}$ in. high, $3\frac{1}{2}$ in. broad; depth of cup $1\frac{3}{8}$, diameter 2 in. Nest.

Usually 5—6 in number, sometimes 4, and very similar in appearance to those of *P. pyrrhula europaea*. The ground colour varies from bluish white to a decided clear greenish blue. Eggs.

As eggs are found in Scandinavia in May and again in July two broods are probably reared. In Finland most eggs are laid in June: average date about the second or third week in the month. Breeding Season.

Measure-
ments.

Average of 65 eggs (25 in coll. Wasenius, 16 by the author, 11 by Rey, etc.) from Finland, Scandinavia, etc., 20.42×14.69 mm., Max. 23.2×14.8 and 21×16 mm., Min. 18×14.4 and 19.2×14 mm. Average weight (11 eggs) 137 mg. (Rey).

b. *P. pyrrhula rossikowi* Derjugin.

Breeding Range: Transcaucasia and probably in the whole of the Caucasus.

[A very distinct form, *Pyrrhula murina* Godm. inhabits San Miguel in the Azores, but is now on the verge of extinction. Eggs unknown.]

30. Caucasian Rose-Finch, *Carpodacus rubicilla* (Güld.).

Carpodacus rubicilla (Güld.). Dresser, Birds of Europe, IV, p. 69; id. Man. Pal. Birds, p. 319. *C. rubicilla rubicilla* (Güld.). Hartert, Vög. Pal. Fauna, p. 99.

Breeding Range: The Caucasus range, where it is chiefly met with in the higher valleys, frequenting the banks of the mountain streams. Nesting habits not known, but the eggs probably resemble those of *C. rubicilla severtzovi* Sharpe, described and figured by Dresser in the *Ibis* 1904, p. 107, pl. III, fig. 1 and 3. They are of a beautiful blue colour, sparingly spotted at the large end with black, and average (3 eggs) 23.86×17.1 mm. (coll. H. E. Dresser).

[Rose Finch, *Carpodacus roseus* (Pall.).

Carpodacus roseus (Pall.). Dresser, Man. Pal. Birds, p. 324. *C. rosea* (Pall.). Hartert, Vög. Pal. Fauna, p. 105.

Breeding Range: Siberia, from the Yenesei to Sakhalien. (Has once been recorded from Hungary.)

Czekanowski, who found this species nesting in the valleys of the R. Angara, near Paduna, has given no details of its breeding habits. A clutch of 5 eggs in Dresser's collection from the Upper Yenesei averages in size 20.62×15.1 mm., Max. 21.2×15 and 20.3×15.4 mm., Min. 20×15 mm. These eggs are clear pale blue, without spots.]

31. Scarlet Rosefinch or Grosbeak, *Carpodacus erythrinus* (Pall.).

Plate 9, fig. 9—12 (Moscow, 30. V. 83).

Eggs: Thienemann, Fortpfl., Tab. IC, fig. 16, a. Baedeker, Tab. 20, fig. 12. Taczanowski, Tab. LXVII, fig. 2. Seebohm, Brit. Birds, pl. 12; id. Col. Fig., pl. 56.

Foreign Names: Bohemia: *Hjl rudýj*. France: *Roselin cramoisi*. Germany: *Karmingimpel*. Hungary: *Karmazsin pirók*. Italy: *Verdone bastardo*. Poland: *Gil dziwoni*. Russia: *Tschetschewiza*. Sweden: *Rosenfink*, *Rödhämpling*.

Pyrrhula erythrina (Pall.). Newton, ed. Yarrell, II, p. 172; Saunders, Man., p. 197. *Carpodacus erythrinus* (Pall.). Dresser, Birds of Europe, IV, p. 75; id. Man. Pal. Birds, p. 321. *C. erythrina erythrina* (Pall.). Hartert, Vög. Pal. Fauna, p. 106.

Breeding Range: The greater part of European Russia and a few localities in E. Prussia, Hungary, etc. [Also in Siberia as far as the Lena, replaced by other subspecies in central Asia and Kamtschatka.]

It is said to have bred in E. Finmark in 1867—8, and nests regularly in southern Finland, especially in Nyland, and has been met with in summer in the Kuopio district. In Livonia, Esthonia and Kurland it is found, but not in large numbers, and is recorded as breeding near Archangel. Seebohm met with two males at Ust Tzilma on the Petschora on June 7. In Great Russia it is not uncommon and breeds not uncommonly in the Moscow Government and also in Volhynia. Further south it is found as far as the lower waters of the Volga and Don, but the Caucasian birds appear to approach the Himalayan form, *C. erythrinus roseatus* (Hodgs.). In Poland it is generally distributed but nowhere common, while in Germany its only breeding place at the present time is the north eastern district of E. Prussia, although it is said to have formerly bred in Silesia. In Austro-Hungary, besides Galicia, it has occasionally bred in N. Hungary (Gömör, Szepes and Sáros counties).

Con-
tinental
Europe.

Hartert describes this bird as breeding commonly in several localities near Pillau, between Königsberg and Memel, and on the Kurische Nehrung. Its favourite haunts are swampy woods of *Alnus glutinosa* with dense undergrowth, always in the neighbourhood of rivers, and here the nest is usually built low down in thick bushes. It is a very flimsy construction of dead stalks, and dry grass lined with fine roots and horsehair. Diameter of cup $2\frac{3}{4}$ in., depth $1\frac{1}{4}$ — $1\frac{1}{2}$ in., diameter of nest about 5 — $6\frac{1}{2}$ in., depth $2\frac{3}{8}$ in. The loud, flute like note of the cock when once heard is quite unmistakable.

Nest.

Usually 5 in number, though clutches of 6 are said to have been found, and second layings often consist of only 4 eggs. They are of a beautiful deep cerulean blue, which is however somewhat fugitive, sparsely marked towards the blunt end with fine spots and streaks of deep chocolate, almost blackish, brown and occasionally a few violet grey underlying markings.

Eggs.

In E. Prussia full clutches are generally to be found in the second week of June (earliest date June 7), but fresh eggs may be taken till July (Hartert), while in S. Finland the breeding season appears to be very similar, eggs having been taken from June 9 to 18, and even in the first week of July. In mid-Russia full clutches have been taken from May 23 onwards, but most eggs are laid early in June. Probably only one brood is reared as a rule. The hen sits very closely when incubating.

Breeding
Season.

Measurements.

Average size of 86 eggs (48 by writer, 28 by Wasenius and 10 by Rey) from Russia 20.05×14.29 mm., Max. 22.2×14.2 and 22×15.5 mm., Min. 18×13.3 mm. Average weight (10 eggs) 123 mg. (Rey).

32. Pine Grosbeak, *Pinicola enucleator* (L.).

Plate 9, fig. 14 (Kittila, 4. VI. 88), fig. 13 and 15—17 (Kittila, 10—15. VI. 89).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 1. Hewitson, III. Ed. I, pl. LIII.* Baedeker, Tab. 20, fig. 11. Seebohm, Brit. Birds, pl. 12; id. Col. Fig., pl. 56. Ootheca Wolleyana, Tab. XII, fig. 1—20.

Foreign Names: Bohemia: *Hýl ořešník*. Denmark: *Krognaeb*, *Svensk* or *Norsk Papegøie*. Finland: *Küpilintu*. France: *Bouvreuil dur bec*. Germany: *Hakengimpel*, *Fichtengimpel*. Holland: *Haakbek*. Hungary: *Nagy pírók*. Italy: *Cinfolotto delle pinete*, *Cardinale*. Lapland: *Parajas-loddi*. Norway: *Konglebit*. Poland: *Gil klešk*. Russia: *Shur*. Sweden: *Tallbit*, *Nattvaka*, *Svensk papgoja*.

Pyrhula enucleator (L.). Newton, ed. Yarrell, II, p. 177; Saunders, Man., p. 199. *Pinicola enucleator* (L.). Dresser, Birds of Europe, IV, p. 111; id. Man. Pal. Birds, p. 338. *P. e. enucleator* (L.). Hartert, Vög. Pal. Fauna, p. 114.

Breeding Range: N. Scandinavia and N. Russia. [Also in N. Siberia, but replaced in the east by *P. enucleator kamtschatkensis* (Dyb.).]

Continental Europe.

In Norway this species is found in Saltdalen ($67^{\circ} 20'$) according to Westerlund, and is tolerably numerous in the birch forests of E. Finmark (Sydvaranger, etc.). In Sweden it only breeds in the northern and eastern part of Swedish Lapland, and is usually found nesting in the fir region here and in the adjoining parts of Finnish Lapland. Wolley obtained a large series of nests and eggs in 1855—58 from this neighbourhood. It does not nest in S. Finland, but occurs locally in the Kola peninsula, and in the Archangel Government, where Harvie-Brown records it from near Archangel and Seebohm from the Lower Petschora, while Pleske found it in the pine forests west of the White sea.

Nest.

The nest is usually placed 4 to 12 ft. from the ground, most frequently about 5 or 6 ft., and over the greater part of its range this bird appears to inhabit the region of conifers, nesting very often in small spruces and also pines close to the stem. In the Kola peninsula and E. Finmark it appears to breed in the birch forest. The foundation of the nest consists of a flattish and rather loosely built structure of interlaced trailing twigs and roots, which are sometimes of considerable length. Within this, and looking almost like another nest, is a compact lining of fine roots or wiry grass with sometimes hair lichens (*Usnea*) or a little hair.

The usual number is from 3 to 4, but on one occasion Sandman Eggs. found 5 eggs in a nest. They are handsome and characteristic: blue green in ground colour as a rule, varying somewhat in depth of tone, some eggs being very pale in tint and others varying from yellowish to greyish green. The markings consist generally of a few bold purplish brown blotches, sometimes almost black, and occasionally a dark streak or irregular line, with underlying paler violet grey blotches and spots. Occasionally an egg is closely freckled all over with small spots, and a good many show a tendency towards a zone of markings at the big end, while eggs are sometimes found with one or two very large blotches only. The shell is tolerably smooth and shows but little gloss.

From the last days of May to the first week of July. Meinertzhagen Breeding Season. took a nest with much incubated eggs at Muonioniska on May 30, but this is an unusually early date, and most eggs are laid from the 10th to the 20th of June. The hen is a close sitter, and both sexes are remarkably unsuspecting in their habits.

Average of 100 eggs (59 by the writer, 24 by Sandman and 17 by Measurements. Rey) 26.03×17.72 mm., Max. 30×18.5 and 28×19.1 mm., Min. 23×17 and 23.8×16.9 mm. A dwarf egg in Newton's collection measures about 19×15.7 mm. Average weight of 17 eggs 221 mg. (Rey).

33. Scotch Crossbill, *Loxia curvirostra scotica* Hart.

Plate 26, fig. 8 (Ross, 19. III. 99).

Eggs: Hewitson, III. Ed. I, pl. LIV, fig. 3. Seebohm, Brit. Birds, pl. 13; id. Col. Fig., pl. 56. Frohawk, Br. Birds, II, pl. V, fig. 180.

Nest: O. Lee, II, p. 48.

Loxia curvirostra L. (partim). Newton, ed. Yarrell, II, p. 187; Dresser, Birds of Europe, IV, p. 127; Saunders, Man., p. 201; Dresser, Man. Pal. Birds, p. 339. *L. curvirostra scotica* Hart. Hartert, Vög. Pal. Fauna, p. 120.

Breeding Range: Very common locally in the forests of mid- and north Scotland.

This strong billed race (frequently mistaken for *L. pytyopsittacus*) British Isles. has increased enormously in numbers of late years in Scotland, owing to the amount of re-forestation that has taken place there. It is now found in abundance from the wooded parts of S. E. Sutherland southward through the counties which form the Moray Basin. Fuller details as to its present distribution in this area will be found in the work of Harvie-Brown and Buckley on the *Vert. Fauna of the Moray Basin*, I, p. 298, etc. On several estates they are now shot down owing to supposed damage done to the forests by destruction of seed-cones. In mid-Scotland it has been

recorded as breeding not uncommonly in many localities, more especially in the older forests, and many instances are on record of its nesting in the southern counties down to the Solway district and the Cheviots. The breeding limits of this race and the weak billed English form are however imperfectly known. *L. c. scotica* is a winter visitor to England and *L. c. anglica* occurs in Scotland.

Nest.

Generally built in a Scotch fir or spruce, occasionally in a larch. It is often placed among the topmost twigs of a high tree, at other times near the end of a horizontal bough, but generally tolerably high up. Few nests are less than 25 ft. from the ground and many are much higher but it is stated that they have occasionally been found as low as 5 ft. In larches the nest are easily seen early in the year, but in evergreen conifers they are often very hard to find, and can only be detected by hearing the low chirruping of the sitting hen while being fed on the nest by the cock. The foundation of the nest consists of a loosely built platform of dead twigs of the larch or fir, while the interior is composed of dry grasses, lichens, etc., lined with wool, moss, finer grasses, and a few of the green spikes of the Scotch fir. Other materials occasionally used are deer hair and a few feathers. External diameter of upper nest 5 in., of cup $2\frac{1}{2}$ to $2\frac{5}{8}$ in., depth of cup $1\frac{1}{4}$ in. Although the Crossbill can hardly be said to breed in colonies, it is usual to find several nests within a short distance of one another.

Eggs.

The usual number varies from 3 to 4, but 5 are occasionally found, and Harvie-Brown has seen a nest containing the extraordinary number of 7 eggs! (*V. F. of Moray Basin*, I, p. 296). In appearance they somewhat resemble those of the Greenfinch, but the markings are often much darker in colour, and as a rule fewer. The ground colour is generally greenish white, occasionally warmer in tone, and the markings consist of a few bold spots, streaks or scrawls of dark purple red, sometimes almost black, chiefly at the large end. In a few cases they are altogether wanting, while in others only the faint underlying blotches, smears and spots of pale reddish brown are met with.

Breeding
Season.

In Scotland fresh eggs may be obtained from February to April, while a second brood is sometimes reared in June, but perhaps the first week or so in March is about the best time. The hen sits very closely, and has been known to allow herself to be taken on the nest.

Measure-
ments.

Average of 100 Scotch eggs (71 by the writer and 29 by F. Norgate) 21.24×15.91 mm., Max. 24×15.5 and 21.6×17.3 mm., Min. 18.6×15.6 and 20.6×14.6 mm. As well be noticed there is considerable variation in size among the above eggs, of which 96 were taken in Ross-shire.

Geographical Races.

a. English Crossbill, *L. curvirostra anglica* Hart.

Eggs: Hewitson, I. Ed. I, pl. CXXXV; II. Ed. I, pl. XLVI, fig. 2.

L. curvirostra L. (partim). Newton, Dresser, and Saunders l. c. (p. 75).

L. curvirostra anglica. Hartert, Vög. Pal. Fauna, p. 119.

Breeding Range: Erratically in England; probably it is this race which breeds in the wooded parts of Ireland. (*L. c. anglica* is a weak billed form, barely distinguishable from the ordinary continental bird.)

In England the Crossbill is chiefly known as an erratic migrant, sometimes remaining to nest for one season, and at other times for two or three years in succession, after which it generally disappears. A few pairs seem however to be permanently resident in the pine woods of N. Hampshire and Surrey, and possibly in other parts also. Isolated instances of breeding have been reported from many counties, and in the bleak "breck" district of Norfolk Mr. F. Norgate found considerable numbers breeding in the scattered pine belts in 1889. In Ireland Crossbills have apparently increased in numbers since 1888, and are now known to breed in fair numbers, but very locally, in most of the large coniferous woods of the country. Probably nesting has also taken place in the Isle of Man.

Norgate (*Birds of Norfolk*, III, p. 391) describes Norfolk nests as composed of Scotch and other fir twigs and dry grass roots, lined with dry grass, rabbit's felt, and occasionally a feather or two. Greenfinches nests from the same locality were composed of similar materials, but the extraordinary tameness of the sitting birds rendered identification easy. All the nests found were built in Scotch firs, with the exception of one, which was placed in an oak. In one case the tree was so small that the nest could be looked into by a man standing on the ground. Many nests were quite inaccessible and practically invisible from below. In Ireland Ussher mentions a nest only 15 ft. from the ground on a steep slope, but describes the usual height as 25 to 40 ft. The favourite nesting site is a group of old Scotch firs on a hill, but larch and spruce trees are occasionally utilized.

The usual number of eggs appears to be 4 in England, but Norgate took a clutch of 5 on April 1. In Ireland Ussher has never found more than 4. The darkest spots on a series of Norfolk eggs are less black than in many Scotch specimens.

Most clutches from Norfolk were taken during the month of March and the first week of April, but there is little doubt that occasionally eggs are to be found in February; and second broods have been recorded from various parts of England in June and July. In Ireland eggs are laid in February or March, sometimes April, and in 1899 the young had left their nests before the end of March (Ussher).

British
Isles.

Nest.

Eggs.

Breeding
Season.

Measure-
ments.

25 eggs taken in Norfolk by Norgate average 22.32×16.06 mm.,
Max. 25×17 mm., Min. 20×16 and 22×15.25 mm. It is noticeable
that the average size is equal to that of eggs of *L. pytyopsitacus*.

b. Continental Crossbill, *Loxia curvirostra curvirostra* L.

Plate 12, fig. 26—29 (Viborg, Denmark, 19. II. 89).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 18, a—b (c?). Baedeker,
Tab. 20, fig. 8.

Foreign Names: Bohemia: *Křivka obecná*. Denmark: *Mindre* or
almindelig Korsnaeb. Finland: *Käpylintu*, *Ristinokka*. France: *Bec-croisé*.
Germany: *Gemeiner* or *Fichtenkreuzschnabel*. Helgoland: *Borrfinck*. Holland:
Kruisbek. Hungary: *Kis keresztorrú*, *Madár*. Italy: *Crociera*. Norway:
Grankorsnaeb. Poland: *Krzyzodziób*. Russia: *Klest-yelovik*. Sweden: *Mindre*
Korsnäbb, *Krumsnabel*.

Loxia curvirostra L. Dresser, Birds of Europe, IV, p. 127; id. Man.
Pal. Birds, p. 339 (part.). *L. c. curvirostra* L. Hartert, Vög. Pal. Fauna, p. 117.

Breeding Range: The larger coniferous woods of the whole of
Europe, except the British Isles, the Iberian peninsula, the Balearic Isles
and Cyprus, where it is replaced by other races. It has not been found
breeding in Sardinia, Sicily or southern Italy.

Con-
tinental
Europe.

In Scandinavia and Russia the Crossbill is found as far as the pine
belt extends, sometimes appearing in great numbers. In Denmark it breeds
only rarely; but is found locally in all the large pine forests of middle
Europe, nesting in the Alps from about 2700 ft. to 5400 ft. In the
Balkan peninsula it is found not only in the Balkans, but also in the
mountains of Greece, and is resident in northern Italy in the Etruscan
Apennines and on the southern slopes of the Alps. In Corsica it is fairly
common in the pine forests.

Nest.

Similar to that of the British race already described. Wheelwright
says that Swedish nests are usually built in small pines, very rarely in
firs, never in the depths of the forest, but always on a stony rise where
the trees are small and stand wide apart. During the nesting season the
cock sings from the top of a pine in the vicinity of the nest, and by
watching them he found over 35 nests in one season. They do not breed
in colonies, but two or more pairs are always to be found in the same
district and the same locality is often resorted to year after year.

Eggs.

3—5 in number; similar in appearance to those of the British races.

Breeding
Season.

Apparently there is not much variation in the breeding time over
the greater part of Europe. In Scandinavia it extends from February to
the end of April. In Denmark full clutches have been found from the
end of January onward: in Styria Hanf found two nests with 4 eggs each

on January 20; and a second brood is apparently sometimes reared, as the young from two nests in Upper Bavaria did not leave the nest till Sept. 5. The period of incubation is 14 days, and the hen begins to sit as soon as the first egg is laid.

100 Scandinavian and Danish eggs (24 measured by Rey, 17 by Meves and 59 by the writer) average 21.72×15.64 mm., Max. 25.5×16 and 23×17 mm., Min. 19.4×15.4 and 20.7×14.1 mm. Average weight of 24 Danish eggs 137 mg., varying from 128 to 153 mg. (Rey). Measurements.

e. Spanish Crossbill, *L. curvirostra hispana* Hart.

Foreign Names: Portugal: *Verdilhão*. Spain: *Verdon*.

L. curvirostra hispana Hart. Hartert, Vög. Pal. Fauna, p. 119.

Breeding Range: The Iberian peninsula.

Saunders describes this form as chiefly confined to the forests of Segura, and Lilford met with it commonly in the pine forests of the Guadarrama range in June. Chapman mentions having seen small parties in the Andalucian piñales in spring.

d. Scotch Crossbill, *L. curvirostra scotica* Hart. See p. 75.

e. Balearic Crossbill, *L. curvirostra balearica* (Hom.).

L. curvirostra balearica (Hom.). Hartert, Vög. Pal. Fauna, p. 120.

Breeding Range: Majorca (Mallorca).

Tolerably abundant in this island.

f. Cyprian Crossbill, *L. curvirostra guillemardi* Mad.

L. curvirostra guillemardi Mad. Hartert, Vög. Pal. Fauna, p. 121.

Breeding Range: Cyprus. Guillemard found this bird in tolerable abundance on Troödos, and obtained young birds, April 20—23.

[In addition to the above mentioned races the Algerian and Tunisian bird has been separated under the name of *L. curvirostra poliogyna* Whit. Nothing is known of its nesting habits, except that König found the young on the wing near Batna on May 11. An egg of the N. American form *L. curvirostra americana* Wils. is figured on Pl. 12, fig. 30.]

34. Parrot Crossbill, *Loxia pytyopsittacus* Borkh.

Plate 12, fig. 25 (Wermland, Sweden, 1. IV. 75).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 17, a—b. Baedeker, Tab. 76, fig. 12. Seebohm, Brit. Birds, pl. 13.

Foreign Names: Bohemia: *Křivka bavorská*. Denmark: *Stor Korsnaeb*. Finland: *Iso-käpylintu*. France: *Bec-croisé perroquet*. Germany: *Grosser* or *Kiefernkreuzschnabel*. Helgoland: *Groot Borrfink*. Holland: *Groote Kruisbek*. Hungary: *Nagy keresztcsőrü*. Italy: *Crociere delle pinete*. Norway:

Furukorsnaeb. Poland: *Krzyzodziób papuzka.* Russia: *Klest sosnowik.*
Sweden: *Större Korsnäbb, Kruvas.*

Loxia pityopsittacus Bechst. Newton, ed. Yarrell, II, p. 207; Dresser, Birds of Europe, IV, p. 121; id. Man. Pal. Birds, p. 340. *Loxia pytyopsittacus* Borkh. Hartert, Vög. Pal. Fauna, p. 122.

Breeding Range: Scandinavia and N. Russia as far as Poland. Occasionally also in E. Germany.

Con-
tinen-
tinal
Europe.

In Scandinavia the Parrot Crossbill occurs irregularly as a breeding species in pine forests throughout the whole country from northern Skåne to Lappmark, but is everywhere less numerous than the Common Crossbill; and according to Wheelwright, the two species are never found breeding together in one district in the same season. This is probably accounted for by the different food of the two species, the Parrot Crossbill feeding chiefly on pine cones and the Common Crossbill on those of the fir. In Finland the large-billed bird nests at irregular intervals in various parts of the country and is also resident in Esthonia, Livonia and Poland. It also breeds irregularly in E. Prussia, in the forests of Silesia and in Thuringia, between the rivers Roda and Orla, where C. L. Brehm first described its breeding habits, while it is said also to have nested occasionally in Upper Bavaria and Switzerland, and a pair on one occasion remained to breed near Darmstadt.

Nest.

Similar in construction to that of the Common Crossbill, but perhaps rather better built and more warmly lined with strips of bark, lichens, a few feathers, etc., and constructed of grass stalks, pine needles, mosses (*Sphagnum*, *Hypnum*, etc.) and lichens upon a foundation of twigs. It has been found at varying heights, but seldom less than 15 ft. from the ground, and from 4 to 7 ft. from the main stem. External diameter $5\frac{1}{4}$ —6 in., height $2\frac{3}{4}$ — $3\frac{1}{2}$ in., diameter $2\frac{1}{2}$ —3 in., depth $1\frac{1}{2}$ — $1\frac{3}{4}$ in.

Eggs.

3 or 4 as a rule, but 5 sometimes, though rarely, occur. Not only are the eggs larger than those of the Common Crossbill, but the markings are frequently bolder and often almost black in colour. Occasionally the ground is suffused with a beautiful pinkish blush.

Breeding
Season.

Variable, eggs having been found from December to June. In Scandinavia the usual breeding time is from the beginning of March till late in April, but eggs have occasionally been taken in February. In Silesia Brehm found most birds nesting in February and March, but also in mid-December and January, as well as in May and June in some seasons.

Measure-
ments.

Average of 100 eggs (23 by König-Warthausen, 13 by Rey, 12 by Meves and 52 by the writer) 22.31×16.5 mm., Max. 26.32×16.36 and 22.29×18.05 mm., Min. 20×15 mm. (Wheelwright, Sweden). Rey gives the average weight as 169 mg., varying from 160 to 180 mg.



1



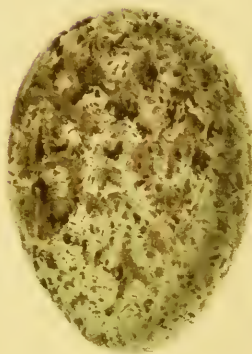
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3



4



5



6



7



8

A. Reiche, pinx.

Raven, *Corvus corax* L.
 1—5 and 7—8 *C. corax corax* L. 6 *C. c. principalis* Ridgw.



A. Reicherth, pinx.

1—7 Hooded Crow, *Corvus cornix* L.
 8—11 Chough, *Pyrrhocorax pyrrhocorax* (L.).



A. Reichert, pinx.

1—10 Carrion Crow, *Corvus corone* L.



A. Reichert, pinx.

1—7 Rook, *Corvus frugilegus* L.
 8—11 Alpine Chough, *Pyrrhocorax graculus* (L.).



1—6 Nutcracker, *Nucifraga caryocatactes* (L.).

7—14 Jackdaw, *Coloeus monedula* (L.).



1—10 Magpie, *Pica pica* (L.).



1—6 Jay, *Garrulus glandarius* (L.).
7—13 Siberian Jay, *Perisoreus infaustus* (L.).



A. Reichenow 17 pins

1—4 Golden Oriole, *Oriolus oriolus* (L.).
 5—9 Waxwing, *Ampelis garrulus* (L.).
 10—17 Lesser Grey Shrike, *Lanius minor* Gm.



1-4 Northern Bullfinch, *Pyrrhula pyrrhula* L.
 5-8 Bullfinch, *P. pyrrhula europaea* Vieill. 9-12 Scarlet Grosbeak, *Carpodacus erythrinus* (Pall.). 13-17 Pine Grosbeak, *Pinicola enucleator* (L.).
 18-22 Hawfinch, *Coccothraustes coccothraustes* (L.).



A. Reichenow. pin 26

1—8 Chaffinch, *Fringilla coelebs* L.
 9—16 Brambling, *F. montifringilla* L. 17—21 Greenfinch, *Chloris chloris* (L.).
 22—26 Citril Finch, *Carduelis citrinella* (L.).



A. Reicher, p³⁰ X.

1—5 Linnet, *Carduelis cannabina* (L.). 6—10 Twite, *C. flavirostris* (L.).
 11—15 Mealy Redpoll, *C. flammea* (L.). 16—20 Goldfinch, *C. carduelis* (L.).
 21—25 Siskin, *C. spinus* (L.). 26—30 Serin, *Serinus canarius serinus* (L.).



1—10 House Sparrow, *Passer domesticus* (L.). 11—20 Tree Sparrow, *P. montanus* (L.).
 21—24 Rock Sparrow, *Petronia petronia* (L.).
 25 Parrot Crossbill, *Loxia pytyopsittacus* Borkh. 26—29 Crossbill, *L. curvirostra* L.
 30 American Crossbill, *L. curvirostra americana* Wils.



1—5 Corn Bunting, *Emberiza calandra* L. 6—11 Yellow Bunting, *E. citrinella* L.
 12—15 Cirl Bunting, *E. cirlus* L. 16—20 Ortolan, *E. hortulana* L.
 21—22 Cretschmar's Bunting, *E. caesia* Cretz. 23—26 Rock or Meadow Bunting, *E. cia* L.



Reichert, pinx.

1 Pine Bunting, *Emberiza leucocephala* S. G. Gmel. 2-6 Reed Bunting, *E. schoeniclus* (L.).
 7 Rustic Bunting, *E. rustica* Pall. 8-9 Yellow breasted Bunting, *E. aureola* Pall.
 10-11 Red headed Bunting, *E. luteola* Sparrm. 12-16 Black headed Bunting, *E. melanocephala* Scop.
 17-21 Snow Bunting, *Passerina nivalis* (L.). 22-26 Lapland Bunting, *Calcarius lapponicus* (L.).



A. Reichert, pinx

- 1, 2 Intermediate Reed Bunting, *Emberiza schoeniclus canneti* (Brehm)
 3 Thick-billed Bunting, *E. pyrrhuloides* Pall. 4 Japanese Greenfinch, *Chloris sinica minor* (T & S.).
 5 Manchurian Greenfinch, *C. s. ussuriensis* Hart.
 6 Little Bunting, *Emb. pusilla* Pall. 7—9 Melodious Warbler, *Hippolais polyglotta* (Vieill.).
 10—18 Cassin's Cowbird, *Molothrus cabanisii* Cass.



1—5 Skylark, *Alauda arvensis* L. 6—9 White winged Lark, *Melanocorypha sibirica* (Gm.).
 10—11 Brehm's Crested Lark, *Galerida theklae* Brehm. 12 Black Lark, *M. yeltonensis*
 Forst. 13—17 Woodlark, *Lullula arborea* (L.). 18—22 Crested Lark, *G. cristata* (L.).
 23—27 Calandra Lark, *M. calandra* (L.).



1—4 Short toed Lark, *Calandrella brachydactyla* (Leisl.). 5—8 Pallas's Short toed Lark, *C. minor heinei* (Hom.). 9—12 Shore Lark, *Eremophila alpestris flava* (Gm.). 13—16 Alpine Pipit, *Anthus spinoletta* Sav. 17—18 Rock Pipit, *A. spinoletta obscurus* (Lath.). 19—21 American Pipit, *A. spinoletta pensilvanicus* (Lath.). 22—27 Meadow Pipit, *A. pratensis* (L.).



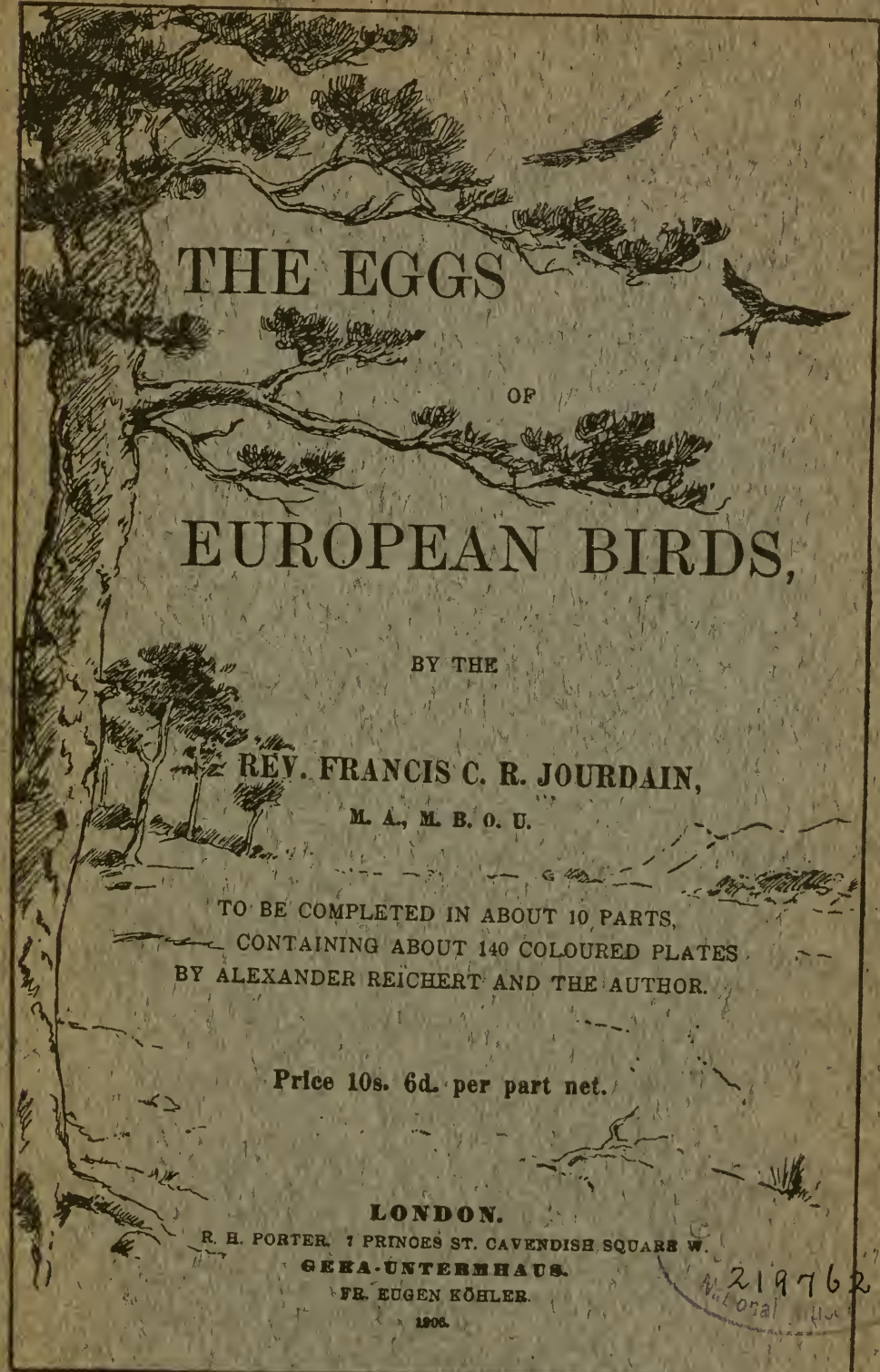
1—4 Red throated Pipit, *Anthus cervinus* (Pall.). 5—8 Tawny Pipit, *A. campestris* (L.).
 9—18 Tree Pipit, *A. trivialis* (L.). 19—23 White Wagtail, *Motacilla alba* L. 24 Richard's
 Pipit, *A. richardi* Vieill. 25—29 Pied Wagtail, *M. alba lugubris* Temm.



1—5 Grey Wagtail, *Motacilla boarula* L. 6—10 Blue headed Wagtail, *M. flava* L.
 11—14 Northern Yellow Wagtail, *M. flava borealis* (Sund.). 15—18 Yellow Wagtail,
M. flava rayi (Bp.). 19—22 Grey headed Wagtail, *M. flava cinereocapilla* Savi. 23 Yellow
 headed Wagtail, *M. citreola* Pall. 24—27 Black headed Wagtail, *M. flava melano-*
cephala Licht.



1-4 Great Tit, *Parus major* L. 5-8 Blue Tit, *P. coeruleus* L. 9-12 Coal Tit, *P. ater* L. 13-16 Azure Tit, *P. cyanus* Pall. 17-20 Northern Willow Tit, *P. atricapillus borealis* Selys. 21-24 Tree Creeper, *Certhia familiaris* L. 25 Wall Creeper, *Tichodroma muraria* (L.). 26-30 Long tailed Tit, *Aegithalos caudatus* (L.).



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Natural Hist.

35. Two-barred Crossbill, *Loxia leucoptera bifasciata* (Brehm).

Plate 34, fig. 18 (Archangel, 4. V. 92).

Eggs: Baedeker, Tab. 20, fig. 10.

Foreign Names: Bohemia: *Krivka bilokrídla*. Denmark: *Hoidvinget Korsnaeb*. Finland: *Kirjasipi küpylintu*. Germany: *Zweibindiger Kreuzschnabel*. Helgoland: *Witt-jükked Borrfinke*. Hungary: *Szalagos keresztcörü*. Italy: *Crociere fasciato*. Norway: *Hoidvinget Korsnaeb*. Poland: *Krzyzodziób dwupręgowy*. Sweden: *Bündel* or *Norsk Korsnäb*, *Pipkrums*.

Loxia bifasciata (C. L. Brehm). Newton, ed. Yarrell, II, p. 211; Dresser, Birds of Europe, IV, p. 141; id. Man. Pal. Birds, p. 343; Saunders, Man., p. 203. *L. leucoptera bifasciata* (Brehm). Hartert, Vög. Pal. Fauna, p. 123.

Breeding Range: Northern European Russia. [Also Siberia; but perhaps the eastern birds may form a separate race, *L. leucoptera elegans* Hom. See *Vög. Pal. Fauna*, p. 124.]

Although well known as an erratic visitor to Scandinavia and Finland in varying numbers, this bird has not been definitely recorded as breeding there, but a nest ascribed to it was taken near Upsala in March 1890. Its home appears to be the great forests of the Archangel Government, but it is not found in the Kola peninsula, and its range northward naturally does not extend beyond the limits of the coniferous forest. Reliable notes on the breeding of this species are much to be desired.

Dresser describes a nest from the Archangel district as smaller and slighter than that of the Common Crossbill. The dimensions given by O. Bamberg (*Zeitschr. f. Ool.* 1904, p. 52) of two nests ascribed to this species from the Lena valley are approximately as follows: external diameter $5\frac{1}{2}$ — $7\frac{1}{2}$ in., height $2\frac{1}{2}$ — $2\frac{3}{4}$ in., diameter of cup $2\frac{1}{4}$ — $2\frac{3}{4}$ in., depth 1 — $1\frac{1}{4}$ in. The foundation of these nests consisted of fir twigs, stalks, lichens and moss, with dead leaves interwoven, lined with lichens, roots, down and small feathers.

3—4 in number, and 5 are said sometimes to occur. Four eggs from Archangel in the British Museum average 20.8×14.7 mm., and are thus decidedly smaller than those of the Common Crossbill, besides being more boldly marked. On the other hand Ottosson describes an egg from Siberia as 22.6×15.9 mm., weight 135 mg., and an egg in Rey's collection measures 22.4×16 mm. and weighs 160 mg. Bamberg describes the eggs as averaging (17 specimens) 23.52×16.6 mm., Max. 24.6×16.4 and 23.2×17.4 mm., Min. 22.5×16.1 and 24.1×16 mm., average weight 154 mg., varying from 138 to 168 mg. If these measurements are correct the eggs exceed the normal size of eggs of *L. pytyopsittacus*, but it is worthy of note that the eggs of the American White winged Crossbill,

Continental
Europe.

Nest.

Eggs.

L. leucoptera leucoptera Gm. are decidedly small. Six eggs from N. America in the British Museum average only 20.65×14.7 mm. [This form appears to have occurred in the British Isles. For illustrations of the egg see Seebohm, *Br. Birds*, pl. 19; id. *Col. Fig.*, pl. 56.]

36. Chaffinch, *Fringilla coelebs* L.

Plate 10, fig. 1—8 (Germany).

Eggs: Thienemann, *Fortpfl.*, Tab. XXXVI, fig. 5, a—e. Hewitson, I. Ed. I, pl. XVI, fig. 3, 4; II. Ed. I, pl. XLI, fig. 1; III. Ed. I, pl. XLIX, fig. 1. Baedeker, Tab. 12, fig. 3. Taczanowski, Tab. LXXI, fig. 1. Seebohm, *Brit. Birds*, pl. 13; id. *Col. Fig.*, pl. 56. Frohawk, *Br. Birds*, pl. IV, fig. 148—155.

Nest: O. Lee, II, p. 10.

British Local Names: *Spink, Chink, Pink, Twink, Scoppie, Shellie, Shel-apple, Shilfa; Buck-, Horse-, Copper- and Beech-finch, Apple bird.* Manx: *Ushag-y-choan.* Welsh: *Y Bink, Winc, Gwinc, Asgell fraith.* Gaelic: *Breacan-beithe.*

Foreign Names: Bohemia: *Pěnkava obecná.* Denmark: *Bogfinke.* Finland: *Finkki, Peipponen.* France: *Pinson, Quinson.* Germany: *Buchfink, Edelfink, Fink.* Helgoland: *Bochfink.* Holland: *Vink, Kwinker, Schildvink.* Hungary: *Erdei Pinty.* Italy: *Fringuello.* Norway: *Bogfink.* Poland: *Zięba.* Portugal: *Tentilhão.* Russia: *Sjablik.* Sweden: *Bofink.* Spain: *Pinzon real.*

Fringilla coelebs L. Newton, ed. Yarrell, II, p. 68; Dresser, *Birds of Europe*, IV, p. 3; id. *Man. Pal. Birds*, p. 306; Saunders, *Man.*, p. 183. *F. coelebs coelebs* L. Hartert, *Vög. Pal. Fauna*, p. 125.

Breeding Range: Europe generally, but scarce within the Arctic Circle. [Also in W. Siberia, Asia Minor, Palestine, etc. Replaced by other forms in N. Africa, the Azores, Canaries, etc., and does not breed in the Færöes or Iceland.]

British
Isles.

Generally distributed and plentiful throughout the cultivated and wooded parts of the British Isles, but naturally absent from the bare moorlands. In the north of Scotland it is found commonly in the straths as far as the limits of tree and brushwood growth, and nests in small numbers in the Orkneys. It has also been known to breed in the Shetlands, but is absent from the open and treeless islands of the Outer Hebrides, although nesting in the wooded islands off the west coast, such as Mull, Eigg, etc. In Ireland it is a common resident everywhere, except in those districts which are altogether destitute of trees.

Con-
tinental
Europe.

Here the Chaffinch is not only a familiar inhabitant of gardens, orchards, and in fact all localities where trees grow, but is also met with in the deep forests, and on the mountain ranges as well as in the plains.

In the Alps according to Fatio it is found breeding in the Haute Engadine up to about 5400 ft. In the Iberian peninsula it is commonest in winter, but many remain to breed locally where there are trees, even in the extreme south of the country. It is plentiful also in Corsica, Sardinia and Sicily, but in the latter island and in southern Italy is chiefly met with in the mountains. This is also the case in the southern part of the Balkan peninsula. In the north of Europe the Chaffinch becomes scarce in the north of Scandinavia and Russia, but a few pairs breed as far north as Enare Lappmark and up to the limits of the birch region, while Collett observed a pair in June on an islet near the North Cape. In Russia it is recorded from the Kola peninsula, near Archangel, and the Urals to lat. 62°.

In the British Isles is as often in the fork of a bough in a hedgerow Nest. as in a tree, usually from 4 to 15 ft. high.* In the north of Scotland it is occasionally built in low bushes almost on the ground. In the great European plain it is generally from 9 to 30 ft. high, but Rey has found nests in young conifers at a height of 3 ft., and Fatio and Irby mention isolated examples of nests built within a few inches of the ground in Switzerland and Andalucia. There is a good deal of variation in the materials used and also in size, but as a rule it is most artistically constructed of wool, moss, dry grasses, roots, etc., studded externally with lichens, fragments of bark, or even paper, affixed with spiders' webs; and lined chiefly with hair and a few feathers. The nest, which is built by the hen, is well felted together, and generally shaped to fit the supporting bough. The cup is deep, with somewhat concave sides, diameter nearly 2 in., depth $1\frac{5}{8}$ — $1\frac{7}{8}$; external diameter about $3\frac{1}{4}$ —4, height $1\frac{3}{4}$ —3 in.

Usually 5 in the first brood, but 6, and on the continent even 7, have Eggs. been found; while the second brood often consists of only 4. There is considerable variation in colouring: the normal ground colour being pale greenish stone colour, with spots and streaks of dark purple brown, often suffused with cloudy patches of pale sienna brown, as though the colour from the spots had 'run'. Sometimes the darker markings are wanting, and only pale brown cloudings and speckles are met with; and occasionally a clutch is found entirely without markings. Many eggs show a tendency to a bluish ground, and a very remarkable variety with dark purplish brown, almost black, markings on a clear blue ground has occurred not only in Great Britain, but also in Germany, where it is not uncommon in some districts, e. g. near Glatz in Silesia (Hartert), Greece and Scandinavia. The shell is dull and almost devoid of gloss.

* Instances of nests on wall fruit trees, or against walls, have occasionally been recorded; also among ivy on tree trunks.

Breeding
Season.

In the British Isles first clutches are found from about April 15 onwards, and the eggs of the second brood in the latter half of May and early June. In Germany first broods from April 20 to May; second broods in June (Rey). In the north the breeding season is later: on Karlö the earliest date given by Sandman is May 28, and most nests were taken in early June. In the Parnassus eggs have been taken from April 18 to June 23 (Krüper).

Measure-
ments.

The average size varies somewhat according to locality. Rey gives the average of 100 mid-European eggs as 19.3×14.6 mm., Max. 22.8×15.5 and 22.5×15.8 mm., Min. 17×13.7 and 17.7×13.2 mm. 32 eggs from Karlö and Enare are rather larger, averaging 20.13×14.72 mm (Sandman and Nordling), and on the other hand Reiser gives measurements of eggs from Parnassus as 19.1 to 17.5×15.3 to 14.1 mm. An unusually broad egg in my collection measures 20×16.5 mm., and dwarf eggs are sometimes met with, 13×10 , 14.5×11.5 , 16×12.5 mm., etc. Average weight 125 mg. (Rey). 15 full eggs average 2.024 g. (Foster).

Geographical Races.

a. European Chaffinch, *F. coelebs coelebs* L. See above.

b. Moorish Chaffinch, *F. coelebs spodiogenys* Bp.

Fringilla spodiogenys Bp. Dresser, Birds of Europe, IV, p. 13; id. Man. Pal. Birds, p. 309. *F. coelebs spodiogenys* Bp. Hartert, Vög. Pal. Fauna, p. 127.

Breeding Range: Tunis, but replaced in Algeria and probably also in S. Marocco by the closely allied *F. coelebs africana* Lev. and in N. Marocco by *F. coelebs koenigi* Roths. & Hart., according to Hartert. Has occurred in Italy. For notes on the breeding habits of this bird see Whitaker, *Birds of Tunisia*, p. 214, König, *Journ. f. Ornith.* 1893, p. 57, etc. Eggs usually 3 or 4, rarely 5 in number; larger as a rule than those of the European race. 17 eggs (14 by Erlanger and 3 by the writer) average 21×15.29 mm., Max. 23×16 mm., Min. 19×15 and 21×14 mm. A dwarf egg measures 17×13 mm. (Erlanger). Ground colour dull pale greenish blue, 'sparsely clouded and spotted with vinous and russet markings' (Whitaker). Breeding season from mid-March to April and May.

[In Madeira the resident race is *F. coelebs madeirensis* Sharpe. 7 eggs average 21.57×16.3 mm. (König and Schmitz*); average weight of 3 eggs, 160 mg. (König). The Azorean birds are known by the name of *F. coelebs moreletti* Puch. Average of 7 eggs, 21.27×15.36 mm. In the Canary group *F. c. canariensis* Vieill. is found on Tenerife, Gran Canaria and Gomera, *F. c. palmae* Trist. on Palma and Hierro, while a distinct species,

* Eggs figured in *Journ. f. Ornith.* 1890, Tab. VIII, fig. 2.

the Teydean Chaffinch, *F. teydea* Webb & Berth. inhabits the pine woods of the Peak of Tenerife. 14 eggs of *F. c. canariensis* average 21.8×15.4 mm. and are sparingly marked at the big end with fine red brown spots or streaks on a pale bluish green ground.* The Teydean Chaffinch only lays 2 eggs, blue green in ground colour with blackish brown spots and underlying vinous blotches.† Average size of 6 eggs 23.45×16.45 mm. As will be seen from the above, the eggs of the N. African and Atlantean Chaffinches are as a rule larger and more sparingly marked than those of the Continental form.]

37. Brambling, *Fringilla montifringilla* L.

Plate 10, fig. 9—16 (Muonio, 8—19. VI. 92).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 6, a—e. Hewitson, I. Ed. Suppl. pl. CLXIX; II. Ed. I, pl. XLI, fig. 2; III. Ed. I, pl. XLIX, fig. 2, 3. Baedeker, Tab. 12, fig. 2. Seebohm, Brit. Birds, pl. 13; id. Col. Fig., pl. 57. Frohawk, Br. Birds, II, pl. V, fig. 156, 157.

British Local Names: *Mountain* or *Bramble Finch*, *Cock-o'-the North*.

Foreign Names: Bohemia: *Jikavec*. Denmark: *Kvaeker*, *Norsk Bogfinke*. Finland: *Peippo*. France: *Pinson des Ardennes*. Germany: *Bergfink*. Helgoland: *Quäker*. Holland: *Keep*, *Berg-* or *Boschwink*. Hungary: *Fenyö rinty*. Italy: *Peppola*. Lapland: *Vintan*. Norway: *Bjergfink*, *Kvaeker*. Poland: *Jér*. Portugal: *Tintihão montez*. Russia: *Wjurok*. Sweden: *Bergfink*, *Norrqvint*. Spain: *Montañas*, *Millero*.

Fringilla montifringilla L. Newton, ed. Yarrell, II, p. 75; Dresser, Birds of Europe, IV, p. 15; id. Man. Pal. Birds, p. 311; Saunders, Man. p. 185; Hartert, Vög. Pal. Fauna, p. 130.

Breeding Range: Scandinavia and N. Russia. [Also in Siberia up to about 50° N. Lat.] (In the British Isles the Brambling is said to have bred once or twice, but the evidence is not conclusive.)

In many parts of Norway it is decidedly numerous, haunting the subalpine coniferous woods and also the birch forest, up to about 70° N. Lat., while southward its range extends to about 59° N., where a few pairs breed on the high fjeld. In Sweden it does not as a rule breed south of lat. 62° or 63°, though occasional instances of nests in Upland and Westmanland (about lat. 60°) are on record. In Lapland it is numerous and breeds on the Kola peninsula and throughout northern Russia, while Bianchi has recently recorded it as breeding in the S. Petersburg Government, but in the Urals its range does not extend beyond lat. 62°.

Con-
tinental
Europe.

* Eggs figured in *Journ. f. Ornith.* 1890, Tab. VIII, fig. 3.

† Eggs figured *ibid.* Tab. VIII, fig. 1.

Nest. Very similar in construction to that of the Chaffinch, but as a rule less neatly finished and rather larger. The materials used also vary according to locality, some nests being almost entirely composed of bents and dry grasses, while other are covered externally with fragments of birch bark, lichens, etc. and lined with feathers, hair, and willow down. It is usually built at the junction of a bough with the stem of a birch or small fir, at a height of from 6 to 10 ft., but occasionally much higher. External diameter about $4\frac{1}{4}$ in., diameter of cup $2\frac{1}{4}$ — $2\frac{1}{2}$ in., depth about $1\frac{1}{2}$ in.

Eggs. Generally 5 to 7 in number, and somewhat similar in character to those of the Chaffinch, from which they differ as a rule in their darker and more greenish ground colour and more cloudy and less distinct markings. The variety with a pale blue ground occurs only rarely, but has been taken in Lapland by Meves.

Breeding Season. In the valleys of southern and middle Scandinavia the laying season begins about mid-May, and on the mountains at least a week later, but in the north of the country eggs are usually found in June and even July and in Lapland the first clutches are taken early in June. On Karlö Sandman found eggs from May 20 to June. Probably one brood only is reared in the season.

Measurements. Average of 100 eggs (83 measured by Rey and 26 by the writer) from Lapland and Norway, 19.5×14.6 mm., Max. 22.2×15.6 mm., Min. 18.1×13.5 mm. Average weight of 83 eggs, 126 mg. (Rey).

38. Snowfinch, *Montifringilla nivalis* (L.).

Eggs: Thienemann, Fortpfl., Tab. XXXVI, fig. 7. Baedeker, Tab. XII, fig. 4.

Foreign Names: Bohemia: *Pěnkava podhorní*. France: *Pinson de neige*, *Niverolle*. Germany: *Schneefink*. Greece: *Chionáda*. Hungary: *Havasi Pinty*. Italy: *Fringuello alpino*. Poland: *Losczak zniczek*.

Montifringilla nivalis (L.). Dresser, Birds of Europe, III, p. 617; id. Man. Pal. Birds, p. 297. *M. nivalis nivalis* (L.). Hartert, Vög. Pal. Fauna, p. 132.

Breeding Range: Sierra Nevada, Pyrenees, Alps, the mountain ranges of the Balkan peninsula and perhaps also the Apennines. [Also Palestine (?).]

Continental Europe. In Spain Dr. A. C. Stark found these birds very common in the Sierra Nevada at 3000 to 6000 ft. in small flocks, and probably it also occurs in the Sierra Guadarrama. In the central Pyrenees it is generally distributed along the snow line, among the outcrops of rock, and is not uncommon. Along the whole Alpine range it is locally common in summer above

6500 ft. even up to nearly 9000 ft., but has not been known to breed on the Jura. In Italy it is tolerably numerous on the Alpine chain from Liguria to Venetia, and has been observed at various points on the Apennines, as far south as Gran Sasso. In the Balkan peninsula it is found in Montenegro and probably in other mountainous districts, while in Greece Reiser identified this species on the Korax and Kiona at about 6000 ft. in 1894. [In Palestine a few pairs of this race, or perhaps the Caucasian form, are found on Hermon and the Lebanon.] One specimen has been recorded from Sussex (*Bull. B. O. C.*, XV, p. 58).

In uninhabited districts the nest is built in crevices of rocks and cliffs which are free from snow, but where buildings and stone walls exist, many nests are to be found underneath the eaves or in holes in walls. The nest is rather bulky, built chiefly of dry grass; together with tufts of hair, wool, leaves, wood-shavings and a few feathers; lined with feathers of Ptarmigan, woven together with horsehair, etc. External diameter $8\frac{1}{4}$ in., diameter of cup $3\frac{1}{2}$ in. (S. B. Wilson). The Hospices on the S. Bernard, Simplon, Grimsel, and S. Gothard are all inhabited by several pairs of these birds. Nest.

Vary in number usually from 4 to 5, but 6 are occasionally found. They are pure white, regular oval in shape, somewhat thin shelled and with little gloss. Eggs.

According to Fatio the first clutches are to be found at the end of April or the beginning of May, and a second brood is often reared towards the end of June or in August. On the S. Gothard S. B. Wilson found nearly hatched young on June 16, and of 5 nests examined none contained eggs on May 27, so that here the eggs are apparently laid about the beginning of June, which corresponds with nesting dates from various localities. In the Pyrenees H. M. Wallis was of opinion that nesting had not begun on June 21. These observations tend to show that in some localities at any rate, only one brood is reared as a rule. Breeding Season.

Average of 62 eggs (25 measured by Rey and 37 by the writer) from the Alps, 23.42×16.96 mm., Max. 25.5×18.1 and 25×18.2 mm., Min. 21×16 and 21.5×15.3 mm. Average weight (25 eggs) 225 mg., varying from 210 to 230 mg. (Rey). Measurements.

Geographical Races.

a. Alpine Snowfinch, *M. nivalis nivalis* (L.). See above.

b. Caucasian Snowfinch, *M. nivalis alpicola* (Pall.).

Montifringilla alpicola (Pall.). Dresser, Birds of Europe, IX, p. 187; id. Man. Pal. Birds, p. 298. *M. nivalis alpicola* (Pall.). Hartert, Vög. Pal. Fauna, p. 133.

Breeding Range: The alpine regions of the Caucasus. [Also in Persia and Afghanistan to E. Turkestan.]

In the summer it inhabits the mountains at a height of from ten to fourteen thousand feet, and apparently resembles the European race in its breeding habits.

39. Rock Sparrow, *Petronia petronia* (L.).

Plate 12, fig. 21, 22 (Spain); 23, 24 (Greece).

Eggs: Thienemann, Fortpfl., Tab. XXXIV, fig. 18, a—c. Baedeker, Tab. 12, fig. 10. Reiser, Orn. Balc. III, Taf. III, fig. 20, 21.

Foreign Names: Bohemia: *Vrabec žlutokrký*. France: *Moineau soulcie*. Germany: *Steinsperling*. Holland: *Notmusch*. Italy: *Passera lagia*. Poland: *Loszczak leśny*. Portugal: *Pardal franzez*. Russia: *Kamenij worobej*. Spain: *Gorrión montés*, *Chilla*.

Petronia stulta (Gm.). Dresser, Birds of Europe, III, p. 607; id. Man. Pal. Birds, p. 295. *Petronia petronia petronia* (L.). Hartert, Vög. Pal. Fauna, p. 141.

Breeding Range: Southern Europe: Spain, S. France, locally in the Alps and Austria, Italy and Greece. [Also near Smyrna.]

Con-
tinent-
al
Europe.

Although not uncommon on rocky ground and in the Sierras of the Iberian peninsula, this species is nevertheless extremely local. It occurs also in the south of France, and is found in small numbers in the mountainous part of Switzerland. In Germany according to Hartert it is confined to the 'Mussel-chalk' districts of Thuringia, the valley of the Saale and its tributaries, the Unstrut, Ilm and Gera. It is said also to have been found formerly in the Wetterau and the Rhine valley. In Austria it is of very rare occurrence but has been observed in the Tyrol.

In Italy it is found in suitable localities over the greater part of the country and also in Sicily, but does not breed in Lombardy and is rare in the Trent and Po valleys.

In the Balkan peninsula Lilford observed this species near Cetinje, Montenegro, in 1857, but it has not been observed there since, and is not found in Bulgaria. In Greece however it is common, building among the ruins of the Acropolis and in the roofs of the houses. Reiser records it from Thessaly, Parnassus, Acarnania, etc., and Lilford from Albania. In the islands of the Greek archipelago it is however rare. [Also in Asia Minor (Smyrna).]

Nest.

Over the greater part of southern Europe the nest is generally found in crevices of rocks, and occasionally in old walls, ruined towers, holes in trees, etc. In Greece is not only breeds commonly in ruins, but also nests underneath the tiling of inhabited houses (*Orn. Balc. III*, p. 236).

It is said to have formerly nested occasionally in fruit trees, and Reiser mentions one instance of its breeding in a pine tree. The nest is much like those of the other Sparrows, composed of straw, grass, etc., and lined with feathers.

4 to 7 in number, of the usual Sparrow type of markings, but varying considerably, some showing much of the whitish ground colour, and others being handsomely marbled and spotted. Reiser figures an egg in which the usual minute brown spots have run together into a large coffee coloured blotch. The only constant difference between the eggs of this species and those of other Sparrows in their decidedly stronger gloss. Eggs.

In Greece Krüper says that two broods are reared in the plains, but only one in the mountains. First eggs are found from mid-April onwards, but mostly towards the end of the month, and second broods in June; in the mountains towards the end of May. Breeding Season.

Average size of 86 eggs from S. Spain and Greece (44 by Reiser, 24 by Rey and 18 by the writer) 21.85×15.67 mm., Max. 23.5×16.5 and 21.7×16.9 mm., Min. 19.3×14.8 and 20.3×14.7 mm. Average weight (44 eggs) 199 mg. (Reiser); 24 eggs 216 mg. (Rey). As will be seen from the above they are generally rather smaller than those of *P. domesticus* (L.). Measurements.

Geographical Races.

a. Continental Rock Sparrow, *P. petronia petronia* (L.). See above.

b. Sardinian Rock Sparrow, *P. petronia hellmayri* Arrig.

P. petronia hellmayri Arrig. Hartert, Vög. Pal. Fauna, p. 143.

Breeding Range: Sardinia and Corsica.

Barely distinguishable from the Continental form. In Sardinia it is an abundant resident, but is scarce in Corsica, where a few pairs breed in the mountains in May.

c. Russian Rock Sparrow, *P. petronia exigua* (Hellm.).

P. petronia exigua (Hellm.). Hartert, Vög. Pal. Fauna, p. 143.

Breeding Range: The mouth of the Don and the Caucasus to Erzerum.

Sarudny says the eggs vary in size from 22.4×16.1 to 20×14.5 mm.

[In Madeira and the Canaries a small dark form is found commonly, *P. petronia madeirensis* Erl., which nests under the eaves of buildings, and lays small, light coloured eggs. Average size of 10 eggs, 21.24×15 mm. In the Barbary states the resident form is *P. petronia barbara* Erl. 3 eggs taken by Erlanger average 21×15.8 mm. In Palestine the large and very distinct *P. petronia puteicola* Festa is found in summer, breeding in old wells. 9 eggs average 21.33×15.9 mm. in size. Breeding season, mid-April.]

40. House Sparrow, *Passer domesticus* (L.).

Plate 12, fig. 1—10 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXIV, fig. 15, a—e. Hewitson, I. Ed. I, pl. XLI, fig. 1, 2; II. Ed. I, pl. XLII, fig. 3, 4; III. Ed. I, pl. LIII, fig. 3, 4. Baedeker, Tab. 12, fig. 7. Taczanowski, Tab. LXX, fig. 1. Seebohm, Br. Birds, pl. 13; id. Col. Fig., pl. 56. Frohawk, Br. Birds, I, pl. IV, fig. 132—143.

British Local Names: *Spadger*, *Spuckie*, *Sprung*, *Craff* (Cumberland). Manx: *Jallyn*. Welsh: *Golfan Aderyn y tô*. Scotland: *Spuig*, *Spurd*. Gaelic: *Gealbhoun*. Erse: *Gahn*, *Gealbhan*.

Foreign Names: Bohemia: *Vrabec domácí*. Denmark: *Spurv*, *Graa*- or *Huss-spurv*. Finland: *Varpunen*. France: *Moineau commun*. Germany: *Hausperling*, *Hausspatz*. Greece: *Spurgitis*. Helgoland: *Karkfink*. Holland: *Huismus*. Hungary: *Házi veréb*. Italy: *Passera oltremontana*. Norway: *Graa*- or *Hus-spurv*. Poland: *Luszczak wróbel*. Portugal: *Pardal*. Russia: *Domaschni woroboj*. Spain: *Gorrión*, *Pardal*. Sweden: *Gråspink*, *Sparf*.

Passer domesticus (L.). Newton, ed. Yarrell, II, p. 89; Dresser, Birds of Europe, III, p. 184; id. Man. Pal. Birds, p. 289; Saunders, Man., p. 179. *P. domestica domestica* (L.). Hartert, Vög. Pal. Fauna, p. 147.

Breeding Range: Europe, with the exception of Italy, and the adjacent islands. [Also Siberia and at Tangier.]

British Isles.

Generally distributed over the whole of the inhabited parts of Great Britain and Ireland, but scarce in some of the high-lying villages, and never found at any distance from dwelling-places. It is found also in the Isle of Man, on nearly all the inhabited islands on the west of Scotland (though replaced by the Tree Sparrow on S. Kilda and scarce in the Outer Hebrides), and in the Orkneys, Fair Isle and Shetlands.

Continental Europe.

Although as yet unknown in Iceland and the Færøes, this obtrusive species has established itself in almost every inhabited part of the Continent with but few exceptions. In the Iberian peninsula it is plentiful and not infrequently breeds in the foundations of the nests of the larger raptorial birds, as well as in roofs of houses, etc. To Italy however it is only a rare straggler in the north, but is said to be resident in Udine; as well as in Istria. In the Balkan peninsula its range extends to Euboea, and it is also found in the Cyclades and Cyprus. Von Homeyer has recorded it from the Balearic Isles, but it is absent from Corsica, Sardinia and Sicily. In northern Europe its range extends in Russia to Archangel and the lower Petschora; in Lapland it is found up to nearly lat. $67\frac{1}{2}^{\circ}$ N., and on the northern coast is noted by Pearson from the Pechenga, while in

Norway it has reached Öxfjord, south of Hammerfest. It is however still unknown in the Færöes and Iceland.

The characteristically untidy nest is generally placed in some crevice or recess of a building, very often underneath eaves, or behind spouting. Ivy-covered walls are also much used, and in large towns any convenient nook, even in a statue, is soon occupied. Many nests are also built in trees, sometimes high up among the smaller branches, and at other times close to the stem, but always at a fair height. The House Martin is often ejected from its home in order to provide a nesting site for this species, which has also been found breeding in the foundations of nests of rooks, storks, and the larger birds of prey, eagles, kites, etc., as well as in sand martins' holes, and occasionally in crevices of cliffs. Nest.

When built in the open the nest is a large domed structure, composed of straw, dead grass and any available material, while the lining generally consists chiefly of feathers, though hair, wool and other substances are also used. When placed in a hole the outer covering is sometimes dispensed with either partly or altogether. If undisturbed several broods may be reared from one nest, and if the first clutch of eggs is removed another will be found about ten days later. Dr. Rey mentions two instances in which no fewer than ten clutches were removed from one nest in a single season.

Usually 4 or 5 in number, but instances of 6 and even 7 eggs in one nest have occurred and sometimes the full clutch consists of 3 only. They vary considerably, but it is usual to find one egg in each nest much more lightly marked than the others. Some eggs are quite white, while others have the markings confined to a cap or zone at the big end, but the majority are more or less finely spotted all over with varying shades of ashy grey and brown. The varieties are too numerous for description, but it should be noted that some eggs show a decided tendency to erythrisms. This has also been observed in Sweden. According to Mr. J. P. Nunn from 60 to 70 per cent of the lightly marked eggs are unfertile (*Zool.* 1888, p. 30). Eggs.

As a rule the Sparrow is not a particularly early breeder, and eggs are seldom found in the country districts before May, while in the midlands the second week is about the usual time. In towns and where artificial heat is maintained breeding takes place almost all the year round, and the same thing has been observed in places with a mild climate. Saxby found eggs in the Shetlands as early as April 11 and newly hatched young in December. In the northern limits of its range the eggs are not laid till the end of May or early June, while in Greece they have been found by mid-March. Breeding Season.

Average size of 100 German eggs, 22×15.6 mm., Max. 25.2×15.6 and 23×17 mm. Average weight 207 mg. (Rey). The same author Measurements.

mentions dwarf eggs 12.5×10.8 and 12.7×10.2 mm., as well as an abnormally large egg 25.9×16.9 mm. Eggs from northern Europe are slightly larger: thus 20 eggs from Finland average 23.2×16.3 mm. (Sandman). As will be seen from the above measurements there is considerable variation in size and shape in the eggs of this species. The average weight of 33 full eggs is 2.568 g. (Foster).

[Several Geographical Races of this species are found south of the Mediterranean: *P. domesticus tingitanus* Loche inhabits Marocco, Algeria and Tunis, *P. d. ahasver* Kleinschm. the country south of the Atlas, *P. d. biblicus* Hart. part of Syria and Palestine, etc.]

41. Italian Sparrow, *Passer italiae* (Vieill.).

Plate 26, fig. 9 (Ticino).

Eggs: Baedeker, Tab. 12, fig. 8.

Foreign Names: Italy: *Passera*.

Passer italiae (Vieill.). Dresser, Birds of Europe, III, p. 585; id. Man. Pal. Birds, p. 290; Hartert, Vög. Pal. Fauna, p. 152.

Breeding Range: Italy, Corsica, southern France and the Balearic Isles.

Con-
tinen-
tal
Europe.

This species replaces the Common Sparrow, south of the Alps, on the mainland of Italy, where it is an abundant resident in the towns and villages. It is however absent from Sardinia, Malta and Sicily (except at Messina), but occurs in the Balearic Isles, and locally in the Tyrol and Istria in company with *P. domesticus* (Arrigoni) as well as in Elba and Corsica. In the Riviera it is found at Nice, and occurs also as far as Lyon.

Nest,
etc.

In nesting habits it closely resembles the House Sparrow, and the eggs are quite undistinguishable, though perhaps slightly smaller than typical eggs of *P. domesticus* from middle Europe. Breeding season from April to July.

Measure-
ments.

Average size of 38 eggs measured by the writer, 21.76×15.37 mm., Max. 23.6×16.4 mm., Min. 20×16 and 20.5×14.1 mm.

42. Spanish Sparrow, *Passer hispaniolensis* (Temm.).

Plate 26, fig. 10 (Sokia, Asia Minor, 16. V. 99).

Eggs: Baedeker, Tab. 12, fig. 9.

Foreign Names: France: *Moineau espagnol*. Italy: *Passera sarda*. Portugal: *Pardal*. Spain: *Gorrión molinero*.

Passer hispaniolensis (Temm.). Dresser, Birds of Europe, III, p. 593; id. Man. of Pal. Birds, p. 291. *P. hispaniolensis hispaniolensis* (Temm.). Hartert, Vög. Pal. Fauna, p. 156.

Breeding Range: Locally in Spain and the Balkan peninsula. [Also in the Cape Verde Isles, the Canaries, N. Africa, and from Asia Minor to Central Asia; while local races are found in S. Italy and the main islands of the Mediterranean.]

In the Iberian peninsula this species is exceedingly local, but is abundant in some places. It is also found on some of the Canary Islands, and in the Barbary States large colonies are frequently met with. In Greece it appears to be local in the breeding season, but Krüper records it from Acarnania and near Vrachori, and Reiser from Velestino in Thessaly. The latter naturalist also discovered a colony near Philippopolis in E. Rumelia in 1893. In Asia Minor it is locally abundant, breeding in huge colonies.

Continental
Europe

As a rule this bird prefers to nest in the open country, avoiding towns and villages, but usually near cultivated ground. In southern Spain and Marocco the nest is often placed under that of one of the larger birds of prey, but this habit is also often shared by *P. domesticus*. Occasionally however it builds an independent nest among the branches, spherical in shape but more neatly constructed than that of its congener. In Algeria and Tunis hundreds of these birds nest in colonies in the tamarisk thickets, and also in the date palms and poplars, while at Sousa in E. Tunis Whitaker found nests under the eaves of a crowded café, not more than 9 or 10 ft. from the ground. In the Balkan peninsula colonies breed in the nests of the White Stork and Imperial Eagle, and in Rumelia Reiser found nests among the branches of willows. In Asia Minor the nests are sometimes placed so closely together that the trees are completely covered by them.

Nest.

Usually 5—7 in number. In colour they are subject to little variation; nearly all having a pale bluish ground, rather sparsely marked with dark leaden or olive-grey spots and streaks, with finer underlying paler bluish grey spots. The markings frequently tend to form a cap. One egg in a clutch is sometimes lighter than the rest, but this tendency is not nearly so common as in the House and Tree Sparrow.

Eggs.

In N. Africa from April onwards, while in the Balkan peninsula and Asia Minor most eggs are laid about the middle of May.

Breeding
Season.

Average size of 104 eggs (chiefly from Asia Minor) 21.98×14.19 mm., Max. 24×16 and 23.5×16.2 mm., Min. 20×14.5 and 21.1×14 mm. Reiser gives the average weight of 13 eggs from Thessaly as nearly 164 mg, varying from 120 to 200 mg.

Measure-
ments.

Geographical Races.

Spanish Sparrow, *P. hispaniolensis hispaniolensis* (Temm.). See above.

Sardinian Sparrow, *P. hispaniolensis arrigonii* Tsch.

P. hispaniolensis arrigonii Tsch. Hartert, Vög. Pal. Fauna, p. 157.

Breeding Range: Sardinia and probably also Corsica.

In Sardinia small colonies nest in the groups of wild olive trees; some also build about houses and towns. Nests of dry grass, lined with feathers, like the Common Sparrow's (A. B. Brooke).

Maltese Sparrow, *P. hispaniolensis maltae* Hart.

P. hispaniolensis maltae Hart. Hartert, Vög. Pal. Fauna, p. 157.

Breeding Range: Malta and Sicily.

Common in Sicily, breeding in small parties or isolated pairs, but congregating in large flocks in winter and early spring.

Calabrian Sparrow, *P. hispaniolensis brutius* Fiore.

P. hispaniolensis brutius Fiore. Hartert, Vög. Pal. Fauna, p. 158.

Breeding Range: S. Italy (Taranto, Catanzaro, etc.).

[From Transcaucasia and Palestine eastward to Kashmir is found *P. h. transcaspicus* Tsch., while in S. Algeria another race, *P. h. flückigeri* Kleinschm. is the resident form.]

43. Tree Sparrow, *Passer montanus* (L.).

Plate 12, fig. 11—20 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXIV, fig. 13, a—d. Hewitson, I. Ed. I, pl. XLI, fig. 3, 4; II. Ed. I, pl. XLII, fig. 1, 2; III. Ed. I, pl. LIII, fig. 1, 2. Baedeker, Tab. 12, fig. 6. Taczanowski, Tab. LXX, fig. 2. Seebohm, Br. Birds, pl. 13; id. Col. Fig., pl. 56. Frohawk, Br. Birds, I, pl. IV, fig. 144—147.

British Local Names: *Mountain Sparrow, Copper Head*. Welsh: *Aderyn y to geir mewn bargod*.

Foreign Names: Bohemia: *Vrabec polní*. Denmark: *Skovspurv*. Finland: *Metsävarpunen*. France: *Friquet*. Germany: *Feldsperling, Baumsperrling*. Helgoland: *Ingelsk Karkfink*. Holland: *Ringmusch, Boommusch*. Hungary: *Mezei Veréb*. Italy: *Passera mattugia*. Norway: *Pilfink*. Poland: *Luszczak Mazurek*. Russia: *Polewoj worebej*. Sweden: *Fültsparf, Pilsparf*. Spain: *Gorrion serrano*.

Passer montanus (L.). Newton, ed. Yarrell, I, p. 82; Dresser, Birds of Europe, III, p. 597; id. Man. Pal. Birds, p. 293; Saunders, Man., p. 181.

P. montana montana (L.). Hartert, Vög. Pal. Fauna, p. 160.

Breeding Range: Locally throughout Europe, scarce in the extreme north, and absent from Portugal and most of the Mediterranean islands. [Also in Siberia eastward to China: apparently only accidental in N. Africa.]

British
Isles.

In England it is not nearly so common as the House Sparrow and is as a rule very local, being generally found in colonies, often at some distance from houses. It has however been found breeding in every county

with the exception of Cornwall and Devon, although very scarce in Cumberland and Westmorland. In Wales it is very sparingly distributed over the northern counties and has been met with in the breeding season in Anglesea, Carnarvon, Denbigh, Flint, Montgomery and Brecon, but is still unknown in the western and southern parts of the country, except at Llandaff. It nests in the Isle of Man, but in Ireland is only known to have permanently established itself in the County Dublin. In Scotland it occurs sporadically in colonies, chiefly on the eastern side of the mainland from Sutherland southward, but has also been recorded from W. Sutherland and Argyll, and is said to have formerly bred in Ayr. It is found in Bute and many of the Inner Hebrides (Eigg, Coll, Tiree, Iona, Oronsay, Jura etc.), and also in Skye, while it is common on Barra and S. Kilda, and has been recorded as nesting on Unst, Shetlands (1903).

In the Iberian peninsula it is unknown in Portugal and only occurs locally in eastern Spain. It is absent from Corsica and Sardinia, but appears to be found in Sicily. Though wanting in Greece it is common in Bulgaria and Macedonia, and appears to be very generally distributed throughout the countries of central Europe, in some places being even more abundant than the House Sparrow, as in parts of Austro-Hungary. Northward it was formerly plentiful in the Færøes, but has apparently disappeared of late, and is unknown in Iceland, while in Scandinavia Collett found it established at Vardö (about 70° 30' N.) in 1885, and in Russia it is found as far as Archangel and the Petschora valley.

Con-
tinental
Europe

In England the favourite breeding places are holes in pollarded willows or other trees, hollows in ivy covered trees, and in old nests of Herons, Rooks, Crows or Magpies. In treeless districts it is sometimes placed in holes of cliffs or loosely built walls, while exceptionally it has been recorded from haystacks, holes of Green Woodpecker and Sand Martin, thick hollies, thatch or tiling of cottages, etc., and nesting boxes are often appropriated. In some parts of the Continent it regularly haunts the villages and towns, and in eastern Europe frequently builds among the foundations of Storks' nests and the eyries of the larger birds of prey, Reiser has found as many as 30 pairs breeding in one Eagle's nest. In construction the nest resembles that of the House Sparrow, being as a rule carelessly constructed of straw, dead grass, etc., warmly lined with feathers, wool, or hair. Kleinschmidt has found fresh blooms of hyacinth at the entrance of a nesting box occupied by this species. Some nests are domed and substantially built, but where the hole is small but little material is used.

Nest.

4—6 in number and similar in character to those of the House Sparrow; but on comparing a series of both species it will be seen that the eggs of the Tree Sparrow have as a rule finer and more numerous markings,

Eggs.

sometimes almost concealing the ground colour, and producing a marbled appearance. There is also a greater tendency to brown, some eggs having rich chocolate markings, and the gloss is decidedly higher. One egg is as a rule much lighter in colour than the rest; more rarely two light eggs are found in a clutch.

Breeding
Season.

In the south of England the first eggs are generally laid about mid-May, but in the Midlands most are laid towards the end of the month, and in northern localities, such as S. Kilda and the Shetlands, they are not laid till the third week in June. Two broods are usually reared, and fresh eggs may be met with as late as August. In Germany Rey found most eggs in May, and is of opinion that in some districts only one brood is reared. In N. Russia Seebohm took eggs early in June.

Measure-
ments.

Average size of 103 eggs (65 from Germany by Rey and 38 from England by the writer) 19.55×14.05 mm., Max. 22.2×14.1 and 20.2×14.8 mm., Min. 17.5×13 mm. An abnormally large egg in the Rey collection measures 22.6×15.4 mm; weight 175 mg. 4 eggs from the Petschora average 22×14.5 mm. The average weight is 159 mg. (Rey).

[The Desert Sparrow, *P. simplex saharae* Erl., inhabits the sandy wastes of Algeria, Tunis, and Tripoli. Eggs 3 in number: size about 19×13.5 mm.]

44. Corn Bunting, *Emberiza calandra* L.

Plate 13, fig. 1 (Greece), 2—4 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 8, a—d. Hewitson, I. Ed. I, pl. III, fig. 1, 2; II. Ed. I, pl. XXXIX, fig. 1; III. Ed. I, pl. XLVII, fig. 3. Baedeker, Tab. 3, fig. 3. Taczanowski, Tab. LXV, fig. 1, LXVI, fig. 1. Seebohm, Br. Birds, pl. 13; id. Col. Fig., pl. 57. Frohawk, II, pl. V, fig. 181—187.

British Local Names: *Bunting Lark*, *Grass Bunting*, *Horse or Clod Lark*. Welsh: *Bras-yr-yd*. Isle of Man: *Thistle Cock*, *Barley Bird*. Manx: *Pompee-ny-hoarn*. Gaelic: *Gealag Bhuachair*. Shetlands: *Cornbill*. Erse: *Gealbhan an guib ramhair*.

Foreign Names: Bohemia: *Propàska*, *Pištěk*. Denmark: *Kornlaerke*, *Bomlaerke*. France: *Proyer*, *Preyer*. Germany: *Gerstenammer*, *Grauummer*. Greece: *Tsiphtes*. Helgoland: *Dicke Diert*. Holland: *Graauwe Gors*, *Gierst-vogel*. Hungary: *Sordély*. Italy: *Strillozzo*. Norway: *Kornspurv*. Poland: *Póswierka prosowa*. Portugal: *Trigueirão*. Russia: *Obsjanka prosjanka*. Spain: *Triguéro*, *Ave tónta*. Sweden: *Kornsparf*, *Kornlärka*.

Emberiza miliaria L. Newton, ed. Yarrell, II, p. 38; Dresser, Birds of Europe, IV, p. 163; id. Man. Pal. Birds, p. 343; Saunders, Man., p. 207. *E. calandra calandra* L. Hartert, Vög. Pal. Fauna, p. 165.

Breeding Range: The British Isles, S. Sweden, and all central and southern Europe, but absent from northern Russia. [Also N. Africa, Palestine and Asia Minor to Turkestan.]

In Great Britain the Corn Bunting is a local resident, being perhaps most numerous in the maritime counties and in the flat corn lands, but is not uncommon locally in the little walled in crofts up to 1000 ft. It is not found in mountainous, moorland, or thickly wooded districts, and is also rare or absent from many cultivated and open districts inland. In N. Wales it is practically confined to a belt one mile wide along the coast, but breeds inland near Llangollen and Montgomery (Forrest). It breeds in the Isle of Man, and is generally common in Ireland near the coast and on the islands, but less numerous and local in the interior. It inhabits most of the islands off the W. coast of Scotland and is also common on the Orkneys and Shetlands.

British
Isles.

In Norway it is only known to breed in the extreme south (Lister and Jaederen), but in Sweden it is distributed over the southern and western provinces as well as Öland. South of the Baltic and the Gulf of Riga it is generally distributed in suitable localities, being very plentiful on the plains of Jutland, but is said to be local in the south of Russia. In the countries bordering the Mediterranean it is very common, and also in the islands, especially Sardinia.

Con-
tinental
Europe.

In the British Isles the nest is usually placed in long mowing grass, clover, or corn fields, but occasionally it is found in furze, low scrub, or briars, and is then raised some little distance from the ground. It is built of roots, bents, grasses, etc., lined with finer grasses and sometimes a few hairs. There is very often some large and conspicuous plant in the neighbourhood of the nest. On the arid plains of southern Spain it is frequently found under the shelter of one of the thistles or large liliaceous plants which are common there, while near Gibraltar Irby found many nests on the edge of marshes. The hen is a close sitter, and the cock generally keeps on droning out his monotonous song at intervals from some point of vantage such as a wall, telegraph wire, or bush, in the neighbourhood of the nest.

Nest.

3—5 in number, occasionally 6, in the British Isles; on the Continent Rey gives 5 as the usual clutch, but 7 have been found in southern Spain. They are subject to much variation, some being almost white, or pale blue with faint brown markings, but in most cases the ground colour varies from greyish or yellowish white to warm rufous brown, while the markings are of the most varied character, and consist generally of pale lavender or greyish brown underlying blotches, spots and streaks, with very bold 'worm-lines', streaks and spots of deep blackish brown, sometimes tending to form a cap or zone at the big end. An unusual variety has only a few

Eggs.

fine spots, while the most strongly erythristic type has a few blackish streaks on a red-brown ground.

Breeding
Season.

In England the first eggs are laid at the end of May, but most birds breed during the month of June, although on the South Downs many birds do not lay till early July, and fresh eggs can be obtained till late in July or even August; while in Ireland eggs are rarely taken in May, but are sometimes found as late as August. In Germany according to Rey two broods are reared: the first clutches being occasionally deposited in April, but generally in May, and the second about mid-June or July. In southern Spain and Greece the eggs are laid from about mid-April to mid-May, while in N. Africa young birds have been met with on the wing at the end of April, but most eggs are laid early in May.

Measure-
ments.

100 eggs measured by Rey average 24.3×17.6 mm., Max. 28×19 mm., Min. 21×17 and 22×16 mm. An egg from the New Forest measures 28.6×18 mm. (E. W. Blagg), and some English eggs are almost round in shape, 19×17.8 mm. (H. G. Tomlinson). Average weight 135 mg. (Rey); 213 mg. (Bau). 4 full eggs average 3.086 g. (N. H. Foster).

[The race inhabiting the Canaries has been separated under the name of *E. calandra thameri* Tsch. It is an abundant resident on all the islands.]

45. Yellow Bunting, *Emberiza citrinella* L.

Plate 13, fig. 6—11 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 4, a—d. Hewitson, I. Ed. I, pl. III, fig. 3, 4; II. Ed. I, pl. XXXIX, fig. 3, 4; III. Ed. I, pl. XLVII, fig. 2. Baedeker, Tab. 3, fig. 8. Taczanowski, Tab. LXVII, fig. 1. Seebohm, Br. Birds, pl. 13; id. Col. Fig., pl. 58. Frohawk, Br. Birds, II, pl. V, fig. 188—195.

Nest: O. Lee, IV, pp. 100, 102.

British Local Names: *Yellow Hammer*, *Yellow Yeorling*, *Scribbling Lark*, *Goldfinch*, *Yite*. Cornwall: *Gladdie*. Welsh: *Llinos Felen*, *Melyn yr eithin*. Manx: *Ushag wee*. Scotland: *Yite* or *Yitey*, *Spink*, *Yeldroch*. Gaelic: *Buidheag*. Erse: *Buidheog*.

Foreign Names: Bohemia: *Strnad obecný*. Denmark: *Gulspurv*, *Gulverling*. Finland: *Keltasirkku*. France: *Bruant jaune*, *Verdière*. Germany: *Goldammer*. Helgoland: *Gjühl Klütjer*. Holland: *Geelgors*, *Schrijver*. Hungary: *Czitrom sármány*. Italy: *Zigolo giallo*. Norway: *Gulspurv*. Poland: *Poświerka Trznadel*. Russia: *Obiknovenoi owsjanka*. Spain: *Cerillo*. Sweden: *Gröning*, *Gulsparf*.

Emberiza citrinella L. Newton, ed. Yarrell, II, p. 43; Dresser, Birds of Europe, IV, p. 171; id. Man. Pal. Birds, p. 353; Saunders, Man., p. 209. *E. citrinella citrinella* L. Hartert, Vög. Pal. Fauna, p. 167.

Breeding Range: The British Isles and Continental Europe, except the north of Scandinavia and Russia, and in the south, Portugal, the greater part of Spain, southern Italy, Greece and the Mediterranean Islands. [Also inhabits western Asia.]

In the British Isles it is a common resident in most parts of the mainland and islands, but has not yet been found breeding in the Shetlands. British Isles.

In the Iberian peninsula it is found north of the Cantabrian Mts. and in Navarre, but further south is only a winter straggler. In Italy it is common in the northern provinces, but becomes scarcer towards the middle of the peninsula and is absent from the south. It is also unknown in Greece, but is very plentiful in Bulgaria, and occurs on the Montenegrin mountains, although absent from the coast. In Russia some birds appear to belong to an imperfectly known geographical race, *E. citrinella erythro-genys* Brehm, which probably also inhabits W. Siberia, Turkestan, Persia and Asia Minor. North of lat. 67° 40' in Finland and 65½° in E. Russia it is not found, and in Scandinavia its range does not extend beyond lat. 70° N., but over the rest of Europe it is fairly common and general. Con-
tinental
Europe.

Frequently built on the ground at the foot of a hedge, bush, or steep bank, and generally partly hidden by growing grass. Sometimes however it is placed in a bush at some little height, and an instance is on record of a nest 7 ft. from the ground in a broom-plant, while others have been found 10—12 ft. high in the side of a haystack (*Zool.* 1903, p. 465) and twice on fruit trees trained against a wall 5 and 7 ft. high, in one case on an old Blackbird's nest. Another extraordinary site is within a hollow turnip! (*Field*, 7. VI. 02); while in Germany a nest has been found under a turntable at a station. Occasionally also a hen has been found incubating eggs on the bare ground, probably when the nest has been destroyed while she was laying. Nest.

Nests vary in size according to position, those built in bushes being naturally more bulky than those placed in a hollow on a bank side. The materials consist chiefly of stalks, grasses, etc., with a little moss and a smooth lining of horsehair, while occasionally a few leaves are used in the foundation.

3—5 in number, but clutches of 6 have been occasionally recorded from the Continent. In some districts the set almost invariably consists of 3, and in Ireland Ellison has sometimes found 2 only, while 5 are scarce. In Germany Rey states that the first clutch consists generally of 5 eggs, the second of 4, and the third of 3 or 4. In colour and markings they show great variety. Some eggs are almost pure white, without any markings; but the most usual ground colour is a pale purplish white, with fine underlying spots or streaks of pale violet, and pencilled with interlacing hair lines or streaks of dark purplish brown, and a few spots of the same Eggs.

colour. Occasionally the ground colour has a decided rufous tint, and some eggs are a warm brownish red, with a few blackish hair lines.

Breeding
Season.

As three broods are frequently reared, the breeding season is of long duration. In England the first eggs are laid late in April, but in the hills and the north the more usual time is in May, sometimes not till the second or third week. From this time onward eggs may be found till August and even September. In Ireland most eggs are laid in May and June, but late clutches are occasionally found. In Germany Rey has taken eggs from April 25 to July 31. In the northern part of its range only one brood is reared and the eggs are laid in June. Incubation lasts 14 days, and the hen is a close sitter, while the cock reiterates his simple song from a hedge or tree close at hand.

Measure-
ments.

Extraordinary variations in shape and size are occasionally met with. Rey gives the average size of 100 eggs as 21.2×15.9 mm., Max. 24.2×17.1 and 23.5×17.7 mm., Min. 18.5×14.3 mm. Abnormally elongated eggs measure 30.2×15 mm. (R. Smith), 28.3×14.3 mm. (E. W. H. Blagg) and 28×16.4 mm. (E. Rey). Some eggs are pyriform in shape, while others are almost spherical, measuring 18.3×17 , 18×16.8 mm., etc. (C. A. Westerland), and 3 dwarf eggs measure 14.3×10.5 , 14.2×12 and 13.3×11 mm. (R. H. Read). Average weight of normal eggs 160 mg. (Rey), 178 mg. (Bau); 15 full eggs average 2.702 mg. (Foster).

Geographical Races.

a. Common Yellow Bunting, *E. citrinella citrinella* L. and

b. Eastern Yellow Bunting, *E. citrinella erythrogeus* Brehm. See above.

46. Pine Bunting, *Emberiza leucocephala* S. G. Gmel.

Plate 14, fig. 1 (Amur, 5. V.).

Foreign Names: Bohemia: *Skrivan sibirsky*. France: *Bruant à couronne lactée*. Germany: *Fichtenammer*. Italy: *Zigolo gola rossa*. Poland: *Poświerka białobista*. Russia: *Strenatka-beloshapotchnaya*.

Emberiza leucocephala Gmel. Dresser, Birds of Europe, IV, p. 217; id. Man. Pal. Birds, p. 359. *E. leucocephalos* S. G. Gmel. Hartert, Vög. Pal. Fauna, p. 169.

Breeding Range: Siberia, from the Urals to the mouth of the Amur. Has occurred on Helgoland and in Austria, Dalmatia, Italy, etc.

According to Dybowski (*Journ. f. Ornith.* 1873, p. 86) the nest is always in the open, on the edge of the forest or thickets, and is placed on the ground in a slight depression at the foot of a tree, bush, or fallen bough. It is built of grass stalks and bents, smoothly lined with finer grasses and horsehair. External diameter about $5\frac{1}{2}$ in., depth 2 in., dia-

meter of cup $2\frac{3}{8}$ in., depth $1\frac{3}{16}$ in. The eggs are 4—6 in number, varying in ground colour from pale pinkish to violet or greenish, with numerous fine brown streaks and hair lines or spots, and pale underlying violet grey spots. On the whole they bear a great likeness to the eggs of the preceding species, and like them are sometimes found very lightly marked. Incubation is performed by the hen, the cock singing from some dead branch in the neighbourhood, and the eggs are laid at the end of May, a second brood being reared in July. Average measurements of 54 eggs (22 by Taczanowski, 7 by Rey and the rest by the writer) 21.48×16.1 mm., Max. 23.3×16.7 and 23×17.3 mm., Min. 19×16.3 and 19.6×14.2 mm. One egg weighs 170 mg. (Rey); average of 22 eggs, 173 mg. (Bau).

47. Black headed Bunting, *Emberiza melanocephala* Scop.

Plate 14, fig. 12—15 (Attica); 16 (Smyrna).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 3, a—c. Baedeker, Tab. 3, fig. 9. Taczanowski, Tab. LXV, fig. 3. Seebohm, Brit. Birds, pl. 15; id. Col. Fig., pl. 58. Reiser, Orn. Balc. III, Taf. III, fig. 22—24.

Foreign Names: Bohemia: *Propáska černohlavýj*. France: *Bruant crocote*. Germany: *Kappenammer*. Greece: *Ampelourós*, *Krasopoüli*. Hungary: *Kucsmás sármány*. Italy: *Zigolo capinero*. Montenegro: *Žutar*, *Žutka*. Russia: *Tschernolowaja owsjanka*.

Emberiza melanocephala Scop. Newton, ed. Yarrell, II, p. 64; Dresser, Birds of Europe, IV, p. 151; id. Man. Pal. Birds, p. 346; Saunders, Man. p. 205; Hartert, Vög. Pal. Fauna, p. 170.

Breeding Range: S. E. Europe. [Also Palestine and Asia Minor to the Caucasus, Persia and Beluchistan.] Has occurred in the British Isles.

In Greece and many of the islands of the Archipelago, Crete, and Cyprus, this bird is a well known and numerous summer visitor, arriving at the end of April and breeding plentifully in the vineyards and gardens of the plain, and in smaller numbers on the hillsides. It is also common in the low lying parts of Macedonia, Rumelia, etc., but becomes scarcer north of the Balkans. On the west side of the peninsula it is very common in the plains of Dalmatia and Montenegro, but is rare above 1500 ft. In south Russia it is found as far as the lower part of the Volga valley, and in Italy occurs frequently on the east coast, where it occasionally breeds, especially in Venetia. In Asia Minor it is found in vast numbers.

Seebohm describes nests from Greece as neatly finished inside, but rather loose and ragged in appearance outside; the foundation consisting of dry grass, thistle leaves, etc., and the main part constructed of the yellow dry stalks of small flowering plants, covered with seed capsules, lined with brown roots and finer grasses and sometimes hair. Diameter of cup $2\frac{3}{4}$ in.,

Con-
tinental
Europe.

Nest.

depth 2 in. In Greece the nest is usually built on a vine stock, but in Turkey it is often placed among the standing peas, and in Montenegro von Führer found nests 5—6 ft. from the ground in wild pomegranate or other bushes. At other times it is found almost touching the ground in low scrub, and also in brambles and creepers.

Eggs. Usually 4 or 5 in number, but 6 are sometimes met with, and Führer took one clutch of 7 eggs. In type they differ widely from most Bunting eggs, except those of *E. luteola*. The ground colour is pale greenish blue, rarely without markings, but generally with pale violet underlying spots, and brown blotches or spots, but not streaks. Some eggs have very bold blotches of warm brown; others have distinct zones or caps of confluent spots at the big end, and a third type has the fine spots evenly distributed or almost obsolete.

Breeding Season. Krüper states that in Greece the breeding season begins in mid-May (about a fortnight after the arrival of the birds) and lasts through June; most eggs being laid about May 20—30. In Montenegro Führer took 40 nests between May 27 and July 5. Only one brood is reared; incubation lasts 14 days, and the hen is relieved by the cock about mid-day and towards evening.

Measurements. Average of 100 eggs (50 by Rey and 50 by the writer) 22.42×16.06 mm., Max. 26×15.1 and (according to Reiser) 23.8×18.2 mm., Min. 19×14.5 and 19.25×14 mm. As will be seen, these eggs vary much in shape and size, some being much elongated, while others are almost spherical (19.5×16.4 mm.). Rey gives the average weight as 172 mg., and in a series of 35 eggs weighed by Reiser the weight varies from 135 to 200 mg.

[Red headed Bunting, *Emberiza luteola* Sparrm.

Plate 14, fig. 10, 11 (Kuldscha).

Eggs: Ibis 1904, pl. III, fig. 7—9.

Emberiza luteola Sparrm. Dresser, Birds of Europe, IX, p. 211; id. Man. Pal. Birds, p. 347; Hartert, Vög. Pal. Fauna, p. 171.

Breeding Range: Transcaspia, Afghanistan, Turkestan and S. W. Siberia as far as the Altai Range. (Has occurred twice on Helgoland.)

Nest. This bird is said to frequent lowlands and cultivated ground, building a flattish nest about $4\frac{3}{4}$ to $5\frac{1}{2}$ in. in diameter, with a rim $1-1\frac{1}{2}$ in. thick. It is usually placed either on, or at a short distance from the ground in a small bush, and is composed of dry grasses, stalks, leaves and twigs loosely put together, lined with finer grasses and frequently also with horsehair.

Eggs. The eggs are 3 to 4 in number, similar in character to those of the preceding species, but usually paler in ground colour. Some specimens are not unlike light eggs of the White Wagtail. They are sparsely marked with fine ochreous brown spots, and still finer underlying ashy specks, on a pale greenish or bluish white ground. The markings tend to form a cap at the big end. In one clutch from Transcaspia the spots are purplish red in colour, but this is unusual. The breeding season lasts throughout May.

Average of 22 eggs (2 by Rey and 18 by the writer) 20.04×15.38 mm., Max. 22×16 and 21.2×16.5 mm., Min. 19×15.6 and 20.2×14.5 mm. Two eggs weigh 138 and 150 mg. (Rey.)] Measurements.

48. Yellow breasted Bunting, *Emberiza aureola* Pall.

Plate 14, fig. 8, 9 (Siberia).

Eggs: Baedeker, Tab. 12, fig. 11. Journ. f. Ornith. 1856, Tab. II, fig. 15.

Foreign Names: Bohemia: *Strnad ruský*. Finland: *Kulta sirhku*. Germany: *Weidenammer*. Russia: *Strenatka tschernolitsaya*. Sweden: *Rysk Videsparf*.

Emberiza aureola Pall. Dresser, Birds of Europe, IV, p. 223; id. Man. Pal. Birds, p. 349; Hartert, Vög. Pal. Fauna, p. 173.

Breeding Range: Russia, east of Lake Onega and north of lat. 50° N. [Also Siberia to Kamtschatka, etc.] Has occurred once in England (Cley, Norfolk, 21. IX. 05), and also on Helgoland, as well as in Austro-Hungary, Italy, Holland and S. France.

Near Archangel this species is exceedingly common, but in the country between the Dwina valley and the great Lakes is only thinly distributed. It is said also to be common in the governments of Moscow, Tula, and Kazan, although unknown near Moscow till 40 or 50 years ago. In the valleys on the western slopes of the Urals it is scarce. Its usual haunts are the low meadows interspersed with small alder and birch bushes, and overgrown with patches of *Veratrum album*; but in S. E. Siberia Radde met with it among the brush covered river banks up to 6000 ft.

Con-
tinental
Europe.

Usually built either on the ground or close to it, sometimes in low bushes or on stumps, and often under the shelter of a plant of *Veratrum album*. Many of the nests found by Dybowski in E. Siberia were however 3 ft. from the ground. The nests are not easy to find, as the sitting birds frequently run some distance before taking wing. They are composed of dry grasses, with a lining of a few horsehairs. Both sexes incubate.

Nest.

Usually 4 or 5 in number, rarely 6. Some eggs bear a considerable resemblance to those of the Reed Bunting, but as a rule the ground colour is distinctly greenish, sometimes decidedly so, and at other times varying to stone colour, pale bluish or olive. The markings consist of spots and streaks, occasionally also hair lines, of dark brown, with underlying cloudings of purplish grey or brown, which sometimes almost obscure the ground colour.

Eggs.

In Russia fresh eggs may be found from June 9 to early in July, while on the Upper Lena, Hall took nests between June 18 and 25. Near Archangel most nests contained newly hatched young on July 13—14 (Harvie-Brown).

Breeding
Season.

Measure-
ments.

Average of 52 eggs (11 by Rey, 3 by Meves and 38 by the writer) 20.53×15.05 mm., Max. 22.2×15.3 and 21.5×16 mm., Min. 18×15.3 and 20×14 mm. A dwarf egg in Dresser's collection measures 15.2×11.5 mm. Average weight of 11 eggs 120 mg. (Rey).

49. Cirl Bunting, *Emberiza cirlus* L.

Plate 13, fig. 12—15 (Greece).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 5, a—c. Hewitson, I. Ed. I, pl. XI, fig. 1; II. Ed. I, pl. XL, fig. 1; III. Ed. I, pl. XLVIII, fig. 2. Baedeker, Tab. 3, fig. 7. Seebohm, Brit. Birds, pl. 13; id. Col. Fig., pl. 58. Frohawk, Br. Birds, II, pl. V, fig. 196—197.

Foreign Names: Bohemia: *Strnad evřivý*. France: *Bruant zizi*. Germany: *Zaunammer*, *Zirnammer*. Holland: *Cirlgors*. Hungary: *Sövény sarmány*. Italy: *Zigolo nero*. Portugal: *Sia*, *Siocho*. Russia: *Ogorodnaya ovsyanka*. Spain: *Linacéro*.

Emberiza cirlus L. Newton, ed. Yarrell, II, p. 50. Dresser, Birds of Europe, IV, p. 177; id. Man. Pal. Birds, p. 354. Saunders, Man, p. 211. Hartert, Vög. Pal. Fauna, p. 175.

Breeding Range: Southern England, Wales, the countries bordering on the Mediterranean and Black Seas from Spain to the Caucasus. [Also Asia Minor and N. W. Africa.]

British
Isles.

It is rather remarkable that this bird, which on the Continent has its head quarters in the Mediterranean region, should be found breeding in so many English and Welsh counties. Full details as to its distribution will be found in the *Zoologist* 1892, pp. 121 and 174. Briefly the Cirl Bunting breeds commonly but locally along the counties bordering our southern coasts, in the Isle of Wight, and also in smaller numbers in Somerset, Wilts, Gloucester, the Thames valley, Hertford, Bedford, Northampton, Warwick, Worcester, Hereford and Salop. It is also said to have occasionally nested in Stafford, Yorkshire, and Lancashire, but in view of its absence from the north of England and the eastern counties, further evidence is desirable. In Wales a few pairs are now known to breed locally in Glamorgan, Cardigan, Brecon, Montgomery, Carnarvon and Flint, and it is not uncommon locally in Denbigh.

Con-
tinental
Europe.

In the Iberian peninsula it is plentiful in the north of Portugal and tolerably common in southern Spain. It is found also throughout France, Italy, Corsica, Sardinia, Sicily, etc., but is local in Switzerland, and in Germany only occurs in small numbers in the south west (valleys of the Rhine, Mosel and Saar). In Austro-Hungary it is only recorded from the coast districts, but is widely distributed and common in the Balkan peninsula, breeding principally in the hilly districts. In Russia it is found

in the Crimea, but is scarce in the Caucasus; while it is common on the hills of Asia Minor and Crete, and is abundant in the mountain ranges of N. W. Africa.

In the British Isles the nest is usually found in gorse, often some little distance above the ground, less frequently in hedge bottoms or bramble thickets, and occasionally on the ground on a bankside. In the south of Europe and N. Africa it haunts the brush grown hill sides, and is also found in open glades of cork forest near Gibraltar. The nest is built chiefly of bents and roots, with occasionally moss, leaves, etc., lined with finer grasses and usually, but not always, with horsehair. External diameter about 4 in., diameter of cup $2\frac{1}{2}$ —3 in.; depth of cup $1\frac{1}{2}$ in. The cock is not at all shy, but pours forth his vigorous, but monotonous song with head thrown back and widely opened bill from some bush or tree in the vicinity of the nest. Nest.

4—5 (rarely 6 in number in southern Europe), while late broods often consist of only 3. As a rule the eggs are characterized by their pale bluish or greenish white ground and bold, almost black streaks. Occasionally however a nest is found in which the ground colour of the eggs has a pinkish tinge, and such exceptional clutches are not to be distinguished from eggs of the Yellow Bunting. I have seen eggs of this kind from the Parnassus, where *E. citrinella* does not occur, as well as from the south of England. In a clutch from Asia Minor the markings are of a distinctly reddish brown, instead of the usual very dark sepia. Eggs.

In England the usual time for first clutches is from about May 10 to the end of the month, while second broods may be looked for from mid-July to August. In warm, sheltered spots, eggs may occasionally be found at the beginning of May. In southern Spain the eggs are laid early in April, and in Greece from the middle to the end of the month, second broods being found up to the middle of July. Breeding Season.

Average size of 100 eggs (53 by Rey and 47 by the writer) 21.13×16.11 mm., Max. 23×17 and 21×18 mm., Min. 19.2×15 mm. An abnormally large egg from Greece measures 26.4×22.4 mm. (Reiser). Average weight of 53 eggs, 166 mg. (Rey); of 22 eggs, 171 mg. (Bau). It will be noticed that as a rule the eggs are broader than those of *E. citrinella*, and are occasionally very rounded in shape. Measurements.

[Strickland's Bunting, *Emberiza cinerea* Strickl.]

Egg: Ibis 1904, Pl. III, fig. 11.

Emberiza cinerea Strickl. Dresser, Birds of Europe, IV, p. 159; id. Man. Pal. Birds, p. 352; Hartert, Vög. Pal. Fauna, p. 178.

This species, which is supposed to have been seen once on Helgoland, is not uncommon in Asia Minor, but the nesting habits and eggs are almost unknown. Two eggs from a nest taken on May 10, 1889 by one of Krüper's

collectors average 20.5×15.4 mm. in size, and are bluish white, sparingly marked with black spots and small blotches and a few pale underlying spots. (Coll. Dresser and Newton). Mr. F. C. Selous has a clutch of eggs taken in Asia Minor at a height of 3000 ft. from a nest on the ground, which may belong to this bird. Three eggs average 20.53×16.23 mm., and are dull French white with a few very dark spots, scrawls and hair lines of sepia brown, and pale underlying violet grey blotches. They are less glossy than eggs of *E. cirius* or *caesia*.]

50. Ortolan, *Emberiza hortulana* L.

Plate 13, fig. 16 (Switzerland), 17—20 (S. Sweden).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 7, a—d. Hewitson, I. Ed. I, pl. CXXVI; II. Ed. I, pl. XL, fig. 2; III. Ed. I, pl. XLVIII, fig. 1. Baedeker, Tab. 3, fig. 5. Taczanowski, Tab. LXV, fig. 2; LXVI, fig. 2. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 57.

Foreign Names: Bohemia: *Strnad zabradú*. Denmark: *Hortulanverling*. Finland: *Metsäsirkku*, *Peltopeiippo*. France: *Bruant ortolan*. Germany: *Gartenammer*, *Ortolan*. Helgoland: *Orteloan*. Holland: *Ortolaan*, *Vremdeling*. Hungary: *Kérti sármány*. Italy: *Ortolano*. Norway: *Hortulan*. Poland: *Poświerka ogrodniczek*. Russia: *Sadovaja ovsjanka*. Sweden: *Ortolansparf*, *Ortolan*. Spain: *Hortolano*.

Emberiza hortulana L. Newton, ed. Yarrell, II, p. 57; Dresser, Birds of Europe, IV, p. 185; id. Man. Pal. Birds, p. 356; Saunders, Man., p. 213; Hartert, Vög. Pal. Fauna, p. 180.

Breeding Range: Europe, locally, from $68^{\circ} 40'$ N. lat. in Sweden and 57° N. in the Urals southward, but not the British Isles. [Also in Asia from Smyrna and Syria to Afghanistan and W. Mongolia; N. W. Africa.]

Con-
tinental
Europe.

In view of its wide distribution on the continent it is remarkable that the Ortolan is only a rare straggler to the British Isles. In Spain and Portugal it is not uncommon in the mountainous districts, and in Andalusia Chapman found it breeding in the islets of the marisma. In France it is commonest in the south, but is absent from the islands of the western Mediterranean, or only winters there; and is equally scarce in the south of Italy, though not uncommon further north. It breeds here and there in Switzerland, especially in the south west, and is not uncommon in some parts of Holland (Gelderland and N. Brabant). In the great plain of N. Germany it is not uncommon, but local (though formerly almost unknown), but becomes scarcer in the south. It is local and not plentiful in Austro-Hungary, but is common and widely distributed in Turkey, and is met with on the higher mountains of Greece to a height of over 7000 ft., and also in Crete. In S. Russia and the Crimea it is common, and occurs also in the Caucasus; while northward its limits extend from 68° N. lat. in Finland to only 57° N. in the Urals; and in Scandinavia

it is common in the S. Norwegian valleys and in the S. W. provinces of Sweden, but comparatively rarely found N. of Stockholm, except along the coast.

The situation varies according to locality. Thus in Sweden it is generally found in the green rye fields, and in the great plain of central Europe among the corn; but in Norway it haunts the bush grown hillsides, and nests in similar places as a rule in the Iberian and Balkan peninsulas. It is placed either on, or close to the ground, in a slight hollow, under shelter of growing crops or bushes, and is built of dead grasses and roots, lined with finer roots and sometimes hair, somewhat carelessly constructed. Approximate diameter $3\frac{3}{4}$ in., height 2 in. In northern Europe the monotonous, 'Tink, tink, tink-tjöhrr' of the cock may be heard till late in the summer nights (Wheelwright). Nest.

Usually 5 or 6 in number, but sometimes only 4 are found. The ground colour varies from bluish white to creamy and warm pinkish or reddish grey, rather sparsely spotted with very dark purple brown markings and occasionally a few streaks or scrawls of the same colour. There are generally a few underlying streaks and spots of pale violet grey. Now and then an egg is met with almost devoid of markings, and one set has the spots in the form of a zone. Eggs.

In Spain eggs may be found from May 5 (Chapman), while in Greece and Asia Minor the usual time is from May 13 onwards, and in central Europe the latter half of May. In Scandinavia most eggs are laid in the second half of May and early in June, and in Finland towards the beginning of June. As will be seen the breeding season varies very little, for even in Norway and Sweden full clutches are occasionally found at the beginning of May. Apparently only one brood is reared. Breeding Season.

Average of 100 eggs (29 by Rey and 71 by the writer) 19.73×15.29 mm., Max. 22×16.25 and 20×17 mm., Min. 18.2×16 and 18.8×14.3 mm. These measurements are sometimes slightly exceeded: 22.5×16.5 (Reiser, Greece), 19×14.1 (Westerlund, Sweden) and 18×14.5 (Bau). Average weight of 36 eggs, 142 mg. (Bau); Rey gives as average, 158 mg. Measurements.

51. Grey necked Bunting, *Emberiza buchanani* Blyth.

Emberiza huttoni Blyth. Dresser, Birds of Europe, IX, p. 215; id. Man. Pal. Birds, p. 357. *E. buchanani* Blyth. Hartert, Vög. Pal. Fauna, p. 182.

Breeding Range: Has occurred in the Caucasus (Derbent) and Crimea. [Transcaspia, Turkestan, Persia and Afghanistan.]

The only definite information as to the breeding of this bird is that given by Blanford (*Zoology and Geology of E. Persia*, p. 259). He found a nest with 3 well-incubated eggs on May 22, at an elevation of 8000 ft. Nest.

It was built in a thick bush, about a foot from the ground, and was neatly and compactly built of moss.

Eggs. The eggs were very pale green, 'with small distinct rounded surface spots and minute dots of purplish black and fainter purplish grey markings, the latter being chiefly confined to the larger end'.

Measurements. Average size 24×16.5 mm.

52. Cretzschmar's Bunting, *Emberiza caesia* Cretz.

Plate 13, fig. 21 (Parnassus, 4. VI. 76); 22 (Attica, 4. V. 80).

Eggs: Reiser, Orn. Balc. III, Taf. III, fig. 1, 2.

Foreign Names: France: *Bruant cendrillard*. Germany: *Rostammer*, *Grauer Ortolan*. Greece: *Blāchos*. Italy: *Ortolano grigio*.

Emberiza caesia Cretz. Dresser, Birds of Europe, IV, p. 213; id. Man. Pal. Birds, p. 358; Hartert, Vög. Pal. Fauna, p. 182.

Breeding Range: The Balkan peninsula. [Also Asia Minor to the Caucasus.]

Continental Europe. In Greece this Bunting is one of the most conspicuous birds, haunting the bare rocky hillsides in company with Chats and Larks, and only occasionally perching for an instant on the scattered clumps of thyme and low scrub which grow here and there. It also nests on the mountains of Corfu and in the Cyclades, and is ubiquitous on Cyprus, where Guillemard met with it even on the summit of Troödos. In Macedonia it is much scarcer, but is not uncommon on the hillsides in Asia Minor and Syria while a few pairs are said to breed in Lower Egypt.

Nest. Generally built on the ground, sometimes among rocks, and at other times under cover of a tuft of grass, or in a low bush. It is neatly and compactly made of dead grasses, lined with fibres and horsehair (Tristram).

Eggs. 4 or 5 as a rule, but clutches of 6 are occasionally found in Greece. They somewhat resemble those of the previous species, but the ground colour is darker and the markings often more numerous. The ground varies from greyish or yellowish white to russet or reddish grey, with almost black spots and streaks (sometimes showing a purple penumbra) and violet grey underlying spots and 'worm lines'. The shell is somewhat glossy.

Breeding Season. Krüper found eggs in Greece from the end of April or the beginning of May onward, most eggs being taken between May 4—16; but as fresh eggs as well as fledged young were found on June 16, it is probable that two broods are reared. In Syria according to Tristram these birds were beginning to sit by April 19, but two nests with eggs were taken by F. C. Selous near Smyrna on May 20 and 24.

Measurements. Average of 60 eggs (28 by Rey, 17 by Reiser and 15 by the writer) 19.55×15.17 mm., Max. 21.6×16.2 and 19.2×16.7 mm., Min. 17.8×14.3

and 18.5×13.5 mm. Hartert mentions an egg 22.5×17 (Greece, Krüper). Average weight of 28 eggs, 138 mg. (Rey); of 17 eggs, 136 mg. (Reiser).

53. Rock Bunting, *Emberiza cia* L.

Plate 13, fig. 23—26 (Basses Alpes, France).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 6, a—b. Baedeker, Tab. 3, fig. 6.

Foreign Names: France: *Bruant fou* or *des prés*. Germany: *Zipammer*. Greece: *Tsichlōni tou Bounou*. Hungary: *Bajszos sármány*. Italy: *Zigolo muciatto*. Portugal: *Trigueirão*. Russia: *Gornaya ovsjanka*. Spain: *Escribáno, Cip-cip*.

Emberiza cia L. Dresser, Birds of Europe, IV, p. 205; id. Man. Pal. Birds, p. 368. *E. cia cia* L. Hartert, Vög. Pal. Fauna, p. 183.

Breeding Range: The countries bordering on the Mediterranean, penetrating northward to Switzerland, S. W. Germany and part of Austro-Hungary. [Also Asia Minor, Syria, and the Atlas range.] Has occurred once in Sussex, *Bull. B. O. C.* XIII, p. 28 (1903).

In Spain and Portugal this species is not uncommon on the slopes of the sierras, breeding near the patches of cultivated ground and vineyards on the hillsides. It is also found in the Pyrenees commonly to about 3600 ft. and exceptionally up to 5100 ft. in Andorra, and also in many of the more hilly parts of southern and eastern France, and is generally distributed throughout the mountainous districts of Switzerland up to about 4000 ft. In Italy it breeds in the Alps and Apennines, as well as in the mountains of Sicily; but in Germany it appears to be chiefly confined to the valleys of the Neckar and the Rhine to the Drachenfels, the Eifel, and near Neuenburg. In Austro-Hungary a few pairs breed sporadically in Moravia, Lower Austria, Salzburg, Styria, and on the N. slopes of the Transylvanian Alps. In the Balkan peninsula it occurs not uncommonly in the mountains of Bosnia, Herzegovina and Montenegro up to 4200 ft., and has also been met with in the Balkans; it is also a tolerably common resident in the higher mountains of the south of the peninsula, where its simple song is to be heard in the still fir woods (Krüper). In the hill districts of the Crimea and Caucasus, as well as Asia Minor, it is not rare, and a few are found in the Lebanon, while some remain to breed in the Atlas range.

Con-
tinent-
al
Europe.

Usually placed on rocky ground among stones and rough grass, sometimes, as in the Rhine valley, among the tangled growth on the stone walls which separate the vineyards, and occasionally low down in some small bush. It is composed of moss, edelweiss leaves, grasses, roots, Nest.

and sometimes strips of vine bark, lined with fine roots, horsehair, etc. External diameter about $4\frac{1}{4}$ in., diameter of cup $2\frac{1}{4}$ in., depth $1\frac{1}{2}$ in.

Eggs. 4—5 in number, and very characteristic. Upon a greyish white or pale buff ground, many irregular dark brown or blackish hair lines are interwoven, and tend sometimes to form a zone. There are also a few spots, and underlying pale grey hair lines and spots are visible.

Breeding Season. In Germany eggs have been taken early in April, but the usual time appears to be the beginning of May. Chapman and Irby state that in Spain the eggs are laid in April, but fresh eggs may be found till the end of June; while in Greece Krüper rarely found full clutches before mid May, and obtained most eggs in the last days of May and in June (earliest date, May 11; latest July 7). Tristram also found eggs in Lebanon towards the end of June. Probably only one brood is reared as a rule in the northern parts of its range.

Measurements. Average size of 86 eggs (25 by Bau, 14 by Rey, 4 by Reiser and 43 by the writer) 20.63×16.01 mm., Max. 23.3×16.5 and 20.75×17.5 mm., Min. 19.5×15.5 and 20.2×15 mm. Average weight of 25 eggs, 152 mg. (Bau); of 14 eggs, 158 mg. (Rey).

Geographical Races.

a. European Rock Bunting, *E. cia cia* L. See above.

b. Eastern Rock Bunting, *E. cia par* Hart.

E. cia par Hart. Hartert, Vög. Pal. Fauna, p. 184.

Breeding Range: N. Caucasus, E. Persia, Transcaspia, Turkestan, Afghanistan and Beluchistan.

Four eggs from Issik Kul are rather small, averaging 19.27×15.42 mm.

[East Siberian Meadow Bunting, *Emberiza cioides castaneiceps* Moore.

Emberiza cioides Brandt (*part.*). Dresser, Birds of Europe, IX, p. 223; id. Man. Pal. Birds, p. 364; Saunders, Man., p. 215. *E. cioides castaneiceps* Moore. Hartert, Vög. Pal. Fauna, p. 186.

Breeding Range: E. Siberia (lower Amur and Ussuri valleys), Askold, Manchuria, Corea, and China as far south as Foochow. Has been once obtained in England.

Nest. The nest, composed of twigs, leaves, grass and fern fronds, lined with fine grass, fibres and hair, is usually placed in a small pine, not far from the ground (*Ibis* 1905, p. 45). Some are compactly built, while others are carelessly constructed.

Eggs. 4—5 in number, and fully described in the *Ibis*, 1900, p. 36. They have a wreath of interlacing vandyke brown hair lines round the big end, with a few pale grey underlying streaks and occasionally a yellowish cloud, upon a greyish white ground. Two broods are reared in China, as fledged young have been shot on May 24, while eggs have been taken as late as June 26 and young found in July. Average size of 6 eggs in Brit. Mus., 19.63×15.23 mm.

The eggs of the western form, *E. cioides cioides* Brandt, are very similar, but occasionally the ground colour is of a warmer tint. Average size of 28 eggs (9 by Hartert, 6 by Taczanowski, and 13 by the writer) 20.26×15.6 mm., Max. 22×16.1 and 19×16.5 mm., Min. 19×15.2 and 20×14.7 mm. Eggs figured in *Journ. f. Ornith.* 1873, Tab. II, fig. 25, 26.]

54. Rustic Bunting, *Emberiza rustica* Pall.

Plate 14, fig. 7 (Sotkamo, Finland, 19. VI. 87).

Eggs: Baedeker, Tab. 12, fig. 13 (nec 12), 76, fig. 10. Seebohm, Br. Birds, pl. 68 (nec 15); id. Col. Fig., pl. 58. Newton, Proc. Zool. Soc. 1897, pl. LI, fig. 8, 9.

Foreign Names: Denmark: *Bondeverling*. Finland: *Pohjansirkku*. Germany: *Waldammer*. Helgoland: *Road-strüked Nieper*. Holland: *Boschgors*. Italy: *Zigolo boschereccio*. Norway: *Vidjespurv*. Poland: *Poświerka tzypregowa*. Sweden: *Videsparf*.

Emberiza rustica Pall. Newton, ed. Yarrell, II, p. 29; Dresser, Birds of Europe, IV, p. 229; id. Man. Pal. Birds, p. 362; Saunders, Man., p. 217; Hartert, Vög. Pal. Fauna, p. 188.

Breeding Range: Norrland in Sweden, E. Finland and N. Russia. [Also Siberia to Kamtschatka. (?)]

Apparently this species is extending its range westward, but as it is partial to swampy forest it is possible that its presence has been frequently overlooked. It is found nesting, though sparingly, in the forests of N. Russia as far as lat 62° N. in the Urals, and occurs near Archangel, but is much less common than *E. pusilla*. It is also said to have bred in N. W. Russian Lapland, and in 1867 was found nesting in E. Finland. Since that time a good many nests have been taken there, chiefly in the neighbourhood of Sotkamo (S. Uleåborg). In Sweden a pair were shot by B. Fries on May 20, 1821 at Haparanda, and a young bird near Luleå on September 6, 1835; but definite proof of its breeding there was not forthcoming till July 1899, when unfledged young were found in Norrland. In 1902 a nest with 4 young was found in the Degenfors district in Westerbotten, and since then it has also been ascertained to breed in Norbotten. [East of the Urals it appears to be scarce in the Yenesei valley, though Seebohm shot one in lat. 62° N., but common in Transbaikalia and Amurland; it was met with by Middendorff in the Stanowoi Mts., and is also found in Kamtschatka.]

Con-
tinental
Europe.

Built of grasses and bents, and placed on the ground or low down in bushes, in openings of swampy coniferous forests. Nest.

Usually 4 or 5 in number, occasionally 6. In character they resemble somewhat the eggs of the Reed Warbler, and are entirely devoid of the usual hair lines and streaks so frequently found in Buntings' eggs, appro- Eggs.

aching in this respect those of the Yellow breasted and Black headed Buntings. The ground colour varies from pale sea green to greenish blue or greenish grey, with numerous greyish olive or yellowish brown irregular blotches and spots, which are generally thickest at the big end, and underlying blotches of pale violet. Some eggs are said to show a reddish shade of ground.

Breeding
Season.

In the Archangel district eggs have been taken from June 3 to July 10, and in Finland from May 28 to June 25. Only one brood is reared.

Measure-
ments

Average of 43 eggs (21 from Finland in coll. E. Wasenius, 5 by Sandman and 17 by the writer), 20.36×15.12 mm., Max. 21.8×15.2 and 20.5×15.5 mm., Min. 19×14 mm. According by Ramberg some eggs do not exceed 18.5 mm. in length. Rey gives the weight as 117 mg.

55. Little Bunting, *Emberiza pusilla* Pall.

Plate 15, fig. 6 (ex Nehr Korn coll.).

Eggs: Middendorff, Reis. Sibir., Zool. pl. XIII, fig. 4. Naumannia 1854, Taf. 3, fig. 5. Baedeker, Tab. 76, fig. 5. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 57.

Foreign Names: Bohemia: *Strnad malinký*. Denmark: *Dvaergverling*. Finland: *Vähäsirkku*. France: *Bruant nain*. Germany: *Zwergammer*. Helgoland: *Französ Nieper*. Holland: *Dwerggors*. Italy: *Zigolo minore*. Sweden: *Dvergsparf*.

Emberiza pusilla Pall. Newton, ed. Yarrell, II, p. 34; Dresser, Birds of Europe, IV, p. 235; id. Man. Pal. Birds, p. 363; Saunders, Man., p. 219.

Breeding Range: N. Russia, from Onega Bay to the Urals, chiefly between lat. 64° N. and the forest limit. [Also Siberia to the lower Amur.]

Con-
tinental
Europe.

In the Dwina delta and the forests around Archangel it is very common, though local, haunting not only the old pine forests, but also the mixed woods of young pines, firs, alders, and birches. Seebohm also found it very numerous on the Lower Petschora from north of about lat. 66° to the tundra beyond the limit of forest growth. [The first eggs were taken on the Boganida by von Middendorff, who also met with this species on the Stanowoi Mts. Seebohm and Popham found many pairs breeding in the Yenesei valley, especially between the Arctic circle and lat. 71° on the tundra, and the latter observed young birds even on the Brekhowski Islands. Pallas recorded it from the willow swamps of Lake Baikal, and Schrenk discovered a nest on the lower Amur.]

Nest.

Usually a hollow among dead leaves, moss and grass, well lined with fine grasses, while occasionally a few reindeer hairs are also found in the lining, but this appears to be exceptional. Most nests are found in openings of the forest, but a few pairs breed on the tundra, where a few dwarf

willows are the only tree growth. Schrenk's nest was placed among the tussocks of a swamp in an opening of the forest.

Generally 4 to 5, occasionally 6 in number, and exceedingly variable in colouring and markings. They have been compared to those of the Corn, Reed, Rustic and Black faced Buntings. The ground colour in some cases is greenish, at other times pink, grey, stone colour or brown; while the markings usually consist of blotches or spots and scrawls of dark brown, sometimes purplish and sometimes greyish, with underlying blotches of pale violet or reddish grey.

In the Dwina valley the best time appears to be June 20—24, while on the Yenesei Seebohm took fresh eggs from June 23 to the end of the month, and hard sat eggs on July 6. Popham however found fresh eggs by the middle of the month, and on the Brekhowski Isles young were still being fed by their parents on July 25.

Average of 33 eggs (32 by the writer and 1 by Rey) 18.28×13.94 mm., Max. 20.2×14.3 (Rey) and 19×14.8 mm., Min. 16.4×13.3 and 18×13.2 mm. Rey gives the weight of one egg as 130 mg.

[Yellow-browed Bunting, *Emberiza chrysophrys* Pall.]

Emberiza chrysophrys Pall. Dresser, Birds of Europe, IV, p. 193; id. Man. Pal. Birds, p. 356; Hartert, Vög. Pal. Fauna, p. 189.

Breeding Range: E. Siberia (Dauria, Tarei-Nor, Rivers Argun and Willni, Askold I.)

Supposed to have occurred at Lille and in Luxemburg. Breeding habits and eggs as yet unknown.]

[In N. W. Africa is found the House Bunting, *E. striolata sahari* Lev. It is extraordinarily tame, and breeds generally under the eaves or in holes of the walls of native houses, depositing 3—4 greenish white eggs, freckled with brown spots and also underlying grey specks, in March and April.* Average size of 26 eggs (13 by Erlanger, 9 by König and 3 by Hartert) 19×13.84 mm., Max. 20×14.4 and 19.1×14.6 mm., Min. 18×13 mm. Average weight of 9 eggs, 96 mg. (König). In Palestine and Arabia it is replaced by the Striped Bunting, *E. striolata striolata* (Licht.), which is also found in Nubia, Kordofan and eastward to India, and has occurred in Turkey. In Rajputana it breeds in November (perhaps also in July), depositing 3 eggs about 18.5 to 19×12.2 to 13.2 mm. in size and resembling those of *E. s. sahari* in appearance.]

56. Red Bunting, *Emberiza schoeniclus* (L.).

Plate 14, fig. 2—6 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 9, a—c. Hewitson, I. Ed. I, pl. III, fig. 5, 6; II. Ed. I, pl. XXXIX, fig. 2; III. Ed. I, pl. XLVII,

* Eggs figured in *Journ. f. Ornith.* 1896, Tab. VII, fig. 9, a, b.

fig. 1. Baedeker, Tab. 3, fig. 4. Taczanowski, Tab. LXVII, fig. 2. Seebohm, Brit. Birds, pl. 15; id. Col. Fig., pl. 57. Frohawk, Br. Birds, II, pl. VI, fig. 198—206.

Nest: O. Lee, I, p. 140.

British Local Names: *Reed* or *Water Sparrow*, *Blackcap*, *Black headed Bunting*. Welsh: *Golfan y gors*. Scotland: *Moss Sparrow*, *Black Bonnet*, *Coalyhead*.

Foreign Names: Bohemia: *Strnad rákosní*. Denmark: *Rørspurv*, *Rørverling*. Finland: *Pajusirkku*. France: *Bruant des roseaux*. Germany: *Rohammer*. Helgoland: *Nieper*. Holland: *Rietgors*. Hungary: *Nádi veréb*. Italy: *Migliarino di padule*. Norway: *Sivspurv*, *Rørspurv*. Poland: *Poświęrka potrzos*. Russia: *Bolotnaja ovsjanka*. Sweden: *Stöfsparf*. Spain: *Molinero*.

Emberiza schoeniclus L. Newton, ed. Yarrell, II, p. 23; Dresser, Birds of Europe, IV, p. 241; id. Man. Pal. Birds, p. 370; Saunders, Man., p. 221. *E. schoeniclus schoeniclus* L. Hartert, Vög. Pal. Fauna, p. 194.

Breeding Range: Europe generally, but replaced by other forms in the greater part of Hungary, the Balkan peninsula, and S. Russia, in the breeding season. [Also in W. Siberia, but not in Iceland on the Færöes.]

British
Isles.

In Great Britain and Ireland it is a generally distributed resident in all suitable localities, and in some places very common. It is also found on most of the islands, and is not uncommon even in the Outer Hebrides, and breeds, though sparingly, in the Orkneys. Hitherto it has not been found nesting in the Shetlands, and on the mainland of Scotland north of the Great Glen it is somewhat local.

Con-
tinenta
Europe.

In Spain only a few pairs breed on the islets of the marismas in the south, but it is not uncommon locally further north, at the Albufera of Valencia, etc. In Portugal it is only known as a winter visitor, but is resident in central and southern Italy, as well as in the Italian islands, according to Arrigoni, although not noticed in Sardinia or Corsica in the breeding season by Brooke, Wharton or Whitehead. Over the great plain of central Europe it is a generally distributed summer visitor in districts suited to its habits, and is also found in Scandinavia and N. Russia almost up to the shores of the Arctic Ocean. To south eastern Europe it is only a winter visitor.

Nest.

Almost invariably found in the neighbourhood of water, or in damp and marshy neighbourhoods. As a rule the nest is either on, or close to the ground, often in grass or coarse vegetation or in a thick tuft of rushes, and generally well concealed. Another common site is among flood drift on an osier stump, a foot or so from the ground; while in the north it is said to nest not uncommonly on the branches of sapling firs. Hewitson

records nests on bunches of flattened reeds, and an abnormal site is mentioned in the *Zoologist* for 1897, p. 336, where a nest was found suspended from the boughs of a willow and overhanging the water, over 5 ft. above its surface. In 1886 I came across a nest in Oxfordshire in a heap of dead sticks by the water side: Ussher mentions nests between boulders on Lough Mask, and two or three feet high in heather in Connemara, and Witherby found one several feet up in a tree. On the Petschora Seebohm found another built within an old Fieldfare's nest, 9 ft. above the water. The principal materials used are dead grasses, bents, and reeds or rushes, with occasionally a little moss or withered leaves of sedge or reed, lined with finer grasses, a little hair, and in some districts the flowering tops of reeds. Diameter of cup $2\frac{1}{4}$ in., depth $1-1\frac{3}{8}$ in. The hen sits very closely, and often flutters away from the nest as if injured.

Generally 4 or 5, sometimes 6 in number. In Ireland a full set Eggs. occasionally consists of 3 only, while on the other hand R. H. Read has taken a clutch of 7 eggs in Norway. Two hens have been known to lay in a single nest; nine eggs, consisting of two distinct sets of 6 and 3 eggs respectively, were found in a nest on the Elbe in 1878. They are rather variable in colouring, but are often of stone colour, varying from pale greyish olive to warm buff. Some eggs however have a pale greenish ground, others are decidedly rufous, and occasionally a set of white eggs devoid of markings is met with. As a rule however they are boldly spotted and streaked with very dark brown, almost black, and underlying worm lines and spots of violet grey. The dark brown markings generally show a penumbra of sepia or purple brown. Ussher describes a set with slender streaks on a smoke grey ground. They are opaque looking in appearance and have little or no gloss.

In England eggs may be taken from about mid-April onward throughout Breeding Season. May, June and early July, and two or sometimes three broods are reared, but in Ireland the usual time is from May 20 through June and sometimes July. Lilford has recorded a full clutch as early as March 23, but this is quite exceptional. The breeding season does not appear to differ much on the continent; but in Scandinavia few eggs are laid before mid May and in Lapland not till mid June, while at the mouth of the Petschora Seebohm received fresh eggs June 19—23. Period of incubation about 13—14 days.

There appears to be little difference in size between eggs from the Measurements. north of Europe and those from further south. Average size of 172 eggs (72 by A. Bau, 37 by Rey and 73 by the writer), 19.39×14.43 mm., Max. 22×15.4 and 19.5×15.5 mm., Min. 17.4×13.4 mm. Average weight of 72 eggs, 130 mg. (Bau); of 37 eggs, 135 mg. (Rey). 5 full eggs average 2.138 g. (Foster).

Geographical Races.

a. Common Reed Bunting, *E. schoeniclus schoeniclus* (L.). See above.

b. *E. schoeniclus canneti* (Brehm).

Plate 15, fig. 1, 2 (Herzegovina, 19. V. 90).

E. schoeniclus canneti (Brehm). Hartert, Vög. Pal. Fauna, p. 197.

Breeding Range: Hungary, Dalmatia, Bosnia, Herzegovina, Servia, Albania, Bulgaria and Thessaly.

Con-
tinental
Europe.

In Hungary (except in the N. W., where the common Reed Bunting is found) this intermediate form is not uncommon; von Führer observed it in the reed beds of the Scutari Lake, and Reiser describes it as common in marshes in Bulgaria. It is also known to breed in Servia, Bosnia, Albania and probably also Thessaly.

In breeding habits it is not known to differ from the ordinary form, and the eggs are similar in appearance, but appear to be rather larger.

Average size of 18 eggs (16 from Hungary by the writer and 2 from Herzegovina by Rey) 21.1×14.93 mm., Max. 22.2×14.7 and 21×15.5 mm., Min. 19.6×14.5 and 20.1×14 mm.

c. *E. schoeniclus tshusii* Reis. & Almásy.

E. schoeniclus tshusii Reis. & Almásy. Hartert, Vög. Pal. Fauna, p. 198.

Breeding Range: From the north of the Dobrudscha to S. Russia and Lenkoran.

d. *E. schoeniclus othmari* Hart.

E. schoeniclus othmari Hart. Hartert, Vög. Pal. Fauna, p. 198.

Breeding Range: Apparently replaces the preceding form in E. Bulgaria.

57. Thick-billed Reed Bunting, *Emberiza pyrrhuloides* Pall.

Plate 15, fig. 3 (S. Russia).

Eggs: Baedeker, Tab. 12, fig. 12.

Foreign Names: Russia: *Kamichowaya ovsjanka*. Turkestan: *Karabash kuchkach*.

Emberiza pyrrhuloides Pall. Dresser, Birds of Europe, IV, p. 249; id. Man. Pal. Birds, p. 372. *E. pyrrhuloides pyrrhuloides* Pall. Hartert, Vög. Pal. Fauna, p. 198.

Breeding Range: The shores of the Caspian Sea from the foot of the N. Caucasus and the lower Volga to Transcaspia and Turkestan, as far E. as Issik Kul, etc.

Little is known of the breeding habits of this bird, but probably they resemble those of *E. schoeniclus*. In appearance the eggs are also

very similar, but are perhaps slightly larger. Two clutches of 5 eggs from Transcaspia were taken on May 15 and 20. Average size of 11 eggs (1 by Rey and 10 by the writer) 20.16×14.3 mm., Max. 21×15.5 and 20×16.1 mm., Min. 19.5×15 and 20×14.8 mm.

Geographical Races.

a. *E. pyrrhuloides pyrrhuloides* Pall. See above.

b. *E. pyrrhuloides reiseri* Hart.

E. pyrrhuloides reiseri Hart. Hartert, Vög. Pal. Fauna, p. 199.

Breeding Range: Thessaly (Lamia, Volo) where it is apparently resident.

c. *E. pyrrhuloides palustris* Savi.

E. pyrrhuloides palustris Savi. Hartert, Vög. Pal. Fauna, p. 199.

Breeding Range: Italy, only during the breeding season in the north, but resident in Tuscany, S. Italy and Sicily; also in the south of France and in E. Spain.

Arrigoni describes the eggs as rather larger than those of *E. schoenichus*, paler and more blue in tint.

[Other forms inhabit E. Turkestan, the Saissan Nor, etc.]

58. Lapland Bunting, *Calcarius lapponicus* (L.).

Plate 14, fig. 22—26 (Lapland).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 12, a—e. Hewitson, III. Ed. I, pl. XLVI, fig. 1, 2. Baedeker, Tab. 3, fig. 2. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 57. Newton, Ootheca Wolleyana, Tab. XI, fig. 19—24.

Foreign Names: Bohemia: *Strnad laponski*. Denmark: *Laplands Verling*. Finland: *Lapinsirkku*. France: *Plectrophane lapon*. Germany: *Lerchen-Spornammer*. Helgoland: *Berg-Seilling*. Holland: *Ijsgors*. Iceland: *Solskrikia*. Italy: *Zigolo di Lapponia*. Lapland: *Värri-cicás*. Norway: *Laplands Spurv*. Poland: *Poświerka sponiasta*. Russia: *Punocka*. Sweden: *Lappsparf*.

Plectrophanes lapponicus (L.). Newton, ed. Yarrell, II, p. 15; Dresser, Birds of Europe, IV, p. 253. *Calcarius lapponicus* (L.). Dresser, Man. Pal. Birds, p. 373; Saunders, Man., p. 223. *Calcarius lapponica lapponica* (L.). Hartert, Vög. Pal. Fauna, p. 200.

Breeding Range: N. Scandinavia, Lapland, Kolguev, Waigatz, Novaya Zemlya and the Arctic coast of Russia. [Also Arctic Siberia and N. America, Greenland.]

In Norway this species is found breeding not only on the islands and cloudberry covered moorlands of Finmark, but also in the upland swamps of the Dovrefjeld as far south as lat. 62°. In Sweden it is however only

met with in Lapland, where it breeds in some numbers locally on both sides of the Russian border, generally in marshy ground overgrown with dwarf willow. It is also numerous in Russian Lapland, north of the coniferous belt, on the tundra. On Kolguev it is one of the commonest birds, but is local on Waïgatz, and only found in the south of Novaya Zemlya. On the tundra near the mouth of the Petschora it is the commonest bird. To Iceland it is only a rare straggler, but specimens have been shot in May on Jan Mayen and Franz Josef Land.

Nest.

It is not uncommon to find several pairs breeding within a short distance of one another where suitable nesting ground is limited in extent. The nest is built on the ground, often in the side of a tussock, or under cover of some dwarf shrub, like that of a Red throated Pipit; and is composed chiefly of dead grasses and a little moss, with a lining of finer grasses, sometimes reindeer or lemming hair, and apparently always a few feathers. This last characteristic is generally sufficient to distinguish the nest from that of the Red throated Pipit, which it otherwise much resembles. Height of nest about 2 in., breadth about $3\frac{1}{4}$ —4 in., diameter of cup $2\frac{1}{2}$ in., depth $1\frac{1}{2}$ in. The hen sits closely, but the presence and song of the cock, which is generally to be seen on some adjoining hillock, discloses the whereabouts of the nest.

Eggs.

Generally 6, occasionally 5 in number, while 7 have been found. They are rather variable in colour, the ground colour ranging from greenish grey to pale olive brown, with blotches and cloudings of darker reddish brown (which in some cases almost obscure the ground colour) and worm lines, streaks and spots of almost blackish brown. Occasionally eggs are found which are undistinguishable from some varieties of eggs of *A. cervinus*, while others approach those of *E. schoeniclus*, or even *A. pratensis*.

Breeding Season.

In mid Norway full clutches may be taken in the first week of June, but in the north of the country not till the middle of the month. In Lapland about June 12—15 is the best time, and in Kolguev Pearson found young on the wing early in July.

Measurements.

Average of 100 eggs (36 by Rey and 64 by the writer) 20.67×14.96 mm., Max. 23×16 mm., Min. 18×14.3 and 19.3×14 mm. An exceptionally large egg from N. America measures 23.5×17.1 mm., and a dwarf 14×12.3 mm. (Rae). Average weight of 36 eggs, 149 mg. (Rey); of 28 eggs, 142 mg. (Bau).

59. Snow Bunting, *Passerina nivalis* (L.).

Plate 14, fig. 17—21 (Greenland).

Eggs: Thienemann, Fortpfl., Tab. XXXII, fig. 11, a—e. Hewitson, I. Ed. I, pl. XI, fig. 2; II. Ed. I, pl. XXXVIII, fig. 1, 2; III. Ed. I, pl. XLVI,

fig. 3. Baedeker, Tab. 3, fig. 1. Taczanowski, Tab. LXVI, fig. 3. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 57. Frohawk, Br. Birds, II, pl. VI, fig. 207—209.

British Local Names: *Snowflake*, *Snowbird*, *White Lark*. Scotland: *Cock o' the North*, *Gualach*. Shetlands: *Snaa Fool*.

Foreign Names: Bohemia: *Strnad sněžní*. Denmark: *Sneverling*, *Snefugl*. Finland: *Lumi Pirrku*. France: *Ortolan de neige*. Germany: *Schneeammer*. Helgoland: *Seising*, *Ijskletter*. Holland: *Sneeuvgors*. Hungary: *Hósármány*. Iceland: *Snjótítlingur*. Italy: *Zigolo della neve*. Lapland: *Allap*. Norway: *Snefugl*, *Snespurv*. Poland: *Poświerka śniegula*. Russia: *Podorožnik*. Sweden: *Snösparf*.

Plectrophanes nivalis (L.). Newton, ed. Yarrell, II, p. 1; Dresser, Birds of Europe, IV, p. 261; id. Man. Pal. Birds, p. 374. *Plectrophenax nivalis* (L.). Saunders, Man., p. 225. *Passerina nivalis nivalis* (L.). Hartert, Vög. Pal. Fauna, p. 202.

Breeding Range: Arctic and subarctic Europe, extending to the Færøes, Shetlands, and the higher mountains of Scotland. [Also Greenland, Arctic N. America and Asia, except Alaska and Kamtschatka, where *P. nivalis townsendi* Ridg. replaces it.]

The first definite record of the breeding of this species in our islands is that of Saxby, who obtained a nest with 3 eggs on July 2, 1861 in Unst. Since that date there is evidence of its having bred several times in the Shetlands. For a century past it has been supposed to nest on the higher mountain ranges of Scotland, and in July 1886 a nest with young was found in Assynt by Messrs. Peach and Hinxman, and two years later Mr. J. Young found one with 5 eggs in the same district, while on June 5, 1893, another nest with 5 eggs was taken in Banff, at a height of about 3700 ft. Since then young have been met with and old birds seen in summer in various localities, such as the Torridon Hills (W. Ross), Ben Nevis, Ben Cruachan, etc. The head quarters of this species appears to be the Cairngorm range, but scattered pairs are to be met with on many of the peaks over 3000 ft. high, nesting among the loose stones of the screes, usually not far from the top.

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Isles.

In the south of Norway it breeds on the high fjeld, below the snow line, as far as about lat. 60° N., but in the north it is found not only on the shore, but even on the isolated stacks out at sea, nesting generally under boulders. In Lapland it is found both on the barren uplands, strewn with erratic boulders, and also on the rocky parts of the coast, and Sandman records an instance of its breeding on Karlö. On Kolguev it is common, nesting in fissures of the bluffs, and on Novaya Zemlya and Waigatz it is more plentiful than any land bird (Pearson), while a few pairs appear to breed at the mouth of the Petschora and near Habarova, and probably

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nest among the heaps of driftwood in default of rocks. Further north it is common in Franz Josef Land and generally distributed in Spitzbergen. In the Færøes a few pairs formerly bred on the tops of the mountains, and also in the northern islands of the group, but of late years their numbers appear to have diminished. In Iceland it is common and generally distributed, from the sea coast up to the snow line (2000 ft.), avoiding only the low-lying grassy or marshy districts, and breeding in crevices of the lava, sometimes at a considerable depth, as well as under boulders and in stone heaps or in walls. [In Arctic N. America it is known to breed as far north as Grinnell Land (lat. 82° 33' N).]

Nest. Although as a general rule the nest is placed out of sight in some crevice of the rock, it is occasionally found in quite an exposed site. Chapman has seen nests built quite openly among boulders on the high fjeld in Norway; on Franz Josef Land one was found on a small open ledge 5 ft. from the ground; on Waïgatz Feilden and Pearson noticed old nests on flat boulders in the dry bed of a stream, and found young in a nest on the top of a little pinnacle 3 ft. high and 6 in. wide. Captain Lyons found a nest on the bosom of the corpse of an Eskimo child on Southampton Island. The materials consist chiefly of dead grasses and stalks, with occasionally a little moss or a few twigs, lined with finer grasses, a little hair or wool and feathers of Ptarmigan, Snowy Owl, Raven, Gull, etc. The nests vary in size according to their position; approximate diameter of cup, $2\frac{3}{4}$ — $3\frac{1}{4}$ in.

Eggs. Usually 5 or 6 in number, occasionally 4 or 7, while 8 are occasionally found in Greenland. They are very variable in colouring, and in some cases extremely handsome. The ground colour is usually pale bluish or greenish, but occasionally white, sometimes with a yellowish or reddish tinge; while the markings generally tend to form a zone or cap at the big end, and consist of spots, blotches, and streaks of deep red brown, and sometimes a few spots or lines of almost black, generally with underlying spots or blotches of violet grey.

Breeding Season. In Scotland and mid Norway the first eggs are laid at the end of May and the first days of June. In Lapland they are rather later, and most eggs are found in the latter half of June. In Iceland the breeding time seems to vary considerably. A few older birds have eggs about May 20, but most nests are found in June, and may even be met with up to the second week of July with fresh eggs. In Franz Josef Land the first fledged young were seen July 10—26, and on the Taimyr full clutches were found by June 10. The period of incubation is 14 days. When flushed from the nest the hen is usually joined at once by the cock, and soon begins to work her way back to the eggs as inconspicuously as possible.

Average of 100 eggs (27 by Rey and 73 by the writer) 22.04×16.14 mm., Max. 24.1×16 and 21.5×17.5 mm., Min. 19.5×16.1 and 21.2×14.9 mm. These measurements are sometimes exceeded: Max. 24.8×15.9 mm. (Hantzsch), Min. 19.2×15.2 (Hantzsch) and 22.9×14.4 mm. (Nordling). H. J. Pearson has a dwarf egg from Iceland, 13.7×11 mm. Average weight of 27 eggs, 168 mg. (Rey); of 32 eggs, 173 mg. (Bau). Full eggs average 4 g. (Hantzsch).

Measure-
ments.

[The White throated Bunting, *Zonotricha albicollis* Bp., has occurred three times in Great Britain; all probably escaped birds.]

ALAUDIDAE.

60. Calandra Lark, *Melanocorypha calandra* (L.).

Plate 16, fig. 23—25 (Greece), 26, 27 (S. Russia).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 5, a—d. Baedeker, Tab. 66, fig. 6. Taczanowski, Tab. LXIII, fig. 1. Seebohm, Col. Fig., pl. 58. Reiser, Orn. Balc. III, Taf. III, fig. 17, 18 (var.).

Foreign Names: France: *Calandre*. Germany: *Kalanderlerche*. Greece: *Kalandra*, *Gialiandra*. Italy: *Calandra*. Portugal: *Cochicho*. Russia: *Stepnoi Javronok*. Spain: *Alóndra*, *Calandria*.

Melanocorypha calandra (L.). Dresser, Birds of Europe, IV, p. 365; id. Man. Pal. Birds, p. 382. *M. calandra calandra* (L.). Hartert, Vög. Pal. Fauna, p. 208.

Breeding Range: Portugal and the countries bordering on the Mediterranean and Black Seas, but not known to breed in Egypt.

In Portugal this species, although very local, is found in Trazos Montes, as well as in the south. In Spain it is an abundant and conspicuous resident in the great plains of the south and east, haunting both corn and grass lands as well as arid plains. It has only been noticed in southern France, and was not observed by Wharton or Whitehead in Corsica, but is extremely common in Sardinia. In Italy it is a common resident in the central and southern provinces, and a few pairs appear to breed in Venetia, while it is also found commonly in Sicily. In the Balkan peninsula it is common on suitable ground, in Dalmatia (near Zara), in Montenegro (only near Podgorica), in Bulgaria (common on the plains and in the Dobrudsha), in Turkey (especially numerous near Saloniki), and in Greece (Thessaly, Acarnania, Attica, and the Cyclades). It is plentiful on the steppes of S. Russia and the Crimea, but local on the Kirghis Steppes,

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and though met with north of the Caucasus, is not found in the Baku district. [Also in Armenia, Asia Minor, Cyprus, Palestine, and N. W. Africa, from Marocco to Tunis, but replaced in Turkestan, Persia, Afghanistan, etc. by *M. calandra psammochroa* Hart.]

Nest. Placed in a depression of the ground, sometimes as much as 3 or 4 in. deep, and sheltered by coarse herbage or corn. It is composed of the usual dead grasses, bents, etc., lined with rather finer materials; diameter of cup about $2\frac{1}{2}$ in. It is generally well concealed, and is usually found only by flushing the hen from the nest.

Eggs. 4—5 in number as a rule in the south of Europe. In Montenegro von Führer found normally 5, and occasionally 4 or 6. Krüper once found a clutch of 7 eggs in Acarnania, and F. C. Selous took clutches of 6 and 7 near the Maeander River in Asia Minor. They are small for the size of the bird and are generally boldly spotted and blotched with ochreous brown and underlying grey spots, thickly distributed over a yellowish white ground, sometimes in a zone. Some eggs have been compared to those of the Great Grey Shrike. Reiser describes and figures some remarkable Greek specimens with only a few bold spots of dark brown and lilac (*l. c.*). Most eggs show a fairly decided gloss.

Breeding Season. In S. Spain the first eggs are found in the first or second week in April, and thence onward through May and early June; while in N. Africa they may be taken as early as the end of March and throughout April and May, so that probably two broods are reared. In Greece the breeding season lasts from the end of April to June, and in Montenegro from May 4 to the end of the month.

Measurements. Average of 100 eggs (68 by Rey and 32 by the writer) 24.23×17.87 mm., Max. 27.1×18.9 and 26.8×19.2 mm., Min. 21.5×16.5 and 22.5×16 mm. Average weight of 68 eggs, 239 mg. (Rey), of 38 eggs, 237 mg. (Bau).

[In Transcaspia, Asia Minor, Persia, etc., is found an allied species, *M. bimaculata* (Ménétr.). Eggs like those of *M. calandra*. Average of 3 in Dresser's collection, taken by Sarudny in Transcaspia on June 10, 23.3×17.2 mm.]

61. White winged Lark, *Melanocorypha sibirica* (Gm.).

Plate 16, fig. 6--9 (S. Russia).

Eggs: Thienemann, Fortpfl., Tab. IC, fig. 14, a, b. Baedeker, Tab. 66, fig. 7. Seebohm, Brit. Birds, pl. 15; id. Col. Fig., pl. 58.

Foreign Names: Germany: *Sibirische Lerche*. Hungary: *Fehérszárnyu pacsirta*. Poland: *Skowronek białokrzydły*. Russia: *Belokriloj Javronok*. *Melanocorypha sibirica* (Gm.). Newton, ed. Yarrell, I, p. 642; Dresser,

Birds of Europe, IV, p. 373; id. Man. Pal. Birds, p. 385; Hartert, Vög. Pal. Fauna, p. 211. *Alauda sibirica* Gm. Saunders, Man., p. 257.

Breeding Range: Steppes of S. E. Russia. [Also from Transcaspia to the Yenesei valley.]

In Russia the range of this species extends from the steppe land north of the Caucasus (Stawropol government), throughout the Astrakhan steppes and northward to Saratow and Orenburg. In this district it is plentiful, but only occurs rarely in the south Russian steppes. It has strayed to England as well as various parts of the continent. Continental Europe.

Placed on the ground on the grassy steppes in any slight depression, and composed of dead grasses, etc., often sheltered by a grass tuft. Nest.

Usually 4, although 3 and 5 are said to occur occasionally. In size they differ only slightly from those of the Skylark and Crested Lark, and as a rule are thickly spotted or blotched with olive brown upon a greyish or yellowish white ground, like the eggs of *M. calandra*. Many eggs show a tendency towards a zone of markings round the big end, and as a rule they are a trifle greener in colouring than most Larks' eggs. Eggs.

The end of April and throughout May, varying according to locality. Breeding Season.

Average size of 100 eggs (72 by Rey and 28 by the writer), 22.61×16.38 mm., Max. 24.5×17 and 23.5×17.2 mm., Min. 20.5×15.2 mm. Average weight, 213 mg. (Rey). Measurements

62. Black Lark, *Melanocorypha yeltonensis* (Forst.).

Plate 16, fig. 12 (Kirghis Steppes).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 8, a—c.

Foreign Names: Germany: *Mohrenlerche*. Russia: *Javronok Tschernoï*.

Melanocorypha yeltonensis (Forst.). Dresser, Birds of Europe, IV, p. 377; id. Man. Pal. Birds, p. 386; Hartert, Vög. Pal. Fauna, p. 213.

Breeding Range: S. E. Russia: the salt steppes E. of the Volga. [Also from the Caspian Sea to W. Siberia and Turkestan.]

In the Kirghis steppes this bird is a common resident, breeding in the neighbourhood of the salt marshes, but not on the dry steppes. Little is known of its breeding habits, which however probably resemble those of the other Larks. The nest is placed on the ground, and is well hidden. Continental Europe.

The eggs are generally 4 in number, though 5 are said to occur occasionally, and resemble those of the Calandra Lark, but show a more decidedly white ground. Eggs

Average size of 23 eggs (4 by Rey and 19 by the writer) 25.1×18.12 mm., Max. 28×18.2 and 25.5×19 mm., Min. 22.5×18 and 24.2×17.2 mm. Average weight of 4 eggs, 319 mg. (Rey). The breeding season appears to full in the first half of May. Measurements.

63. Short toed Lark, *Calandrella brachydactyla* (Leisl.).

Plate 17, fig. 1 (Odessa), 2—4 (Greece).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 7, a—d. Hewitson, II. Ed. I, pl. XXXVII*; III. Ed. I, pl. XLV, fig. 4. Baedeker, Tab. 66, fig. 2. Taczanowski, Tab. LXIII, fig. 2. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 58.

Foreign Names: France: *Alouette calandrelle*. Germany: *Kurzzehige Lerche*. Greece: *Tsaréthra kalokairiné*, *Molochthros*. Italy: *Calandrella*, *Calandrino*. Portugal: *Carreirôla*. Russia: *Maloui Javronok*. Spain: *Terréra*, *Terrerilla*.

Calandrella brachydactyla (Leisl.). Newton, ed. Yarrell, I, p. 637; Dresser, Birds of Europe, IV, p. 341; id. Man. Pal. Birds, p. 393; Saunders, Man., p. 255. *C. brachydactyla brachydactyla* (Leisl.). Hartert, Vög. Pal. Fauna, p. 214.

Breeding Range: S. Europe, from the Iberian peninsula to S. Russia. [Also N. Africa from Morocco to Egypt, and Asia Minor to Beluchistan.]

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In the Iberian peninsula it is a common summer visitor in the plains, arriving about mid March, and frequently found in company with the Calandra Lark. In Spain it is commonest in the cultivated districts and the dry marisma, while in Portugal its favourite haunts are sandy plains near the sea, not only in the south, but also near Oporto. In France it is found in diminishing numbers northward as far as the plain of Troyes, and though scarce in the northern provinces of Italy, is plentiful in the central and southern parts. It is also found in the Balearic Isles, Sardinia, Sicily, and Malta, but not in Corsica; and has been recorded from almost every province in the Balkan peninsula, being especially numerous in the heaths of Montenegro, where it breeds up to 1500 ft. It breeds in the Cyclades, but is local and not common in Cyprus, while its range in Russia extends to the steppes of Astrakhan and the Caucasus, where it is common.

Nest.

Generally in some slight depression, such as a hoof print or a natural hollow, and often under the shelter of a tuft of grass or clump of thistles; built of dried grasses, roots, etc., and neatly lined with hairs, plant down or a few feathers, in some cases, but not always.

Eggs.

Usually 4 or 5 in number, and extraordinarily variable in appearance. Some eggs are almost white, while others vary in ground colour from yellowish or brownish, to occasionally pinkish or pale bluish, and are almost covered with innumerable fine spots of pale brown, greyish yellow or pale greenish brown. The markings often tend to form a zone at the big end; and sometimes a dark hair line is found, emphasizing the likeness to the eggs of the Yellow Wagtails. In N. Africa the number of eggs seldom exceeds three.

In Greece generally from the end of April onward, but exceptionally much earlier, for Reiser records nearly fledged young on Hymettus on April 27. In Spain the breeding season is slightly earlier, beginning about mid-April in the extreme south. According to Arrigoni two broods are reared in Italy, in April and July, while in N. Africa the eggs of the first brood are laid in April or May and those of the second early in June. Period of incubation, 13 days. Breeding Season.

Rey gives the average of 104 eggs from Greece and Portugal as 19.6×14.6 mm., Max. 23.8×14.2 and 20.7×15 mm., Min. 16.1×13.8 and 20.5×13.5 mm. Reiser however records an egg 21.6×15.8 mm. N. African eggs are very similar; average of 22 (Erlanger and König), 20.1×14.3 mm. Average weight (Rey) 129 mg. Measurements.

64. Pallas's Lark, *Calandrella minor heinei* (Hom.).

Plate 17, fig. 5—8 (S. Russia).

Eggs: Thienemann, Fortpfl., Tab. IC, fig. 15. Baedeker, Tab. 66, fig. 3.

Foreign Names: Germany: *Stummellerche*. Russia: *Maloui Javronok*.

Calandrella pispoletta (Pall.). Dresser, Birds of Europe, IV, p. 355; id. Man. Pal. Birds, p. 395. *C. minor heinei* (Hom.). Hartert, Vög. Pal. Fauna, p. 219.

Breeding Range: Steppes of S. E. Russia. [Also Transcaspia.]

Eversmann says that the true home of this species is on the steppes of the Caspian, northward to Indersk and eastward to Lake Aral, where it is found in countless numbers. Henke found it less common than *C. brachydactyla* on the salt marshes between the Volga and the Ural, but easily distinguishable by its note. Continental Europe.

Placed on the ground in the most barren parts of the steppes, where there is little vegetation except a few *Artemisia* plants, and composed of grasses and bents, with sometimes down in the lining. Nest.

4—5 in number, tolerably glossy, and greyish or greenish white in colour, with medium sized spots of hair brown, and ashy grey underlying markings. The ground colour, according to Rey, is as a rule more greenish in tint than in the eggs of *C. minor polatzeki*. In some cases the spots are thickest at the big end. Eggs.

From the beginning of April to June. Breeding Season.

Average of 58 eggs (54 by Rey and 4 by the writer) 18.7×14.56 mm., Max. 20.1×15.2 mm., Min. 17×13.8 mm. Average weight 136 mg. (Rey). Measurements.

Geographical Races.

a. Andaluçian Lark, *C. minor baetica* Dress.

Foreign Names: Spain: *Marismeña*, *Cujailla*.

C. baetica Dress. Dresser, Birds of Europe, IV, p. 351; id. Man. Pal. Birds, p. 395. *C. minor baetica* Dress. Hartert, Vög. Pal. Fauna, p. 218.

Breeding Range: S. Spain.

In Andaluçia, where it was first discovered by Lord Lilford, this bird is found commonly in the valley of the Guadalquivir, and also in the Vega de la Janda. In Granada it is resident near Malaga, and according to Hartert also in Murcia and Valencia.

Nest. Placed in a slight hollow, sometimes on the bare ground, at other times under shelter of a grass tuft, a clump of thistles, or a small bush, in the islets in the marisma or in the marshes by the river. It is also found in the corn lands, especially below Seville. The nest is composed of dry grasses, with sometimes a few feathers in the lining and is said to be rather more neatly built than that of *C. brachydaçtyla*.

Eggs. Usually 3—4, but 5 are occasionally found. They differ considerably in appearance from those of the Short toed Lark, which also breeds in the same district, having an almost white ground, sparingly spotted or blotched with ochreous or reddish brown and underlying violet grey. In some cases the markings tend to form a zone.

Breeding Season. The first eggs may be found at the beginning of April, but most are laid in the latter half of the month, and also in May.

Measurements. Average of 32 eggs 19.8×14.37 mm., Max. 21.5×14.1 and 19.1×15.2 mm., Min. 18.2×13.7 and 19.2×13.6 mm.

b. Pallas's Lark, *C. minor heinei* (Hom.). See above.

[In addition to the above races, Tenerife is inhabited by *C. minor rufescens* (Vieill.), while in Lanzarote and Fuertaventura another form, *C. minor polatzeki* Hart. is met with. The eggs are very similar to those of the Andaluçian form. Average of 70 eggs (54 by Rey and 16 by the writer) 19.78×14.29 mm., Max. 23.5×14.7 and 21.7×15.4 mm., Min. 17.6×14 and 20×13 mm. Average weight 136 mg. (Rey). In N. Africa, from Marocco to Egypt, *C. minor minor* (Cab.) is abundant locally. The clutch usually consists of 3 eggs, which are laid from the beginning of April onward to June. Average of 15 eggs by Erlanger, 19.8×14 mm., Max. 21×16 mm., Min. 18×14 and 20×11 mm. Average weight 132 mg.]

[Desert Lark, *Ammomanes deserti algeriensis* Sharpe.

Eggs: König, Journ. f. Ornith. 1896, Tab. VII, fig. 6.

Ammomanes deserti (Licht.). Dresser, Birds of Europe, IV, p. 329; id. Man. Pal. Birds, p. 397. *A. deserti algeriensis* Sharpe. Hartert, Vög. Pal. Fauna, p. 221.

Breeding Range: S. Algeria and Tunis.

Said to have occurred in Spain, Portugal, etc., probably in error. The eggs, 3—4 in number, are cream coloured, finely speckled all over with rusty brown and violet grey. Breeding season, April and May. Average size of 22 eggs (10 by König, 7 by Erlanger, 3 by Whitaker, etc.) 21.5×15.7 mm., Max. 23.2×16.6 and 22×17.2 mm., Min. 20×15 mm. Average weight (17 eggs) 155 mg. (König and Erlanger). In Lower Egypt and Sinai another form, *A. deserti isabellina* (Temm.), occurs; from Palestine to the Persian Gulf, *A. deserti fraterculus* Tristr. of which 4 eggs average 22×15.2 mm. in size; and in TranscaspiA *A. deserti parvirostris* Hart.

Banded Desert Lark, *Ammomanes phoenicura arenicolor* (Sund.).

Eggs: König, Journ. f. Ornith. 1896, Tab. VII, fig. 7.

Ammomanes cinctura (Gould). Dresser, Birds of Europe, IV, p. 335; id. Man. Pal. Birds, p. 398. *A. phoenicura arenicolor* (Sund.). Hartert, Vög. Pal. Fauna, p. 224.

Breeding Range: S. Algeria to the Sinaitic peninsula.

Has occurred once at Malta. The clutch appears to consist usually of 2 to 3 eggs, laid in April and May, and resembling those of the preceding species, but with a rosy or apricot coloured flush. The markings also tend to form a zone at the big end. Average of 15 eggs (7 by König, 3 by Erlanger, etc.) 20.36×14.85 mm., Max. 22×16 mm., Min. 19×14 mm. 8 eggs average 130 mg. in weight.]

65. Crested Lark, *Galerida cristata* (L.).

Plate 16, fig. 20—22 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 2, a—d. Hewitson, III. Ed. I, pl. XLV, fig. 5. Baedeker, Tab. 66, fig. 8. Taczanowski, Tab. LXII, fig. 3. Seebohm, Brit. Birds, pl. 15; id. Col. Fig., pl. 58.

Foreign Names: Bohemia: *Chocolouš*. Denmark: *Toplaerka*. France: *Cochevis*, *Alouette huppée*. Germany: *Haubenterche*. Holland: *Kuifleeuwerik*. Hungary: *Búbos pacsirta*. Italy: *Cuppellaccia*. Poland: *Smieciucha*. Sweden: *Tofslärka*.

Alauda cristata L. Newton, ed. Yarrell, I, p. 632; Saunders, Man., p. 253. *Galerita cristata* (L.). Dresser, Birds of Europe, IV, p. 285. *Corydus cristatus* (L.). Dresser, Man. Pal. Birds, p. 390. *Galerida cristata cristata* (L.). Hartert, Vög. Pal. Fauna, p. 228.

Breeding Range: Europe generally, except Norway, N. Sweden and Russia, the British Isles, Corsica, and Sardinia, where it is absent. Replaced by other forms in the Iberian and Balkan peninsulas and S. Russia.

In Sweden this species has increased its range of late years, and is now known to breed as far N. as Upsala, while it is common in Skåne and Halland. In Russia it is found in small numbers in the Baltic provinces, but does not nest in Finland or N. Russia. In Jutland however it is not uncommon, and is locally plentiful in France, the low countries, Germany and Austro-Hungary, while in Switzerland, where it was formerly

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rare, it is now established in many localities. In Italy it is common, as is also the case in Sicily.

Nest. Almost invariably found in the immediate neighbourhood of roads and dwelling places, where small parties of two or three birds may frequently be met with, and are as a rule extraordinarily tame and familiar. They show decided preference for low lying sandy and barren districts and avoid mountain ranges, breeding frequently by the roadsides, and also on the fallows and among corn, potato fields, or in gardens. The nest has also been found on low turf walls and on the roofs of sheds in the fields. It is composed of the usual materials, dead grasses, bents, etc., with a lining of finer grasses and occasionally a few horsehairs. Diameter of cup about $2\frac{1}{4}$ in., depth 1 in.

Eggs. According to Rey, about 66 per cent of German nests contain 4 eggs, and the remainder 5. (Clutches of 6 are rarely, if ever found in Europe, but occur in the case of some of the Asiatic races, while some of the N. African forms often lay 3 eggs only). In appearance they run through most of the variations of the Calandra and Skylark's eggs, but are more glossy than the eggs of the latter bird. Dr. Rey possesses a erythristic variety with a distinctly red ground.

Breeding Season. In Germany Rey found the earliest full clutches at the end of April, and the last fresh eggs at the beginning of June. Period of incubation 13 days; the young remain in the nest for 10 days and are able to fly in 18 days.

Measurements. Rey gives the average of 100 eggs as 22.7×16.8 mm., Max. 24.7×17 and 22×18.3 mm., Min. 19×15 mm. This agrees closely with the average of 38 eggs as given by Bau, 22.6×16.6 mm. Average weight 192 mg. (Rey), 189 mg. (Bau). Abnormal eggs in the Rey collection measure 27.5×18.9 and 18×13.2 mm., and Ottosson records an egg, 21.5×14.7 mm.

Geographical Races.

a. Mid-European Crested Lark, *G. cristata cristata* (L.). See above.

b. S. Russian Crested Lark, *G. cristata tenuirostris* Brehm.

Foreign Names: Russia: *Javronok chochlatyi*, *Posmetushka*.

G. cristata tenuirostris Brehm. Hartert, Vög. Pal. Fauna, p. 230.

Breeding Range: S. Russia to Rumania (Sarepta, Poltava, Czernavoda, and Baragana).

Found in the valleys of the Lower Volga and Dnieper, and resident in small numbers near houses on the Astrakhan steppes, as well as in the Crimea. Also in the lower Danube valley.

c. Caucasian Crested Lark, *G. cristata caucasica* Tacz.

G. cristata caucasica Tacz. Hartert, Vög. Pal. Fauna, p. 230.

Breeding Range: The Caucasus and W. shores of the Caspian, from Petrowsk to Lenkoran.

Although breeding almost exclusively on the steppes, a few pairs nest in the Caucasus up to about 4000 ft. according to Bogdanow.

d. Balkan Crested Lark, *G. cristata meridionalis* Brehm.

Plate 16, fig. 18, 19 (Attica).

Eggs: Baedeker, Tab. 66, fig. 9.

Foreign Names: Greece: *Korudwólòs*, *Katzouliéra*.

G. cristata meridionalis Brehm. Hartert, Vög. Pal. Fauna, p. 230.

Breeding Range: Dalmatia, Herzegovina, Montenegro, Turkey and Greece.

In Montenegro Reiser met with a pair breeding at a height of 1500 ft., but this is exceptional, and most birds are found in the vineyards, gardens, and roadsides of the peninsula. In Greece this form is common and general as well as in the Cyclades, and probably also in Crete. Eggs 4—5 in number.* The breeding season in the south begins in April, in the north usually in early May. Average of 10 eggs from Greece (6 by Reiser and 4 by Rey *in litt.*) 23×16.52 mm., Max. 24.9×17.1 mm., Min. 20.9×15.9 and 24.7×15.8 mm. Average weight of 6 eggs 186 mg. (Reiser).

e. Spanish Crested Lark, *G. cristata pallida* Brehm.

Foreign Names: Portugal: *Cotovia de poupa*. Spain: *Curretera*, *Cujada*.

G. cristata pallida Brehm. Hartert, Vög. Pal. Fauna, p. 231.

Breeding Range: S. Spain and Portugal.

In the Iberian peninsula besides the present race, Brehm's Crested Lark, *G. theklae* Brehm, is also found. Hartert has identified this form from Valencia, Murcia, Granada and Seville, and in Portugal from Beira and Estremadura. It haunts the plains in preference to the sierras, where *G. theklae* is met with. Nest made of dead grasses with horsehair in lining; diameter of cup $2\frac{1}{4}$ in. Eggs usually 4, rarely 5 in number, and variable in colour and markings. The breeding season begins about mid April. 28 eggs from the Guadalquivir valley average 22.64×16.59 mm., Max. 24×17 and 23×17.5 mm., Min. 21×16.3 and 22×16 mm.

[In N. Africa several other races are found; *G. c. riggerbachii* Hart. inhabits the corn fields and plains of middle and S. W. Marocco, *G. c. macro-*

* In Asia Minor the usual clutch consists of 5 eggs, and occasionally 6 are found (F. C. Selous).

rhyncha Tristr. is found in N. and mid Algeria, and N. Tunis; while further S. *G. c. arenicola* Tristr. replaces it; and *G. c. nigricans* Brehm, inhabits the Nile delta. In N. Palestine is found *G. c. cinnamomina* Hart., but in the Jordan valley *G. c. brachyura* Tristr. The eggs of *G. c. macrorhyncha* differ but little from typical eggs of *G. cristata*. Average of 32 eggs by König and Erlanger 22.37×16.62 mm., weight 189 mg. Those of *G. c. arenicola* are rather larger. Average of 14 by Erlanger 23.5×16.8 mm., Max. 26×17 mm. Average weight 195 mg. The eggs of *G. c. riggenbachi* are also according to Hartert rather above the average, 4 eggs measuring 24.4×17.3 mm.]

66. Brehm's Crested Lark, *Galerida theklae* Brehm.

Plate 16, fig. 10, 11 (S. Spain).

Eggs: Baedeker, Tab. 66, fig. 10.

Galerida theklae theklae Brehm. Hartert, Vög. Pal. Fauna, p. 237.

Breeding Range: Southern Spain and Portugal.

This short and thick billed species has been very generally confounded with the Spanish form of the Crested Lark, *G. cristata pallida*, so that but little reliable information is obtainable with regard to its nesting habits. It occurs apparently not only in Murcia and Valencia, but also in Granada, haunting the sierras in preference to the plains; and also in the hills of Algarve in Portugal. Either this or a closely allied form is also found in the Balearic Isles.

Nest. Probably as a rule 3, occasionally 4 in number, as is known to be the case in several of the N. African races of this bird. They appear also to have a greater tendency to approach the type of Woodlarks' eggs, but well authenticated specimens of the Spanish form are still desiderata.

[The breeding habits of the N. African forms of this species have received some attention from König, Erlanger, and Whitaker. Hartert separates them as follows: *G. t. erlangeri* Hart. from N. Marocco (Tangier district), *G. t. ruficolor* Whit., from middle and southern Marocco, *G. t. superflua* Hart. south of the Atlas in Algeria and Tunis, *G. t. harterti* Erl. north of the Atlas in the same countries, *G. t. carolinae* Erl. the stony deserts of S. Tunis and Tripoli and *G. t. cyrenaicae* Whit. Barca. Erlanger and Whitaker distinguish another form, *G. t. deichleri* Erl. from the sandy deserts of S. Algeria and Tunis. There appears to be little difference between the eggs of these races. The normal clutch consists of 3, rarely 4. Average size of 4 eggs of *G. t. ruficolor* 22.7×17.07 mm. (Hartert); of 6 eggs of *G. t. harterti* 22.66×16.83 mm. (Erlanger); while 18 eggs of *G. t. superflua* average 22.55×16.55 mm., average weight 181 mg. (Erlanger), and were found from the end of March onward.]

67. Woodlark, *Lullula arborea* (L.).

Plate 16, fig. 13—15 (Germany), 16, 17 (S. France).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 4, a—d. Hewitson, I. Ed. I, pl. CXXXIX, fig. 4, 5; II. Ed. I, pl. XXXVI, fig. 3; III. Ed. I, pl. XLV, fig. 3. Baedeker, Tab. 66, fig. 5. Taczanowski, Tab. LXII, fig. 2. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 58. Frohawk, Br. Birds, II, pl. VIII, fig. 255.

British Local Name: Welsh: *Uchedydd y coed*.

Foreign Names: Bohemia: *Skřivan lesní*. Denmark: *Hedelaerke*. Finland: *Mehtaleivo*. France: *Cujelier*, *Alouette lulu*. Germany: *Heidelerche*. Greece: *Molochdós tourlaki*. Holland: *Boonleeuwerik*. Hungary: *Erdei pacsirta*. Italy: *Tottavilla*. Poland: *Skowronek borowy*. Russia: *Sula*, *Liesnoi Javronok*. Sweden: *Trüdlarka*. Spain: *Alondra de Monte*.

Alauda arborea L. Newton, ed. Yarrell, I, p. 625; Dresser, Birds of Europe, IV, p. 321; id. Man. Pal. Birds, p. 389; Saunders, Man., p. 251. *Lullula arborea* (L.). Hartert, Vög. Pal. Fauna, p. 241.

Breeding Range: Europe, locally, except in N. Scandinavia and N. Russia. [Also N. W. Africa and E. to Persia.]

This bird has apparently decreased in numbers of late years, and is not now found in many localities where it is described as common by the earlier British writers on Ornithology. It is however still found locally in the south of England, and in some parts of Wales and Ireland. In England it is commonest, though always local, in the counties bordering the S. coast, and in the Isle of Wight; but also occurs in suitable ground in the Lower Severn and Thames valleys. A few pairs breed on the slopes of the Chilterns, and a colony exists on the heaths near Thetford, on the borders of Suffolk and Norfolk. In the N. Midlands few reliable records of breeding of late years are known, but nests have been found in Northants, and probably a few still breed in Leicestershire and possibly also in Shropshire and Cheshire, though it is apparently now extinct in S. Derbyshire, where it was once common. In the northern counties it is recorded from a few localities in Yorkshire (chiefly on the E. coast), Lancashire, and Cumberland, where Macpherson found it breeding on the W. coast. It is a scarce resident in S. Wales; formerly much commoner in Pembroke, scarce in Cardigan, but locally not uncommon on the borders of Brecon and Radnor. In N. Wales, although there is little doubt that a few pairs nest, definite records are still wanting. In Scotland no reliable information as to the breeding of this bird has been received of late years, although Harvie-Brown took a nest in Stirlingshire in 1863. In Ireland it still breeds in Co. Wicklow, and possibly in other districts, but is now one of the rarest residents, though formerly found in Munster, Leinster, and Ulster (Ussher).

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In the Iberian peninsula it is local, but not uncommon in certain districts of the southern provinces, and also on the tableland of central Spain, 2000 ft. above the sea; breeding generally where the undergrowth is not too thick. It is also found in small numbers in Portugal, but in France is fairly numerous in wooded districts, being sedentary in the S. and S. W. and migratory in the N. In some parts of Brabant it is not uncommon, but in Denmark and N. Germany is scarce and local, though rather more numerous in the S. of the country, and is generally distributed and common in Switzerland. Colonies exist in Livonia and Esthonia, and it is said to breed in one locality in Finland (Åbo Län), as well as in various districts of central and southern Russia, from Kiew and Kharkow in Little Russia eastward to Saratow and Kazan, and is a scarce resident in the Caucasus. In Scandinavia it is confined to the southern part of the peninsula: not uncommon in S. and S. E. Norway, but scarce as a breeding species in Sweden. In Italy it is resident in the hilly districts, especially in the S., and is also found in Sicily, while in Sardinia and Corsica it is common. The geographical races of this species have not yet been thoroughly investigated, but probably the birds inhabiting the Balkan peninsula will have to be separated as *L. arborea flavescens* Ehmcke, and possibly also the Corsican-Sardinian birds also. In Greece it appears to inhabit the higher mountain ranges only, but further N. it is found commonly on hillsides and high-lying plains near the edge of forest in Albania, Bulgaria, Montenegro, Bosnia, etc., and is said to be plentiful on Crete and near Constantinople. [It is also resident in the mountain ranges of the Barbary states, and a pale coloured race, *L. arborea pallida* Sar. occurs in Transcaspia, E. Persia, etc.]

Nest.

Generally sheltered by some low bush, dead bracken, heath, or grass tussock, and placed on the ground on a warm, sunny hillside in mountainous districts, choosing especially those which are partly covered with dead bracken and heath. In open, flat country it seems to prefer the neighbourhood of pine woods, and in Spain often nests in open glades of cork oak and ilex forest. It is rather neatly built of coarse bents and moss, lined with finer grasses, and sometimes a few horsehairs. M. A. Mathew records a nest built in a strawberry bed in N. Devon, and N. Wood found one on the stump of an old oak overgrown with grass in Derbyshire.

Eggs.

Almost invariably 4 or 5 in number, although according to Fatio, 6 are known to occur, but rarely. No instance of a clutch of 6 eggs has occurred within my own experience. The eggs are somewhat glossy, pale greenish white or dirty white in ground colour, generally somewhat thickly speckled with spots, and sometimes a few blotches, of hair brown and underlying violet grey markings. Not infrequently the markings tend to form a distinct zone at the big end, and occasionally they are decidedly reddish in tint, almost approaching the finely spotted eggs of *H. rustica*

in type. In some cases the brown spots are wanting and only a few underlying grey blotches are visible. Eggs closely resembling those of *Alauda arvensis* and *Anthus pratensis* have been ascribed to this species, perhaps through errors in authentication.

In Great Britain the Woodlark is a very early breeder, and the eggs of the first brood are generally found in the last week of March and the first fortnight of April, but occasionally as early as mid March, both in the south of England and in Wales; while eggs of later broods may be found till late in June. In Germany most eggs are found between the beginning of May and the end of June, but exceptionally earlier. A nest with 1 egg is said to have been found in Oldenburg on Feb. 21, 1884, (*Journ. f. Orn.* 1886, p. 313), but this is scarcely credible. In central Spain Lilford found fresh eggs about the beginning of May at 2000 ft., and in Corsica Whitehead found many nests after May 13, but in Sardinia eggs may be found early in April, and Krüper took eggs of the Balkan race from April 25 to June 14, but found most nests in the latter half of May. The hen sits closely, and incubation lasts 14—15 days.

Breeding Season.

Average of 100 eggs (46 by Rey and 54 by the writer) from England, France, Holland and Germany, 21.12×15.59 mm., Max. 24×16.3 and 22×17.2 mm., Min. 18×15.2 and 20×14.5 mm. Corsican eggs are generally large and light coloured. Average of 14 eggs, 21.45×16.01 mm., Max. 24.2×16.3 mm., Min. 19.5×16 and 20.7×15.2 mm. Eggs from the Balkan peninsula resemble those from Corsica. Average of 23 from Greece, 21.21×16.05 mm., Max. 22.5×16.5 and 21.3×17.2 mm., Min. 20.5×16.6 and 21.5×15.1 mm. Average weight according to Bau (39 eggs), 153 mg., while Rey gives 156 mg. as the average of 46 German eggs.

Measurements.

68. Skylark, *Alauda arvensis* L.

Plate 16, fig. 1—5 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 1, a—e. Hewitson, I. Ed. I, pl. CXXXIX, fig. 1—3; II. Ed. I, pl. XXXVI, fig. 1, 2; III. Ed. I, pl. XLV, fig. 1. Baedeker, Tab. 66, fig. 4. Taczanowski, Tab. LXII, fig. 1. Seebohm, Br. Birds, pl. 15; id. Col. Fig., pl. 58. Frohawk, Br. Birds, II, pl. VIII, fig. 245—254.

Nest: O. Lee, IV, p. 22, 24.

British Local Names: *Field Lark*. Welsh: *Uchedydd*. Scotland: *Laverock*. Gaelic: *Uiseag*. Manx: *Ushag y tappee*. Erse: *Fuiseog*.

Foreign Names: Bohemia: *Skřivan polní*. Denmark: *Sang-* or *Graslaerke*. Finland: *Leivonen*. France: *Alouette des champs*. Germany: *Feldlerche*. Holland: *Leeuwerik*. Hungary: *Mezei pacsirta*. Portugal: *Laverca*. Sweden: *Sånglärka*. Spain: *Alondra*.

Alauda arvensis L. Newton, ed. Yarrell, I, p. 614; Dresser, Birds of Europe, IV, p. 307; id. Man. Pal. Birds, p. 387; Saunders, Man., p. 249. *A. arvensis arvensis* L. Hartert, Vög. Pal. Fauna, p. 244.

Breeding Range: Europe generally, except in the extreme north and south; replaced in the south east by *A. arvensis cantarella* Bp.

British
Isles.

Common and generally distributed throughout Great Britain and Ireland, but less numerous in the N. of Scotland and scarce in some of the wilder districts, such as the N. W. coast. It is however found in almost all the islands, including the Shetlands, Orkneys, Hebrides, etc. being only absent from a few outlying rocky islets and holms. It is a lover of the open country and avoids woodlands, narrow valleys and the high mountains, but may be met with up to 2000 ft. in England. It is unknown in Iceland, but a few pairs are known to have bred in the Færöes. Scottish birds have been separated under the name of *A. arvensis scotica* by Tschusi on account of their darker colouring.

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tinental
Europe.

In Scandinavia it breeds commonly in south and middle Sweden, and is also found in Norway almost up to the N. Cape, but is not numerous beyond the Arctic circle, and does not penetrate beyond Lat. $68\frac{1}{2}^{\circ}$ N. in Lapland. It is the only bird which regularly nests on Helgoland, and is generally distributed over the whole of the great European plain, and is especially numerous in the plains of Jutland. (In the Iberian peninsula it is only a winter visitor, but a small dark race appears to breed on the Portuguese serras, in the mountains of Castile, and according to Saunders, also in Aragon, which requires further investigation.) Over the northern parts of its range it is a summer migrant, but towards the south it is to a great extent sedentary.

Nest.

Always placed on the ground, often in growing crops in cultivated districts, among grass by road sides, among rough pasture or on moorlands, and near the coast, even out on the open beach among the shingle and sand, and among the dunes. It is placed in a hoofprint or any natural depression, and is composed of dead grasses and bents, lined with finer grasses, and sometimes, but not always, with horsehair. The old birds are said to have been known to remove their young from the nest in their claws. As the hen is a close sitter, the nest is frequently only found by accident.

Eggs.

In the British Isles the clutch usually consists of 3 or 4 eggs, but in some districts 5 are not uncommon. Rey gives 5 as the normal number in Germany, and adds that 6 have been occasionally found; a statement which also occurs in the works of Fatio and Westerlund. In Denmark the first brood is said usually to consist of 4 and the second of 5. Eight eggs, belonging to two clutches, have been found in one nest in Kent. They are very variable in size and shape, and also differ considerably in

colouring. White, or almost white eggs are not uncommon; but the usual type varies in ground colour from dull white to greyish, greenish, or brownish white, thickly spotted with olive or hair brown and grey. Sometimes these markings are evenly distributed over the whole surface, but at other times they tend to form a bold zone or cap at the big end. Some eggs are decidedly ferruginous in tone, while a less rare variety has a greenish cast.

As two if not three broods are often reared, the breeding season is of long duration. A few pairs may breed in March, but few eggs are found as a rule before the latter part of April in England, and frequently not till early in May. From this time onward eggs may be taken till the end of July. In Germany Rey took all his eggs between the middle of April and July 25. Incubation lasts 14 days, and the hen sits closely, returning to the nest very cautiously on foot, while apparently busied only in feeding.

Breeding
Season.

Although the breadth of these eggs is fairly constant, the length is very variable, so that averages of small series show great discrepancies. Average of 190 eggs (100 by Rey, 58 by Bau and 32 by the writer) from Germany and England, 23.21×16.83 mm., but abnormally large eggs measure as much as 28×17.1 , 27×16.8 (Newton coll.) and 24.3×18.5 , 26.1×18.3 mm. (Rey coll.), while the smallest egg is 18.8×15.3 mm. (Bau). Rey gives the average weight as 182 mg., and Bau (58 eggs) as 193 mg.

Measure-
ments.

Geographical Races.

Common Skylark, *A. arvensis arvensis* L. See above.

Mediterranean Skylark, *A. arvensis cantarella* Bp.

Foreign Names: Greece: *Tsarēthra*. Italy: *Lodola*.

A. arvensis cantarella Bp. Hartert, Vög. Pal. Fauna, p. 246.

Breeding Range: Sardinia, Sicily, S. Italy, the Balkan peninsula from S. Hungary to N. Greece, and S. Russia.

Few, if any, of these birds are resident in Corsica, but in Sardinia it is very numerous on the plains and is also common in Sicily and S. Italy, especially Apulia. In the Balkan peninsula it is found in Dalmatia, and is common on the mountain plateaux of Montenegro up to about 5700 ft. on the Crna Planina, but is absent from the coast district. In Bulgaria not only is it found in great numbers on the plains, but also on the mountains, in company with the Balkan Shore Lark. In Macedonia it is fairly common, but to Greece it is chiefly a winter visitor, though possibly a few pairs may breed on the highest mountains, as Krüper observed one near the summit of the Veluchi range in summer.

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tinental
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In breeding habits it does not appear to differ from the common form.

[The Asiatic form, *A. arvensis cinerea* Ehmcke, which breeds in W. Siberia, Turkestan, Persia, etc. (and winters as far W. as Algeria and Tunis) has occurred in Scotland in winter (*Ann. Scott. Nat. Hist.* 1906, p. 139). In Algeria, N. Tunis and perhaps part of Marocco the resident birds belong to the race *A. arvensis harterti* Whit. Eggs 4 in number; average of 8 (Erlanger and Whitaker), 22.25×16.44 mm.]

[Curve billed Lark, *Alaemon alaudipes* (Desf.).

Eggs: König, Journ. f. Orn. 1895, Tab. VII, fig. 5, a, b.

Certhilauda desertorum (Stahl.). Dresser, Birds of Europe, IV, p. 273. *C. alaudipes* (Desf.). Id. Man. Pal. Birds, p. 375. *Alaemon alaudipes alaudipes* (Desf.). Hartert, Vög. Pal. Fauna, p. 250.

Breeding Range: N. Africa, south of the Atlas Range. (Stated to have occurred in S. Europe, but probably erroneously.)

A true desert haunting bird, breeding on, or under shelter of low scrub, and laying 3—4 eggs, creamy white, with violet shell marks, and brown surface spots, which sometimes form a zone. They may be found from March to May. Average size of 16 eggs (König 5, Erlanger 4, and 7 by the writer), 21.78×16.55 mm., Max. 23×18 mm., Min. 20×15 mm. Average weight of 9 eggs, 173 mg.]

69. Dupont's Lark, *Chersophilus duponti* (Vieill.).

Certhilauda duponti (Vieill.). Dresser, Birds of Europe, IV, p. 279; id. Man. Pal. Birds, p. 376. *Chersophilus duponti duponti* (Vieill.). Hartert, Vög. Pal. Fauna, p. 252.

Breeding Range: N. Algeria and Tunis. Also recorded from Portugal and said to occur on the Balearic Isles. (One accidental occurrence in Italy in Nov. 1900.)

The status of this bird in Europe is by no means satisfactorily known. Barboza du Bocage records the 'var. lusitanica' from the S. of the Tagus, opposite Lisbon, but whether it is resident in Portugal or not is doubtful. Irby states that several have been obtained in the Malaga district, and of late years many skins are said to have been received from the Balearic Isles, but von Homeyer saw no Larks there except the Short-toed and a form of Crested Lark. In Italy one specimen has been recorded (20. XI. 1900). In Tunis Whitaker has found it throughout the greater part of the high plateaux of central Tunis to over 3000 ft. as well as in the plains, and is of opinion that its apparent scarcity is due to the extraordinary capacity possessed by the bird for concealing itself. Its haunts are covered with patches of wild thyme and other plants, which afford it ample cover.

Nest. The nest is placed at the foot of some plant, and is loosely built of bents and soft particles of *Anthemis mixta*.

Eggs. The eggs are 3—4 in number, and may be found in Tunis from the beginning of April to late in June. They vary considerably, even in

the same clutch, and are not always to be distinguished from some eggs of the Crested Larks. The ground colour is glossy greyish or creamy white, generally thickly covered with small spots of yellowish or hair brown and underlying grey shell markings.

Average of 30 eggs (7 by Erlanger, 6 by Whitaker and 17 by the writer), 23.5×17.46 mm., Max. 25.2×17.3 and 23.2×18.2 mm., Min. 21.6×17 and 23×16.5 mm. Average weight of 7 eggs (Erlanger) 214 mg. Measurements.

[Further south a rufous form, *C. duponti margaritae* (Kön.) is found. Average of 14 eggs taken by Erlanger (Mar. 28 to April 9), 22.28×16.82 mm. Average weight 192 mg.]

70. Shore Lark, *Eremophila alpestris* L.*

Geographical Races.

a. N. European Shore Lark, *E. alpestris flava* (Gmel.).

Plate 17, fig. 9—12 (Norway).

Eggs: Thienemann, Fortpfl., Tab. XXVI, fig. 3, a—d. Hewitson, III. Ed. I, pl. XLV.* Baedeker, Tab. 66, fig. 1. Seebohm, Brit. Birds, pl. 15; id. Col. Fig., pl. 58. Newton, Ootheca Wolleyana, Tab. XI, fig. 13—18.

Nests: Pearson, *Beyond Petsora*, pl. 23; *Three Summers*, pl. 32, a, b.

Foreign Names: Bohemia: *Skřivan podhorní*. Finland: *Tunturileivo*. France: *Alouette de la Sibérie*. Germany: *Alpenlerche*, *Ohrenlerche*. Holland: *Bergleeuwerik*. Italy: *Lodola gola gialla*. Lapland: *Ruossa Alap*. Norway: *Fjeldlaerke*. Russia: *Javronok snejny*. Sweden: *Berglärka*.

Otocorys alpestris (L.). Newton, ed. Yarrell, I, p. 604; Dresser, Birds of Europe, IV, p. 387; id. Man. Pal. Birds, p. 378; Saunders, Man., p. 259. *Eremophila alpestris flava* (Gm.). Hartert, Vög. Pal. Fauna, p. 255.

Breeding Range: N. Europe within the Arctic Circle. [Also N. Siberia.]

This species is common during the breeding season in the N. of Scandinavia, especially throughout Finmark, but a few pairs also nest above the limits of tree growth as far south in Norway as the Dovrefjeld and Rörås. In Sweden it breeds on the fells in Lapland, and according to Kolthoff has even nested in Jemtland on the Orviksfjellen. In Russian Lapland nests have been found in the alpine region of the north of Finland, as well as in the low lying country along the Murman coast. On Kolguev it is plentiful, and breeds also on Dolgoi, and in some numbers on Waigatz. It is also found on Novaya Zemlya, but in smaller numbers, and in the Archangel Government on the mainland of N. Russia. Formerly

* Linnés *Alanda alpestris* is based on specimens described from Carolina, and the name *E. alpestris alpestris* (L.) is therefore restricted to the N. American form. Continental Europe.

it was supposed also to breed in the Urals (Perm Government), but definite proof is still wanting. In the Balkan peninsula and the Caucasus it is replaced by other forms.

Nest. Usually placed on the ground in the side of a tussock of dead grass, the upper edge of the nest being level with the ground (Pearson). The same writer supposes that the nest hollow in the soft peaty soil is sometimes made by the bird itself. Wolley noticed that in E. Finmark the nest was built near to a stone. In the most northerly part of its range this bird breeds on the tundra, often close to the sea coast, but in the south it haunts the mountains and is found only above the tree limit. The nest is loosely built of dry sheep grass, lined with the down of *Salix lanata*, the cotton rush, and other plants, sometimes with reindeer hair.

Eggs. Usually 4—5 in Scandinavia, but on Kolguev Pearson never found more than 4, and on both Kolguev and Waïgatz some clutches of 3 only were incubated. An examination of a large series shows that these eggs vary considerably; the ground colour being generally greenish white, thickly mottled with olive brown or light yellowish spots. In some cases the ground colour is scarcely visible, while in others a few bold spots of dark brown, or a decided zone, are found at the big end. Many eggs are like those of the Skylark, but are as a rule paler in colouring, and occasionally a dark hair line is found at the big end.

Breeding Season. One of the earliest of the northern passerine birds, nesting almost before the snow is melted. Probably two broods are reared in many cases, for fresh eggs may be found in Finmark from May 12 till July; but most eggs of the first brood are laid towards the end of May or early in June. Pearson's eggs from Russian Lapland, Kolguev, etc. were taken between June 7 and July 24; the nest found on the latter date containing 1 fresh egg! The female sits very closely at times, and has been known to run on to the eggs within a few feet of the watcher. Wolley found that when the first clutch was taken, a second, and even a third if necessary, was deposited within a short distance of the original site.

Measurements. Average of 100 eggs (17 by Rey and 83 by the writer) 22.76×16.24 mm., Max. 26×16.8 and 24.9×18 mm., Min. 20.5×15 and 21×14.7 mm. Average weight according to Rey 191 mg.

b. Saharan Shore Lark, *E. alpestris bilopha* (Temm.).

Eggs: König, Journ. f. Orn. 1896, Tab. VII, fig. 8, a, b.

Otocorys bilopha (Temm.). Dresser, Birds of Europe, IV, p. 399; id. Man. Pal. Birds, p. 380. *E. alpestris bilopha* (Temm.). Hartert, Vög. Pal. Fauna, p. 257.

Breeding Range: The Sahara, from Rio del Oro to Egypt. (Has occurred at Malaga.)

Breeds on stony plains, nesting generally at the foot of a plant of *Helianthemum*, during the second half of April. The nest is neatly built of stems and grasses, lined with plant down and even bits of linen, and is frequently surrounded by small stones. Eggs 2—3 in number, averaging according to König (16), 21.3×15.1 mm., and weighing 160 mg. The ground colour varies from creamy to bluish white, with fine speckles and a few spots of brick colour, and underlying grey markings.

[In the Maroccan Atlas another race, *E. alpestris atlas* (Whit.) is found, which has not occurred in Europe.]

c. Brandt's Shore Lark, *E. alpestris brandti* (Dress.).

Otocorys brandti Dress. Dresser, Birds of Europe, IV, p. 402; id. Man. Pal. Birds, p. 380. *E. alpestris brandti* (Dress.). Hartert, Vög. Pal. Fauna, p. 257.

Breeding Range: Kirghis Steppes to Dauria.

A clutch of 3 eggs in the British Museum, taken by Mr. St. G. Littledale on the Altai range, averages in size, 21.8×15.6 mm. Breeds on the steppe as well as in the mountains, laying in May.

d. Caucasian Shore Lark, *E. alpestris penicillata* (Gould).

Otocorys penicillata (Gould). Dresser, Birds of Europe, IV, p. 395 and Man. Pal. Birds, p. 381 (part.). *E. alpestris penicillata* (Gould). Hartert, Vög. Pal. Fauna, p. 261.

Breeding Range: Caucasus and Taurus ranges up to 14000 ft.

Radde describes the nest as flattish, and built of grasses, lined with sheep's wool. Eggs 4—5; thickly spotted with reddish brown on a greenish yellow ground. They are slightly larger than those of the arctic race, 5 eggs in the British Museum averaging 23.26×17.04 mm.

e. Balkan Shore Lark, *E. alpestris balcanica* (Rehnw.).

Eggs: Reiser, Orn. Balc. II, Taf. III, fig. b, c.

Otocorys penicillata (Gould). Dresser, Birds of Europe, IV, p. 395 and Man. Pal. Birds, p. 381 (part.). *E. alpestris balcanica* (Rehnw.). Hartert, Vög. Pal. Fauna, p. 262.

Breeding Range: The higher mountains of the Balkan peninsula.

In all probability breeds on all the higher mountains of the peninsula. Reiser met with nesting pairs on the Vran planina in Bosnia, the Crna and Sinjavina planinas in Montenegro, and found nests on the Strigel and Baba planinas in the Etropol Balkan, where it was not uncommon. It has also been observed at various points in the Trojan Balkan, the Rhodope Dagħ, and on the Stara planina (Servian border). In Greece it has only been recorded from the Korax and Kiona. The nests were larger and

more strongly built than those of the Skylark. Eggs 3—4, tolerably glossy, ground colour yellowish white, more or less thickly spotted with grey and brown, and occasionally with black hair lines or spots. Average of 7 eggs (Reiser), 23.04×17.03 mm., average weight 194 mg. They were taken May 25—28.

[Another race *E. alpestris bicornis* (Brehm) breeds on the edge of the snow line on Hermon and Lebanon, in Palestine, building a compact and deep nest in a tuft of *Astragalus* or *Draba*. (Tristram.)]*

MOTACILLIDAE.

71. Richard's Pipit, *Anthus richardi* Vieill.

Plate 18, fig. 24 (Siberia).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 14, a, b (?). Hewitson, II. Ed. I, pl. XXXVI, fig. 3; III. Ed. I, pl. XLIV, fig. 4. Baedeker, Tab. 35, fig. 1. Journ. f. Orn. 1873, Tab. II, fig. 21. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58.

Foreign Names: Bohemia: *Linduška velka*. Germany: *Spornpieper*. Helgoland: *Brüüf*. Hungary: *Sarkantyús Pipis*. Italy: *Titro*. Norway: *Stor Piplærke*. Sweden: *Stor Piplärka*.

Anthus richardi Vieill. Newton, ed. Yarrell, I, p. 598; Dresser, Birds of Europe, III, p. 325; id. Man. Pal. Birds, p. 219; Saunders, Man., p. 139. *A. richardi richardi* Vieill. Hartert, Vög. Pal. Fauna, p. 265.

Breeding Range: Siberia, Turkestan, Tibet and Mongolia. Has strayed to most European countries. Although formerly supposed to have bred in Europe, this species is now known to have its nesting grounds in the plains of Siberia and China. Its western limit appears to be the steppes of Turkestan, where Sewertzow found eggs, and Scully noticed it near Yarkand in the breeding season, frequenting swampy ground. In the Yenesei valley Seebohm found old and young plentiful in the low meadows by the river in August, up to lat. 58° N. and Popham observed pairs near Yeniseisk early in June. In the Baikal district Dybowski found it nesting plentifully in 1868, and Hall describes it as found commonly on the Upper Lena, while Przewalski and David also observed it breeding in marshy districts in Mongolia. Hartert also records it from the Tian Shan, Chami, Nan Shan, Kuku Nor, to the upper Chuan-che and Kan-su. A smaller race (*A. in-*

* *Rhamphocorys clot-bey* Bp. which is found on the N. edge of the Sahara in Algeria and Tunis, has not been recorded from Europe. Sitting bird and eggs figured by König, *Journ. f. Orn.* 1895, Tab. XIV.

fuscatus Blyth) has been found nesting on the low hills near Fu-chau by Rickett and La Touche.

Placed on the ground, often in a hoof print, and difficult to find, as the hen runs from the nest when warned by the cock, which is always on the watch. La Touche and Rickett describe the nest of *A. richardi infuscatus* as a loose cup of dry grass with sometimes a few twigs or a little moss, placed in a hollow under a thick grass tuft (*Ibis* 1905, p. 47). Nest.

4—6 in number, varying in ground colour from pale olive or greenish grey to dirty pink, and as a rule thickly marked with fine olive or reddish brown spots and obscure underlying grey markings. Like so many Pipits' eggs, they tend to fall into two types, a greenish and a reddish one. Some varieties have been compared to eggs of the Shore Lark and White Wagtail. Those of *A. r. infuscatus* from Foh-kien are boldly spotted. Eggs.

Apparently in the first half of June in Siberia, while Dybowski is of opinion that a second brood is reared in July. The southern race breeds in Foh-kien in April and May. Breeding Season.

Average of 24 eggs (10 by Dybowski, 12 by the writer, etc.), 21.38 × 16.4 mm., Max. 23 × 17.2 mm., Min. 20 × 16.5 and 20.8 × 15.4 mm. Weight of 1 egg, 167 mg. (Rey). Four eggs of *A. r. infuscatus* are smaller, averaging 20.05 × 14.95 mm. Measurements.

72. Tawny Pipit, *Anthus campestris* (L.).

Plate 18, fig. 5—8 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 13, a—c. Baedeker, Tab. 35, fig. 2. Taczanowski, Tab. LX, fig. 2. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a.

Foreign Names: Bohemia: *Linduška rolni*. Denmark: *Markpiber*. France: *Pipi rousseline*. Germany: *Brachpieper*. Holland: *Duinpieper*. Hungary: *Parlagi pipis*. Italy: *Calandro*. Poland: *Świergotek rudawy*. Portugal: *Curintuni*. Russia: *Stscheuritzza polewaya*. Sardinia: *Fanfarrone*. Sweden: *Fjäll Piplärka*.

Anthus campestris L. Newton, ed. Yarrell, I, p. 592; Dresser, Birds of Europe, III, p. 317; id. Man. Pal. Birds, p. 218; Saunders, Man., p. 137. *A. campestris campestris* L. Hartert, Vög. Pal. Fauna, p. 267.

Breeding Range: From mid Sweden and the Gulf of Finland southward locally over the whole of Europe, but absent from Norway, the British Isles, Iceland, etc. [Also found in N. Africa, Palestine and Asia Minor to Afghanistan, and S. W. Siberia.]

In Sweden it is found in Blekinge, Halland, and is common along the sandy coast of Skåne as far as Kullaberg, and has been recorded from Öland and S. Gotland. Apparently scarce in Denmark, it is however found Continental Europe.

in Livonia and Esthonia, although but few records of its presence in central Russia exist. It is on the other hand locally common in Poland, and also on the Kirghis steppes as well as in the Crimea and Caucasus districts. Westward it has been found breeding in suitable spots in most parts of the Balkan peninsula, avoiding the higher mountains and wooded districts, but is not common, except in a few districts, in Greece. In Austro-Hungary and Germany it is rather local, but is generally to be found in dry, sandy, barren heaths, and on the outskirts of pine forests, but is less common than one might expect in E. Prussia. Few pairs breed in Switzerland, and in Italy it is for the most part a bird of double passage, although some stay to nest in suitable localities throughout the country and also in Sicily. In Holland scattered pairs haunt the dunes along the coast and on the islands, as well as the inland heaths of Brabant and Gelderland; and is also breeds in Luxemburg (Belgium). In France it is not uncommon in the S., and in Spain breeds in some numbers on the dreary and forbidding-looking high tablelands of La Mancha and Murcia, and in scattered pairs in Valencia and Catalonia, while further S. in Andalucia and Granada it is a bird of the sierra. This appears to be the case also in Portugal, where it haunts high ground in the breeding season. In the Balearic Isles it is common and generally distributed, and is plentiful in Corsica after April (Whitehead).

Nest. Rather a bulky structure, built of roots, stalks, etc., lined with finer grasses and sometimes with horsehair. Von Führer noticed thistle down and seeds of *Ranunculaceae* in nests from Montenegro, and also that the site on rocky ground generally faced east. On the plains the nest is generally sheltered by a grass tussock or a dwarf bush, and in sand dunes is often concealed by a clump of marram grass, while in N. Africa it is sometimes found among growing crops, but as a rule it prefers open and barren country. The hen sits close and the nest is difficult to find, although the metallic notes of the cock, delivered in true Pipit fashion during a short flight, are characteristic. It is moreover a difficult bird to watch on broken ground owing to the extraordinary speed with which it runs. Diameter of cup $3\frac{1}{8}$ in.

Eggs. Usually 4 or 5 in number, but 6 are occasionally found. They are thin shelled and have rather more gloss than most Pipits' eggs, while in colour they bear a remarkable resemblance to those of the Rufous and Grey-backed Warblers, and vary considerably. The ground colour varies from yellowish or even reddish white to greenish or bluish white, generally rather thickly spotted and streaked with reddish brown and pale inky or violet underlying blotches. The markings sometimes are so thick that they almost obscure the ground, and sometimes they tend to form a zone or cap.

Breeding Season.

In central Europe the eggs are seldom laid before the end of May or the beginning of June, and probably one brood is reared; the July nests

which are occasionally met with being probably second layings. In Montenegro von Führer took 13 nests between May 17 and July 14. Apparently in N. Africa two broods are reared, for Whitaker says that eggs may be taken in April, May and June in Tunis.

Average of 137 eggs (43 by Bau, 40 by Rey and 54 by the writer), 21.96×15.75 mm., Max. 23.8×16.6 and 22.5×17.1 mm., Min. 19×15 and 20×14.6 mm. The variation in size apparently does not depend upon locality. Hartert mentions an abnormally large egg, 24.6×17.4 mm. Average weight of 43 eggs (Bau), 156 mg., of 40 eggs (Rey), 158 mg.

Measurements.

[In the Canary Isles from Lanzarote to Ferro is found Berthelot's Pipit, *Anthus berthelotii* Bolle. Eggs figured in *Journ. f. Ornith.* 1890, Tab. VIII, fig. 7. They are usually 4 in number, and resemble rather pale eggs of the Meadow Pipit. Breeding season from March to May. Average size of 60 eggs (19 by König, 14 by Bau and 27 by the writer), 19.2×14.6 mm., Max. 20.6×14.6 and 20×15.2 mm., Min. 18×14.5 and 18.5×14 mm. Average weight of 14 eggs, 122 mg. (Bau). The eggs of the Madeiran race, *A. berthelotii madeirensis* Hart., are variable in size, ranging according to Schmitz from $21-17.5 \times 16.5-14.5$ mm., and may be found from the beginning of February (on low ground) till August (on the hills).]

73. Tree Pipit, *Anthus trivialis* (L.).

Plate 18, fig. 9—18 (Germany), 41, fig. 10 (Anhalt, coll. Rey).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 7, a—f. Hewitson, I. Ed. I, pl. CXIV; II. Ed. I, pl. XXXV; III. Ed. I, pl. XLIII. Baedeker, Tab. 35, fig. 8. Taczanowski, Tab. LXI, fig. 1—3. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a. Frohawk, Br. Birds, I, pl. III, fig. 97—100.

Nest: O. Lee, I, p. 136.

British Local Names: *Tit-, Bank, Field, Tree, or Blood Lark.*
Welsh: *Ehedydd* or *Pibganwr y coed.*

Foreign Names: Bohemia: *Linduška lesní.* Denmark: *Traepiber.* Finland: *Mettäkivvinen.* France: *Pipi des arbres.* Germany: *Baumpieper.* Holland: *Boompieper.* Hungary: *Erdei pipis.* Italy: *Prispolone.* Norway: *Traepiplærke.* Poland: *Swiergotek drzewny.* Russia: *Lasnoi konok.* Sweden: *Trädpiplärka.*

Anthus trivialis (L.). Newton, ed. Yarrell, I, p. 569; Dresser, Birds of Europe, III, p. 309; id. Man. Pal. Birds, p. 211; Saunders, Man., p. 131. *A. trivialis trivialis* (L.). Hartert, Vög. Pal. Fauna, p. 272.

Breeding Range: Europe generally, from lat. 69° in Scandinavia and 66° in N. E. Russia to the Cantabrian and Pyrenean Mountains, mid-Italy and the Caucasus. [Also from lat. 62° in Siberia to N. Palestine, etc.]

In England this species is generally distributed, except in the most barren and treeless districts, such as the high moorlands and W. Cornwall, and in some of our well wooded valleys is exceedingly common. In Wales

British Isles.

it is also common in all the wooded parts of the country, and is found in smaller numbers on the bare hillsides of N. Wales up to about 1500 ft. (Forrest). It is rare in Anglesea and absent from the Isle of Man. In Scotland it is less numerous, except perhaps in the S. W., but exists sporadically in suitable spots along the W. coast to Assynt. It is of course not found on the higher mountains, but is common in Inverness, and was found breeding in E. Sutherland in 1875 by Buckley, for the first time. In the Orkneys it has been only once noticed in summer, and is absent from the Hebrides. In Ireland it is not known to breed, and is also absent from the Færöes and Iceland.

Con-
tinental
Europe.

In Spain the Tree Pipit is found locally N. of the Cantabrian Mountains (Santander, *Ibis*, 1883, p. 184), a fact which seems to have been overlooked by most writers. In the Pyrenees it is scarce, but throughout the whole of central Europe it is found wherever the country is sufficiently wooded, breeding in the Alps in some cases as high as the limits of tree growth. In Italy it is confined to the uplands of the northern provinces and the Po valley, and in the Balkan peninsula it breeds commonly in Rumania and Bulgaria, not only in the plains, but also in the mountains to far beyond the tree limit, nesting in company with the Alpine Pipit at a height of about 5100 ft. South of the Balkans it appears to be found only on migration, but in Russia it breeds in the Crimea, and in the Caucasus not only in the forest, but also in the subalpine zone, beyond the tree limit. In the north it is found commonly in the wooded parts of Norway up to lat. 69°, and in Finnish Lapland its range extends to Enäre, while in the Kola peninsula a few occurrences have been reported from the Kandalax district, and in the Petschora valley it was observed by Seebohm at Ust-Tsilma (lat. 66°).

Nest.

In the British Isles the nest is found in hedge banks, meadows, parks, rough pasture, the outskirts of woods, and occasionally in plantations where there is not much undergrowth. Another favourite spot is on the side of a railway cutting or embankment. Generally the nest is placed within a short distance of a tree or bush, but occasionally at some considerable distance from anything of the kind, and it is said to be sometimes placed in cornfields. It is built in a small hollow, generally sheltered by a tussock, and consists of dead grasses, stalks, moss, etc., lined with finer grasses and sometimes, but not always, with horsehair. Von Mojsisovic asserts that in Hungary it is frequently found in reed beds! Diameter of cup $2\frac{1}{2}$ — $2\frac{3}{4}$ in., depth $1\frac{1}{2}$ — $1\frac{3}{4}$ in.

Eggs.

The number of eggs laid varies according to locality from 4 to 6 as a rule. In Northumberland and Durham about 30 per cent of the nests contain 6 eggs, and it is comparatively rare to find 4 only; while in S. Derbyshire the normal set consists of 5, often 4, but rarely 6. Instances

of 7 eggs in a nest have occurred in Durham (twice), N. Wales, Pomerania, etc., but the largest clutch I know of is one of 8 eggs in J. G. Tuck's collection, taken in W. Suffolk. In Germany 11 per cent of the nests found by Rey contained 6 eggs, and the remainder 5. The variation in colour and markings is extraordinary. It is almost impossible to describe all the known varieties, of which eleven of the more usual types are figured on Plate 18. Exceptionally eggs with purple blotches on a pale blue ground have been met with. (R. H. Read.) Roughly classifying the eggs as 'grey' or 'brown' and 'red' in general effect, it will be found that among the 'grey' eggs in some cases a few bold spots only of dark sepia with soft edges are found, in others the spots are evenly distributed as in *Motacilla alba* (fig. 9), and sometimes the ground is almost completely concealed (fig. 10), or else the spots form a cap or zone (fig. 11). Somewhat similar variations are to be found among the 'red' eggs, and occasionally a bold spot or hair line almost black in colour is found at the big end. There is always a great similarity in appearance between eggs from the same nest. The curious egg figured on Plate 41 appears to have all the colouring matter concentrated on one half of the egg. It will be noticed that some eggs show much more gloss than others.

In England the breeding season begins about mid May, and fresh eggs may be obtained till the beginning of July, but most eggs are laid in the midlands between May 20 and June 10. In Germany the nesting time is very similar, but most eggs are found in June; and in the high north eggs are rarely found before the middle of the month. In most cases only one brood is reared, but apparently a second is sometimes hatched off. When surprised on the nest the hen will sometimes run a few yards in order to draw attention from the eggs, but as a rule she does not sit very closely, but slips off and joins the cock in uttering the monosyllabic alarm note, while the intruder remains in the neighbourhood.

Breeding
Season.

Average of 174 eggs (82 by Bau, 72 by Rey and 20 by the writer), 20.09×15.1 mm., Max. 23.4×15.4 and 23×17.2 mm., Min. 18×14 mm. A dwarf egg measures 13×10.1 mm. (Derbyshire). Average weight of 82 eggs, 132 mg. (Bau), of 72 eggs, 135 mg. (Rey).

Measure-
ments.

74. Petschora Pipit, *Anthus gustavi* Swinh.

Plate 26, fig. 11 (R. Yenesei, 3. VII. 77, Seebohm).

Anthus seebohmi Dress. Dresser, Birds of Europe, III, p. 295. *A. gustavi* Swinh. Id. Man. Pal. Birds, p. 217; Hartert, Vög. Pal. Fauna, p. 274.

Breeding Range: N. E. Russia, from the lower Petschora eastward. [Also N. Siberia eastward to Bering's Sea.]

Con-
tinen-
tal
Europe.

Seebohm and Harvie Brown found this species breeding on the swampy tundra in the Petschora valley, about $67\frac{1}{2}^{\circ}$ N., beyond the limits of forest growth, but interspersed with willow thickets, in June 1875. It was not uncommon near Alexievna and several nests were brought in by natives, but was not observed further north. [In Siberia Finsch and Brehm recorded it from the estuary of the Ob in 1876: Seebohm found it common about lat. $70\frac{1}{2}^{\circ}$ in the Yenesei valley in 1877; Popham took one nest in lat. $69^{\circ} 40'$ in 1897, and afterwards found it breeding in some numbers in the marshes N. of Toorrukhansk in 1900, obtaining four nests. It has also been obtained in Tschuski Land, N. of Kamtschatka and on Bering Island.]

Nest.

Popham describes the first nest found by him as placed in a rather swampy place among dwarf willows, well hidden by a tussock of grass, which quite concealed the eggs. The bird fluttered along on the ground when flushed from the nest. Seebohm observes that the materials used are chiefly flat-leaved grasses and water plants, with small leaves, and occasionally a few dwarf *Equiseta*.

Eggs.

4—5 in number, and variable in colouring, some eggs being almost uniform dark brown, with a black hairstreak or spot, while others are much lighter, being almost covered with small yellowish brown spots, in some cases with purplish marbling and in others with a dark cap or zone at the big end.

Breeding
Season.

On the Petschora Seebohm obtained fresh eggs from June 22 to the first week of July. On the Yenesei Popham took a nest on June 26, and Seebohm received eggs at the end of June and early July, while young were being fed by the parent birds on July 25.

Measure-
ments.

Average of 14 eggs in the British Museum, 21.36×14.76 mm., Max. 22×15.2 mm., Min. 20.5×15 and 22×14 mm. According to Dresser however they range from 24.9×16.5 to 20.3×14.7 mm.

75. Meadow Pipit, *Anthus pratensis* L.

Plate 17, fig. 22—27 (Lapland).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 8, a—c. Hewitson, I. Ed. I, pl. LXVIII, fig. 2, 3; II. Ed. I, pl. XXXVI, fig. 1; III. Ed. I, pl. XLIV, fig. 1, 2. Baedeker, Tab. 35, fig. 5. Taczanowski, Tab. LXI, fig. 4. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a. Frohawk, Br. Birds, pl. III, fig. 101.

British Local Names: *Tit*, *Ground*, *Mountain*, *Meadow* or *Peat Lark*; *Ling Bird*, *Moor Tiling* or *Peep*. Welsh: *Ehedydd Bach*, *Gwas y gog*. Manx: *Ushag y veet*. Scotland: *Moss Cheeper*, *Cheefinch*, *Heather Lintie*. Orkneys: *Teeting*. Shetlands: *Teetick*, *Hill Sparrow*. Gaelic: *Glasian*. Erse: *Kirkeen* (phon.).

Foreign Names: Bohemia: *Linduška lučni*. Denmark: *Eng-Piber*. Finland: *Heinäkirvinen*. France: *Pipi des prés*. Germany: *Wiesenpieper*. Holland: *Graspieper*. Hungary: *Réti Pipis*. Iceland: *Grátitlingur*. Italy: *Pispola*. Lapland: *Cici-cicas*. Norway: *Engpiplaerke*. Poland: *Świergotek łączny*. Portugal: *Petinha*. Russia: *Lugovoi konek*. Sweden: *Ängpiplärka*. Spain: *Cinceta*.

Anthus pratensis L. Newton, ed. Yarrell, I, p. 575; Dresser, Birds of Europe, III, p. 285; id. Man. Pal. Birds, p. 210; Saunders, Man., p. 133; Hartert, Vög. Pal. Fauna, p. 275.

Breeding Range: Iceland, the Færöes, the British Isles, and Continental Europe, but absent from the Iberian peninsula, the Mediterranean Islands, and the Balkan peninsula, and rare in S. Italy. [Also Siberia (valley of the Ob) and Turkestan.]

In Great Britain this bird is very generally distributed throughout most of the open country,* avoiding only the thickly wooded and highly cultivated parts, and is equally at home in the marshes by the sea shore and on the high moorlands some thousands of feet above the sea. It is also found in nearly all the islands round our coasts, including the Isle of Man, the Hebrides, Orkneys, Shetlands, etc., and has even been recognized on S. Kilda. In Ireland it is also common and general.

British
Isles.

Besides being common on the Færöes and found in Iceland up to the limits of plant growth, it is found on suitable ground throughout the greater part of the Continent. In Scandinavia it occurs chiefly on the fjeld above the coniferous belt in the S., but in the N. is met with at all heights, up to the N. Cape, and is found in Finland commonly as far as N. Lapland. In N. Russia its range extends to the Archangel government, where it is common on the Murman coast and has been found nesting at the mouth of the Petschora, but does not breed on Kolguev or Novaya Zemlya. Over the great European plain it is generally distributed where the country is suited to it, but its breeding range does not extend to the Iberian peninsula, where it is only known as a winter visitor. It is also scarce in the south of France, and though a few pairs remain to breed on high ground even in the southern provinces of Italy, it is chiefly found on double passage. In the mountain ranges of central Europe it has been found nesting at a height of over 3000 ft. Formerly a few pairs were supposed to breed in the mountains of the Balkan peninsula, but later observations show that it only occurs there on passage. It is known to nest in the Carpathians, but probably only occurs on migration in S. Russia. [East of the Urals it is found in W. Siberia as far as the Ob valley and

Con-
tinental
Europe.

* It is however unaccountably rare or altogether absent in some districts, such as Oxfordshire (O. V. Aplin).

in N. Turkestan. In Palestine Tristram observed a few pairs up to mid summer.]

Nest. In the British Islands on low ground the nest is generally found in marshy places, neatly concealed by a grass tussock or sometimes rushes, but on the rough pastures and moorlands it is often found among the heather. Other sites are on the edges of peat cuttings, in the scanty grass growing among the sandhills by the sea coast, and the nest is said to have been found in cornfields in the south of England. It is generally well hidden, and the hen sits very closely and can be caught on the nest without difficulty when its position is known. In Iceland it is sometimes placed quite out of sight in some fissure in the ground. It is slight in construction, and Lilford compares it to the inner cup of the Tree Pipit's nest. The materials used are dead grasses and bents, sometimes with a little moss in the foundation, lined with finer grasses and horsehair. Diameter of cup about $2\frac{1}{2}$ in., depth $1\frac{1}{8}$ — $1\frac{1}{2}$ in.

Eggs. In the British Isles 4 to 6 in number as a rule, while a nest with 7 eggs has been found on the Yorkshire moors. In Iceland usually 5—6, once 7 (Hantzsch); while in Norway out of 14 nests found on the fjeld, 7 contained 6 eggs and 3 held 7. As a rule they show less variation than those of the Tree Pipit, and generally belong to a brown or grey type, thickly covered with fine spots, and often with a black hairstreak at the big end. The pink type so common in the Tree Pipit only occurs very rarely, and closely resembles that of the Grasshopper Warbler. Eggs with a bluish ground and few, if any, pale grey markings are also occasionally found, while others are greenish in tint. A remarkable set from Scotland has Bunting-like streaks on a dull stone coloured ground, and an Irish set has deep rich brown caps to the big end (Brit. Mus.).

Breeding Season. In the British Isles two broods are generally reared. The first eggs are found about April 20 in S. England and about a week later in Wales, but not till mid-May in the Shetlands. From this time onward they may be found through May and June till early in July. In Iceland rarely before June; in S. Scandinavia however the first eggs are laid in May, but in the high North often not till mid-June, while in the European plain the breeding season does not begin till early in May. Incubation lasts 13—14 days.

Measurements. Average of 143 eggs (48 by Rey, 43 by Bau and 52 by the writer), 19.34×14.19 mm., Max. 21.3×15.2 mm., Min. 17.2×13.1 and 17.7×13 mm. A dwarf egg from Westmoreland in the Brit. Mus. measures 10.3×8.6 mm. Average weight of 43 eggs (Bau), 121 mg., of 48 eggs (Rey), 114 mg. 23 full eggs from Ireland average 2.196 g. in weight (Foster). Curiously enough Icelandic eggs are rather small; average of 16, 18.36×13.98 mm. (Hantzsch).

76. Red breasted Pipit, *Anthus cervinus* Pall.

Plate 18, fig. 1—4 (Lapland).

Eggs: Baedeker, Tab. 35, fig. 7. Naumannia, 1854, Taf. 3, fig. 4. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a. Newton, Ootheca Wolleyana, Tab. XI, fig. 7—12.

Nest: Pearson, 'Beyond Petsora', pl. 31.

Foreign Names: Finland: *Peurakirvinen*. France: *Pipi à gorge rousse*. Germany: *Rotkehliger Pieper*. Poland: *Świergotek rdzawoszyjny*. Sweden: *Rödstrupig Ängpiplärka*.

Anthus cervinus Pall. Dresser, Birds of Europe, III, p. 299; id. Man. Pal. Birds, p. 213; Saunders, Man., p. 135. *A. cervina* Pall. Hartert, Vög. Pal. Fauna, p. 277.

Breeding Range: N. Europe within the Arctic circle. [Also N. Siberia to Kamtschatka and the Aleutian Isles.]

In Norway this species breeds in the Tromsö Stift, and in E. Finmark is even commoner than the Meadow Pipit. In W. Finmark it is not uncommon, and also nests in Tromsö Amt, but is not certainly known to breed S. of the Arctic circle, though it is said to have bred near Trondhjem (Collett). In Sweden it was first found nesting in 1867 on the Russian border, in Torneå Lapmark and on Ounastuntura, and in 1904 S. A. Davies found it common on the bogs at the head of the Kongämä (lat. 69° N.). Along the coast of Russian Lapland it is locally common, especially near the lakes and on marshy ground, but does not appear to range far inland. East of the White Sea it breeds on Kolguev, and is quite common on Waigatz and Dolgoi, while it has been observed on the S. Island of Novaya Zemlya, but has not been proved to breed there. On the mainland it is also found on the tundra beyond the limit of forest growth, and is plentiful in the Petschora valley (lat. 68°).* [Further east it is found in the Taimyr peninsula and on the tundra of N. Siberia.]

Con-
tinental
Europe.

During the breeding season it chiefly haunts swampy ground, and as a rule places its nest in a recess of one of the big hummocks or tussocky ridges so often met with in bogs. Sometimes the nesting ground is overgrown with willow scrub and dwarf birch. Collett mentions a nest under a willow bush, and Pearson found one in a hole 6 in. deep, and another in an old lemming burrow. Almost invariably the nest is well sheltered and concealed, but that figured by Pearson was built in the open, among grass — a most exceptional site. It is built of grasses and bents, and in some districts a little hair is woven into the lining, while in others this is altogether wanting. No feathers are ever used.

Nest.

* Alston and Harvie Brown also record it from the Dwina delta (*Ibis*, 1873, p. 61).

Eggs. Generally 5 or 6, while on one occasion Pearson found a nest with 7 eggs. They vary in the most extraordinary manner, even in the same nest; so that in a large series some eggs will be found to resemble those of the Lapland Bunting, while others recall those of the Meadow Pipit, Blue headed Wagtail, Tree Pipit and even Tree Sparrow! Some show a pale bluish green ground with numerous fine spots; others are finely stippled all over with pale ochreous and have a dark hair line at the big end, while a third type has bold blotches and streaks of sepia, and a very characteristic variety is clouded with rich maroon or mahogany colour, sometimes entirely obscuring the ground, and varying in depth from the palest shade to almost blackish red or dark olive. The rich red type seems to be characteristic, but careful authentication is always necessary. Collett remarks that spiral lines, though not invariably present, are frequently met with.

Breeding Season.

On the Kongämä Davies took the first clutch on June 17, and in Finmark the breeding season appears to begin about June 20, but fresh eggs (perhaps second layings) may be obtained till the beginning of July. On the lower Petschora the time is rather earlier, as out of 39 eggs obtained by Seeböhm and Harvie Brown on June 22, many were much incubated. Most clutches taken by Pearson in the first fortnight of July on Kolguev and Waigatz were hard set, and young were seen on the wing on Dolgoi on July 20, so that the breeding season varies but little.

Measurements.

Average of 100 eggs (33 by Rey and 67 by the writer), 19.23×14.24 mm., Max. 21×14.3 and 18.1×15.1 mm., Min. 17.1×13.9 and 18×13.4 mm. They are slightly smaller than eggs of the Lapland Bunting, but do not differ appreciably from those of the Meadow Pipit in size. They are however decidedly lighter than Lapland Buntings' eggs. Average weight according to Rey, 127 mg., but 20 eggs taken by Ottosson only average 114 mg.

77. Rock or Alpine Pipit, *Anthus spinoletta* (L.).

Geographical Races.

a. Alpine Pipit, *A. spinoletta spinoletta* (L.).

Plate 17, fig. 13—16 (Switzerland).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 9, 10, a—c. Baedeker, Tab. 35, fig. 3. Taczanowski, Tab. LIX, fig. 1.

Foreign Names: Bohemia: *Linduška vodní*. France: *Pipi spioncelle*. Germany: *Wasserpieper*. Hungary: *Havasi pipis*. Italy: *Spioncello*. Poland: *Świergotek nadwodny*. Spain: *Espioncela*.

Anthus spinoletta (L.). Newton, ed. Yarrell, I, p. 581; Dresser, Birds of Europe, III, p. 335; id. Man. Pal. Birds, p. 214; Saunders, Man., p. 141. *A. spinoletta spinoletta* (L.). Hartert, Vög. Pal. Fauna, p. 279.

Breeding Range: The higher mountain ranges of central and southern Europe. [Also in Asia Minor.]

The evidence of the breeding of this species in the Iberian peninsula is not altogether satisfactory. Irby recorded it from the Sierra del Niño, near Tarifa at 2500 ft., but only speaks of it as a winter visitor to the coast in the *Ornith. of the Straits of Gibraltar* (2nd. Ed.). Arévalo quotes Seoane as recording it from the Sierra Nevada, and also mentions San Ildefonso, but gives no details. In the Pyrenees however it is very common on the bare uplands above the forest belt to above the snow line, both on the French and Spanish sides, and Eagle Clarke met with it in Andorra up to 8200 ft. In France it is found in the Vosges Mts., and is also generally distributed throughout the whole Alpine region up to about 7500 ft., from the Basses Alpes through Switzerland to the Tyrol. In Germany it is found in the Schwarzwald, Thüringer Wald, Rauhe Alp, Bavarian Alps, and especially on the Sudeten (Riesengebirge) on the Bohemian border. It is found also in many other districts of Austro-Hungary, the Carpathian range, the Transylvanian Mts., Com. Banat in Hungary, Bosnia, Herzegovina, the Semmering Alps, Styria, Carinthia, etc. In Italy it is said to be found in the Lombardy highlands, the Apennines and even Calabria. In the Balkan peninsula it is known to inhabit the grassy uplands of Montenegro, Albania and the Rhodope Daghs, but is only a winter visitor to Greece. It has been obtained in Sardinia in spring, and probably breeds there. In the Caucasus, and perhaps also in the Urals, it is replaced by *A. s. blakistoni*.

Con-
tinenta
Europe.

Usually cunningly concealed in a hollow under a grass tussock, at other times under shelter of a *Rhododendron* bush, or even in a crevice of the rocks, or among stones. It is built of coarse grasses and stalks of Alpine plants, often with roots attached, and sometimes also moss, lined with finer bents and a few hairs, and occasionally a feather or bit of wool. It is a difficult nest to find, and the birds are generally wary, but where they are plentiful the hen may occasionally be flushed from the eggs.

Nest.

Usually 5, but sometimes 4 or 6.* They do not vary much, and the bright red variety has apparently not occurred. The greyish white ground colour is almost hidden by innumerable ashy, brownish olive, or purplish brown spots. Some eggs show a tendency to a cap or zone of dark spots and there is occasionally a dark hair streak at the big end.

Eggs.

In the Alps the first eggs are laid at the end of April or early in May, but as they may occasionally be found in June and even early in July it is probable that a second brood is sometimes reared. In Carinthia Keller took a full clutch as early as April 27, but most eggs are laid in

Breeding
Season.

* Naumann speaks of clutches of 7 and 3 as rare, but I can find no confirmation of the statement.

May in Central Europe. In the Pyrenees the best time appears to be the last week in May and the first days of June.

Measure-
ments.

Average of 100 eggs (55 by Rey and 45 by the writer), 21.3×15.52 mm., Max. 24×15.8 and 22.5×16.5 mm., Min. 19.3×14.9 mm. Average weight, 152 mg. (Rey). Exceptional eggs are recorded by Blasius (24×15.2 mm.) and Pražák (18.9×14 mm.).

b. Blakiston's Pipit, *A. spinoletta blakistoni* Swinh.

Breeding Range: Caucasus and probably also the S. Urals. [Also Turkestan, Tian Shan, Altai, and Nan Shan to Chuanche.]

Common above the tree limit throughout the Caucasus according to Radde. Some form of this species also occurs in the Urals up to lat. 64° N. On the Nan Shan Przewalski found a nest at a height of 11,200 ft.

c. American Pipit, *A. spinoletta pensilvanicus* (Lath.).

Plate 17, fig. 19—21 (Labrador).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 9, a—c. Baedeker, Tab. 35, fig. 6. Seebohm, Br. Birds, pl. 14.

Breeding Range: Subarctic N. America from Alaska to Greenland, and on the mountains above the tree limit as far S. as Colorado. (Has occurred on Helgoland).

For nesting notes see Coues, *Birds of the North West*, p. 40, Macoun, *Cat. Canadian Birds*, p. 652, etc. Rey describes the eggs as intermediate between those of *A. pratensis* and *A. cervinus*. Those which I have seen were very variable, some showing a tendency towards the pink type, while others resembled the dark brown type of *A. cervinus* eggs, or typical eggs of *A. pratensis*.

Average of 44 eggs (20 by Rey and 24 by the writer), 19.54×14.58 mm., Max. 23.2×15.3 and 22×16 mm., Min. 17.2×14 mm. Average weight, 126 mg. (Rey).

d. British Rock Pipit, *A. spinoletta obscurus* (Lath.).

Eggs: Hewitson, I. Ed. I, pl. LXVIII, fig. 1; II. Ed. I, pl. XXXVI, fig. 2; III. Ed. I, pl. XLIV, fig. 3. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a. Frohawk, Br. Birds, I, pl. III, fig. 102.

Nest: O. Lee, III, p. 132.

British Local Names: *Sea Titling*, *Rock*, *Sea*, or *Sand Lark*. Scillies: *Pinnick*. Welsh: *Ehedydd bach*. I. of Man: *Sea Lark*. Scotland: *Sea Lintie*. Orkneys and Shetlands: *Tang Sparrow*, *Teetick*. Ireland: *Rock Lark*. Erse: *Kirkeen traw*.

Foreign Name: France: *Pipi des roches*.

Anthus obscurus (Lath.). Newton, ed. Yarrell, I, p. 586; Dresser, *Birds of Europe*, III, p. 343; id. *Man. Pal. Birds*, p. 216; Saunders, *Man.*, p. 143. *A. spinoletta obscura* (Lath.). Hartert, Vög. Pal. Fauna, p. 283.

Breeding Range: Coasts of British Isles, Channel Isles and N. W. France.

On all the rocky and precipitous coasts of the British Isles this bird is found in the breeding season, but as a rule it avoids the low lying portions of our shores at this time, though not uncommon there during the winter months. Thus it is not known to breed in Lincolnshire or East Anglia, but on the other hand the nest has been found among the sandhills of Walney Island, and Macpherson says that a pair or so may be found in the Solway marshes, while a few breed even on the flat coast of Louth. It shows a great partiality for islands, and there are few outlying holms that are not tenanted by this bird, from the Blaskets and Scillies to S. Kilda and the Shetlands. It is strictly maritime in its habits, and is seldom seen at any distance from the sea.*

British
Isles.

On the Channel Islands it is very numerous, especially on Alderney, Sark, and Herm, as well as the adjacent islets, and is also found on the rocky and broken coast and islets of N. W. France. On Ushant it is plentiful according to Eagle Clarke.

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tinental
Europe.

As a rule the nest is not an easy one to find, as the cock is usually on the look out, and at his warning the hen slips quietly away from the eggs. Both parents show great anxiety as long as one remains anywhere near the nesting place. The site too is very variable: sometimes the nest may be found within a few feet of high water, while at other times it may be high up on some towering cliff, and Eagle Clarke took a nest on Foula at a height of 1300 ft. It is often placed deep in a crevice of the rocks, so that it is sometimes necessary to remove stones from the opening before the eggs can be reached. The entrance is often partly concealed by some maritime plant or by a curtain of ivy. Other sites which have occasionally been used are holes in old walls and in the soil at the top of cliffs, old rabbit or puffin burrows, on a shelf in a sea cave (Ussher), in the cabin of an old fishing smack (Harvie Brown), or the wreck of a boat (Seebohm), on low banks overgrown with grass, under bracken in the Scillies (Frohawk), and in thick beds of sea campion or nettles, and according to Dixon under heaps of dry seaweed. In the Orkneys it has been known to breed among loose stones, on the beach or on the top of the cliffs; while in Wexford Ussher says that it generally nests on the slopes of grassy banks or low cliffs. Dry grasses and bents are the usual materials, generally with more or less horsehair in the lining, but moss and seaweeds are also occasionally used, and Borrer records a nest

Nest.

* It should however be mentioned that Pipits, supposed to be of this species, have been observed far inland in Wales during the breeding season by Davenport (near Bala and on Aran Mt.), Walpole Bond (nest found on the Brecon border), and others, while Harting has met with them in the Mangerton Mts., Co. Kerry at 2756 ft. (see *The Field*, Mar. 3 to April 20, 1901). The matter however needs further investigation.

from Eastbourne built of seaweed, mixed with the egg capsules of the whelk (*Buccinum undatum*). Dixon noticed a large gull's feather in the lining of a nest on the Farnes.

Eggs.

4—5 in number, but Aplin found a nest with 6 highly incubated eggs in Carnarvonshire. In colour they vary from greenish white, closely freckled with greyish brown (*Motacilla* type), to dirty white, mottled and sometimes almost obscured by olive or reddish brown, with grey underlying markings. In some eggs the markings are bold and at times they are concentrated in a zone or cap at the big end. One egg of this type in the British Museum is almost white, with a dark brown cap. Erythristic varieties are not uncommon. Ussher has taken eggs with specks of red and violet on a pinkish ground in Kerry (*Anthus trivialis* type); on the W. coast of Great Britain the red spotted type occurs occasionally, F. C. Selous took a clutch with dark red spots and a few grey underlying marks on a bright salmon pink ground in the Orkneys, and a pale brick dust coloured form has been taken on Foula (Eagle Clarke).

Breeding Season.

Two broods appear to be usually reared, and the first eggs are laid in April (April 17, hard sat eggs on the I. of Man, F. S. Graves; May 7, young in nest, Wexford, Poole), but most birds lay during the last days of April and the first half of May, while the best time for eggs of the second brood is in the first week of June in the S., and the second or third in the N. of the British Isles.

Measurements.

Average of 100 eggs from the British Isles measured by the writer, 21.29×15.91 mm., Max. 24×16.2 (S. Kilda) and 20.5×17.2 mm., Min. 17.8×15.3 (Waterford) and 20.5×14.1 mm. As a rule they are decidedly larger than eggs of *A. pratensis*, but as will be seen the measurements of the two species overlap. A. H. Evans has clutches of remarkably small eggs, authenticated by himself and T. E. Buckley, which are quite indistinguishable from typical Meadow Pipits' eggs. Average weight of 4 Scotch eggs, 160 mg. Four full eggs from Ireland average 3.054 g. (Foster).

e. Færøe Rock Pipit, *A. spinoletta kleinschmidti* Hart.

Local Name: Færøes: *Graatujtlingur*.

A. spinoletta kleinschmidti. Hartert, Vög. Pal. Fauna, p. 284.

Breeding Range: The Færøes.

Feilden describes this race as extremely abundant, though confined to the coast. Bunyard however observed a pair or two in the mountains at a moderate height in 1905. In nesting habits it resembles our British bird, and lays 4—5 eggs, which vary in much the same way, but there is not a single erythristic specimen among the very large series in the British Museum collected by Müller, and one or two eggs show a dark hair streak at the big end. Müller took a nest with 4 eggs on April 29,

1868, and noticed a bird building on April 4, but the great majority of his nests were taken in the latter half of May and in June. Average size of 100 eggs measured by the writer, 22.21×16.11 mm., Max. 24×16.5 and 22.5×17 mm., Min. 19×14.2 mm. The last measurement is taken from a clutch which is somewhat smaller than any of the others. As will be seen at once, the eggs of this form are on an average decidedly larger than those of *A. s. obscurus*.

f. Scandinavian Rock Pipit, *A. spinoletta littoralis* Brehm.

Plate 17, fig. 17, 18 (Denmark).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 11, a—c. Baedeker, Tab. 35, fig. 4.

Foreign Names: Denmark: *Skjaer Piber*. Finland: *Luotokirvinen*. Norway: *Skjaerpiplaerke*. Sweden: *Skär Piplärka*.

A. obscurus (Lath.) (*part.*). Newton, ed. Yarrell, I, p. 586 (*A. rupestris* Nilss.); Dresser, Birds of Europe, III, p. 343; id. Man. Pal. Birds, p. 216; Saunders, Man., p. 143. *A. spinoletta littoralis* Brehm. Hartert, Vög. Pal. Fauna, p. 284.

Breeding Range: The coasts and islands of Scandinavia.

A fairly common breeding species along the whole Norwegian coast line and islands, but not penetrating far up the fjords, from the Cattegat to the Varanger Fjord. In Russian Lapland it is found W. of the Ribatchi peninsula, but is absent from the Murman coast and the shores of the White Sea. Birds from the N. (Varanger Fjord, etc.) differ somewhat as a rule from those found on the W. coast (See Aplin, *Zool.* 1896, p. 379). In Sweden it is found along the coast line from the most southerly part up to about lat. 61° , and has been recorded from Bornholm, but does not breed on Gotland. It has also been found nesting on some of the Danish islands in the Cattegat (Deget, Hirtsholmen and Nordre Røn), and Vejro in the Samsö Belt (Winge).

Con-
tinental
Europe.

In nesting habits it resembles the British and Færøe races. The nest is built of bents and moss, seaweed being also used at times, and reindeer hair has been found in the lining. Diameter of cup, $2\frac{3}{8}$ in., depth nearly 2 in.

Nest.

Usually 5 in number, sometimes 4. The few that I have examined were rather pale in colour, and a blackish hairstreak is often found at the big end. Reddish types are apparently not found.

Eggs.

On the west coast of Norway it is one of the earliest breeders, and often has young before the end of May, laying again in June, but in the high N. probably only one brood is reared, and the eggs are laid at the end of May or early in June.

Breeding
Season.

Measure- Average of 19 eggs (Norway), 21.5×15.45 mm., Max. 24×17 mm.
ments. (Westerlund), Min. 19.2×14.5 and 20.1×14.3 mm.

78. Yellow Wagtail, *Motacilla flava* L.

Geographical Races.

a. British Yellow Wagtail, *M. flava rayi* (Bp.).

Plate 19, fig. 15—18 (England).

Eggs: Hewitson, I. Ed. I, pl. LIX, fig. 3; II. Ed. I, pl. XXXIV, fig. 3; III. Ed. I, pl. XLII, fig. 3. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a. Frohawk, Br. Birds, I, pl. III, fig. 95, 96.

Nest: O. Lee, IV, p. 140.

British Local Names: *Yellow Molly* or *Wagster*, *Cow Bird*, *Barley Bird*, *Seed Fool*, *Oatseed Bird*. Welsh: *Siglen* or *Tinsigl felen*. Scotland: *Oatear*, *Seed Lady*.

Foreign Name: France: *Bergeronette à tête jaune*.

Motacilla raii (Bp.). Newton, ed. Yarrell, I, p. 564; Dresser, Birds of Europe, III, p. 277; id. Man. Pal. Birds, p. 208; Saunders, Man., p. 129. *M. flava rayi* (Bp.). Hartert, Vög. Pal. Fauna, p. 294.

Breeding Range: British Isles, N. W. France.

British
Isles. In England the Yellow Wagtail is a common summer migrant, breeding in the plains and the more open valleys, but not as a rule over about 700 ft. In Cornwall and Devon it occurs chiefly on migration, but has nested in S. Devon. It is scarce in the Lake district, and absent of course from the great moorland district of the N. of England. In Wales it is exceedingly local, but two or three colonies exist in Cardigan (one on the Teifi bog, about 500 ft. above the sea); in Merioneth it breeds at Bala and near the S. W. coast, while in the N. it is local in Flint and Denbigh, and occurs also in the upper Severn valley; and in Brecon is common in the valleys of the Usk and Wye, etc. It is not found on the Isle of Man, and in Scotland is practically unknown N. of the Great Glen, though stated by Booth to breed near Inverness. In the Dee area it nests on the Aberdeen coast (between Don and Newburgh), and is not uncommon in some localities in the Forth district (Vale of Menteith, etc.). It also occurs sporadically in the Clyde area, and in small numbers in Tay, but further S. our information is still defective. In Ireland its distribution is very remarkable; one colony breeds about Lough Neagh in Ulster; in Connaught another is found along the shores of Loughs Corrib, Mask, and Carra; and in 1868 it was found breeding near Dublin, but has not been noticed there since.

Con- In E. France *M. flava flava* appears to be prevalent, but from Dieppe
tinental westward *M. f. rayi* is found.
Europe.

Usually placed among the thickest herbage in mowing grass or pastures, Nest. but sometimes also in cornfields, when it is necessarily much more exposed. It is sometimes placed beside a bank in Ireland, or at the foot of a wall, but all the nests which I have seen were built in the open, though generally well concealed by grass. In Sealand it has been known to breed in strawberry and cabbage fields (Cummings). In cornfields the nest is sometimes so low in a hollow that the back of the sitting bird is below the level of the surrounding ground. The birds are wary, but their evident anxiety discloses the approximate position of the nest, and the hen will after a few tentative flights, drop on to the nest, and sits closely on being walked up. As a rule these birds do not breed close to one another, though two or three pairs may be found in the same field. Newton however records an exceptional case where 3 or 4 nests were placed within a few yards of one another annually near Thetford. Most nests are built of bents and roots, with sometimes a little moss, and lined with finer grasses and horsehair. Occasionally a little wool is also introduced, and Hewitson records two nests, one lined with rabbit down and the other without any hair in a lining of fine roots. Diameter of cup, $2\frac{1}{4}$ — $2\frac{1}{2}$ in., depth, $1\frac{1}{8}$ — $1\frac{1}{4}$ in. It is not uncommon to find a thistle or other conspicuous plant in the immediate neighbourhood of the nest; and though most nests are found near rivers and lakes, it may be found breeding on hillsides far away from the nearest stream.

Generally 5—6 in number, but clutches of 4 eggs have been found Eggs. incubated, and 7 are occasionally met with in Norfolk, while Norgate has one set of 8. The greyish white ground colour is almost obscured by fine mottling of ochreous brown, while many eggs show a blackish hair streak at the big end. In some cases the colour may be described as uniform greyish olive, and exceptionally almost white eggs have been found. There is generally a great similarity in colouring to the eggs of the Sedge Warbler, and some varieties are barely distinguishable from those of the Grey Wagtail.

The usual nesting time in the S. of England is from the second week of May to the beginning of June, but exceptionally a full clutch may be taken towards the end of April.* In the midlands and N. the usual time is during the last week of May or the first fortnight of June: and as a rule it is certainly not double brooded, as stated by Dixon and others, though it is probable that a second brood is occasionally reared in the S., as fresh eggs have been found at the end of June and even in early July. Breeding Season.

Average size of 100 eggs measured by the writer, 19.01×14.15 mm., Measurements.
Max. 21.5×14 and 20.1×15.2 mm., Min. 16.9×12.7 (Rey coll.) and

* Eggs have also been found in Lancashire on April 26, a month earlier than the usual date (F. S. Mitchell).

17.2 × 12.2 mm. (dwarfs). As will be seen the variations in size and shape are very great, but on the average the eggs are slightly larger than those of the Blue headed form. Average weight (13 eggs) 110 mg. Six full eggs weigh 2.111 g. (Foster).

b. Pallas's Yellow Wagtail, *M. flava campestris* Pall.

Motacilla raii (Bp.) (*partim*). Dresser, Birds of Europe, III, p. 277; Man. Pal. Birds, p. 208. *M. flava campestris* Pall. Hartert, Vög. Pal. Fauna, p. 294.

Breeding Range: Kirghis Steppes, from the Volga to Transcaspia. Has occurred in Hungary. This form closely resembles *M. flava rayi* in appearance. No authentic breeding notes available.

c. Blue headed Wagtail, *M. flava flava* L.

Plate 19, fig. 6—10 (Germany).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 5, a—c. Hewitson, I. Ed. I, pl. CXXXIV, fig. 1—3; II. Ed. I, pl. XXXIV, fig. 1, 2; III. Ed. I, pl. XLII, fig. 2. Baedeker, Tab. 35, fig. 9. Taczanowski, Tab. LVIII, fig. 2. Seebohm, Br. Birds, pl. 14; id. Col. Fig., pl. 58a. Frohawk, Br. Birds, I, pl. III, fig. 94.

Foreign Names: Bohemia: *Konipas žlutý*. Denmark: *Gul vipstjert*. France: *Bergeronette printanière*. Germany: *Gelbe Bachstelze*, *Schafstelze*. Helgoland: *Bliihoaded Gühlblabber*. Holland: *Gele Kwikstaart*. Hungary: *Sárga billegető*. Norway: *Gulerle*. Poland: *Pliszka żółta*. Sweden: *Gulärva*.

Motacilla flava L. Newton, ed. Yarrell, I, p. 558; Dresser, Birds of Europe, III, p. 261; id. Man. Pal. Birds, p. 205; Saunders, Man., p. 127. *M. flava flava* L. Hartert, Vög. Pal. Fauna, p. 287.

Breeding Range: Europe generally, excepting the British Isles, N. Scandinavia and Russia, the Iberian, Italian and Balkan peninsulas and S. Russia, where it is replaced by other forms.

British Isles. A few instances of the breeding of this race in Great Britain are on record, usually near the coast. Hancock mentions four nests in the Tyne valley, near Gateshead in 1869—70 (*Cat. Birds Northumberland and Durham*, p. 60); it has also been recently recorded as breeding in Sussex, near Winchelsea, in 1901 and 1903 (*Zool.* 1901, p. 389; 1903, p. 420), and subsequently in other localities (N. F. Ticehurst). It may possibly have also bred in Suffolk and Kent.*

Con-
tinental
Europe. In France this appears to be the prevalent form, except in the N. W. (*M. flava rayi*), while Eagle Clarke observed *M. f. cinereocapilla* in the Camargue, where it probably breeds. Possibly the Yellow Wagtails which breed N. of the Cantabrian Mts. in Spain also belong to this race, which is

* See also Cambridge Phillips, *Birds of Breconshire*, p. 51.

found on the outskirts of the Pyrenees, but the limits of the various races are still very imperfectly known, and are complicated by the fact that two, or even three, forms may occur on passage in the same locality. In the Low Countries, Denmark, Germany, and Austro-Hungary it is tolerably common on suitable ground, but as a rule is absent from mountainous districts and dry heaths. In Switzerland it nests chiefly in the plains, but also in smaller numbers in the higher valleys; and in Italy appears to be restricted to the highlands of the Po valley. In Russia it is generally distributed through the Baltic Provinces, S. Finland, Central Russia and Poland. In Scandinavia the present form is confined to S. Norway, where it is met with very sparingly, and Sweden, where it is found throughout Götarike, but becomes scarce in the W., and is probably not found N. of lat. 62°, though it is said to occur in Jemtland.

The nest and breeding habits closely resemble those of *M. f. rayi* Nest. already described. It is always on the ground, frequently on railway embankments, at other times in rank grass in marshy meadows, or in crops of clover, rape, sainfoin, peas, wheat, etc.

5—6 in number, though 7 are occasionally found in S. Finland Eggs. (Pousar). Practically all the eggs of the various races of Yellow Wagtail are indistinguishable, and some of the smaller eggs bear a great resemblance to those of the Sedge Warbler.

Only one brood is reared annually. In Germany, Denmark, and Austro-Hungary eggs are seldom found before June, sometimes late in July. They may however be taken occasionally in the last fortnight of May, and this appears to be the more usual time in the Low Countries and E. France, while in the Swiss valleys they are still earlier. Breeding Season.

Average of 100 eggs (72 by Rey and 28 by the writer), 18.75×13.90 mm., Max. 21×14.3 and 19.2×15.2 mm., Min. 16.3×12.8 mm. Average weight, 105 mg. (Rey); 108 mg. (Bau, 39 eggs). The shape and size of the eggs are very variable, but on the average they are a little smaller than those of *M. f. rayi*. Measurements.

d. Dombrowski's Yellow Wagtail, *M. flava dombrowskii* (Tsch.).

M. flava dombrowskii (Tsch.). Hartert, Vög. Pal. Fauna, p. 289.

Breeding Range: Wallachia, the Dobrudscha, and in small numbers in N. Bulgaria.

e. Sykes's Yellow Wagtail, *M. flava beema* Sykes.

M. flava beema Sykes. Hartert, Vög. Pal. Fauna, p. 290.

Breeding Range: W. Siberia, from Orenburg to the Yenesei. Has occurred in England. (*Zool.*, 1902, p. 232, etc.)

f. Grey headed Yellow Wagtail, *M. flava cinereocapilla* Savi.

Plate 19, fig. 19—22.

Eggs: Baedeker, Tab. 35, fig. 10.

Foreign Names: Italy: *Cutrettola capocenerino*. Portugal: *Lavandisca amarella*. Spain: *Nevadilla*.*M. flava cinereocapilla* Savi. Hartert, Vög. Pal. Fauna, p. 292.

Breeding Range: The Iberian peninsula, Sicily, Italy (except in the northern highlands), Dalmatia, Bosnia and Herzegovina. [Also in N. Africa.]

Con-
tinental
Europe.

In southern Spain this race is not uncommon locally in marshy spots in the marisma and near rivers. (Whether the breeding birds of N. Spain and Portugal all belong to the same form cannot be stated with certainty at present. In Portugal some race of Yellow Wagtail is abundant). Eagle Clarke observed it in the Camargue in May, and in Italy it is known to breed in Venetia, Tuscany and commonly in Calabria, as well as Sicily, but apparently not in Sardinia. Further east it is found in Dalmatia, N. W. Bosnia and Herzegovina. [In N. Africa it has frequently been found breeding, not only in Algeria, but also in Tunis.]

Nest.

Much resembles the other races in its breeding habits, nesting by preference in herbage close to water, but where this is lacking, it has been known to breed on sandy islets surrounded by water, in rushy glades of woods (Chapman) and in low scrub, near, but not quite on the ground (Noble). Where suitable nesting ground is scanty, several pairs will be found breeding close to one another.

Eggs.

5—6 in number, and very similar to those of other races in appearance. In N. Africa 4 is the usual number.

Breeding
Season.

Decidedly earlier than that of the more northern races. In Spain the eggs are usually laid in the last ten days of April or early in May, but as the nest has been taken in June in N. Africa by Tristram and others it seems probable that two broods are reared there.

Measure-
ments.

Average of 35 eggs from S. Spain and N. W. Africa, 18.56×14.06 mm., Max. 20.5×14.7 and 18.6×15 mm., Min. 17.4×13.6 and 18×13.5 mm.

g. Arctic Yellow Wagtail, *M. flava thunbergi* Billberg.*

Plate 19, fig. 11—14 (Lapland).

Nest: Pearson, *Three Summers in Russian Lapland*, pl. 57.Foreign Names: Finland: *Keltasirkku*. Lapland: *Fiskis-cicásch*. Sweden: *Nordisk Gulivrla*.

* This name is very reluctantly adopted in accordance with Lönnerberg's paper in the *Journ. f. Orn.*, 1906, p. 531.



St. Reichert, pinx.

- 1—5 Wren, *Troglodytes troglodytes* L. 6—8 Crested Tit, *Parus cristatus* L.
 9—12 Marsh Tit, *P. palustris communis* Bald. 13—16 Bearded Tit, *Panurus biarmicus* (L.).
 17—20 Golderest, *Regulus regulus* (L.). 21—24 Firecrest, *R. ignicapillus* Temm.
 25—26 Grey-backed Warbler, *Agrobates galactodes syriaca* (H. & E.).
 27—30 Cetti's Warbler, *Cettia cetti* (Marm.).



Reichert, prop.

1-6 Fantail Warbler, *Cisticola cisticola* (Temm.). 7-9 Bonelli's Warbler, *Phylloscopus bonelli* (Vieill.) 10 Siberian Chiffchaff, *P. collybita tristis* Blyth. 11-15 Nuthatch, *Sitta europaea caesia* Wolf. 16-18 Subalpine Warbler, *Sylvia subalpina albistriata* (Brehm). 19-23 Sardinian Warbler, *S. melanocephala* (Gm.). 24, 25 Dartford Warbler, *S. undata* (Bodd.) 26 Olive-tree Warbler, *Hippolais olivetorum* (Strickl.). 27, 28 E. Olivaceous Warbler, *H. pallida* (H. & E.). 29 Booted Warbler, *H. caligata* (Licht.). 30 Paddy-field Warbler, *Acrocephalus agricola* Jerd.



1—4 Nightingale, *Luscinia megarhynchos* Brehm. 5—6 Northern Nightingale, *L. luscinia* (L.). 7—14 Redbreast, *Erithacus rubecula* (L.). 15—17 Black throated Green Warbler, *Dendroica virens* Baird. 18—22 Rock Nuthatch, *Sitta neumayer* Michah. 23 Greek Sombre Tit, *Parus lugubris lugens* Brehm. 24—27 Lapp Tit, *P. cinctus* Bodd.

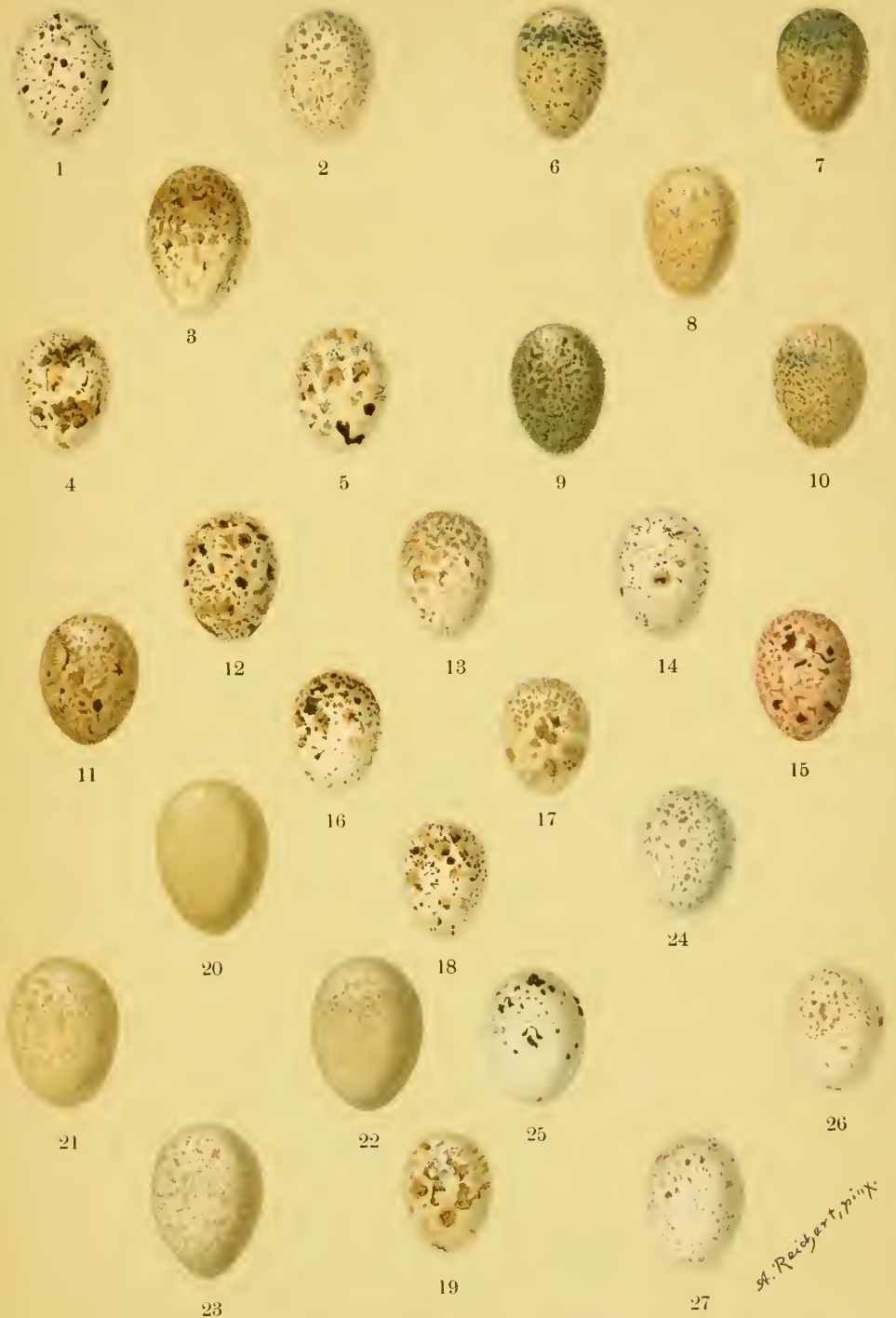


A. Reichenow, pinz.

1—6 Great Grey Shrike, *Lanius excubitor* L. 7, 8 Southern Grey Shrike, *L. excubitor meridionalis* Temm. 9 Isabelline Shrike, *L. cristatus isabellinus* Ehr. 10—19 Woodchat, *L. senator* L.



1—17 Red backed Shrike, *Lanius collurio* L. 18—22 Red tailed Shrike,
L. cristatus L. 23, 24 Bobolink, *Dolichonyx oryzivorus* (L.).



1—5 Garden Warbler, *Sylvia borin* (Bodd.). 6—10 Whitethroat, *S. communis* Lath.
 11—15 Blackcap, *S. atricapilla* (L.). 16—19 Lesser Whitethroat, *S. curruca* (L.). 20—23
 Barred Warbler, *S. nisoria* (Bechst.). 25 W. Orphean Warbler, *S. hortensis hortensis* (Gm.).
 24, 26, 27 E. Orphean Warbler, *S. hortensis crassirostris* Cretz.



1 - 5 Willow Warbler, *Phylloscopus trochilus* (L.). 6-10 Chiff Chaff, *P. collybita* (Vieill.)
 11 - 14 Wood Warbler, *P. sibirica* (Bechst.). 15-17 Savi's Warbler, *Locustella luscinioides* (Savi).
 18-21 Grasshopper Warbler, *L. naevia* (Bodd.). 22 - 25 Moustached Warbler, *Luscinola melano-*
opogon (Temm.). 26-29 Icterine Warbler, *Hippolais icterina* (Vieill.).



1



2



3



4



5



6



7



8



9



10



11



12



13

1—10 Blackbird, *Turdus merula* L. 11 Red winged Thrush, *T. fuscatus* Pall.
 12 Black throated Thrush, *T. ruficollis atrogularis* Temm.
 13 Dusky Thrush, *T. obscurus* Gm.



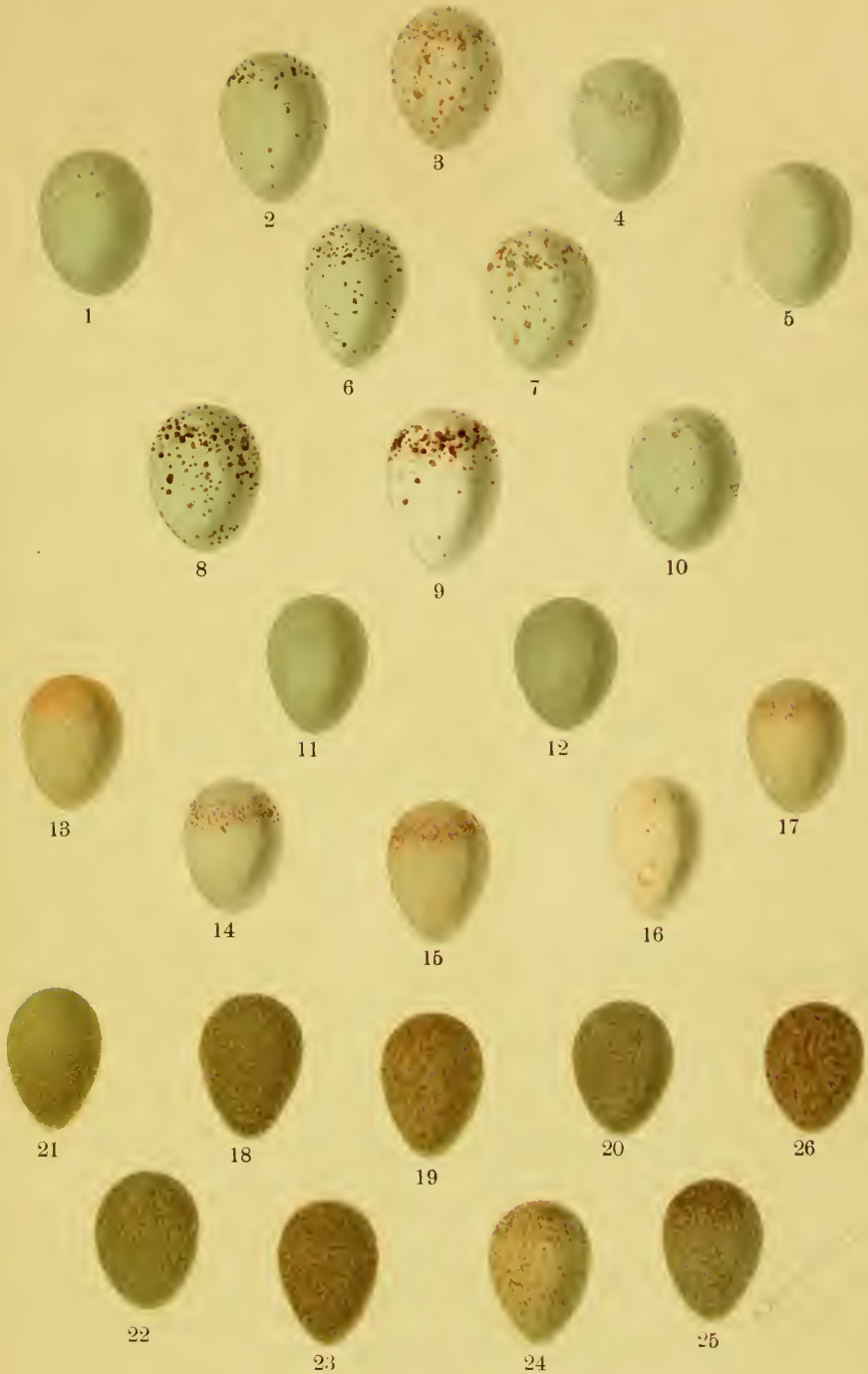
1 E. Siberian Thrush, *Turdus sibiricus davisoni* (Hume). 2—10 Mistle Thrush, *T. viscivorus* L. 11 Northern Ring Ouzel, *T. torquatus torquatus* L. 12—13 Alpine Ring Ouzel, *T. t. alpestris* (Brehm).



1-6 Redwing, *Turdus musicus* L. 7-14 Song Thrush, *T. philomelos* Brehm.
15-17 W. Olivaceous Warbler, *Hippolais pallida opaca* Cab.



1—11 Fieldfare, *Turdus pilaris* L.
 12—13 Swainson's Thrush, *T. ustulatus swainsonii* Cab.



1—10 *E. Russet Wheater*, *Saxicola hispanica xanthomelaena* H. & E. 11—12 *Whinchat*, *Pratincola rubetra* (L.). 13—17 *Stonechat*, *P. torquata rubicola* (L.). 18—20 *White spotted Bluethroat*, *Luscinia svecica cyaneacula* (Wolf.). 21—26 *Red spotted Bluethroat*, *L. s. svecica* (L.).



1-4 Brown Thrasher, *Toxostoma rufum* (L.). 5-8 Palestine Bulbul, *Pyenonotus capensis xanthopygos* (H. & E.). 9 Blue Rock Thrush, *Monticola solitarius* (L.). 10-13 Black Wheatear, *Saxicola leucurus* (Gm.). 14 African Desert Wheatear, *S. deserti deserti* Temm. 15-16 Asiatic Desert Wheatear, *S. d. atrogularis* Blyth. 17-20 Pied Chat, *S. pleschanka* (Lep.)



A. Reichenow, pinx.

1—4 Great Spotted Cuckoo, *Coccyzus glandarius* (L.). 5—6 Red breasted Flycatcher, *Muscicapa parva* Bechst. 7—14 Spotted Flycatcher, *M. striata* (Pall.). 15—19 Swallow, *Chelidon rustica* (L.). 20—24 Crag Martin, *Riparia rupestris* (Scop.).



1-6 Nightjar, *Caprimulgus europaeus* L. 7-9 Red necked Nightjar, *C. ruficollis* Temm.
 10 Red fronted Serin, *Serinus pusillus* (Pall.). 11 Lesser Redpoll, *Carduelis linaria cabaret*
 (Müll.). 12 Greenland Redpoll, *C. hornemanni hornemanni* (Hölb.). 13 Coues' Redpoll, *C.*
hornemanni exilipes (Coues). 14 Black headed Yellow Wagtail, *Motacilla flava melanocephala*
 Licht. 15-18 Hoopoe, *Upupa epops* L.



1—24 Common Cuckoo, *Cuculus canorus* L.



A. Reichenow, pinx.

1-24 Common Cuckoo, Cuculus canorus L.

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Motacilla viridis Gm. Dresser, Birds of Europe, III, p. 269; id. Man. Pal. Birds, p. 206. *M. flava borealis* Sund. Hartert, Vög. Pal. Fauna, p. 294.

Breeding Range: N. Scandinavia und Russia. [Also in Siberia, eastward to the Sea of Okhotsk.] Has occurred in England where it is believed to have bred once. (*Bull. B. O. C.*, XIII, p. 68, etc.).

In Norway this race is found commonly in the sæter enclosures of the southern high fjeld as far south as the Dovre. Northward it breeds commonly in E. Finmark in all grassy spots. In Sweden it does not range further south than lat 63° N. and is plentiful on the Upper Muonio. In Finland it is tolerably common in Uleåborg, and in Russia is found on the Murman coast, the Olonetz Government N. of Lake Onega, and the Archangel Government. It is very numerous near Archangel, and also on the Petschora to about lat. 67° N., but is absent from the Kanin peninsula, the tundra N. of the Arctic Circle and the islands in the Arctic Ocean. [Eastward its range extends right across Asia.]

Con-
tinental
Europe.

Like that of the other races, well concealed and by no means easy to find. It is placed on the ground under shelter of a grass tussock or stump. The parent birds are very wary, and the hen leaves the eggs long before the intruder approaches (S. A. Davies).

Nest.

Usually 5—6 in number, but Pearson once took a clutch of 7 on the Murman coast. They show the same variations as those of the Blue headed form.

Eggs.

Full sets may be found in Lapland from about June 13 onward, and newly hatched young on the 26th.

Breeding
Season.

Average of 100 eggs (77 by Rey and 23 by the writer), 18.31×13.97 mm., Max. 21.3×14 and 19.6×15.4 mm., Min. 16.1×12.9 mm. Average weight, 106 mg. (Rey).

Measure-
ments.

h. Black headed Wagtail, *M. flava melanocephala* Licht.

Plate 19, fig. 24—27 (Odessa, 10. V.).

Eggs: Thienemann, Fortpfl., Tab. XXV, fig. 6, a—b.

Foreign Name: Greece: *Tsina*.

Motacilla melanocephala Licht. Dresser, Birds of Europe, III, p. 273; id. Man. Pal. Birds, p. 207. *M. flava melanocephala* Licht. Hartert, Vög. Pal. Fauna, p. 295.

Breeding Range: The Balkan peninsula S. of the Danube, S. Russia and the Caucasus. [Also Asia Minor and Persia.] Has once occurred in England (*Bull. B. O. C.*, XIII, p. 69).

Con-
tinental
Europe.

In Greece it breeds in the marshes and on the edges of the lagoons near the sea, and is especially common on the islets where colonies of Gulls nest, in Acarnania. It is also abundant in the marshes of Macedonia, and Robson found a colony not far from Constantinople. In Bulgaria according to Reiser, it is very plentiful in some localities, e. g. near Sophia; but avoids mountainous districts and becomes scarce in the Danube valley. Although more characteristic of the E. than of the W. of the Balkan peninsula, it nevertheless breeds in the meadows at the N. end of the Scutari Lake, and is also found in S. Dalmatia. In S. Russia it is met with from the mouth of the Danube to the Caucasus, where Radde states that it is found nesting not only in the lowlands, but also up to over 6000 ft. [An Asia Minor it is common on the islands near Smyrna, and Danford found it generally distributed on suitable ground in the interior of the country; while it also breeds locally in Persia, where Witherby took eggs near Shiraz at 5200 ft. on May 3, 1902.]

Nest.

Placed on the ground, either in a marsh, or when on drier ground sheltered by tamarisk bush or *Salsola*. In Bulgaria however it is generally built in a cornfield. Most observers describe it as well hidden and most difficult to find, but when the nests are placed close together, as is sometimes the case, a careful search is generally successful.

Eggs.

Usually 5 or 6, sometimes only 4. Most eggs examined have a dark hair streak at the big end.

Breeding
Season.

In Greece and Turkey the first eggs are laid at the end of April and the beginning of May, but in Bulgaria the time appears to be rather later; while in Greece and Asia Minor eggs have been taken till late in June, so that possibly two broods are reared.

Measure-
ments.

Average of 18 eggs (6 by Rey and 12 by the writer), 18.68×14.45 mm., Max. 20.5×14.8 and 19.3×15.1 mm., Min. 17.1×14 mm. Average weight (Rey), 122 mg.

79. Yellow headed Wagtail, *Motacilla citreola* Pall.

Plate 19, fig. 23 (Kultuk, Lake Baikal).

Eggs: Journ. f. Orn. 1873, Tab. II, fig. 20.

Foreign Names: Bohemia: *Konipas žutohlavý*. Germany: *Gelbköpfige Bachstelze*. Russia: *Trjasoguska želtoglovaja*.

Motacilla citreola Pall. Dresser, Birds of Europe, III, p. 245; id. Man. Pal. Birds, p. 203. *M. citreola citreola* Pall. Hartert, Vög. Pal. Fauna, p. 296.

Breeding Range: N. E. Russia. [Also Siberia to Mongolia.]

Seeböhm and Harvie Brown met with this species in the Petschora valley in small numbers as far S. as about lat. 66°, but in the delta of the river it was quite the commonest bird, haunting the open spaces between the willow thickets on the islands in great numbers. It is however absent from the Dwina delta, but is said to occur in the Orenburg Government (?). [In Asia its range extends from the Ob valley and perhaps N. Turkestan through Siberia to Lake Baikal. Przewalski found it breeding commonly in S. E. Mongolia, but not in Ussuri Land, while in the mountain ranges of Central Asia it is replaced by *M. c. citreolides* (Gould).] Con-
tinen-
tal
Europe.

Carefully concealed among the tangled grass and flowers in the open spaces between the clumps of willows, in the Petschora delta; while in Dauria, Dybowski found it sheltered by dry grass or low scrub in marshy places. It is placed on the ground, and is composed of grasses and bents, sometimes with moss, lined with fine roots and reindeer hair, while occasionally a few feathers are also added. Inner diameter about $2\frac{1}{2}$ in., depth about $1\frac{3}{8}$ in. It is a very difficult nest to find; the cock being generally on the look out, and both sexes flying about overhead with incessant cries on the approach of danger. Nest.

Usually 5 or 6, exceptionally 7 in number. They are very similar in appearance to those of *M. flava*, but as a rule the markings are less distinct, and the general appearance paler. The ground colour is yellowish white, thickly specked with small pale rusty spots, and frequently with a dark hair line or two at the big end. There is but little gloss. Eggs.

In the Petschora delta eggs were taken from June 19 to 27, and young able to fly were procured on July 20, and were common by August 1. In Dauria also the eggs are laid about mid-June. Only one brood is reared. Breeding
Season.

Average of 64 eggs (15 by Dybowski, Rey, etc., and 49 by the writer), 19.05×14.06 mm., Max. 21×15 mm., Min. 18×14 mm. A dwarf egg from the Petschora measures 16.8×13.2 mm. Weight (5 eggs), 127 mg. (Rey). Measure-
ments.

80. Grey Wagtail, *Motacilla boarula* L.

Plate 19, fig. 1, 3, 4, 5 (Germany), 2 (S. Russia). Pl. 26, fig. 12
(Staffordshire, Blagg Coll.)

Eggs: Thienemann, Fortpfl. Tab. XXV, fig. a—c. Hewitson, I. Ed. I, pl. LIX, fig. 2; II. Ed. I, pl. XXXIII, fig. 2; III. Ed. I, pl. XLII, fig. 1. Baedeker, Tab. 35, fig. 11. Taczanowski, Tab. LXIX, fig. 2, 3. Seebohm, Br. Birds, pl. 14; id. Col. Fig. pl. 58 a. Frohawk, Br. Birds, I, pl. III, fig. 93. Dresser, pl. —, fig. 20—24, and pl. —, fig. 47, 48. Nest: O. Lee, IV, p. 114.

British Local Names: *Rock Wagtail*. Welsh: *Siglen or Tinsigl Lwyd*.

Foreign Names: Bohemia: *Konipas horni*. Denmark: *Graa Vipstjert*. France: *Hochequeue*. Germany: *Graue Bachstelze*. Greece: *Tsilibethra*. Helgoland: *Gühl Lungen*. Holland: *Groote gele Kwikstaart*. Hungary: *Hegyibillegető*. Italy: *Ballerina gialla*. Poland: *Pliszka wolarka*. Portugal: *Alveola amarella*. Russia: *Trjasoguska gornaja*. Sardinia: *Coetta groga*. Spain: *Pepita amarilla*. Sweden: *Grå ärta*.

Motacilla sulphurea Bechst. Newton, ed. Yarrell, I, p. 552. *M. melanope* Pall. Dresser, Birds of Europe, III, p. 251; id. Man. Pal. Birds, p. 202. *M. boarula boarula* L. Hartert, Vög. Pal. Fauna, p. 298.

Breeding Range: Central and southern Europe, but absent from the North and represented by subspecies in N. Asia and Madeira. [Also found in the Great Atlas.]

British
Isles.

In Great Britain this species, though nowhere very numerous, is found in scattered pairs breeding at intervals along the courses of rivers and streams in most hilly districts in Scotland, Wales, the Cumbrian and Pennine ranges, and the W. of England, but is absent as a rule during the breeding season from the level plains and the sea coast. It breeds regularly in the Devonian peninsula, but is only known to nest occasionally in the counties east of Dorset, Wilts, and Gloucester in the S. of England, although nests have been recorded from Hants, Sussex, Surrey, Kent, Berks, Bucks, Oxford and Northants. Further north a few pairs breed in Leicester, and it is common in Derby and W. Yorks, but does not nest in Notts or E. Yorkshire, though recorded by Cordeaux in N. Lincoln. It is rare in Anglesea and the Isle of Man, but is pretty generally distributed on the mainland of Scotland, while it occurs in small numbers on most of the Inner Hebrides and on Skye, and it is said to breed in the Orkneys. To the Shetlands and Outer Hebrides it is only a straggler. In Ireland it has been recorded as nesting in every county.

Con-
tinental
Europe.

It is absent from Ireland, the Faeröes, Scandinavia, Denmark and N. Russia; while in Germany it is common on the mountain streams of

the middle and south of the Country (especially the Harz, Thüringia, Saxony, Franconia and the South), but is rarely met with on the northern plains. In Switzerland it is generally distributed, breeding up to about 6000 ft., and is also found in the hilly parts of France and Belgium. It is almost universal along the Pyrenean range, and is met with on all the principal sierras of the Iberian peninsula, from the S. Nevada to the Cantabrian Mts, as well as in Sicily, Sardinia and Corsica, and is said to breed occasionally on Malta. In Italy it is confined to the hilly districts in the breeding season, and this is also generally the case in the Balkan peninsula and Austro-Hungary. In S. Russia it is tolerably common, but does not range as far N. as the Government of Moscow, though in the Urals it is said to be found as far as lat 59°. [It is also common in the Canaries; and by the streams in the Great Atlas (Meade-Waldo).]

Although essentially a haunter of clear mountain streams, a few pairs will generally be found breeding for some distance after the river has debouched into the plain, even as far as the sea-coast, using ledges and cavities in the stonework of water mills, walls, and bridges as nesting sites in default of high banks and rocks. The nest is generally, but not invariably, placed close to water, often on a ledge of rock or on a steep bank side, and occasionally among tree roots. Among less usual sites may be mentioned the top of an old stump, and in a ventilator of a house in N. Wales, on a shelf in a room entered through a broken window, while Seebohm records a nest built on the ruins of an old Thrush's nest and another in the fork of an alder, close to the ground, and E. W. Blagg found a nest in semi-darkness at the far end of a natural cave not far from the R. Dove. Sometimes the nest is concealed by a natural growth of fern, ivy, or other vegetation, and is then not easy to see, especially as the bird will sit close when it fancies itself unobserved. It is however decidedly a shy bird in the early breeding stages, and when flushed from the nest while building or before incubation has begun, is very liable to forsake it altogether. On the other hand the parents display the greatest anxiety for the safety of their eggs or young; and the same locality, and sometimes the same spot, is often resorted to year after year. The foundation of the nest consists of moss, with sometimes a few small twigs, skeletonized leaves, and roots or grasses, and the lining is generally horsehair, white preferably, though cowhair is also sometimes used, and in one case the lining consisted entirely of pigs' bristles. A few feathers are also said to be occasionally found. In the Canaries König found goat as well as cow hair, and wool, used as lining material, and in the highlands of Greece Seebohm observed that the lining was thicker than usual. Diameter of cup about 2¼ in., depth 1—1¼ in.

Nest.

Eggs.

4—6 in number, but 5 is perhaps the usual clutch. In a cold spring I have known 3 eggs only to be laid, and in the Canaries 4 is the typical clutch, but in S. Derbyshire it is rare to find more than 5, although 6 are commonly found in the N. of England, etc. In Germany the first brood consists of 5—6, and the second of 4—5, according to Rey.* In colour and markings a good deal of variety exists. Typical eggs somewhat resemble these of the Yellow Wagtails, but are as a rule paler in colour. They are generally of some shade of buff or stone colour, faintly marbled with yellowish or greyish brown. Occasionally a set with distinct markings is met with, and it is not uncommon to find a blackish hair line at the big end. Exceptionally a set resembling miniature eggs of the Pied Wagtail occurs; while E. W. Blagg found a nest with 5 eggs in Staffordshire, which were a beautiful warm pink with pale reddish markings and red hair lines when fresh, and Meade-Waldo states that brick red eggs are frequently met with in the Canary Isles, sometimes together with a single white egg. In Ireland R. J. Ussher has taken eggs almost white, and also with bold reddish brown and underlying grey markings on a white ground. White eggs have also been recorded from Yorkshire (*Zool.* 1904, p. 315). The shell is very thin and delicate, without noticeable gloss.

Breeding
Season.

In England and Wales the eggs are usually laid between April 15 and the beginning of May, often in the last week of April; but occasionally a pair may be found breeding at the beginning of April, or even in the last days of March. If the first nest be taken the hen begins to lay again after an interval of a week, and occasionally a second brood is reared, in which case the eggs are laid early in June. In some districts of the Continent however, two broods appear to be usually brought off. Thus in Germany the first eggs are laid in the latter half of April, and those of the second brood in early June; but Jäckel records an egg laid in Bavaria on March 19 — an exceptionally early date. In Greece Reiser has recorded nearly fledged young at the beginning of April, but the more usual time for eggs is the end of March or early April, while the eggs of the second brood are laid in the latter half of May. In the Canaries eggs may be found through March and April.

Measure-
ments.

Average of 100 eggs (61 by Rey and 39 by the writer), 18.81×14.27 mm., Max. 21.7×14.3 (Cumberland) and 19.1×15.1 , Min. 17×14.1 and 19.1×12.7 mm. Average weight, 114 mg. (Rey); of 36 eggs, 112 mg. (Bau). 22 eggs from Tenerife are about the same size, averaging 18.6×14.2 mm. (König). 15 full eggs from Ireland average in weight 1.952 g (Foster).

[Besides the common European form of this species treated of above, *M. boarula boarula* L., in Asia the Eastern Grey Wagtail, *M.*

* C. Sachse has recorded a clutch of 7 eggs.

boarula melanope Pall. replaces it, but the boundaries of the two races are not yet clearly defined. Six eggs (one of which is bright pink in colour) from the British Museum average 18.8×14 mm. In Madeira and the Azores a third form, *M. boarzula schmitzi* Tsch. is resident. Average of 19 eggs (9 by Padre Schmitz and 10 by the writer) 19.4×15 mm.]

81. Pied and White Wagtails, *Motacilla alba* L.

Geographical Races.

a. Pied Wagtail, *M. alba lugubris* Temm.

Plate 18, fig. 25—29 (Herts).

Eggs: Thienemann, Fortpfl. Tab. XXV, fig. 2, a—c. Hewitson, I. Ed. I, pl. LIX, fig. 1; II. Ed. I, pl. XXXIII, fig. 1; III. Ed. I, pl. XLI, fig. 1, 2. Seebohm, Br. Birds, pl. 14 (2 figs.); id Col. Fig., pl. 58. Frohawn, Br. Birds, I, pl. III, fig. 91. Dresser, pl. —, fig. 1—6.

British Local Names: *Dishwasher*, *Penny Wagtail*, *Nanny Wash-tail*; *Grey Hemplin*, *Watty* (Lake District), *Whippjack* (Kent). N.-Wales: *Brech y Fuches*; S. *Sigl digwt*. Manx: *Ushag-vreck*.

Foreign Names: Germany: *Trauer-Bachstelze*. Helgoland: *Swart-rögged Lungen*. Sweden: *Engelska sädesärta*.

Motacilla lugubris Temm. Newton, ed. Yarrell, I, p. 538. Dresser, Birds of Europe, III, p. 239; id. Man. Pal. Birds, p. 197. Saunders, Man. p. 121. *M. alba lugubris* Temm. Hartert, Vög. Pal. Fauna, p. 301.

Breeding Range: The British Isles; also in N. W. France and occasionally in Holland and on the Norwegian coast.

The Pied Wagtail is very generally distributed over Great Britain and Ireland and on most of the adjacent islands. There is reason to believe that it has occasionally bred in the Shetlands, and it is resident in the Orkneys, but is only a straggler to S. Kilda, and is absent from the Outer Hebrides. It nests on Skye and on most of the inhabited Inner Hebrides.

In Scandinavia this race has been met with on a few occasions in S. Sweden, and probably bred there in 1895. In Norway it is also recorded as having nested in the Jaederen, Stavanger and Bergen districts. Hitherto it has not been found breeding in Denmark, but O. Leege met with a pair nesting in the E. Frisian Islands in 1906, and in Holland it occasionally interbreeds with *M. alba alba*, and has nested in S. Holland. Koch asserts that it has once bred in Münster (Westphalia), but the statement is hardly credible. Its scarcity in the Channel Islands is remark-

British
Isles.

Con-
tinental
Europe.

able, and recent observations as to its distribution in N. W. France are much to be desired; as well as confirmation of the statement that it occasionally breeds in the S. W. of France.

Nest.

The favourite breeding haunts of this bird are in the neighbourhood of farm houses, or old buildings, sometimes at some distance from water; also the neighbourhood of ponds, chalk pits or old brick fields. It is not confined to low ground, but also haunts the hill sides up to 1500 ft. in Wales (Forrest). The nest is very often placed in a hole in a wall or building, or in thick ivy, but is also frequently built in a hollow in a bank by a stream or road side or in a crevice of rock. In some districts the crowns of pollarded willows are a favourite site; while on Scotch lochs I have seen nests among the loose stonework of the landing stages, within a few inches of the water. Sometimes the nest is built against a tree trunk (especially when covered with ivy), or in the crotch of a bough, as much as 10 or 12 ft. from the ground, while at other times it may be met with in wood stacks or stone heaps. A good many instances have been recorded in which the old nest of some other bird has been adapted for nesting purposes (see *Zool.* 1904, p. 421 and 1905, p. 33), and probably those which N. Wood describes on branches of laurels were built inside old nests of Blackbirds or Thrushes.* In E. Anglia it is often placed in the furze walls of the lambing enclosures, and also in hollows of thatch. Among the more unusual breeding sites the following may be mentioned: — in flower pots inside greenhouses, in trucks or underneath the metals on railway lines, in a boat, on the ground in a turnip field, etc. The size of the nest varies according to the situation, and is sometimes very bulky, while in other cases it merely consists of a lining. Almost anything is used for the foundation, twigs, moss, roots, grasses, dead leaves etc., loosely put together, while the inner lining generally consists chiefly of hair, with sometimes feathers or bits of wool, upon grasses, roots, etc. The hen when incubating is very wary in approaching the nest,† but will often sit very closely in spite of noise and bustle around her. Diameter of cup, $2\frac{3}{8}$ to nearly 3 in., depth $1\frac{3}{8}$ to $1\frac{1}{2}$ in.

Eggs.

5 or 6 in number. Nests with 10—11 eggs have been found in Nottinghamshire twice (J. Whitaker) and the Dove Valley once (F. H. Sikes), but were in all probability the produce of two hens. In colour the ground is bluish or greyish white, evenly freckled with small spots and occasionally streaks of leaden brown, with numerous underlying markings of pale violet grey. A rather scarce variety is marked with good sized

* See however R. H. Read's note in the *Zool.* 1905, p. 33.

† Cf. Ussher, *Birds of Ireland*, p. 35.

blotches, chiefly at the big end; while another uncommon type has the numerous markings of a much warmer brown than usual, recalling the brown variety of the eggs of *M. alba alba* figured by Seebohm (Col. Fig. pl. 58). Pure white eggs have also been taken in Shropshire.

Two broods are reared in the season as a rule: the first clutch being generally laid towards the end of April or the early part of May, while the second is generally to be found about the second or third week in June in the Midlands. Occasionally a third brood is reared (Cf. *Zool.* 1878, p. 28, 1903, p. 313), and possibly the exceedingly late nests with fresh eggs which are sometimes met with even as late as the first week of August belong to this category. Incubation is performed chiefly by the hen, and lasts according to W. Evans 13—14 days.

Average of 100 English eggs (64 by Rey and 36 by the writer), 20.16×15.13 mm., Max. 22.2×15 and 21×16.5 , Min. 18.6×14.3 and 19.8×14.2 mm. Two dwarf eggs in the Brit. Mus. from Hants measure 13×11 and 12.3×10 mm. Average weight, 137 mg. (Rey). Average weight of 4 full eggs, 2 g. (Foster); of 16, 2.309 g. (R. H. Read).

Breeding Season.

Measurements.

b. White Wagtail, *M. alba alba* (L.).

Plate 18, fig. 19—23 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XXV, fig. 1, a—c. Hewitson, III. Ed. I, pl. XLI, fig. 3, 4. Baecker, Tab. 35, fig. 12. Taczanowski, Tab. LVIII, fig. 1. Seebohm, Br. Birds, pl. 14 (2 figs.) id. Col. Fig. pl. 58. Frohawk, Br. Birds, I. pl. III, fig. 92. Dresser, pl. —, fig. 7—12.

Foreign Names: Bohemia: *Konipas bílý*. Denmark: *Hvid Vipstjaert*. Finland: *Valkea västäräkki*. France: *Lavandière*. Germany: *Weisse Bachstelze*. Helgoland: *Blü Lungen*. Holland: *Witte Kwikstaart*. Hungary: *Barázda billegető*. Iceland: *Máríatla*. Italy: *Ballerina*. Lapland: *Pestur*. Norway: *Linerle*. Poland: *Pliszka biała*. Portugal: *Lavandeira*. Russia: *Bieloe Trjasoguska*. Sweden: *Südesärta*. Spain: *Lavandera*.

Motacilla alba (L.). Newton, ed. Yarrell, I, p. 548. Dresser, Birds of Europe, III, p. 233; id. Man. Pal. Birds, p. 200. Saunders, Man. p. 123. *M. alba alba* (L.). Hartert, Vög. Pal. Fauna, p. 302.

Breeding Range: Iceland and Europe generally, with the exception of the British Isles, and apparently also the islands of the Mediterranean.

The British Isles are annually visited by flocks of this race on their northward migration, and a few pairs remain to breed, generally in maritime counties, such as York, Lincoln, Suffolk, Kent, Sussex, the Isle of Wight, Devon, and the coast of N. Wales, but also occasionally inland (Middlesex, Cambs., Hunts., Northants. and Bucks.). Instances of inter-

British Isles.

breeding with *M. a. lugubris* have also been recorded from Norfolk, Suffolk, Oxon, Hants, and Cumberland.

Con-
tinental-
Europe.

In Iceland this is a tolerably common bird, and is generally to be found in the neighbourhood of houses. It has been recorded also from S. Greenland and Jan Mayen, but is not known to have bred there. It is believed to have nested occasionally on the Faerões, but is chiefly known there as a passing migrant. Over the whole of the European continent it is very generally distributed, avoiding only the forest districts and the mountain tops beyond the limits of human habitation. Northward it is found in Norway up to the N. Cape, and in Russia along the Murman coast and the shores of the Arctic Ocean, breeding near every group of Lapp huts. Probably it nests also on Kolguev, but is absent from Novaya Zemlya. E. of the Urals it is replaced by other forms. In Switzerland it is found in the mountains up to about 6000 ft., as well as in the plains. In the Iberian peninsula it is abundant in the N. but has only been recorded once or twice as breeding in the southern provinces. It was not observed during the breeding season in Corsica or Sardinia by Whitehead, Wharton or Brooke, but some remain to nest in Italy, although a large proportion are winter visitors only. In the Balkan peninsula it is found as far south as the mountain ranges of Greece, and has bred at Naxos, in the Cyclades. It is also numerous in S. Russia and the Crimea. [In the E. Mediterranean Stenhouse found a pair breeding off the Syrian coast, while Tristram took the nest in Galilee, and Krüper states that it is common in Asia Minor. Some appear to remain in Egypt throughout the summer.]

Nest.

In breeding habits it closely resembles *M. alba lugubris*, and is quite as variable in its choice of a nesting site. Holes in banks, walls, or trees and wood stacks are perhaps the most favoured spots, but in the sand dunes of Holland it breeds under shelter of a clump of marram grass, and has also been recorded as nesting in Sand Martins' holes, on a strawberry bed, in an old hulk in harbour, in a waggon, on pollarded willows, in crevices of rocks, under eaves of houses, in an old Fieldfare's or Thrush's nest, and in a nesting box in Lapland etc. The nest also resembles that of the preceding race, but the lining material varies according to the locality. Thus in N. Russia Seebohm found Reindeer hair and spiders' cocoons, while in Iceland pony hair or feathers, and on the Continent, wool, cow, goat or horse hair, pigs' bristles and feathers are all utilized.

Eggs.

Usually 5 or 6 in number, rarely 7, while 8 have occasionally been recorded for the first brood: the second consisting of 4 or 5. They are said to be a trifle bluer in tint in a series when compared with those of *M. alba lugubris*, but are practically undistinguishable. Some eggs show a dark hair line at the big end, and an egg from Holland

in the British Museum has the markings at the big end so thickly congregated as to appear almost black. Occasionally a clutch is met with which has warm brown or yellowish brown markings, and Dr. Ottosson has a set beautifully spotted with red on a pinkish white ground, taken in N. Iceland in June 1879.

In Iceland the breeding season is variable. H. H. Slater records fledged young on June 11, an extraordinarily early date, when many birds are only beginning to lay. In the extreme N. of Europe the usual time is about the second or third week of June. In Central Europe two broods are reared, and fresh eggs may be found from the end of April to the beginning of July, while exceptionally eggs have been found as late as the end of July and the beginning of October (Sachse), and fledged young on September 7 (Rey). In Greece the first eggs are laid about mid April.

Breeding
Season.

Average of 100 eggs (72 by Rey and 28 by the writer), 20.43×15.11 mm., Max. 22.1×15 and 20×16.2 , Min. 18×15 and 21×14.4 mm. (Bau's average for 58 eggs is rather less, 19.54×14.61 mm.) J. A. Sandman records eggs from Karlö, 22.9×14.6 and 20.5×14.1 mm., and a dwarf egg in Rey's collection measures 14×11.1 mm., weight 80 mg. The average weight is 136 mg. (Rey), 135 mg. (Bau). Average weight of 6 full eggs from Sweden, 2.3 g. (R. H. Read).

Measure-
ments.

[Other geographical races which breed in the W. Palaearctic region are *M. alba dulchunensis* Sykes, which is found in W. Siberia and the N. Caucasus and *M. alba subpersonata* Meade-Waldo, resident in W. Marocco.]

[MNIOTILTIDAE

Black throated Green Warbler, *Dendroica virens* (Gm.).

Pl. 23, fig. 15--17 (N. America).

Eggs: Thienemann, Fortpfl., Tab. XXII, fig. 3 (errore).

Breeding Range: Eastern N. America, from New England to Hudson's Bay. Has occurred on Helgoland once.

Usually built at the end of a branch of a pine tree, 30 to 50 ft. from the ground, during the month of June. Materials: dry grasses and fibrous matter, lined with hair and down.

Nest.

Generally 4, but sometimes 5 in number, more or less marked with blotches of brown and purple on a white ground. Measurements, 17×12.8 mm., weight 92 mg. (Rey).

Eggs.

NECTARINIIDAE

Of this family only one representative breeds in the W. Palaearctic region, the Jericho Sun Bird, *Cinnyris osea* Bp., which is common in the oases of the plain of Jericho and also occurs in the lower Jordan valley. Tristram has described its nesting habits and eggs in the *Ibis*, 1865, p. 75—6.]

CERTHIIDAE.

82. Tree Creeper, *Certhia familiaris* L.

Geographical Races.

a. British Tree Creeper, *C. familiaris britannica* Ridgw.

Plate 26, fig. 13 (Suffolk. 29 IV.).

Eggs: Hewitson, I Ed. I, pl. XLIX, fig. 3; II Ed. I, pl. LIII, fig. 2; III Ed. I, pl. LXII, fig. 2. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 54. Frohawk, Br. Birds, I, pl. III, fig. 88—90.

British Local Names: *Tree Climber*, *Tree Runner*. Welsh: *Ycropyddydd*. Scotland: *Woodpecker*, *Bark Speeler*. *Certhia familiaris* L. Newton, ed. Yarrell, I, p. 468; Dresser, Birds of Europe III, p. 195 and Man. Pal. Birds, p. 192 (*part.*); Saunders, Man. p. 117. *C. familiaris britannica* Ridgw. Hartert, Vög. Pal. Fauna, p. 320.

Breeding Range: The British Isles, with the exception of the Orkneys, Shetlands and Outer Hebrides.

British
Isles.

In Great Britain this unobtrusive little bird is very generally distributed in almost all well wooded districts, more especially where there is plenty of old timber, and in some localities, such as Devonshire, Pembroke, etc. is plentiful. It is of course absent from the barren and treeless districts; but in Wales it haunts the wooded hillsides up to about 1000 ft, and is resident as far N. as Caithness and E. Sutherland on the mainland, as well as on Skye, and some of the larger islands on the W. coast of Scotland, such as Mull and Jura. It is also found on the Isle of Man and Anglesea, and in all the wooded parts of Ireland.

Nest.

This is very characteristic, and is usually placed behind a piece of loose bark, in the narrow space between it and the trunk of the tree. Occasionally it is found in some crevice or split in the trunk, and may sometimes be placed within a foot or two of the ground, and at other times as much as 30 or 35 ft. high, while Booth records one in the roots of a dead stump, which was some distance below the ground level. Old willows by the side of streams are very frequently chosen as nesting sites on account of the structure of the bark. Another favourite nesting place is behind the stems of ivy encircling a tree. Where the timber is young or suitable sites are scarce the Creeper will nest in buildings and outhouses, building in crannies between upright boards or window ledges, behind loose plaster, or underneath eaves, and in piles of timber. In Merioneth I have seen the nest in the interstices of a loose stone wall in a wood, Macpherson records a similar case from the Lake District, and Booth from Scotland, while in Ireland according

to Ussher it is not uncommon to find nests in holes of walls or piers, and he met with one among the masses of decaying leaves in the middle of an old cypress. In the New Forest it is said to have bred in a Squirrel's 'drey', and Lilford believed that Rooks' nests were also utilized for breeding purposes, and also records a nest in a bunch of dried herbs in an outhouse! The lower part of the crevice is usually filled with birch twigs, while the actual nest is built of moss, roots, grasses, etc., with fine twigs interwoven in the rim, and generally feathers, strips of outer bark, or bits of wool in the lining. Other materials are sometimes used: Borrer noticed one bird using the fibrous matter of asphalted felt, and in another case found catkins of the Balsam poplar used as lining to a nest built of the dry flower stalks of the Portugal Laurel. Though rather apt to forsake while building or laying, the Creeper is not at all a shy bird, as stated by some writers, but is quite indifferent to the presence of man, breeding at times in the recesses of the woods and sometimes in the immediate neighbourhood of houses and pathways, flitting backwards and forwards to the nest within a few feet of bystanders. A remarkable instance of this is mentioned in the *Birds of Sussex*, p. 82, where a nest is recorded in the hollow between the wall and the side post of the door of an occupied cottage. Where suitable sites are scarce, the same nesting place is sometimes used for many years.

Usually 6 in the first brood, but sometimes 5, while 7 have occasionally been taken. Lilford speaks of 8, but probably the references to clutches of 8 and 9 in the fourth edition of Yarrell and in Saunders' *Manual* refer to Naumann's statement that the first clutch in Germany generally consists of 8 or 9 eggs, which however is not confirmed by later observers.

Eggs.

They vary a good deal in appearance, some being heavily marked with a zone of dark reddish brown spots at the big end, with a few grey underlying markings, much resembling the eggs of the Crested Tits, while others are faintly marked with a few pale red spots, generally concentrated towards the big end. The shape is also very variable.

The usual time in England is towards the end of April or the early part of May for first layings. The earliest date for a full clutch of which I have any note is April 10, but from about April 25 to May 10 is the best time, while the eggs of the second brood, which is sometimes reared, may be looked for in June. Incubation lasts for 15 days from the laying of the last egg (W. Evans).

Breeding
Season.

Average of 100 British eggs measured by the writer, 15.52×12.09 mm., Max. 18×12 and 16×13 , Min. 14.2×11.7 and 15.2×11.3 mm. As will be seen, there is practically no difference in

Measure-
ments.

size between British and German eggs. Average weight of 20 eggs, 63 mg. Six full eggs weigh on an average 1,178 g. (Foster).

b. North European Tree Creeper, *C. familiaris familiaris* L.

Egg: Taczanowski, Tab. LXXX, fig. 2.

Foreign Names: Finland: *Puuküpijä*. Germany: *Baumläufer*. Norway: *Trækryber*. Poland: *Pelzacz zashórnik*. Russia: *Pischzucha Swertschok*. Sweden: *Trädskrypare*.

Certhia familiaris L. Dresser, *tt. c. (part.) C. familiaris familiaris* L. Hartert, Vög. Pal. Fauna, p. 317.

Breeding Range: Scandinavia, Russia, Poland, E. Germany, and Rumania. [Also across N. Asia.]

Con-
tinental
Europe.

In Norway this race is found in the coniferous woods as far north as Trondhjems fjord, while in Sweden it was found breeding in Lycksele Lappmark (Westerbotten) in 1896. Its northern breeding limit in the peninsula is therefore about lat. 65°, but on the mainland it appears to have a more restricted range. In Finland it is generally distributed, and is common at Kuopio: in the Olonetz government Meves observed it at Kargopol etc: Mejakoff records it from Wologda, and Sabanaeff from the Urals as far as Pavada: southward it appears to be generally distributed in the forests of the Baltic Provinces and Central and Southern Russia, as far as the N. Caucasus, Prussia, Poland and Rumania. West of the Oder and the Carpathians it is replaced by the next form, *C. f. macrodoctyla*.

Nest.

In breeding habits it resembles *C. f. britannica*, but in nests from the N. the paper like outer bark of the birch is much used as building material, and hair is said to be found in the lining as well as feathers and wool.

Eggs.

Generally 6 in number.

Breeding
Season.

The first eggs are laid from about mid April in Scandinavia, and early in May in the Baltic Provinces: the eggs of the second brood being deposited in the latter half of June or early July.

Measure-
ments.

Average of 26 eggs (18 from Sweden by Ottosson and 8 from Sweden and Esthonia by the writer) 15.52×12.9 mm., Max 17.1×12.3 and 15.5×12.6 ; Min., 15×12 and 16×11.8 mm. Average weight of 18 eggs, 59 mg. (Ottosson).

c. Long toed Tree Creeper, *C. familiaris macrodoctyla* Brehm

Plate 20, fig. 21—24 (Saxony).

Eggs: Thienemann, Fortpfl. Tab. XVII, fig. 10, a—c. Baedeker, Tab. 43, fig. 2,4. (probably this race).

Foreign Names: France: *Grimpereau*. Germany: *Baumläufer*. Hungary: *Fakúsz*. Italy: *Rampichino*.

C. familiaris L. Dresser, *tt. c. (part.)*. *C. familiaris macrodactyla* Brehm. Hartert, Vög. Pal. Fauna p. 319.

Breeding Range: Central Europe, including France, Belgium, Switzerland, N. Italy, W. Germany and Austro-Hungary.*

This race is generally distributed throughout the wooded districts of Central Europe in company with the next species (*C. brachydactyla* Brehm), with which it is frequently confused. Much of the literature on the subject is therefore unreliable, as the notes may apply to either species. It is however tolerably clear that *C. f. macrodactyla* haunts coniferous woods by preference, and in the Alps is found in the forests from about 2400 or 3000 ft. up to the tree limit, whereas *C. brachydactyla* is more at home in the plains and among willows by the water side, and is rarely found higher than 3000 ft. In the Haute Engadine *C. f. macrodactyla* has been observed as high as 5700 ft. In Holland such specimens as have been critically examined belong to *C. brachydactyla*, but *C. f. macrodactyla* has been recorded from Belgium and the mountains of France, and is not uncommon in the Pyrenean forests. In Italy it appears to be confined to the mountainous districts of the north, and in Germany is only met with west of the R. Oder. It is however found throughout Austro-Hungary, and has been recorded from Bosnia and Herzegovina, but not from Montenegro or Bulgaria.

Con-
tinental
Europe.

In nesting habits this race appears not to differ from those already described; but as a rule it does not breed more than about 18 ft. from the ground, while the dimensions of the nest vary according to the size of the cavity.

Nest.

Although according to the older writers as many as 9 eggs were occasionally met with, most modern writers agree in giving the usual number of eggs in the first brood as 5—7, generally 6, and 4—5 in the second. According to Deichler the eggs are as a rule less strongly marked than those of *C. brachydactyla* and not so elongated in shape, but in a large series there is apparently much variation. It is moreover worth noting that in Great Britain, where only one form is found, there is quite as much variety as in a series from Central Europe, where two species occur.

Eggs.

The eggs of the first brood are generally laid in the latter part of April or early in May on the lower ground, and those of the second during June. In some districts eggs are said to have been found at the

Breeding
Season.

* It is not known yet which race inhabits the forests of Denmark.

beginning of April, and in the highest forests of the Alps only one brood is reared, and the eggs are not laid till June.

Measure-
ments.

The series of eggs measured by Bau and Rey may include eggs of other forms or of the next species, and therefore cannot be altogether relied upon. Bau gives the average of 63 eggs as 15.6×11.9 mm., Max. 16.6×12.9 and Min. 14×11 mm: average weight 69 mg. Rey gives the average of 100 German eggs as 15.6×12.1 mm., Max. 16.7×12.6 and 16×13 , Min. 14.6×11 : average weight 68 mg. Abnormal eggs measure 19.7×15.2 (weight 130 mg.) and 6.5×4.5 (weight 45 mg.)

d. Corsican Tree Creeper, *C. familiaris corsa* Hart.

C. familiaris corsa Hart. Hartert, Vög. Pal. Fauna, p. 320.

Breeding Range: Corsica.

Thinly distributed through the coniferous forests among the mountains. A nest found by the writer on May 26 was placed in the dead stump of a pine, and contained 5 eggs, averaging 15.9×12.5 mm., Max. 16.4×12.7 , Min. 15.5×12.3 .

83. Short toed Creeper, *Certhia brachydactyla* Brehm.*

Geographical Races.

a. Mid-European Short toed Creeper, *C. brachydactyla brachydactyla* Brehm.

Egg: Baedeker, Tab. 43, fig. 3.

Foreign Names: Holland: *Boomkruipertje*. (See also under *C. familiaris macrodactyla*.)

Certhia brachydactyla brachydactyla Brehm. Hartert, Vög. Pal. Fauna, p. 323.

Breeding Range: Central Europe (France, the Low Countries, Switzerland, Middle and West Germany, and Austria).

Con-
tinental
Europe.

The exact distribution of this species is still very imperfectly known, owing to the confusion between it and *C. familiaris macrodactyla*. In Germany it is of rare occurrence in the eastern provinces (E. and W. Prussia and E. Pomerania): in the middle and south it is fairly numerous and is the common Creeper in the West, haunting usually the districts wooded with deciduous trees, such as willows, alders and poplars, rather than coniferous woods. All the specimens hitherto obtained in Holland appear to belong to this species, and it is found also in Belgium and in the great plain of France. In Switzerland it is met

* The name should of course be correctly "Short-clawed": there is no difference in the length of the toe between this species and *C. familiaris*.

with on the low ground. and also on the slopes of the Jura up to about 1000 ft., but not higher, and it has also been recorded from Austria.

Usually behind loose bark, but occasionally in holes of buildings, under eaves etc. as in the case of *C. familiaris*. Hartert found a nest near Wesel in a hedge, not far from the ground, in an accumulation of dead leaves, stalks etc., and the late Dr. Kutter knew of a similar instance.

Generally 5 to 7 in number, but as many as 8 to 12 eggs are said to have been found in one nest, probably the produce of two hens.

Deichler (*Journ. für Orn.*, 1896, p. 449) asserts that the eggs are distinguishable from those of the other species by stronger and bolder markings, with a tendency to form a zone at the big end, like miniature eggs of *Hirundo rustica*, whereas the eggs of *C. familiaris* as a rule have the spots fainter and more evenly distributed, something like those of *Parus major*. Probably the comparison of larger series of well authenticated eggs will show that these differences are not constant, but at present the material is insufficient to decide.

Probably similar to that of the other species, but in Switzerland, where it inhabits lower ground, the eggs are naturally laid rather earlier.

Average of 16 eggs (12 by Deichler and 4 by Rey) 16.3×12.3 mm., Max. 16.9×12.1 and 15.9×12.6 ; Min. 15.9×11.9 mm. As far as can be judged from such a small series, the eggs are more elongated in form than in the case of *C. familiaris*.

b. Southern Short toed Creeper, *C. brachyactyla ultramontana* Hart.

Foreign Names: Greece: *Murmikologos*. Italy: *Rampichino*. Portugal: *Trepadeira*. Spain: *Trepatroncos*.

Breeding Range: The Iberian, Italian and Balkan peninsulas.

In the wooded parts of Portugal this bird is a very common resident, and is also found throughout Spain, wherever old timber exists, from the cork oak woods near Gibraltar to the wooded sierras of northern Spain. In Italy it is also a common resident in deciduous woods in the mountains, and in the Balkan peninsula is found in S. Dalmatia, Montenegro, and Albania, breeding generally in the oak forests in the mountains, but also in small numbers in the wooded lowlands (von Führer). In Bulgaria it appears to be scarce, but is common in Macedonia, breeding in the mountains and resorting to the low ground in winter. In Greece it is very scarce, and nests in the highest mountain forests of the Peloponesus, Mid-Greece, and Euboea, but may possibly breed in Corfu.

Very little has been recorded with regard to the nesting habits of this race, which however probably differ but little from those of allied forms. An abnormal nesting site is mentioned by Camusso, in a bank,

Nest.

Eggs.

Breeding
Season.Measure-
ments.Con-
tinental
Europe.

Nest.

between stones placed against it as supports, about 18 in. from the bottom, near Voltaggio in Piedmont.

Eggs etc. The only eggs which I have been able to examine are 3 from Southern Spain, all of which are well marked and decidedly smaller than typical Creepers' eggs, averaging 14.4×11.7 mm. The breeding season in Spain is in April.

c. Cyprian Tree Creeper, *C. brachydactyla dorotheae* Hart.

C. brachydactyla dorotheae Hart. Hartert, Vög. Pal. Fauna, p. 325.
Breeding Range: Troödos Range, Cyprus.

This bird is confined to the Pine forests of the Troödos range, and is not met with lower than about 4000 ft. Guillemard obtained specimens close to the summit (6500 ft.)

[The forests of the mountain region of N.W. Africa are inhabited by the Moorish Tree Creeper, *C. brachydactyla mauritanica* Witherby; while the race which is found in Asia Minor is known as *C. brachydactyla harterti* Hellm.]

84. Wall Creeper, *Tichodroma muraria* (L.).

Pl. 20, fig. 25 (Andermatt, Switzerland, Rey coll.)

Eggs: Thienemann, Fortpfl. Taf. XVII, fig. 9 (errore): Baedeker, Tab. 43, fig. 5; id. J. f. O. 1856, Tab. I, fig. 11. Seebohm, Br. Birds, pl. 18: id. Col. Fig. pl. 54. Dresser, pl. —, fig. 31.

Foreign Names: Bohemia: *Soupálek zedni*. France: *Oiseau papillon*, *Pic de Murailles*. Germany: *Alpen-Mauerläufer*. Greece: *Tso-panákos kókkinos*. Hungary: *Hajnalmadár*. Italy: *Piccio muraiolo*. Poland: *Pomurnik Mentel*. Russia: *Stenolas*. Spain: *Arañero*. *Tichodroma muraria* (L). Dresser, Birds of Europe, III, p. 207; id. Man. Pal. Birds, p. 194. Saunders, Man. p. 119. Hartert, Vög. Pal. Fauna, p. 327.

Breeding Range: The mountain ranges of Central and Southern Europe, from the Tatra and the Alps southward, and from the Estrella Mts. eastward to the Caucasus. [Also in the principal ranges of Asia eastward to Mongolia.]

Con-
tinental
Europe.

Although widely distributed in the more lofty mountain ranges of Southern Europe, the Wall Creeper is nowhere common, and is generally met with singly, or in pairs during the breeding season, on the face of perpendicular rocks, deep gorges, etc. among the mountains. In the Iberian peninsula it is found in the S. Nevada, S. de Antiquera and S. de Gaitán in the south: Lilford met with it in the S. de Guadarráma

and it is also undoubtedly present in the S. de Grédos. It is also said to be resident in the Estrella range (Portugal), and is found generally but not commonly along the Pyrenean Mts., and its outlying spurs, as well as in the Cantabrian Mts. (Picos de Europa etc.). It occurs sparingly in the Vosges, locally in the Jura, and also in the whole of the Alpine system, from the Basses Alpes and the mountains of Savoie (and possibly also in the Cevennes) in the west, through Switzerland and N. Italy to the Tyrol, Carinthia, Styria etc. In Hungary and Galicia it is known to breed in the Tatra and in other parts of the Carpathian Mts. It is not common in the Apennines, and is only found in the higher parts of the range. In the Balkan peninsula it is found in most of the higher mountain systems, from the Transylvanian Alps, Servia, and Bosnia southwards as far as the Parnassus, where one of Krüper's collectors found a nest with young. It is however much less numerous in Greece than in the mountains of Herzegovina, Montenegro, and Bosnia. It has been recorded from Sardinia, and may breed there, as well as in Sicily and on Elba. In the Caucasus it is resident up to about 8000 ft. [In Asia it is found from Palestine and Asia Minor eastward through Persia, Afghanistan, Turkestan etc., to the Himalayas, Tibet and Mongolia. There is no satisfactory evidence of its occurrence in the Atlas, but it is said to have been once met with in Abyssinia.]

Some interesting notes on the breeding habits of this bird are given by Girtanner in the *Verhandl. der St. Gall naturw. Gesells.* for 1864 and 1868, with a coloured plate of the young bird in the nest*, and in the *Orn. Monatsschr.* 1882, p. 274. It is generally placed in a cleft or recess in some precipice or gorge, and is composed chiefly of moss and bits of wool, interwoven with roots, a few grass stalks, and down; while the inner lining is a felted mass of wool and hair of various animals, with occasionally a feather or two or a little fine moss interwoven. The outside diameter is about 6 or 7 in., while the cup measures about 3 or 3½ in. in diameter and 1¼—1½ in. in depth. While incubating the hen is a very close sitter, being fed by her mate, and only leaving the nest once in the day; during the later stages she cannot be dislodged even when the entrance to the nest is struck by a stone (F. C. Keller).

Nest.

Usually 4, but sometimes 5 in. number. They are fine grained, slightly pointed ovate in shape, and are sparsely marked with fine, sharply defined spots and specks of dark reddish or almost blackish brown, chiefly at the big end, on a white ground. The surface of the egg is dull, or only slightly glossy. Some eggs are almost devoid of markings.

Eggs.

* See also a very valuable article by F. C. Keller in the *Zeitschr. für die ges. Ornithologie*, 1885, p. 329.

Breeding
Season.

In the Alps full clutches may be found from the beginning of June to about the 26th of that month, but most eggs appear to be laid between May 28 and June 10. In Carinthia Keller found full clutches from May 25 to June 6.

Measure-
ments.

Average of 31 eggs (13 quoted by Rey and 18 measured by the writer) 20.84×14.85 mm., Max. 22.7×15.7 , Min. 20×14 . (Two eggs in the British Museum, said to have been taken on Mt. Cenis, are smaller than any others I have seen, measuring only 18.7×14 and 18.2×13 mm., and may be the produce of birds kept in confinement.). Rey gives the average weight of 4 eggs as 137.5 mg., varying from 130 to 145 mg., but an egg from S. Spain is said to have weighed only 100 mg. (Hocke).

85. Nuthatch, *Sitta europaea* L.

Geographical Races.

a. British Nuthatch, *Sitta europaea britannica* Hart.

Plate 26, fig. 14 (Surrey, 16. V. 04).

Eggs: Hewitson, I Ed. I, pl. XLIX, fig. 1, 2; II Ed. I, pl. LIV, fig. 2; III Ed. I, pl. LXII, fig. 4. Seebohm, Br. Birds, pl. 12; id. Col. Fig. pl. 54. Frohawk, Br. Birds, I, pl. III, fig. 83, 84. Dresser, pl. —, fig. 39, 40.

Local Names: *Nuthack*, *Nutjobber*, *Mudstopper*, *Woodcracker*, *Jar Bird*. Welsh: *Cnocyll y cnaw*.

Sitta caesia Wolf. Newton, ed. Yarrell, I, p. 473. Dresser, Birds of Europe, III, p. 175 and Man. Pal. Birds, p. 188 (*part.*). Saunders, Man. p. 113. *S. europaea britannica* Hart. Hartert, Vög. Pal. Fauna, p. 332.

Breeding Range: The southern and central counties of England: rare in the north.

British
Isles.

The chief haunts of the Nuthatch are parks and wooded districts, where the timber is allowed to grow to a good size. In localities of this kind it is found throughout the greater part of England and Wales, south of about lat. 55° N., but becomes very scarce or is altogether absent in the extreme west, as in W. Cornwall, Pembroke, the shores of Cardigan Bay, and Carnarvon. It is absent from the Isle of Wight, Anglesea, and the Isle of Man, but has penetrated to the inland counties of Wales, (Montgomery, Radnor, and Brecon) and is not uncommon in Carmarthen. North of lat. 55° the records become very scanty: in Cheshire it is only found in the S. W., it is local and scarce in N. E. Derbyshire, Notts and Lincoln, but occurs in some of the older parks in W. Yorkshire. It is said to have formerly bred in Northumberland,

Durham, and also in Lancashire, and individuals have been obtained in the Lake district and the S. E. borders of Scotland, and it has been recorded as an accidental visitor to Skye.

As a rule the nest is in a hole in a tree trunk, or in some large branch, and is found at varying heights, occasionally not far from the ground. When the entrance is too large it is plastered up by the birds with clay or mud, which sets very hard, and most nests (but not all) show traces of this mud daubing round the hole. The size and depth of the nesting hollow are variable, and the nest itself consists of the laminae of the inner bark of the Scotch fir, or fragments of the outer bark of the silver birch,* as a rule in sufficient quantity to enable the bird to sit close to the entrance hole. When pine or birch bark is not available dead leaves of oak or beech are utilized, and some writers state that dead grass is also met with occasionally. While laying is in progress, the eggs are often scattered and even half buried in the nest lining, but are collected together when incubation begins. The hole is sometimes a natural one: at other times an old woodpecker's nesting place is taken possession of, and several cases are on record where a nest has been found in a hole of a wall. Other abnormal sites are holes in sandbanks or in Sand Martins' burrows, in the foundation of an old Magpie's nest, and in the head of a downpipe from the spouting of a house; while the well known nest from the side of a haystack from East Grinstead which weighed 11 lb., is familiar to visitors to the British Museum. Nest boxes are also readily adopted, the lid being generally plastered down and the bottom of the box being filled up with mud. Starlings frequently dispossess Nuthatches as well as Woodpeckers of their breeding places, but Norgate has on two or three occasions found the mummified remains of Starlings in Nuthatches' nesting holes.†

Nest.

The number of eggs is underestimated by most writers, and varies from 5 to 11, but probably 5 to 8 is the usual clutch, although several instances of 9 and 10 eggs in one nest have been recorded. On May 19, 1906 A. G. Tomlinson found a nest in Berkshire with 14 eggs, but a careful examination showed that some of the eggs were fresh and others addled, so that in all probability the eggs were the first and second layings of the same bird. As a rule the eggs in a clutch are of the same type,** but there is considerable variation in a large series. The normal egg is white, almost devoid of gloss, but not so dull as

Eggs.

* P. H. Bahr counted 1850 pieces of this bark in a single nest (*Br. Birds*, 1907, p. 122).

† *Zool.* 1880, p. 44.

** Exceptions however occur sometimes: A. H. Evans has a white egg in an exceptionally well marked set.

that of *Parus major*, boldly spotted with spots and blotches of dark and light red brown and a few violet shell marks. Sometimes the markings are evenly distributed, but they are generally thicker towards the big end, and sometimes form a zone of confluent blotches. Occasionally a set is met with in which the spots are replaced by fine speckles, while Norgate took a set of 7 white eggs in Norfolk, in which only two showed faint traces of markings.

Breeding
Season.

Early clutches may be taken occasionally in the last ten days of April, but the more usual time is in the first two or three weeks of May, May 1—14 being perhaps the best time. The Nuthatch is apparently a life paired bird, and in some cases at any rate, the eggs of a second brood are laid about the end of June. While incubating the hen sits closely, and by hissing and the use of her powerful beak seeks to deter intruders. The period of incubation is probably about 13—14 days, and a nest under observation by P. H. Bahr was completed in the short space of 4 days.

Measure-
ments.

Eggs of the British race are quite indistinguishable from those of *S. e. caesia*, but are as a rule smaller than those of *S. e. europaea*.

Average of 100 English eggs measured by the writer, 19.2×14.32 mm., Max. 21.5×14 and 20×16 , Min. 16.5×13.5 and 19.1×13.2 mm. Average weight of 7 normal eggs, 130 mg. 12 full eggs average 2.308 g. (R. H. Read).

b. Southern Nuthatch, *S. europaea caesia* Wolf.

Plate 22, fig. 11—15 (Halle à S., Germany).

Eggs: Thienemann, Fortpfl. Tab. XVII, fig. 16, a—b. Baedeker, Tab. 43, fig. 6. Dresser, pl. — fig. 17.

Foreign Names: Denmark: *Nöddekaker*. France: *Torchepot*. Germany: *Kleiber*, *Spechtmeise*. Holland: *Boomklever*. Hungary: *Csuszka*. Italy: *Picchio muratore*. Portugal: *Trepadeira*. Spain: *Trepatroncos*. *Sitta caesia* Wolf. Dresser, *tt. c. (partim)*. *S. europaea caesia* Wolf. Hartert, Vög. Pal. Fauna, p. 331.

Con-
tinental
Europe.

This race is found in the wooded districts of E. Jutland and also on Funen, where according to Winge *S. europaea europaea* also occurs. It is also the representative race throughout Germany, with the exception of E. Prussia, and is most numerous in the deciduous woods of the low ground. Probably the Carpathians form its E. limit in Austro-Hungary, and in the forests of Salzburg, Carinthia, the Danube valley and Transylvania it is not uncommon. In the Vorarlberg Bau met with it breeding up to 3000 ft. In the Balkan Peninsula it occurs in the Dobrudscha, and according to Dresser is very plentiful in the oak woods of Wallachia and Servia. In Montenegro it haunts the mountain forests and has been

met with as high as 7500 ft., and in European Turkey is not uncommon, while in Greece it is resident both in the oak and pine forests north of the Gulf of Lepanto. In Italy and Sicily it is common and sedentary, but is not found on Malta, Sardinia, or Corsica, nor has it been recorded from the Balearic Isles. In Switzerland it is met with not only on the lower slopes, but even in the Haute Engadine, and inhabits the woods of the Low Countries and France. In the chesnut and beech forests of the Pyrenees is also abundant, and either this, or possibly another local race, is found in the principal mountain ranges of the Iberian peninsula (Cantabrian Mts., S. de Guadarrama, Grédos and Estrella, S. Nevada etc.) [Specimens were obtained by Olcese from the hills near Tangier about 1883, and Loche recorded it from Algeria, but recent observers have failed to meet with it.]

In nesting habits this form does not differ from the British race. Nest.
Old holes of the Great Black Woodpecker are not infrequently occupied in Central Europe, and Rey once met with a hole excavated by the bird itself in a very rotten willow trunk. The usual height is between 9 and 18 ft., but exceptionally nests have been found only 1½ ft. above the ground, and 75 ft. high. Notes by Bau in *Z. f. Ool.*, XI, p. 106 (1901).

Generally 6 to 8 in number, less commonly 5 or 9, and indistinguish- Eggs.
able from those of *S. europaea britannica*. A nest with 12 eggs was found by A. Hintz in 1855.

Most authorities are agreed that only one brood is reared in the Breeding
Season.
year, though Girtanner thinks that two broods are sometimes brought off in Switzerland. The breeding season is rather variable. Probably Bau is correct in assuming that the older birds re-occupy the nests of the previous year and lay first, while the younger hens, which have to find and adapt to their needs other sites, breed two or three weeks later. In Wallachia full clutches may be found in the first week of April, while in Germany the usual time is from mid April to late in May in the north, and from April 10 to mid May in the south. In Jutland the first eggs are laid in the last week of April.

A. Bau gives the average of 86 eggs as 19.7×14.4 mm., Measure-
ments.
Max. 21.8×15.1 , Min. 17.6×13.5 mm. Rey gives very similar figures; average of 42 eggs, 19.9×14.6 mm., Max. 22.25×14.5 , and 21.25×15.25 ; Min. 17.5×14.8 . Average weight 135 mg. (Bau); 132 mg. (Rey).

c. *Caucasian Nuthatch, S. europaea caucasica* Rehnw.

S. europaea caucasica Rehnw. Hartert, Vög. Pal. Fauna, p. 333.

Breeding Range: The Caucasus.

Little is known of the distribution or habits of this short-billed

race, except that Radde describes it as a not very numerous resident, haunting the lower deciduous forest region, but occurring also in the birch forest up to nearly 6000 ft. Two nests with eggs were found near Lenkoran on May 7.

[Other allied forms are found in Asia Minor and W. Palestine, (*S. europaea levantina* Hart.), and in the oak forests of S. W. Pessia (*S. europaea persica* Witherby)].

d. Scandinavian or Northern Nuthatch, *S. europaea europaea* L.

Eggs: Baedeker, Tab. 43, fig. 7: Dresser, pl. —, fig. 13.

Foreign Names: Finland: *Pähkinänakkeli*. Norway: *Spetmeise Nödväkke*. Russia: *Popolsen*. Sweden: *Nötväcka*.

Sitta europaea L. Dresser, Birds of Europe, III, p. 169 and Man. Pal. Birds, p. 186. *S. europaea europaea* L. Hartert, Vög. Pal. Fauna p. 329.

Breeding Range: Scandinavia, the Danish Isles and N. Russia.

Con-
tinental
Europe.

In S. Norway it is tolerably common in tracts of deciduous woodland, as far as the highest limits of the hazel and oak, as well as among the birch forests on the west coast, and up to the Gudbrandsdal, south of the Dovrefjeld. In Sweden it is generally distributed, but nowhere very common, in the South up to about lat. 61°; and is also found in Gotland, and in small numbers on Öland. In Denmark it is common on Zealand, Laaland and Falster, and is said to occur also on Fünen. In Russia it is absent from Finland, but is said to have bred near Archangel and to be not uncommon in the Vologda Government. Birds from near Moscow are also described as having pure white underparts, but the limits of this and the next form in E. Europe are not exactly known.

Nest etc.

Apparently similar to that of other races. The eggs number 6 to 8 as a rule, sometimes 9, while clutches of 10 have occasionally been met with. They resemble those of other races.

Breeding
Season.

In Denmark full clutches may be obtained from April 25 to late in May, and about the same time in S. Sweden, but not till May in Norway.

Measure-
ments.

Average size of 52 eggs (22 by Ottosson, 26 by the writer, and 4 by Rey), 20.03×14.92 mm. Max. 21.3×15.2 and 21.1×15.3 , Min. 18.7×14.5 and 19.8×14.2 . Average weight of 22 eggs, 134 mg. (Ottosson, *in litt.*). The eggs of this form, though individually indistinguishable, appear on an average to be slightly larger than those of *S. e. caesia* or *britannica*.

e. Homeyer's Nuthatch, *S. europaea homeyeri* Hart.

S. europaea homeyeri Hart. Hartert, Vögl. Pal. Fauna, p. 330.

Breeding Range: E. Prussia, Russian Baltic Provinces, Poland, Galicia, (? Crimea).

Tolerably common in E. Prussia and in the Russian Baltic Provinces, as well as in Poland and on the plains of Galicia. Probably it is this race which is also found in S. W. Russia and the Crimea, but at present its distribution is not exactly known. Little has been recorded as to its breeding habits, but in the Baltic Provinces it is said to lay 6 eggs at the end of April.

f. **Ural Nuthatch, *S. europaea uralensis* Glog.**

S. europaea uralensis Glog. Hartert, Vög. Pal. Fauna, p. 330.

Breeding Range: The Urals. [Also Siberia].

According to Taczanowski's measurements the eggs appear to be decidedly small: 6 averaging 17.93×13.66 mm., Max. 19×14 , Min. 17.3×13.2 .

86. Whitehead's Nuthatch, *Sitta canadensis whiteheadi* Sharpe.

Plate 26, fig. 15, 16. (Corsica, 26. V. 08, Jourdain.)

Eggs: Ibis, 1885, pl. II. Cat. Eggs Br. Mus., IV, pl. XIV, fig. 15. Dresser, pl. —, fig. 23, 24. Nest: Ibis, 1885, p. 30.

Sitta whiteheadi Sharpe. Dresser, Birds of Europe, IX, p. 133; id. Man. Pal. Birds, p. 190. *S. canadensis whiteheadi* Sharpe. Hartert, Vög. Pal. Fauna, p. 335.

Breeding Range: Corsica.

Nothing has hitherto been recorded with regard to the breeding of this interesting bird beyond the notes by Whitehead in the *Ibis*, 1885, p. 28. The writer however found it not uncommon locally in coniferous forest at 3000 ft. above the sea, breeding in dead and decayed pine trees.

Sometimes an old Great Spotted Woodpecker's nest is used, while at other times the hole is pecked out by the birds in rotten wood at varying heights from 18 to 80 ft. The cavity is lined with strips of the bark of the Mediterranean heath, mixed with moss and a few feathers, so that the sitting bird is almost on a level with the entrance, which is roughly circular. No clay or mud is ever used. As the nest is always in a tree in the later stages of decay, and often at a considerable height, to reach it is often attended with considerable difficulty and danger.

Usually 5 or 6 in number, white, as a rule boldly and thickly spotted and speckled with dark red, chiefly round the big end; but occasionally a set is met with in which the markings are comparatively sparse. They have but little gloss.

Nest.

Eggs.

Breeding
Season.

Whitehead took fresh clutches from May 21 to the end of the month, but in one case I found newly hatched young on May 26, although other nests had fresh eggs on that date. The birds are quite devoid of fear, and approach within a foot or so when the nest is being examined. The cock can generally be called up by an imitation of the hissing sound mentioned by Whitehead, which is the alarm note of this species.

Measure-
ments.

Average size of 31 eggs collected in 1884 and 1908, 17.19×12.94 mm., Max. 18.5×13.3 , Min. 16×12.5 and 16.5×12.1 mm.

87. Krüper's Nuthatch, *Sitta krueperi* Pelz.

Plate 26, fig. 17 (Asia Minor, Krüper).

Eggs: Dresser, pl. —, fig. 19—22.

Sitta krueperi v. Pelz. Dresser, Birds of Europe, III, p. 189; id. Man. Pal. Birds, p. 189. Hartert, Vög. Pal. Fauna, p. 336.

Breeding Range: Asia Minor and the Caucasus.

Con-
tinental
Europe.

Radde received six specimens from Borshom in 1897, and Lorenz records one shot near Kislowodsk in October. [In Asia Minor it is plentiful in the coniferous woods, from near Smyrna eastward to the Taurus, and probably also to the Giaour Dagh*. It occurs among the upper limits of the oak forest, but is most plentiful in the pine belt, and is not uncommon among the cedars and junipers up to the limits of tree growth. Tristram's statement that it occurs in the gorge of the Leontes in Palestine has not been substantiated by specimens.]

Nest.

The nesting hole is usually excavated by the birds in the rotten wood of a dead bough or an old stump, just behind the bark, and can easily be exposed by breaking away the bark by the hand. Occasionally, according to Danford, a deserted Woodpecker's hole is utilized, but there is never any attempt to plaster round the opening with mud or clay. The height from the ground is very variable, usually from 1 to 12 ft., but occasionally as much as 20 ft. high or more. Within the hole there is generally a foundation of filaments of juniper bark, but the lining materials used vary greatly. Some nests are lined with goat's hair, others with fragments of cone seeds, while dry grasses, thistle-down, and fur are also used, and F. C. Selous found one thickly lined with feathers only.

Eggs.

Usually 5, sometimes 6, while 7 have occasionally been found. They are a broad pointed oval in shape, with some little gloss, and are profusely speckled and spotted with brownish red, and lilac shell marks, chiefly towards the big end. In general appearance they are not unlike handsomely marked eggs of *Parus major*. The shell is delicate and fine grained.

* Danford, *Ibis*, 1878, p. 10.

Probably from mid April to the end of the month is the best time for eggs in Asia Minor, but full clutches have been found in the first week in April on lower ground, and higher in the mountains eggs have been taken occasionally late in May.

Breeding
Season.

Average size of 63 eggs (58 measured by the writer and 5 by Rey), 17.14×13.08 mm., Max. 18.3×13 and 17.1×14 , Min. 16×12.7 and 16.3×12.6 mm. According to Rey the average weight is 100 mg.

Measure-
ments.

88. Rock Nuthatch, *Sitta neumayer Michah.*

Plate 23, fig. 18—22 (Smyrna, T. Krüper).

Eggs: Thienemann, Fortpfl. Tab. XVII, fig. 15, a—b. Baedeker, Tab. 43, fig. 8. Dresser, pl. — fig. 25—27.

Foreign Names: Croatia: *Kravarica*. Germany: *Felsen-Kleiber*. Greece: *Tsopanákos*. Montenegro: *Lončar*.

Sitta neumayeri Michah. Dresser, Birds of Europe, III, p. 183; id. Man. Pal. Birds, p. 191. *Sitta neumayer neumayer* Michah. Hartert, Vög. Pal. Fauna, p. 338.

Breeding Range: The Balkan Peninsula, from Croatia, Dalmatia and the Balkans southward to Greece. [Also Asia Minor, probably as far as the Caucasus.]

In Dalmatia this bird haunts the rocky districts at a low elevation, and has been also recorded from Croatia. In Herzegovina it is a well known resident in the Karst region, and in Montenegro it is common along the Adriatic coast and also in the subalpine region. Von Führer found it ranging as high as 5100 ft. It appears to be unknown in the great plains of the Danube valley, but is recorded by Reiser among the Balkans at a height of 6000 ft. on the extreme southern boundary of Bulgaria. It is found in Albania and Macedonia, but Krüper describes it as less common on Olympus than in Greece. It is said to breed on Corfu and is locally common in Greece, especially in Acarnania, but is not found in the Cyclades. Radde describes a Rock Nuthatch as common in the Little Caucasus, up to about 6000 ft., but rare on the S. side of the Great Caucasus. [In Asia Minor it is one of the commonest birds: but in Syria and Palestine it is replaced by a doubtfully distinct pale race, *S. neumayer syriaca* Temm. (Hartert, Vög. Pal. Fauna, p. 338). Other forms occur in Persia and Turkestan.]

Con-
tinental
Europe.

Wherever found this Nuthatch is always a noticeable bird, its rapidly repeated single loud call note attracting attention at once. It is generally met with on rocks or boulder-strewn hillsides, and is very rarely seen on trees. Its remarkable nest is found in caves or on the face of precipitous overhanging rocks, and is as a rule not difficult to

Nest.

find, but occasionally it is built into a natural recess, and is then inconspicuous. It is a solidly built edifice of mud, with chalk stones and bits of dung in places, whose walls vary in thickness from $\frac{1}{2}$ to $1\frac{1}{2}$ in., somewhat irregular in shape, about 8 in. broad across the base and about 24 in. in circumference. The entrance, usually in the middle, is funnel shaped, varying in extreme cases from 1 to 4 in. in length, but generally about $2\frac{1}{2}$ to $3\frac{1}{4}$ in. long, and having an opening about $1\frac{1}{2}$ in. wide. Within these outer walls is placed a thick layer of some soft material such as moss, goats' hair, feathers, thistledown, etc. The exterior surface of the nest is roughened by indentations of the birds' bills, and wing coverts of various species of beetles (*Lydus*, *Chrysomela*, etc.) are often imbedded in the mud.

Eggs.

Usually 8 or 9, but occasionally 7 or even 10 in number. In colour they are pure white, in rare cases quite unmarked, but usually with rust coloured blotches or spots, which are generally more numerous towards the big end. In shape they are very variable, and according to Reiser great differences in shape have been noticed in the same clutch. As a rule they possess more gloss than those of *S. europaea*.

Breeding Season.

In Greece the breeding season extends from the end of March or early in April to the second week in May, but most eggs are laid in the first half of April. In Asia Minor it is rather later, most eggs being laid in the latter half of April or the first days of May, while in the Herzegovina the latter part of May is the usual time. Only one brood is reared in the season, and often the same nest is occupied year after year. When the eggs have been taken, if the damage is slight, the birds will repair the nest and lay again in it a second or even a third time, but on the other hand one pair has been known to construct two nests in a season, only using one for breeding purposes. When incubating the hen sits very closely and may easily be taken on the nest.

Measurements.

Average of 100 eggs (49 by the writer, 33 by Rey, and 18 by Bau), 20.6×15.25 mm., Max. 23×16.5 , Min. 18.5×14.5 and 19×14.25 mm. Seebohm states that the smallest eggs are scarcely larger than those of the House Martin! Average weight according to Rey, 156 mg., but Bau gives 164 mg. (varying from 148 to 175 mg.) as the average of 18 eggs.

PARIDAE.

89. Great Tit, *Parus major* L.

Geographical Races.

a. British Great Tit, *P. major newtoni* Praž.

Eggs: Hewitson, I Ed. I, pl. LXXXI, fig. 1, 2; II Ed. I, pl.

XXXI, fig. 1; III Ed. I, pl. XXXIX, fig. 1. Seebohm, Br. Birds, pl. 9; id. Col. Fig, pl. 53. Frohawk, Br. Birds I, pl. II, fig. 71—72.

Local Names: *Tom Tit*, *Oxeye*, *Blackcap*, *Billy Biter*, *Bee-eater*, *Nope*, *Saw Sharpener*; *Hickmall* or *Hackmall* (Devon).

Parus major L. Newton, ed. Yarrell, I, p. 479; Dresser, Birds of Europe, III, p. 79 and Man. Pal. Birds, p. 161 (*partim*); Saunders, Man. p. 103. *P. major newtoni* Praž. Hartert, Vög. Pal. Fauna, p. 343.

Breeding Range: The British Isles.

This well known bird is common and generally distributed throughout England und Wales, with the exception of the moorlands and higher mountains. It is also common in the Isle of Man, and in the south of Scotland, but becomes scarce in the north and probably rarely, of ever, breeds north of a line drawn from Gairloch to Dingwall, although it has been recorded as a straggler to Sutherland, Caithness, the Orkneys and Shetlands. In the west it breeds in the wooded districts of the Inner Hebrides, Islay, Jura, Mull, etc., and probably also on Skye, but is absent from the Outer Hebrides. In Ireland it is a common resident, breeding in every county, but avoiding the moors and boglands.*

British
Isles.

Although frequently breeding in the neighbourhood of houses, the Great Tit is a decidedly cautious bird, and always avoids observation as much as possible while visiting the nest. After the young are hatched their noisy cries soon disclose its position. The commonest sites are holes in trees or walls, at varying heights, sometimes only an inch or two from the ground or actually in it (*Zool.* 1874. p. 4076, 1884, p. 229, etc.), but generally a few feet above it. When natural holes are scarce, all kinds of artificial openings are utilized: nesting boxes are readily adopted, and letter boxes, pumps, inverted flower pots, beehives, holes in ironwork or statuary, and old tin cans have all been made use of from time to time. Stevenson records nests on the shelf of a three cornered cupboard, and Ralfe one inside an old cannon's mouth. In rocky districts it is not unusual to find this bird breeding in holes and crannies of cliffs, while other cases have been recorded where the nest has been built among the foundations of old Squirrels' dreys and old or even occupied nests of Crow, Rook, Magpie or Sparrow Hawk, and it has been known to breed in a Kingfisher's hole (*Zool.* 1895, p. 71.) All the sites mentioned above are however covered or roofed in to some extent, yet occasionally it has been known to reline the nest of some other bird, generally a Blackbird, Thrush, or Hedge Sparrow. An open nest of this kind is figured in Nelson's *Birds of Yorkshire*, p. 110.

Nest.

* Macpherson records an instance of this species pairing in a wild state with *P. caeruleus obscurus* (*Vict. Hist. of Cumberland*, I, p. 184.

The foundation of the nest consists chiefly of moss with a few bents and roots. On this is placed a thick layer of felted hair or rabbits' fur and a depression is made in it, usually at one side and not in the middle, in order to contain the eggs. While laying is in progress some of the hair is pulled over the eggs and to a casual glance the nest looks unfinished and empty. The bulk of the nest is very variable, depending on the size of the cavity. Approximate diameter of cup $2\frac{3}{4}$ in., depth $1\frac{3}{4}$ in. Montagu states that the eggs are sometimes laid on chips at the bottom of a hole in a tree without any nest.

Eggs. The usual number of eggs varies from 7 to 11, but I have seen 6 eggs much incubated, and have known of several instances of 12 and 13 eggs, while A. W. Johnson and S. Lewis have found nests with 14, Coward records one with 15, and Bucknill one with 17, which latter was probably the produce of two hens. Occasionally the eggs of some other hole-breeding species, such as the Redstart, may be found in the same nest, probably when the Tit has ejected the Redstart: and the two species have also been known to breed side by side. The typical egg is white, with very little gloss, marked sometimes sparingly and at other times richly, with spots or small blotches, and a few fine speckles, of two shades of reddish brown. Sometimes the underlying spots are almost violet-brown in colour. A clutch of pure white eggs has been taken in Hampshire.

**Breeding
Season.**

The Great Tit is a life paired bird, and by far the greater number of our residents only rear one brood in the year, as can easily be proved by any one who will take the trouble to put up a good supply of nesting boxes. Occasionally however, as in the case of some other birds, a second brood is reared, but in one instance of the kind, where I had the birds under observation, some, of not all, of the young of the first brood were killed soon after leaving the nest. The first eggs are laid about the end of April or the beginning of May, and fresh clutches may be taken till about the end of the month, but the best time is about the second or third week of May in the Midlands. When a second brood is reared the eggs are laid in the latter half of June. An instance of winter breeding is recorded in the *Birds of Hampshire*, p. 38. The hen sits very closely and often refuses to leave the nest unless forcibly removed, hissing, making a curious noise by the expulsion of air at intervals, and using her sharp beak with effect. Incubation lasts 14 days (W. Evans); 12—13 days (Steele-Elliott, *Zool.* 1900, p. 424).

**Measure-
ments.**

Average of 100 English eggs measured by the writer, 17.98×13.51 mm., Max. 20.5×13.4 and 17.8×14.7 ; Min. 16×12.6 and 18.5×12.5 mm. Average weight of 20 eggs, 104 mg. Average weight of 26 full eggs, 1.677 g. (R. H. Read); of 8 eggs, 1.843 g. (N. H. Foster).

b. Continental Great Tit, *P. major major* L.

Plate 20, fig. 1—4 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 2, a—c. Baedeker, Tab. 43, fig. 9. Taczanowski, Tab. LXIV, fig. 1. Dresser, pl. —, fig. 25—28.

Foreign Names: Bohemia: *Sjenica velika*. Denmark: *Musvitmeise*. Finland: *Talitiainen*. France: *Mésange charbonnière*. Germany: *Kohlmeise*. Holland: *Koolmees, Plakker*. Hungary: *Széneczinege*. Italy: *Cinciallegra*. Norway: *Kjodmeise, Talgite*. Poland: *Sikora bogatka*. Portugal: *Chapim*. Russia: *Sinitza kusnetschik*. Sweden: *Talgoxe, Talgmes*. Spain: *Santa Cruz, Carbonero. Parus major* L. Dresser, *t. c. (part.) P. major major* L. Hartert, Vög. Pal. Fauna, p. 341.

Breeding Range: Continental Europe, from the Arctic Circle to the Mediterranean, except Greece [Also W. Siberia to the Altai].

The range of this widely distributed bird extends over nearly the whole of Europe. In Norway it is common up to lat. 64°, and breeds sparsely up to the Arctic circle, while in Sweden it is found commonly up to Norrland, and less frequently in the coniferous forests of S. Lapland. In Finland it is also numerous and is recorded as common in the Vologda government, but is only a straggler to the high North, although it has occurred on the Varanger Fjord. Over the whole of Middle Europe it is found commonly wherever trees exist, but in the subalpine regions it becomes scarce. Southward it is found in all the wooded parts of the Iberian peninsula* and also in Italy, but is replaced by *P. m. corsus* in Corsica and Sardinia. In the Balkan peninsula it is perhaps less common than in other parts of Europe, and is chiefly met with in the hills, but the race inhabiting the plains of Greece has been described as distinct. [In Asia it is found apparently from W. Siberia to the Altai range.]

Con-
tinental
Europe.

What has already been written with regard to the British form of this bird applies equally well to the continental race. Leverkühn and others have recorded many instances in which the eggs of this bird have been found in the same nest with those of other species, such as the Blue Tit, Redbreast, Pied Flycatcher, Tree Creeper and Roller. (See *Fremde Eier im Neste*, p. 105, and *Zeit. f. Ool.*, VI, p. 13.). In E. Prussia Hartert found it breeding in Woodpeckers' holes.

Nest.

Usually 10—12 in the first brood and 6—8 in the second, but clutches of 14 (Kollibay), 15 (Herold, *J. f. O.*, 1888, p. 435, and Wüstnei and Clodius) and even 16 (Fatio) are said to have been found. They

Eggs.

* Whitaker (*Birds of Tunisia*, p. 135) attributes Spanish and Italian birds to *P. m. excelsus* Buv.

resemble those of the British race, and show considerable variation in a large series, some clutches being white or nearly so, and others boldly and handsomely marked. The eggs from one nest are generally much alike. Most S. Spanish eggs are exceptionally richly marked, rivalling Greek eggs in appearance.

Breeding
Season.

Apparently two broods are usually reared on the Continent, the second nest being at no great distance from the first. In S. Spain the first eggs may be found about April 10, while in Germany the usual time is about the end of April or the beginning of May, and the eggs of the second brood are found in June, but exceptionally eggs have been met with early in April. In the Baltic Provinces they are not laid till the second half of May, but in the milder climate of W. Norway from the end of April onward.

Measure-
ments.

Bau gives the average of 124 eggs from Central Europe as 17.2×13.4 mm., Max. 19.7×14.7 , Min. 16×12 mm. and Rey's average of 50 German eggs agrees closely: average 17.3×13.5 mm., Max. 19.6×13.3 and 17.6×14.8 , Min. 16.4×12.9 and 17×12.6 mm. Spanish eggs are almost exactly similar in size. Bau gives the average weight as 105 mg., and Rey as 95.5 mg.

c. Corsican Great Tit, *P. major corsus* Kleinsehm.

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 4, a—b (*as P. lugubris*).
P. major corsus Kleins. Hartert, Vög. Pal. Fauna, p. 343.

Breeding Range: Corsica and Sardinia.

A common resident in both islands.

The eggs are 7—9 in number and vary much in markings. They are laid in the second or third week of May. Average of 40 collected by the writer, 17.82×13.76 mm., Max. 18.7×13.7 and 17.3×14.5 , Min. 17×13.3 and 17.2×13.2 .

d. Greek Great Tit, *P. major peloponnesius* Parrot.

P. major peloponnesius Parrot. *J. f. O.*, 1905, p. 547. *P. major aphrodite* Mad. Hartert, *t. c. (part.)*

Breeding Range: Greece.

This small form has only recently been described by Dr. Parrot, but is apparently barely distinguishable from the next race. In Greece it is common in the plains, and breeds not only on the mainland, but also in Corfu and the Cyclades. The first eggs, 8—9 in number, are found at the beginning of April, but they may be obtained till late in May or early in June. They resemble those of other forms, but some are very freely and handsomely marked. Reiser gives the Max. of 31 eggs as 18.7×13.7 mm., weight 210 mg.; Min. 16.4×12.5 , weight 175 mg. A clutch of 9 in the British Museum averages 18.16×13.46 mm.

e. Cyprian Great Tit, *P. major aphrodite* Mad.

P. major aphrodite Mad. Hartert, Vög. Pal. Fauna, p. 344 (*part.*)

Breeding Range: Cyprus.

Not uncommon where trees are to be found. Guillemard obtained one near Kikko Monastery, at 4000 ft., and Glaszner found it breeding early in May. Two nests, each with 7 eggs, found by him were placed in a nest of *Hirundo rufula* on a cliff, and in a hole of a wall. Eggs all brightly marked, but most of them show purplish grey underlying markings in addition to the usual reddish brown spots. Average of 13 eggs (Hartert *in litt.*), 18.07×13.6 mm., Max. 18.5×14 , Min. 17.7×13 .

[Some form of Great Tit is also resident in Asia Minor and Crete; while in the wooded districts of N. W. Africa the representative form is *P. major excelsus* Buvry, and *P. m. blanfordi* Praž. is found in Palestine and Persia.]

90. Blue Tit, *Parus caeruleus* L.

Geographical Races.

a. British Blue Tit, *P. caeruleus obscurus* Praž.

Eggs: Hewitson, I Ed. I, pl. LXXVI, fig. 1; II Ed. I, pl. XXXI, fig. 2; III Ed. I, pl. XXXIX, fig. 2. Seebohm, Br. Birds, pl. 9; id. Col. Fig. pl. 53. Frohawk, Br. Birds, I, pl. III, fig. 78—81. Dresser, pl. —, fig. 45—48 and pl. —, fig. 41.

Nest: O. Lee, III, p. 70.

Local Names: *Tom Tit*, *Blue Cap*, *Billy Biter*, *Pickcheese*, *Maup*. Welsh: *Pela glas bach*, *Yswidw Mawr*.

Parus caeruleus L. Newton, ed Yarrell, I, p. 483. Dresser, Birds of Europe, III, p. 131 and Man. Pal. Birds, p. 177 (*part.*) Saunders, Man. p. 109. *P. caeruleus obscurus* Praž. Hartert, Vög. Pal. Fauna, p. 348.

Breeding Range: British Isles.

In most parts of England this bird is very generally distributed, and is the commonest Tit in many districts, although outnumbered in others by the Great Tit. A few pairs are resident in the Isle of Man, while in Scotland, though it is said to have bred in every county, it becomes scarce in the extreme north, but has bred in E. Sutherland and Caithness. It is also a resident in small numbers in Skye, but not on the outer Hebrides, although it is known to inhabit the larger wooded islands of the Inner Hebrides, such as Jura, Mull, etc. To the outlying islands it is only a scarce straggler. In Ireland Ussher describes it as the commonest and most widely spread of the Tits, breeding in every county.

British
Isles.

Nest. This is generally placed in a hole of a tree or wall, and the opening is as a rule much smaller than that of *P. major*, while the height from the ground is very variable. In one or two cases this bird has been known to breed in a hole in a bank or gravel pit (*Zool.* 1874, p. 4034, 1879, p. 219, etc.). At other times it nests in any suitable hole or cranny in pumps, letter boxes, old water cans, railings, gate posts, street lamps (where I have seen the old birds feeding their young within an inch or so from the gas jet), or inverted flower pots, and even in the crown of a cabbage plant (*Zool.* 1875, p. 4291). An empty earthenware bottle is known to have been occupied almost annually for nearly 100 years (Yarrell, ed. Newton, I, p. 486). Near Ludlow a nest was found in a fire hydrant in the ground in 1900: Ussher describes another in a human skull in the wall of a ruined church; and a third was placed in the body of a dead Redwing in an apple tree (*Birds of Devon*, p. 35). Several instances in which the nest has been built within that of some other species are on record: it is known to have built an open nest in that of a Blackbird at least three times, three times in old Thrushes' nests, once in a Greenfinch's nest, and twice if not more, in Hedgesparrows' nests, in each case inserting a new lining of wool, hair, etc. G. D. Rowley also records an open nest on the bough of a fir tree (*Orn. Misc.* I, p. 73). Old holes of the Pied Flycatcher are also sometimes occupied, and this species has been known to breed in the foundation of an occupied Rook's nest (*Zool.* 1876, p. 4749). The size of the nest of course depends much on the capacity of the hole. The foundation consists chiefly of moss and dead grass, lined with wool and hair in varying proportions, and almost always many feathers. The eggs are generally covered up before incubation begins.

Eggs. The number of eggs laid is very variable. The usual number is from 7 or 8 to 12, but occasionally much larger numbers are met with. Three birds have been observed in attendance at one nest (as in the case of the Long tailed Tit), and there is little doubt that the exceptionally large clutches, from 17 to 20 and even 24 in number (Nelson, *Birds of Yorkshire*, p. 113), are the produce of two hens. In colour they are white, with little or no gloss, occasionally quite unmarked, but usually finely spotted or speckled with light chesnut brown. The markings show a distinct tendency to form a zone or cap at the big end.

Breeding Season. As with the Great Tit only one brood is reared as a rule, and the first eggs are laid at the end of April in the south, or during the first fortnight of May in the Midlands, while it is rare to meet with fresh eggs after the beginning of June. I have never known an instance of two broods being reared by one pair of birds, but as this does occasionally happen in the case of the Great Tit, it is possible that Dixon's

statement may be true in exceptional cases, though it is certainly not the rule. The hen sits even more closely than *P. major* and makes use of the same means to deter intruders. Incubation lasts 13—14 days (W. Evans). When feeding their young the parents have been observed to visit the nest 43 times in half an hour (*Birds of Cheshire*, p. 58).

Average size of 100 British eggs measured by the writer, 15.34×11.89 mm., Max. 16.8×12 and 16.5×12.5, Min. 14×11.8 and 14.3×11.2 mm. Dwarf eggs measure 9×7.4 (Durham, A. W. Johnson) and 9.7×8.5 (R. H. Read). Average weight of 20 eggs, 70.4 mg; 19 full eggs average 1.064 g. (N. H. Foster).

Measure-
ments.

b. Continental Blue Tit, *P. caeruleus caeruleus* L.

Plate 20, fig. 5—8 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 3, a—c. Baedeker, Tab. 43, fig. 11.

Foreign Names: Bohemia: *Modřínka*. Denmark: *Blaameise*, *Blaakop*. Finland: *Sinitiainen*. France: *Mésange bleue*. Germany: *Blau-meise*. Holland: *Pimpelmees*. Hungary: *Kék czinege*. Italy: *Cinciarella*. Norway: *Blaameise*. Poland: *Sikora modra*. Portugal: *Megengro*. Russia: *Sinitschka lasorewka*. Sweden: *Blåmes*. Spain: *Hererrillo*.

Parus caeruleus L. Dresser, l. c. (*partim*). *P. caeruleus caeruleus* L. Hartert, Vög. Pal. Fauna, p. 347.

Breeding Range: Continental Europe, from 64° in Scandinavia and 60° in N. Russia, but Spanish birds closely approach the Corsican and Sardinian form.

This race is generally distributed over the greater part of the Continent, haunting chiefly deciduous woods on low ground, and becoming scarce in coniferous woods and in alpine regions. In Scandinavia its northern limits extend in Sweden up to about lat. 61° N, and in Norway along the W. Coast up to lat. 64°. In Russia it is not found N. of lat. 60° in the E., but occurs in S. Finland and the Olonetz government, and is said to have been obtained near Archangel. Southward its limits extend to the Mediterranean, but probably the birds from the Iberian peninsula will prove to belong to a distinct race. In Italy and to some extent in Greece, it haunts the wooded mountain sides rather than the plains, but is resident in Corfu and the Cyclades. [Also found in Asia Minor and in Crete.

Con-
tinental
Europe.

In nesting habits it resembles *P. caeruleus obscurus*. Where holes are scarce it has been known to breed in old Magpies', Crows' and Squirrels' nests, and Bau found a nest in a Sand Martin's hole (*J. f. Orn.* 1871, 236), while Leverkühn records one built over a deserted Hoopoe's nest.

Nest.

- Eggs.** The normal clutch varies from 8 to 11, occasionally 12 or 13, in the first brood, and 6 to 8 in the second. They are indistinguishable from those of other races.
- Breeding Season.** In Scandinavia, near the N. limit of this bird, the first eggs are laid in mid-May, but in the S. from the latter part of April to the beginning of May. In Germany the eggs of the first brood should be looked for at the end of April or early in May, and the second brood in June or July. In Carinthia the season is rather earlier; from mid April to May, and Keller once met with fledged young on May 4, while in Greece Reiser noticed a bird slip into its nesting hole on March 4.
- Measurements.** Average of 72 eggs measured by Bau, 15.3×11.7 mm., Max. 16.9×12.1 , Min. 14×10.5 . Rey gives the average of 44 eggs as 15.4×11.9 mm., Max. 17×12 , Min. 14.3×11.7 and 15.5×11.5 . L. v. Boxburger records an egg 15.2×12.8 . Average weight, 73 mg. (Bau); 69.7 mg. (Rey).

c. Corsican Blue Tit, *P. caeruleus ogliastrae* Hart.

P. caeruleus ogliastrae Hart. Hartert, Vög. Pal. Fauna, p. 349.

Breeding Range: Corsica and Sardinia.

On Corsica this race is tolerably common, and full clutches of 7—8 eggs may be taken from May 10—16 in the low ground, and later in the hills. Average of 18 Corsican eggs: 15.06×11.87 mm., Max. 16×12 and 15.2×12.3 ; Min. 14.3×12.3 and 15×11.4 . It is also fairly common in the mountains in Sardinia during the breeding season, but not in the plains.

d. Pleske's Tit, *P. caeruleus pleskii* Cab.

Egg: Dresser, pl. —, fig. 36.

P. caeruleus pleskii Cal. Hartert. Vög. Pal. Fauna, p. 351.

Breeding Range: Unknown. Occurs in N. and E. Russia in winter.

The breeding grounds of this race probably lie E. of those of *P. caeruleus caeruleus*, perhaps in the Northern Urals or in N. E. Russia. Dresser has a clutch of 3 eggs ascribed to this race which was taken by Dr. Komar in Vologda on May 30, 1901. Measurements of 2 eggs: 15×12 and 15.2×11.5 . [From Marocco to Tunis the resident form is the Ultramarine Tit, *P. caeruleus ultramarinus* Bp. (Eggs figured by Baedeker, Tab. 43, fig. 12 and *J. f. O.* 1856, Taf. II, fig. 14; Dresser, pl. —, fig. 1—3.). It is common N. of the Atlas, breeding in April and May in old Bee-eaters' holes, etc., and laying 4—8 eggs Average of 13 eggs (5 measured by Rey and 8 by the writer), 16.1×12.25 mm., They are as a rule more heavily marked than European eggs. In the

Canarian group no fewer than four distinct forms are found, viz., *P. c. degener* Hart., which inhabits Fuertaventura and Lanzarote, nesting in holes in the ground: *P. c. teneriffae* Less. in Tenerife, Gran Canaria and Gomera, whose eggs, 4—6 in number (figured in Cat. Eggs. Br. Mus. IV. pl. XIV, fig. 6) are spotted, chiefly at the big end, with dark brown; average size of 39 eggs (2 by König and 37 by the writer), 15.61×12.4 mm., Max. 17×12.4 and 16.3×13 , Min. 14.5×12.1 and 14.7×11.7 mm; *P. c. ombriosus* M-Waldo on Hierro, and *P. c. palmensis* M-Waldo in the pine woods of Palma.]

91. Azure Tit, *Parus cyanus cyanus* Pall.

Geographical Races.

a. Western Azure Tit, *P. cyanus cyanus* Pall.

Eggs: Dresser, pl. —, fig. 6.

Parus cyanus Pall. Dresser, Birds of Europe, III, p. 143 and Man. Pal. Birds, p. 175. *P. cyanus cyanus* Pall. Hartert, Vög. Pal. Fauna, p. 352.

Breeding Range: Eastern Russia [Probably also W. Siberia].

According to Menzbier this bird is extending its range in a southern and south-westerly direction. Lorenz records it as breeding in the Moscow government in small numbers, although unknown there 40 years ago. In the Urals Sabanaeff describes it as a plentiful resident. Eastward the exact limits of this and the Eastern form are not yet clearly defined.

Con-
tinental
Europe.

Dresser describes a nest from the S. Ural as composed of green moss, intermixed with cowhair and lined with white hare's fur.

Nest.

White, sparsely spotted with dull red, chiefly at the big end. Sabanaeff took a nest with 4 eggs on May 29, 1869.

Eggs.

Three eggs in Dresser's collection measure 16×12 , 16.1×11.7 and 16.2×11.7 .

Measure-
ments.

b. Eastern Azure Tit, *P. cyanus tianschanicus* (Menzb.)

Plate 20, fig. 13—16 (Amur).

Eggs: J. f. O. 1873, Tab. I, fig. 14. Cat. Eggs. Br. Mus. IV, pl. XIV, fig. 5. *P. cyanus tianschanicus* (Menzb.). Hartert, Vög. Pal. Fauna, p. 353.

Breeding Range: E. Siberia, W. to Turkestan, S. to Yarkand. Has occurred in Europe in winter. Of the nesting habits of this race we have more information than of the Western form. Dybowski describes it as breeding in old willows by river banks, rarely in old Woodpeckers' holes, and generally at a height of 18 in. to 3 ft. from the ground. The nest is built of the fur of the White Hare and Squirrel, together with a little grass. The Eggs are 10—11 in number, with scanty pale red

spots at the big end, and are found about May 20—26 in E. Siberia. While laying is in progress the hen covers the eggs when leaving them, and sits as closely as other *Pari*. Average measurements of 15 eggs (5 by Dybowski, 5 by Rey, 2 by Hartert and 3 by the writer), 16×11.84 mm., Max. 18.5×12.5 , Min. 15.1×12 and 15.5×11 mm. Average weight of 5 eggs, 74 mg. (Rey).

92. Coal Tit, *Parus ater* L.

Geographical Races.

a. British Coal Tit, *P. ater britannicus* Sh. & Dress.

Eggs: Hewitson, I Ed. I, pl. LXXXI, fig. 3; II Ed. I, pl. XXXI, fig. 4; III Ed. I, pl. XXXIX, fig. 4. Seebohm, Br. Birds, pl. 9; id Col. Fig. pl. 53. Frohawk, Br. Birds, I, pl. III, fig. 73—75. Dresser, pl. —, fig. 31—34.

Local Names: *Little Blackcap*, *Coalhood*, *Ground Tit*. Welsh: *Penloyn*.

Parus ater L. Newton, ed. Yarrell, I, p. 489; Saunders, Man. p. 105. *P. britannicus* Sh. & Dr. Dresser, Birds of Europe, III, p. 93; id. Man. Pal. Birds, p. 165. *P. ater britannicus* Sh. & Dr. Hartert, Vög. Pal. Fauna, 357.

Breeding Range: British Isles*, but absent from the Orkneys, Shetlands, and Outer Hebrides.

British
Isles.

The earlier writers on British ornithology describe this species as rarer than the Marsh Tit, but at the present time it is in most districts the commoner of the two, and in some parts of Scotland and Ireland quite outnumbers the other Tits. Probably this is due to the increase in plantations of conifers, which have a special attraction for this bird. It breeds in every county in England, and though somewhat local, is on the whole common throughout Scotland as far as Sutherland, but is rare in Caithness. On the W. coast it is common on Raasay and in the woods of Skye, and is found on the better wooded islands of the Inner Hebrides, Eigg, Mull, Jura, etc., but not in the Outer Hebrides. It occurs in the Isle of Man. and is common in Ireland, breeding, according to Ussher, in every county.

Nest.

Generally a hole in a tree or stump is chosen within a short distance of the ground; sometimes in a mouse or mole run at the foot of some decayed old root, descending to a depth of one or even two feet below the ground level, or in a bank side. It is also said to have been found in a rabbit hole, and on two occasions I have found nests in holes in the steep banks of gravel pits and once in a fissure of rock. Harvie

* Birds from the Spey Valley and the N. of Scotland show a tendency to approach the Continental form.

Brown records one in a crack on a dry hill of peat by a burn in Sutherland, and has seen others in the ground under fallen foliage etc. Holes in stone or brick walls or stone faced banks are occasionally used, as well as nesting boxes.* In fir woods where holes are scarce, the Coal Tit has been known to excavate a hole in an old Magpie's or Squirrel's nest (Nelson, *Birds of Yorkshire*, p. 110); and it has been recorded as breeding in an old Thrush's nest (*Zool.* 1896, p. 375). F. Bond described an abnormal nest, something like a Long-tailed Tit's, on a branch of a fir tree, close to the bole (*Zool.* 1861, p. 7444) and similar cases have been recorded of other species (Cf. Irby, *Orn. Straits Gibraltar*, 2 Ed. p. 72, and *Annals Scot. Nat. Hist.* 1898, p. 180). The foundation of the nest consists of moss, upon which is placed a thick layer of felted wool and hair, generally rabbit's fur. As a rule no feathers are used, but Borrer and others have found nests freely lined with feathers. Such cases must however be quite exceptional.

The number of eggs is understated by most writers. The usual clutch varies from 7 or 8 to 11, and sets of 9—10 are quite common, while 13 have been found. Hancock (*Cat. Birds Northumberland etc.*, p. 76) mentions an instance where 21 were discovered in one nest, but these were of two types and were almost certainly laid by two hens. While laying is in progress the eggs are covered in the absence of the hen bird. Eggs.

The first eggs are laid about April 20 in the S. of England, but in the Midlands and North full clutches may be found after the first week in May. The sitting bird behaves like the other Tits, hissing, puffing, and sitting until lifted from the eggs. I think that only one brood is reared as a rule. Breeding Season.

Average size of 100 English eggs, measured by the writer, 15×11.63 mm., Max. 16.1×11.9 , and 15.1×12.1 , Min. 13.8×10.7 mm. Average weight of 20 eggs. 67 mg. 9 full eggs weigh 1.415 g. (N. N. Foster). Measurements.

b. Continental Coal Tit, *P. ater ater* L.

Plate 20, fig. 9—12 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 6, a—b. Baedeker, Tab. 43, fig. 10.

Foreign Names: Bohemia: *Sýkora uhelníček*. Denmark: *Sortmeise*. Finland: *Mustatüainer*. France: *Mésange noire*. Germany: *Tannenmeise*. Holland: *Zwarte mees*. Hungary: *Fenyves czinege*. Italy: *Cincia mora*. Norway: *Kulmeise*, *Sortmeise*. Poland: *Sikora sosnowka*. Russia: *Sinica černaja*. Sweden: *Svartmes*. Spain: *Herrerillo*, *Garrapinos*.

* A nest in a box on a window ledge 25 ft. from the ground, is recorded in the *Zool.* 1882, p. 234.

Parus ater L. Dresser, *t. c* (part.). *P. ater ater* L. Hartert, Vög. Pal. Fauna, p. 356.

Breeding Range: Continental Europe, except in the S. E. (Crimea and S. Caucasus).

Continental Europe. This form is somewhat locally distributed over almost all Continental Europe, haunting coniferous forests almost up to the tree limit, and in the southern part of its range avoiding the plains altogether during the summer months. Along the W. coast of Scandinavia it is found breeding up to the Arctic circle, but in Sweden does not range farther N. than lat. 64°. It is found in S. Finland, and has occurred N. of the Vologda government, but only as a rare straggler. Southward it is met with wherever extensive coniferous woods are found, as far as the Mediterranean, and in Switzerland has been known to range as high as 5400 ft.

Nest. Similar to that of the British form. It is placed in a natural hole, sometimes in a deciduous tree at the edge of a pine forest, or, as holes are scarce in conifers, in a mouse or mole run in the ground, and occasionally in a wall. Collett found a deserted nest in a Sand Martin's hole in Norway.

Eggs. The first clutch usually consists of 8 to 11 eggs, and the second of 6 to 8; but 12, and on one occasion 14 (Baltic Provinces, J. v. Gernet) have been recorded. They resemble those of *P. a. britannicus*.

Breeding Season. Two broods are frequently reared, except in subalpine districts, where the season is later. In Germany from mid April onward and towards the end of June, while in Scandinavia few eggs are laid before the end of April and early May. Definite information from southern Europe is scanty, but Krüper obtained eggs in Greece from May 23 to June 12 in the mountains.

Measurements. Average of 105 eggs (55 by Bau, 44 by Rey and 6 by the writer, from Mid-Europe) 14.77×11.60 mm., Max. 16.5×12.0 , Min. 13.5×10.5 mm. Average weight, 63 mg. (Bau), 65 mg. (Rey).

c. Sardinian Coal Tit, *P. ater sardus* Kleinsch.

P. ater sardus Kleinsch. Hartert, Vög. Pal. Fauna, p. 358.

Breeding Range: Sardinia. (Corsican birds apparently do not belong to this race. Cf. Hartert *t. c.*)

The resident Sardinian Coal Tit is confined to the mountain forests, where it is scarce (Brooke). Apparently the Corsican bird is a late breeder, as nests were still empty at the end of May.

d. Cyprian Coal Tit, *P. ater cypriones* Dress.

P. cypriones Dress. Dresser, Birds of Europe, IX, p. 123 and Man. Pal. Birds, p. 165. *P. ater cypriones* Dress. Hartert, Vög. Pal. Fauna, p. 359.

Breeding Range: Cyprus.

This dark race is found in the pine forests in the mountains and must be numerous in the Troödos range, where Glaszner found it nesting in May in stone heaps, holes of walls etc.

Eggs 5, rather thickly spotted and blotched with reddish brown or maroon, especially at the big end, where they form a zone. Average size of 12 eggs (9 by Hartert *in litt.* and 3 by the writer), 16.13×12.6 mm., Max. 18.4×12.6 and 18×13.2 , Min. 14.8×12.5 and 15.5×12 .

e. Crimean Coal Tit, *P. ater moltchanovi* Menzb.

P. ater moltchanovi Menzb. Hartert, Vög. Pal. Fauna, p. 360.

Breeding Range: Mountain forests of the S. Crimea.

f. Caucasian Coal Tit, *P. ater michalowskii* Bogd.

P. ater michalowskii Bogd. Hartert, Vög. Pal. Fauna, p. 360.

Breeding Range: S. Caucasus.

Resident in the mountain forests up to the tree limit. Eggs 8, laid in May.

[In N. Africa two races are found, *P. ater atlas* Meade-Waldo, which inhabits the forest region of the Maroccan Atlas from about 6000 ft. up to the tree limit, and *P. ater ledouci* Malh. which is resident in the forests of cork oak and Aleppo pine in northern Algeria and Tunis, breeding in holes in the ground early in April and laying 8—9 eggs. Eggs figured by Dresser, pl. —, fig. 35. Average size of 9 eggs taken on April 7, 15.1×12.1 mm., Max. 15.5×12.1 , Min. 14.5×12 . *P. ater phaenotus* Blanf. is resident in Persia and S. Transcaspiä.]

93. Crested Tit, *Parus cristatus* L.

Geographical Races.

a. Scotch Crested Tit, *P. cristatus scoticus* (Praž).

Eggs: Hewitson, I Ed. I, pl. CXXXIII; II Ed. I, pl. XXXI, fig. 3; III Ed. I, pl. XXXIX, fig. 3. Seebohm, Br. Birds, pl. 9; id. Col. Fig. pl. 53. Frohawk, Br. Birds, I, pl. III, fig. 82.

Nest: O. Lee, II, p. 104.

Parus cristatus L. Newton, ed. Yarrell, I, p. 499. Saunders, Man. p. 111. *Lophophanes cristatus* (L.). Dresser, Birds of Europe, III, p. 151 and Man. Pal. Birds, p. 180 (*part.*) *P. cristatus scotica* (Praž). Hartert, Vög. Pal. Fauna, p. 365.

Breeding Range: Strathspey, Scotland.

Harvie Brown describes the breeding range of this interesting bird in Scotland as restricted to an area about 30 miles in length. and varying

from 7 to 10 miles in width, along the Spey valley, in Abernethy, Rothiemurchus, and Dulnan, up to the base of the Cairngorms, above Loch Morlich and Larig Ghrue and down the Spey valley to Ballindalloch (*Ver. Fauna of Moray Basin*, I, p. 255; *Tuy*, p. 93). It is essentially a haunter of the pine woods, or where conifers are mixed with hardwoods.

Nest. The more usual sites are holes bored in dead and decayed pine stumps or trees, sometimes in the cleft where a tree has been split, and also in holes of fence posts, both iron and wooden. Nests have also been found in decayed alder and birch branches (*V. F. of Moray Basin*, I, 257 etc.), and O. A. J. Lee found one in the foundation of an old Hooded Crow's nest. Dry moss forms the foundation, on which is placed a carelessly formed layer of deer's hair lined with hare's fur and sometimes feathers or wool. Tufts of cotton grass are also met with at times. The height from the ground varies from 6 in. to 8 ft., often 4 or 5 ft., and the hole is generally about 10 or 12 in. deep.

Eggs. 5 or 6, sometimes 7 or 8 in number, white, spotted chiefly at the big end with rich chesnut red, frequently forming a zone or cap of markings. Occasionally a nest is met with in which the markings are almost obsolete, but as a rule the eggs of the Crested Tits are the handsomest of the family.

Breeding Season. Most eggs are laid about the end of April or early in May, but sometimes much earlier, as in 1894 Hinxman found a nest with nearly fledged young on May 9.

Measurements. Average size of 46 eggs from Strathspey, 16.07×12.56 mm., Max. 17×13 , Min. 14.6×12.3 and 15.5×12 mm.

b. North European Crested Tit, *P. cristatus cristatus* L.

Egg: Taczanowski, Tab. LXIV, fig. 4.

Foreign Names: Finland: *Töyhtötüäinen*. Norway: *Topmeise*. Poland: *Sikora czubatka*. Russia: *Chochlataja sinica*. Sweden: *Tofsmes*. *P. cristatus* L. Dresser, *t. c.* (part.). *P. cristatus cristatus* L. Hartert, Vög. Pal. Fauna, p. 363.

Breeding Range: Scandinavia, Russia, E. Prussia.

Con-
tinental
Europe.

In Norway the range of this form extends to about lat. 64° N., and as high as the limit of conifers extends in the mountains; while in Sweden it is met with from mid-Ångermanland to N. Skåne. In Finland it has been recorded from Pudasjärvi; and it is found in small numbers near Archangel (Cholmogory) in N. Russia, while it is distributed through the pine forests of the Baltic Provinces, Mid-Russia, Poland and E. Prussia. Probably the Vistula and the Carpathians form the

boundary between this and the next race. It is not known to occur E. of the Urals.*

Apparently does not differ from that of *P. c. scoticus*, the hole being usually bored by the bird in the rotten wood of an old pine stump. Russow states that in the Baltic Provinces it sometimes breeds in old squirrel's dreys, and Hartert has taken eggs from a similar site in E. Prussia. Nest.

Generally 5 or 6 in Scandinavia, and 5 to 7 in the Baltic Provinces. Kolthoff records an instance where 9 were found. Some eggs are very boldly and handsomely marked. Eggs.

In Scandinavia it is an early breeder, beginning to nest late in March, while the snow is still deep on the ground, and laying in the latter half of April. In the Baltic Provinces a second brood may sometimes be found at the end of May or early in June. Pousar also states that eggs may be found in S. Finland about this time. Breeding Season.

Average size of 63 eggs (42 by the writer and 21 by O. Ottosson *in litt.*), 16.16×12.68 mm., Max. 17.3×12.6 and 17.2×13.5 , Min. 14.4×12.5 and 15.2×11.6 mm. Average weight of 21 Swedish eggs, 70 mg. (Ottosson). Measurements.

c. Mid European Crested Tit, *P. cristatus mitratus* Brehm.

Plate 21, fig. 6—8 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 10, a—c. Baedeker, Tab. 43, fig. 17. Dresser, pl. —, fig. 7—10. Krause, pl. —, fig. 1—42.

Foreign Names: France: *Mésange huppée*. Germany: *Haubenmeise*. Holland: *Kuifmees*. Hungary: *Búbos czinege*. Italy: *Cincia col ciuffo*. Spain: *Capuchino*.

P. cristatus L. Dresser, *t. c. (part.)*. *P. cristatus mitratus* Brehm. Hartert, Vög. Pal. Fauna, p. 364.

Breeding Range: Continental Europe, W. of the Vistula (Weichsel) and Carpathians.

This race is very generally distributed in those districts of Middle and Western Europe where coniferous forests exist, westward of the R. Vistula in Germany and the Carpathians in Austro-Hungary. In the Balkan peninsula it is absent from Greece, but occurs in the mountain forests of Montenegro and the Balkan range, and in Italy it is confined to the spurs of the Alpine system and is not found in the Apennines. It is plentiful in the woods of Arcachon. In the E. Pyrenees it is common in the pine forest up to 5700 ft; and in the Iberian peninsula is not rare in Portugal, and is found in Spain not only in the mountains Continental Europe.

* Radde however regards it as resident in the Caucasus, though scarce.

of Castile, but also in the extreme south, being numerous in the cork woods near Gibraltar. Possibly however these birds may belong to a different race. Northward its range extends to the fir plantations of Jutland, where a few pairs breed.

Nest. Besides the usual situation in a hole of some decayed stump, this bird is known to breed in old nests of Squirrel, Crow, Magpie, and the larger birds of prey, such as the Goshawk. Sachse has also recorded instances in which he found eggs or young in nests resembling those of the Wren and Long tailed Tit, but with twigs woven into the exterior. They may of course have been old nests of these birds, appropriated by the Tits. In N. Italy, H. M. Wallis found a nest in a hollow log in a wood stack, piled against a tree, and in Germany Walter discovered young birds in a Kingfisher's hole (*J. f. O.* 1881, p. 310). In the Iberian peninsula most nests are placed in hollows in boughs of cork oak or pine trees: Tait mentions one in a hole originally occupied by the Spanish Green Woodpecker (*Ibis*, 1887, p. 184). Several nests have also been recorded in the foundations of Kites' nests. During the process of excavation all the chips are carefully removed by the parent birds.

Eggs. Usually 5 to 7 or 8, but Bau gives 8—10 as the usual number of the first brood, and 6—8 of the second. An instance of 12 eggs being found in one nest is given in the *Zeit. f. Ool.* VIII, p. 27, but here the eggs were undoubtedly laid by two hens. They are not distinguishable from those of other races.

Breeding Season. Two broods are frequently reared: the first eggs being laid in April, generally about the second or third week in the month, and the second late in May or in June. In S. Spain fresh clutches have been taken on April 10, 25, and May 10.

Measurements. Average size of 90 eggs (41 by Bau, 30 by Rey and 19 by the writer) 16.34×12.28 mm., Max. 17.8×12.9 , Min. 15.3×12 and 15.9×11.8 . A very small egg which I took in Brabant measures only 14.3×11.3 . Average weight 82 mg. (Bau & Rey).

94. Lapp Tit, *Parus cinctus* Bodd.

Plate 23, fig. 24—27 (Küstala, Lapland).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 8 (bad). Baedeker, Tab. 76, fig. 17. Newton, Ootheca Wolleyana, Tab. XI, fig. 1—6. Dresser, pl. —, fig. 43—46.

Foreign Names: Finland: *Pistitiäinen*. Lapland: *Kada pija*. Norway: *Laplands meise*. Sweden: *Lappmes*.

Parus cinctus Bodd. Dresser, Birds of Europe, III, p. 125; id. Man. Pal. Birds, p. 172. *P. cinctus* Bodd. Hartert, Vög. Pal. Fauna, p. 365.

Breeding Range: N. Scandinavia, Lapland, and N. Russia. [Also W. Siberia.]

In Norway this species is found from Hallingdal in the Langfjeld (60½°N) and the Dovre up to the limit of tree growth in the N., but on the southern high fjelds is only met with in the pine forests above the spruce belt. In Sweden its range is less extensive and it does not breed S. of Lycksele, about 64° or 65° N. It is tolerably common in the forests of Russian Lapland and the Kola peninsula, but its range does not extend into Finland. It is however a common resident in the forests of the Archangel government, and is found on the Petschora to within the Arctic Circle, and also in the N. Urals. [Also in Siberia W. of the Yenisei, but is replaced by the Eastern race, *P. cinctus obtectus* Cab. in E. Siberia.]

Con-
tinental
Europe.

The most usual situation appears to be in an old Woodpecker's hole in a conifer, but sometimes it is found in a cleft or natural hollow and occasionally in a 'tylla' or nest box. The foundation consists of moss and sometimes black lichens, on which is placed a thick layer of felted hair, usually of the Lemming, Field Voles. or Alpine Hare, with occasionally a few Reindeer hairs. Wolley has also recorded willow down and feathers from the lining in exceptional cases, and noticed that some nests were built upon those of the Redstart, from which the original owners had been ejected.

Nest.

Usually 6—7 in number, but 8 and 9 have been recorded. They are white, spotted with pale rusty brown, and as a rule rather sparsely marked, and with rather finer and paler spots than most eggs of Tits. In a large series however some sets will be found with much bolder and darker markings than others.

Eggs.

The eggs are laid as a rule in the last week of May or the first week in June.

Breeding
Season.

Average of 125 eggs (63 by the writer, 37 by Bau, and 25 by Rey), 16.97 × 12.7 mm., Max. 18.3 × 12.5 and 17.3 × 13.5, Min. 15.3 × 13 and 15.8 × 12 mm. Nordling records eggs 15.2 × 11.8 and 16 × 11.6. Average weight of 37 eggs, 87 mg. (Bau): Rey gives 82 mg.

Measure-
ments.

95. Sombre Tit, *Parus lugubris* Temm.

Geographical Races.

a. Dalmatian Sombre Tit, *P. lugubris lugubris* Temm.

Eggs: Baedeker, Tab. 43, fig. 14 (?).

Foreign Names: Germany: *Trauermeise*. Hungary: *Gyászos cizinege*. Italy: *Cincia dalmatina*. Poland: *Sikora żabo*. Russia: *Gaitscha srjedizemnomorskaja*.

Parus lugubris Natt. Dresser, Birds of Europe, III, p. 121; id Man. Pal. Birds, p. 171. *P. lugubris lugubris* Temm. Hartert, Vög. Pal. Fauna, p. 368.

Breeding Range: From Istria, Slavonia, and S. E. Hungary southward to the Balkans.

Con-
tinental
Europe.

This species differs from its congeners in being of an unsociable disposition, and seems to prefer rocky and broken ground with occasional trees or shrubs to dense forest. Its distribution in Austro-Hungary is not thoroughly known: it is said to have been met with in the Tatra and the Carpathians, is found in the S. E. of Hungary, near Mehadia (Hartert), and certainly is not uncommon on the rugged hillsides of Transylvania, while it has been found in spring in Slavonia, and also breeds in Istria, Dalmatia, Bosnia and Servia, but is not numerous. It is general in the Karstregion of Herzegovina, and is the commonest Tit in the wooded districts of S. Montenegro. In Bulgaria it is also very generally distributed and breeds, but the limits of this and the next race are not yet ascertained, though it is said to be found in S. Russia by v. Nordmann.

Nest.

Most of the nests which have been found were in holes of old trees at varying heights, but from the habits of the bird it is probable that it also nests in crevices of rocks. (Danford describes that of *P. l. anatoliae* as constructed of dry grass and lined first with wool and afterwards with feathers.)

Eggs.

Probably 5 to 7 in number. The few examined have been of the usual Parinetype, marked sparsely with fine red brown spots.

Breeding
Season.

In Transylvania fresh eggs have been taken in the first half of April, while in Herzegovina Kadich gives the end of April or beginning of May as the usual time, and in Montenegro v. Führer met with recently fledged young from mid May to mid June, and Kollibay in S. Dalmatia on May 19.

Measure-
ments.

Average of 7 eggs from Transylvania (coll. Dresser) 18.57×13.84 .
Max. 19×13.6 and 18.8×14 , Min. 18.2×13.3 .

b. Greek Sombre Tit, *P. lugubris lugens* Brehm.

Plate 23, fig. 23 (Grece, Krüper).

Eggs: Reiser, Orn. Balc. III, Taf. III, fig. 5, 6. Dresser, pl. —, fig. 43.

Foreign Name: Greece: *Kleidonas*.

P. lugubris lugens Brehm. Hartert, Vög. Pal. Fauna, p. 368.

Breeding Range: Southern part of the Balkan Peninsula.

In Greece this form is found in most districts, especially near the coast, though not very numerous anywhere. For details see Reiser, *Orn. Balc.* III, p. 176—178. It has also been recorded from Zante and Cerigo. How far its range extends into Turkey is not known, but probably it is found throughout Macedonia.

Con-
tinental
Europe.

Usually placed low down in a hole of a tree, such as the olive or ash. Details of the construction of the nest are still lacking.

Nest.

Apparently 5 to 8 in number, but Krüper remarks that they are fewer than is usual with the *Paridae*. They are white, sometimes almost unmarked, but usually rather sparsely marked with fine reddish spots.

Eggs.

Two broods appear to be generally reared, and according to Krüper the first eggs are laid at the end of March or the beginning of April. Lindermeyer however states that the young are hatched in March, and fresh eggs have been found as late as early June.

Breeding
Season.

Average of 22 eggs (11 by Reiser, 4 by Rey and 7 by the writer), 17.63 × 13.55 mm., Max. 19 × 14 and 17.7 × 14.4, Min. 16.6 × 12.5. Average weight of 11 eggs, 101 mg. (Reiser); of 4 eggs, 80 mg. (Rey).

Measure-
ments.

[In Asia Minor a third race, *P. l. anatoliae* Hart. is found. Egg figured by Dresser, pl. — fig. 44. Average size of 6 eggs, 17.05 × 13.5 mm. *P. l. hyrcanus* Sar. & Loud. ranges to the S. shores of the Caspian and the Elburz range.]

96. Marsh Tit, *Parus palustris* L.

Geographical Races.

a. British Marsh Tit, *P. palustris dresseri* Stejn.

Eggs: Hewitson, I Ed. I, pl. LXXVI, fig. 2; II Ed. I. pl. XXXII, fig. 1; III Ed. I, pl XL, fig. 1. Seebohm, Br. Birds, pl. 9; id. Col. Fig. pl. 53. Frohawk, Br. Birds, I. pl. III, fig. 76. 77.

Local Names: *Willow Biter*, *Blackcap*, etc. (generic). Welsh: *Yswidw Urvyd fach*.

Parus palustris L. Newton, ed Yarrell, I. p. 495. Dresser, Birds of Europe, III, p. 99 and Man. Pal. Birds p. 167 (*part.*). Saunders, Man. p. 107. *P. palustris dresseri* Stejn. Hartert, Vög. Pal. Fauna, p. 373.

Breeding Range: Great Britain, except in N. Scotland.

The study of the British Marsh and Willow Tits is attended with especial difficulty owing to the close resemblance between them. (For the distinctions between the two species see *Brit. Birds* 1907, p. 44.) The glossy-black headed Marsh Tit is apparently rather locally distributed throughout England and Wales, but in some districts, such as the

British
Isles.

N. W. Coast of Wales, it is decidedly rare, and is not found on Anglesea or the Isle of Man. Although as a rule much less numerous than the other Tits, it is common locally. e. g. in parts of Pembroke and Kent. In Scotland the records from the Spey valley and the Forth area appear to refer to the Willow Tit, but probably the present species breeds locally up to about lat. 56°, and possibly in other localities S. of the Grampians.

Nest. Placed in holes in the decaying wood of old willows and alders, less often in oaks, hazels, apple trees, etc., and frequently in dead stumps or holes in bank sides, and occasionally in fence or gate posts. Some nests are in natural holes of varying depth, others (which may however prove to be the work of the Willow Tit) are neatly cut out by the birds to a depth of 6 or 8 inches, ending in a circular chamber, larger than the entrance. The Marsh Tit occasionally breeds in nesting boxes, while an abnormal nest is said to have been found built in the fork of a tree overhanging the water in Lanark (*Annals Scot. Nat. Hist.* 1898, p. 180). The foundation of the nest consists of moss, with a felted layer of rabbits' fur or willow or thistle down as lining, but no feathers. The parents remove the chips while excavating the nest hole.

Eggs. Usually 7 or 8, sometimes fewer, while sets of 9 to 11 and even 12 have been recorded (*Zool.* 1894, p. 345, 429 etc.). As very few of the eggs in collections are properly authenticated, it is uncertain whether the variation which appears to exist, is due to confusion between this species and the Willow Tit. Some eggs are white, others sparsely spotted with dull reddish, or boldly marked with dark reddish brown. The eggs have been found covered, in the absence of the hen while laying was in progress.

Breeding Season. In the Midlands the clutch is generally complete about May 8, and towards the end of April in the S. of England. Like other Tits the hen sits very closely, 'puffing', and refusing to move. A second brood is apparently sometimes reared late in May or in June.

Measurements. Average size of 47 eggs, 15.63 × 12.25 mm., Max. 16.6 × 13.2, Min. 14.5 × 12.2 and 15 × 11.8 mm. Average weight of 12 full eggs, 1.153 g. (R. H. Read). These figures however require confirmation.

b. Scandinavian Marsh Tit, *P. palustris palustris* L.

Egg: Dresser, pl. —, fig. 37.

Foreign Names: Norway: *Sumpmeise*. Russia: *Sinitza bolotnaja*. Sweden: *Kärrmes*.

P. palustris L. Dresser, t. c. (part.). *P. palustris palustris* L. Hartert, Vög. Pal. Fauna, p. 370.

Breeding Range: Middle and south Scandinavia, Baltic Provinces and E. Prussia.

In Norway it is common in the southern and western parts up to about lat. 64° N., while in Sweden it is found from the extreme south up to lat. 62° N., but is unknown on Gotland, although a few pairs occur on Öland. It is also not uncommon in E. Prussia and the Russian Baltic Provinces, and is probably the form found on the Danish islands. Con-
tinental
Europe.

Substantially built of moss, mixed with grasses, and lined with felted hair or fur, with sometimes a few feathers, in a natural hole of a tree. Nest.

6 or 7 to 9 in number, of the usual Parine type. As will be seen from the measurements given, the eggs are generally more elongated in shape than those of *P. atricapillus borealis*. Eggs.

In the Baltic Provinces laying begins at the end of April, and in Scandinavia it is an early breeder, eggs being laid about the second week of May, and young being on the wing early in June. Breeding
Season.

Average size of 44 authenticated eggs measured by Dr. Ottosson (*in litt.*) 16.22 × 12.3 mm., Max. 17.4 × 12.2 and 17.2 × 12.8, Min. 14.6 × 11.1. Average weight 72 mg. (84—51 mg.). Measure-
ments.

c. East European Marsh Tit, *P. palustris stagnatilis* Brehm.

Eggs: Dresser, pl. —, fig. 38—39.

Foreign Name: Hungary: *Barât czinege*.

P. palustris stagnatilis Brehm. Hartert, Vög. Pal. Fauna, p. 371.

Breeding Range: Hungary, Galizia, S. Russia, the Balkan Peninsula, etc. [Also Asia Minor.]

In Hungary it is met with chiefly in the mountain forests, rather than in the plains, while in the Balkan peninsula it becomes decidedly scarce, and has not been recorded from Greece. In nesting habits it probably resembles the other forms. Con-
tinental
Europe.

d. Mid-European Marsh Tit, *P. palustris communis* Baldenst.

Plate 21, fig. 9—12 (Leipzig, Germany).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 7, a, b. Baedeker, Tab. 43, fig. 13.

Foreign Name: Germany: *Sumpfmeise*.

P. palustris L. Dresser, *t. c. (part.)*. *P. palustris communis* Bald. Hartert, Vög. Pal. Fauna, p. 372.

Breeding Range: Mid-Germany, Switzerland, Austria, W. Hungary and Croatia.

This form is found throughout Germany, except in the Rhine valley on the W., and in E. Prussia, where it is replaced by other races. In Switzerland it is generally distributed up to about 3300 or 3600 ft. Con-
tinental
Europe.

Nest, Eggs
etc.

Bau has recorded an instance of breeding in a hole in the ground, near Berlin, and nesting boxes with small entrance holes are sometimes occupied, but as a rule it does not differ in habits from the British form. Bau gives the usual number of eggs as 6 to 9, but in Switzerland according to Fatio the number sometimes reaches 10 or 12, and an instance of 15 is recorded, probably the produce of two hens. The eggs are laid towards the end of April or early in May, while Fatio states that a second brood is sometimes reared in July.

Measure-
ments.

Bau gives the average of 54 eggs and Rey of 32, probably in most of not all cases, of this race. Mean average (86 eggs), 15.91×12.13 mm., Max. 17×12.1 and 16.8×12.7 , Min. 14.9×11.5 mm. Average weight, 70 mg. (Bau), 67 mg. (Rey).

e. West European Marsh Tit, *P. palustris longirostris* Kleinsch.

Foreign Name: France: *Nonnette*.

P. palustris longirostris Kleins. Hartert, Vög. Pal. Fauna, p. 373.

Breeding Range: France, the Rhine valley, Belgium and Holland. (? Perhaps Spain).

Con-
tinental
Europe.

In Holland it is somewhat local, but perhaps most numerous in the Province of Utrecht. Little is known as to its distribution in France, but in the Rhine Provinces it is not uncommon. (Some form of Marsh or Willow Tit occurs in the Iberian peninsula N. of the Cantabrian range and also in the S. Nevada).

f. Italian Marsh Tit, *P. palustris italicus* Tsch. & Hellm.

Foreign Name: Italy: *Cincia bigia*.

P. palustris italicus Tsch. & Hellm. Hartert, Vög. Pal. Fauna, p. 374.

Breeding Range: Italy.

Con-
tinental
Europe.

Chiefly found in the pine forests of the mountainous districts of Piedmont and Venetia, but also occurs, though less commonly, in the Apennines. Arrigoni states that it has been recorded from Sardinia, but this needs confirmation, and it is only known as a rare winter visitor to Sicily.

97. Willow Tit, *Parus atricapillus* L.

Geographical Races.

a. British Willow Tit, *P. atricapillus kleinschmidti* Hellm.

Plate 26, fig. 18.

Parus salicarius Brehm. Dresser, Man. Pal. Birds, p. 168 (*part.*). *P. atricapillus kleinschmidti* Hellm. Hartert, Vög. Pal. Fauna, p. 378.

Breeding Range: Great Britain.

British
Isles.

The distribution of this form in Great Britain is still almost unknown, as until 1897 it was confused with the British form of the Marsh Tit.

Since the publication of Dr. Hartert's article in the *Zool.* 1898, p. 116, specimens have been recorded from Middlesex, Sussex, Bucks, Northants, Gloucester, and Kent, while the specimens obtained by Mr. W. Evans in the Spey, Tweed, and Forth basins also belong to this form. If, as seems probable, the long drawn 'chay, chay, chay' is characteristic of this species, it will probably prove to be generally distributed and locally common.

The few nests which have been identified as belonging to this bird Nest. appear to be placed in holes bored by the birds themselves, or at any rate considerably enlarged by them. They have been found in the decayed wood of old alders, willows, etc, at varying heights from the ground, extending from 6 in. to 1 ft. in depth. The nest itself is a very scanty affair, consisting chiefly of moss. Mr. A. Dixon noticed that the chips were left lying untidily below the nest hole, and not removed as is usually done by the Marsh Tit (*Field*, May 21, 1904).

7 to 9 in number. At present I have not been able to examine Eggs. enough eggs to enable me to judge whether they differ consistently from those of the Marsh Tit. Eggs from Kent and Sussex have bold, rich markings, tending to form a zone at the large end.

Full clutches about May 10 in the S. of England, but in Strathspey Breeding Season. from May 10 to 16.

Average size of 17 English eggs, 15.27×12.4 mm., Max. 16.1×13.1 , Measurements. Min. 14.4×11.6 .

b. Mid-German Willow Tit, *P. atricapillus salicarius* Brehm.

P. salicarius Brehm. Dresser, *l. c.* (*part.*). *P. atricapillus salicarius* Brehm. Hartert, Vög. Pal. Fauna, p. 376.

Breeding Range: Mid Germany and Austria.

This form is now known to exist in many parts of Germany, but not in large numbers, and appears to prefer coniferous woods, especially pine forests, not only in the plains but also in mountainous districts. In some districts it has been met with as high as 3000 ft.

The nest is usually made in some rotten stump, and is excavated by the birds themselves.

c. Rhenish Willow Tit, *P. atricapillus rhenanus* Kleinschm.

Diagrams of nest, egg, etc: Kleinschmidt, J. f. O., 1903, Taf. V. (no letterpress).

P. atricapillus rhenanus Kleins. Hartert, Vög. Pal. Fauna, p. 377.

Breeding Range: The Rhine Valley: probably also France and the Low Countries.

This race has been met with from Worms and Mainz down the Rhine to Wesel, and also in Holland, where it is by no means scarce (*Orn. Jahrb.* 1906, p. 204). Its westward range is still unknown.

Its breeding haunts appear to be willow thickets by rivers, swampy woods etc., where it excavates a hole in some decayed stump. The nest is scanty, like that of other races of this species. Probably the eggs are laid in the latter half of April, as Kleinschmidt found one in the oviduct of a hen bird on April 12.

d. Northern Willow Tit, *P. atricapillus borealis* Selys.

Plate 20, fig. 17—20 (Karlö, J. A. Sandman).

Eggs: Baedeker, J. f. O., 1856, Tab. II. fig. 13; id. Tab. 43, fig. 16, Dresser, pl. —, fig. 40—42.

Foreign Names: Finland: *Hömöttiainen*. Norway: *Nordisk Meise*. Russia: *Gaischki*, *Puchliak*. Sweden: *Tallita*, *Gråmes*.

P. borealis Selys. Dresser, Birds of Europe, III, p. 107. *P. salicarius* Brehm. Id., Man. Pal. Birds, l. c. (part.). *P. atricapillus borealis* Selys. Hartert, Vög. Pal. Fauna, p. 378.

Breeding Range: Scandinavia, E. Prussia, Baltic Provinces, Finland and N. Russia.

Con-
tinental
Europe.

In Norway it is found haunting the coniferous woods and the adjoining birch region throughout the whole country to E. Finmark, but in Sweden its range is more restricted, and it is not found in Skåne or Blekinge in the S., nor northward of lat. $64\frac{1}{2}^{\circ}$. In E. Prussia it breeds occasionally in Masurenland according to Hartert (see also *Falco*, 1907, p. 72), and is the commonest Tit in the Baltic Provinces, and also in Finland. In Lapland Wheelwright found it breeding near Quikjock and it also occurs in the Kola peninsula as far as the tree limit, but only in small numbers. It is replaced in the E. of the Archangel Government, by *P. atricapillus baikalensis* (Swinh.) but is common in Olonetz and Vologda. It has recently been recorded from England (Gloucestershire, 1908).

Nest.

The nesting hole is apparently always bored, or at any rate enlarged, by the birds themselves in a rotten tree. The entrance hole is about 6 or 8 in. long, and becomes wider at the bottom, where the eggs are laid on a bed of fine strips of juniper bark or fibres of decayed willow or alder. No moss, hair, or feathers are used.

Eggs.

Usually 8, sometimes only 7, while 9 to 11 and even 12 have occasionally been found. They are as a rule decidedly shorter and more rounded in shape than those of the Northern Marsh Tit, and perhaps the spots are rather redder, but cannot be distinguished with certainty.

Breeding
Season.

The eggs are laid at the end of April in the Baltic Provinces and a second brood is said to be raised there in June: in S. Scandinavia they are laid about mid-May and about a week later in the extreme N. and in Finland. The eggs are covered up till incubation begins (*Zool.* 1877, p. 198).

Average of 49 well-authenticated eggs by Ottosson, *in litt.*, Measure-
ments. 15.28×12.10 mm., Max. 16×11.8 and 15.6×13.1 , Min. 14.8×12.1 and 15.5×11.5 mm. Average weight, 68 mg. (80—55 mg.). Mean average of 106 eggs, including also 31 by Rey, 15 by Sandman and 11 by the writer, 15.52×12.17 mm., Max. 17×12.4 and 15.8×13.1 , Min. 14.8×12.1 and 15×11.4 mm. Average weight, 74 mg. (Rey).

e. Carpathian Willow Tit, *P. atricapillus assimilis* Brehm.

P. atricapillus assimilis Brehm. Hartert, Vög. Pal. Fauna, p. 379.

Breeding Range: The Carpathians, Transylvanian Alps, and mountains of Bosnia and Servia.

Inhabits the high lying coniferous forests and probably does not differ in habits from other races.

f. Alpine Willow Tit, *P. atricapillus montanus* Bald.

Foreign Names: Germany: *Alpenmeise*, *Bergmeise*.

P. borealis Selys and *P. salicarius* Brehm (*part.*). Dresser, *l. c.*: *P. atricapillus montanus* Bald. Hartert, Vög. Pal. Fauna, p. 380.

Breeding Range: The Alpine system.

This race is found in the coniferous forests of the Jura and Alps from about 3000—3600 ft. to the tree limit, and is resident in the Engadine at 6000 ft. The nest is placed in holes of trees or in mouse runs, and contains 6—10 eggs, which are laid in May or June. Fatio describes them as measurnig $14.5—16 \times 11.5—12.5$ mm.

(Another form, *P. atricapillus bianchii* (Sar. & Härms), has been recorded from Pskov in W. Russia in Winter, but its home in the breeding season is not known.)

g. Siberian Willow Tit, *P. atricapillus baikalensis* (Swinh.)

P. atricapillus baikalensis (Swinh.). Hartert, Vög. Pal. Fauna, p. 380.

Breeding Range: NE. Russia. (Also Siberia to the Sea of Okhotsk and N. Japan). This is the form which is found in the E. of the Archangel Government and was recorded by Seebohm and Harvie Brown from the Petschora.

98. Long tailed Tit, *Aegithalos caudatus* (L.)

Geographical Races.

a. British Long tailed Tit, *A. caudatus roseus* (Blyth).

Eggs: Hewitson, I Ed. I. pl. LXXVI, fig. 3; II Ed. I. pl. XXXII, fig. 2; III Ed. I, pl. XL, fig. 2. Seebohm, Br. Birds, pl. 9; id. Col. Fig. pl. 53. Frohawk, Br. Birds, I, pl. II, fig. 69. Dresser, pl. —, fig. 19—21, pl. —, fig. 42.

Nest: O. Lee, I, p. 84 and 86.

Local Names: *Bottle Tit* or *Jug*, *Featherpoke*, *Long tailed Pie* or *Capon*, *Bumbarrel*, *Mumruffin*, *Miller's Thumb*. Welsh: *Lleian gynffon hir*, *Pwd*, etc.

Acredula caudata (L.). Newton, ed. Yarrell, I, p. 504. *A. rosea* (Blyth). Dresser, *Birds of Europe*, III. p. 63; id. *Man. Pal. Birds*, p. 158. Saunders, *Man.* p. 101. *Aegithalos caudatus rosea* (Blyth) Hartert, *Vög. Pal. Fauna*, p. 384.

Breeding Range: The British Isles, and W. France.

British
Isles.

In all the wooded parts of Great Britain this bird is very generally distributed in varying numbers, but is naturally absent from the barren and wind swept districts and the higher mountain ranges and is on this account local in N. Scotland, and parts of Wales and Ireland. It is also somewhat uncertain in its appearances, being plentiful in one season and scarce the next. Its favourite haunts are on semi-cultivated land, where whitethorn bushes grow freely. In Ireland it breeds in every county, and is numerous in districts suited to its habits. It also breeds on some of the larger islands of Scotland, such as Islay, Mull, and Skye, and also on the smaller islands such as Raasay, where plantations exist.

Con-
tinental
Europe.

There is little doubt that this race is found in W. France, and Hartert states that specimens from the Pyrenees in autumn and winter are indistinguishable from British birds. Possibly it breeds N. of the Cantabrian range in Spain.

Nest.

Very often the nest is built in some thorny bush or hedgerow within a few feet of the ground, especially in whitethorn, blackthorn, furze, holly or brambles; but it is also found at various heights in lichen covered oaks and apples, in conifers, and in the N. of Scotland in birches, generally not more than 30 ft. from the ground, but occasionally as high as 50 ft. (*Zool.* 1882, p. 188). It has also been known to nest in ivy against a wall, at the top of a spruce, 14 ft. high, and among creepers, while Nelson records an instance of breeding within an old Magpies' nest, lined with moss and lichens (*Birds of Yorks*, p. 107). It is generally ovoid in shape and is most wonderfully built of mosses (*Hypnum*), woven together with cobwebs and a few bits of wool or hair. The outside is covered with lichens, and the inside profusely lined with feathers, over 2000 having been counted from a single nest. The opening is high up, and in rare cases is said to be covered with a loose flap. An interesting account of the method of building will be found in Oswin Lee's *Brit. Birds' Nests*, I, p. 80. The time occupied in building seems to vary a good deal, some birds completing their work in 12—14 days, while others take three weeks over it. They are not shy, and are easily watched

to the nest while building; both sexes displaying much anxiety when it is closely approached.

Usually 8 to 12. Much larger clutches occasionally are found: 13, 15, 16, 18, 19 and even 20 have been recorded. It must however be remembered that many instances of 3 birds in attendance on one nest have occurred: Bonhote found 4 birds in one nest with eggs, and 7 and even 9 birds are said to have been seen together. (Cf. *Zool.* 1849, p. 2567 etc.) In these latter cases however it seems possible that what were taken for old birds were in reality the young of an earlier brood. The eggs vary a good deal, some being dull unspotted white, others finely freckled or spotted with light chesnut, especially at the big end.

Eggs.

Nest building begins in March, while the trees are still bare, and exceptionally early nests have been found ready for eggs by the middle of the month, but in most cases the full clutch is not laid till mid April in the S. or the end of April further N. A second brood is often reared later in the year, but the nests are not so easy to see on account of the foliage. Incubation begins before the clutch is completed, and both sexes roost in the nest at night.

Breeding Season.

Average of 100 British eggs (60 by the writer and 40 by Rey *in litt.*) 14.17×11 mm., Max. 15.1×11.8 and 15×12 , Min. 13.2×10.7 and 14×10.1 mm. An abnormally long egg measures 17.2×10.5 (coll. A. W. Johnson). Average weight of 20 eggs, 51.5 mg.

Measurements.

b. White headed Long tailed Tit. *Æ. caudatus caudatus* (L.).

Plate 20, fig. 26—30 (Halle à S., Germany).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. II, *a—d*; Baedeker, Tab. 43, fig. 19 [? perhaps *europaeus*]. Taczanowski, Tab. LXIV, fig. 6. Dresser, pl. —, fig. 18.

Foreign Names: Bohemia: *Sýkora mlynařik*. Finland: *Pyrstöttiäinen*. Germany: *Weissköpfige Schwanzmeise*. Norway: *Langhelet Meise*. Poland: *Raniuszek białogłowi*. Russia: *Chwostowka*. Sweden: *Stjertmes*.

Acr. caudata L. Dresser, Birds of Europe, III, p. 67 and Man. Pal. Birds, p. 157 (*part.*). *Æ. caudatus caudatus* (L.) Hartert, Vög. Pal. Fauna, p. 382.

Breeding Range: N. and E. Europe as far W. as mid-Germany. [Also Siberia to N. Japan.]

In Norway it is rather sparsely distributed, but is most numerous in the eastern part, and has been found as far N. as the Saltdal (lat. 67°). On the fjeld its range extends as high as the subalpine zone. In Sweden it is also rather scarce, but breeds from Skåne up to about lat. 62° or 63° . A few pairs also breed in Finland, and in the Baltic

Continental Europe.

provinces it is common, while it is also recorded from Orlof and the Perm government in N. Russia. The exact limits of its westward and southward range in the breeding season cannot yet be clearly defined, but it breeds in many districts in E. Germany, and also in Denmark, and apparently is found also in Austro-Hungary. [Eastward its range extends to Japan.]

Nest. Like that of the preceding race. An abnormal retort-shaped nest from Denmark is figured in Dresser's Birds of Europe.

Eggs. Accounts vary considerably as to the number usually laid: probably the first laying usually consists of 9—12 eggs and the second of 6—8, while exceptionally clutches of 14 to 18 have been recorded. They do not differ in appearance from those already described.

Breeding Season. In E. Germany finished nests have occasionally been found in mid March, but usually laying begins about April 1, and full sets may be taken from about April 10 to early May, and about a week later in the Baltic Provinces and Scandinavia, while the second brood may be looked for in Germany in June.

Measurements. Average size of 73 eggs from E. Germany (33 by Rey, 20 by Kollibay and 20 by the writer) 13.95×10.91 mm., Max. 16×12 , Min. 12.8×10.2 and 13×10 mm. Ottosson (*in litt.*) gives the average of 47 Scandinavian eggs as 14.17×10.79 mm., Max. 15.1×11.3 and 14.4×11.4 , Min. 13.3×10.8 and 14.2×9.9 mm. Average weight, 51 mg. (Rey.)

c. Continental Long tailed Tit, *Æ. caudatus europæus* (Herm.).

Foreign Names: France: *Mésange à longue queue*. Holland: *Staarthees*. Italy: *Codibugnolo*. *Acr. caudata* L. Dresser, *l. c.*, *part.* *Aeg. caudatus europæus* (Herm). Hartert, Vög. Pal. Fauna, p. 384.

Breeding Range: N. and E. France, the Low Countries, W. Germany, Switzerland, and the N. Italian and Balkan Peninsulas.

Continental Europe. The breeding range of the different forms of Long tailed Tit in France needs investigation, but it is probably this race which is found in the eastern part of the country, except in the extreme S. It breeds also in Holland and Belgium, and in W. Germany, Switzerland, N. Italy, and the Danubian principalities, Bosnia, Servia, Rumania and Bulgaria. Some individuals show much more white on the head than others, and are only to be distinguished from Scandinavian birds by their smaller size and shorter and more compact feathering.

Nest etc. In nesting habits it does not differ from other races. 19 eggs (5 measured by Hartert and 13 by the writer), from Holland and the Rhine valley, average 14.15×11.02 mm. in size; Max. 15.3×11.2 and 14.6×11.5 , Min. 12.8×10.4 . Average weight of 6 Dutch eggs, 53 mg.

d. Crimean Long tailed Tit, *Æ. caudatus tauricus* (Menzb.).

Æ. caudatus tauricus (Menzb.). Hartert, Vög. Pal. Fauna, p. 385.

Breeding Range: The Crimean peninsula.

Menzbier describes this race as found in the forests of the Yaïla range.

e. Macedonian Long tailed Tit, *Æ. caudatus macedonicus* (Dress.).

Acredula macedonica Salv. & Dr. Dresser, Birds of Europe, IX, p. 111 and Man. Pal. Birds, p. 160. *Æg. caudatus macedonica* (Dress.). Hartert, Vög. Pal. Fauna, p. 385.

In Greece this race has been recorded from Mt. Olympus (Thessalia) and the Othrys range on the E. side and in Acarnania on the W., but does not occur in the Peloponesus. In Turkey specimens have been obtained as far N. as Monastir. Little is known as to the nidification of this race, but Reiser found a perfect egg in the oviduct of a hen killed on March 4.

f. Irby's Long tailed Tit, *Æ. caudatus irbii* (Sh. & Dres.).

Foreign Names: Italy: *Codibugnolo*. Portugal: *Rabilongo*. Spain: *Mito*.

Acr. irbii Sh. & Dr., Dresser, Birds of Europe, III, p. 105; id. Man. Pal. Birds, p. 159. *Aeg. caudatus irbii* (Sh. & Dr.). Hartert, Vög. Pal. Fauna, p. 386.

Breeding Range: The Iberian Peninsula, Corsica, S. France, and Italy, except in the extreme N., but not in Sardinia or Sicily.

In Spain it is very local, but common in the Gibraltar cork woods, and is also found on the foot hills of the S. Morena, near Aranjuez etc. It is apparently absent from the district N. of the Cantabrian range (where the resident form may prove to be *roseus*), but occurs locally in Portugal. It is also met with in the S. of France, and according to Sharpe has been obtained near Paris, while in Corsica it is not uncommon, and is also resident on Elba. In Italy it is sedentary in the Middle and Southern provinces, but in summer occurs on passage and is also found breeding in the North, as far as Venice in the E. and the Riviera in the W. After the breeding season it becomes nomadic in its habits, and has occurred in the Tyrol etc.

Con-
tinental
Europe.

Generally placed some 15—16 ft. from the ground in thorny *Smilax* round tree trunks in S. Spain, and among brambles, bushes, or in branches of olive and myrtle trees in Corsica. In construction it resembles that of other races.

Nest.

Usually 7 in number, occasionally as many as 9, and indistinguishable from those of other forms.

Eggs.

Breeding Season. Eggs may be taken in Andalusia from February 20 to early April, while in Corsica Whitehead took full clutches on April 20 and May 23, and in Italy most eggs appear to be laid in April.

Measurements. Average of 18 Corsican eggs: 14.14×10.77 mm., Max. 15.5×11 , Min. 13×10.3 mm. Three Spanish eggs are larger, averaging 15.5×12.3 mm., Max. 16.5×12.1 , Min. 15×12.3 mm.

g. Sicilian Long tailed Tit, *Æ. caudatus siculus* (Whit.).

Acr. sicula Whit. Dresser, Man. Pal. Birds, p. 160. *Æ. caudatus sicula* (Whit.). Hartert, Vög. Pal. Fauna, p. 386.

Breeding Range: Sicily.

According to Whitaker (*Ibis*, 1902, p. 54) it inhabits the wooded inland districts, and breeds in the higher mountain forests, rarely if ever descending below 2100 ft. Two nests were found in forks of olive trees about 8 ft. from the ground, with half fledged young in June, probably second broods.

h. Caucasian Long tailed Tit, *Æ. caudatus major* (Radde).

Acr. caucasica (Lor.). Dresser, Birds of Europe, IX, p. 113; id. Man. Pal. Birds, p. 159. *Æ. caudatus major* (Radde). Hartert, Vög. Pal. Fauna, p. 486.

Breeding Range: The Caucasus.

Lorenz records this bird from the northern slopes, and Radde from the Talysch lowlands and the Tiflis district. Fledged young were obtained from the end of May onward in Transcaucasia.

j. Turkish Long tailed Tit, *Æ. caudatus tephronotus* (Günth.)

Egg: Dresser, pl. —, fig. 22.

Acr. tephronota (Günth.). Dresser, Birds of Europe, III, p. 75; id. Man. Pal. Birds, p. 160. *Æ. caudatus tephronotus* (Günth.). Hartert, Vög. Pal. Fauna, p. 387.

Breeding Range: E. Turkey (Constantinople district). [Also Asia Minor to the Taurus and the S. shore of the Caspian in Persia.]

**Con-
tinental
Europe.** In Europe the range of this black-throated race appears to be confined to the district adjoining the Bosphorus, where it is not uncommon, and in Transcaucasia (Talysch). [On the Asiatic side it is found in Asia Minor as far as the Taurus, and also to the southern shores of the Caspian.]

Nest. Little has been recorded as to its breeding habits, which however are said not to differ from those of the British race. Robson describes the nest as usually placed in a yew tree.

Eggs. Average size of 3 eggs taken by Robson, 13.76×10.86 mm., Max. 14×11 , Min. 13.6×10.6 . They are laid in March or early April.

99. Penduline Tit, *Anthoscopus pendulinus* (L.).

Geographical Races.

a. Western Penduline Tit, *A. pendulinus pendulinus* (L.).

Eggs: Thienemann, Fortpfl., Tab. XVIII, fig. 13, a—b. Baedeker, Tab. 43, fig. 20. Dresser, pl. —, fig. 11.

Foreign Names: Bohemia: *Moudivláček*. France: *Mésange rémiz*. Germany: *Beutelmeise*. Hungary: *Függö czinege*. Italy: *Pendolino*. Poland: *Remiz*. Russia: *Remess*. Spain: *Pajara moscón*.

Ægithalus pendulinus (L.). Dresser, Birds of Europe, III, p. 159; id. Man. Pal. Birds, p. 183. *Anthoscopus pendulinus pendulinus* (L.). Hartert, Vög. Pal. Fauna, p. 389.

Breeding Range: E. Spain, S. France, Italy, Hungary, the Balkan peninsula, Poland and S. Russia. In Germany only sporadically. [Also Asia Minor].

In Spain it has only been definitely recorded as breeding in the neighbourhood of Valencia, but is probably locally distributed in small numbers in the southern and eastern provinces, as Arévalo states that it has been recorded from Seville, Granada, New Castile, and Gerona. It is also locally common in S. France (the Rhone delta etc.), while it occurs in small numbers in Italy in the district drained by the R. Po, and also commonly in Tuscany, as well as the southern provinces, and Sicily, but is not recorded from Apulia. In Switzerland it is said to have bred once or twice, and sporadic instances of nesting have been reported from various parts of Germany, e. g. Silesia (as recently as 1900—02), and with more or less probability also from Magdeburg, Gotha, Brandenburg, Mecklenburg, etc. In Austro-Hungary it appears to have decreased in numbers in the Danube valley and is rare in Transylvania, but not uncommon in Slavonia. In the Balkan peninsula it is found in suitable localities (such as the Scutari Lake, the Utowo-Blato, the Danube valley, the Dobrudscha, etc.) as far S. as Greece, while in Russia it is found in Poland, and is common in some districts of the S., especially Kiew, but does not appear to range N. of about lat 54°, while in the E. it is replaced by the Caspian race.

Con-
tinen-
tal
Europe.

Usually built on thin twigs of willows, or in some districts on tamarisks, and less frequently on poplars, alders, elms or birches. It is placed on the outside of the tree, often overhanging a river or swamp, but sometimes by a roadside away from water, and varies in height above the ground generally from 6 to 30 ft., but sometimes as high as 60 ft. It is beautifully constructed of the down of willow catkins, or other vegetable down, such as cotton grass, or even flax, woven together with fibres of *Parietaria*, irregular in shape, but something like a flask,

Nest.

completely domed, and thickly woven at the bottom, with one or sometimes two openings.* Some observers maintain that these latter nests are unfinished, and it is an undoubted fact that the cock in some cases continues to work at the funnel shaped entrance after his mate has begun to sit. Double nests have occasionally been met with. Giglioli and von Führer estimate the time employed in building at 12 to 15 days, while others, probably from observations on young pairs, place the period at a month at least. The nest is whitish grey in colour, sometimes tinged with brown, and is about 5 to 8 in. high and 3 or 4 in. wide, with a funnel $1\frac{1}{4}$ to $3\frac{1}{2}$ in. long. The birds continually utter an anxious note as long as any one remains near the nesting place.

Eggs. Usually 6 or 7 in number, sometimes 8, while Goebel once found 10. They are pure white, without gloss and very delicate. The remarkably elongated shape is very characteristic.

Breeding Season. In the northern part of its range eggs are rarely laid before June, but in Montenegro v. Führer took 24 nests between May 15 and June 10, and Giglioli states that in Tuscany the eggs are laid about mid April, and the young are on the wing by mid June, while in Bulgaria both fresh eggs and young birds have been found on May 20. In Asia Minor however, fresh eggs may be taken in the middle of May. Incubation lasts 14 days, and both birds roost in the nest.

Measurements. Average of 67 eggs (51 by the writer and 16 by Reiser) 15.73×10.63 mm., Max. 18×11 and 16.2×11.3 , Min. 14×10 . (These figures agree closely with Goebel's average of 76 eggs from Kiew, 15.75×10.5 mm.). Average weight of 16 eggs, 68.7 mg., varying from 55 to 90 mg. (Reiser).

b. Caspian Penduline Tit, *A. pendulinus caspius* (Poelzam).

Egg: Dresser, pl. —, fig. 12.

Æ. castaneus Severtz. Dresser, Birds of Europe, III, p. 165; id. Man. Pal. Birds, p. 184. *Anth. pendulinus caspius* (Poelz.). Hartert, Vög. Pal. Fauna, p. 390.

Breeding Range: The basin of the Lower Volga.

Continental Europe. The northern limit of this race appears to be the Orenburg government. It is exceedingly common on the lower reaches of the Volga, and Bogdanow also found it plentiful in the delta of the Terek, while Radde records it from Tiflis and Lenkoran in Transcaucasia, and found it breeding near Erivan.

Nest etc. In breeding habits it resembles the Western race. Eggs are laid in mid May in Transcaucasia, and vary from 5 to 7 in number.

* Wool is also occasionally but rarely, used.

Average of 67 eggs (61 by Rey and 6 by the writer), 16.03×10.76 mm., Measurements.
 Max. 17.7×11 and 16.2×11.3 , Min. 14.5×10.5 and 15×10 mm.
 Average weight, 67.8 mg. (Rey).

100. Goldcrest, *Regulus regulus* (L.).

Geographical Races.

a. British Golderest, *R. regulus anglorum* Hart.

Eggs: Hewitson, I. Ed. I. pl. LXXXVII, fig. 1, 2; II. Ed. I. pl. XXX, fig. 1, 2; III. Ed. I., pl. XXXVIII, fig. 1, 2. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 53. Frohawk, Br. Birds, I, pl. II, fig. 46—48. Dresser, pl. —, fig. 1.

Nest: O. Lee, II. p. 30.

Local Names: *Golden crested Wren*, *Tom Thumb*. Manx: *Ushag fuygh*. Welsh: *Dryw bach y coed*, *Dryw ben aur*.

Regulus cristatus K. L. Koch. Newton, ed. Yarrell, I. p. 449. Dresser, Birds of Europe, II. p. 453, and Man. Pal. Birds, p. 91 (*part.*) Saunders, Man. p. 57. *R. regulus anglorum* Hart. Hartert. Vög. Pal. Fauna, p. 396.

Breeding Range: The British Isles.

On the mainland of Great Britain this bird is found in all wooded districts from which conifers are not altogether absent. It is also resident in the Isle of Wight, Anglesea and the Isle of Man; and has bred in Skye, Raasay, Islay, Eigg, Mull, etc. where plantations exist, but is absent as a breeding species from the Outer Hebrides, Orkneys, and Shetlands. There is little doubt that the increase of plantations has caused a considerable extension of its breeding range in Scotland and also in Ireland, where it is now resident in every county wherever trees exist.

British Isles.

The beautifully built cup-shaped nest is generally suspended like a hammock from the under surface of the end of a bough of some coniferous tree, generally a spruce or silver fir, or a yew, occasionally a Scotch fir, cedar, larch, or deodar; and less frequently in an evergreen bush, such as juniper or cypress. When the spruces are small the nest is sometimes placed among the topmost twigs, instead of being suspended, and similarly built nests have been found in whitethorns and evergreen oaks, while in exposed districts or where conifers are scarce, it will nest among the ivy round the stems of deciduous trees and in furze bushes. One found in the Isle of Man was built under a witch's broom on a birch, and Ussher records a nest underneath and almost touching a Hooded Crow's nest! The principal material used is green moss, with occasionally a little wool and a lichen or two affixed to the outside. It is worked together by means of spiders' webs, and wool and horsehair are also sometimes used in small quantities, while the inside

Nest.

is warmly lined with feathers, which project over the rim of the nest. The height from the ground varies considerably: when built in evergreen bushes it is often only a few feet high, and Hewitson records one in a juniper 1 ft. above the ground: on the other hand in firs or other trees it is often 20 to 40 ft. high. When beginning to build the birds are shy and apt to forsake, but after the eggs are laid they show great confidence. The hen sits very closely and when disturbed will often approach within a foot or two of the intruder. The depth of the cup, about $1\frac{1}{2}$ in., is almost equal to the internal diameter.

Eggs. Usually 7 or 8 to 9 or 10, but instances of 11 and even 12 eggs have been recorded. The ground colour is sometimes white, sometimes tinged with pale ochreous, but never with the pinky red tinge found in eggs of *R. ignicapillus*. The spots of reddish or ochreous brown are generally concentrated towards the big end, and sometimes form a confluent zone or cap. Exceptionally clutches have been recorded distinctly spotted with reddish on a white ground.

Breeding Season. In England a few cases have been known in which the eggs have been laid about the end of March, but the most usual time for full clutches is from April 26 to May 11 for the first brood, while second broods may be looked for at the end of May or early in June. In Scotland the breeding time is very similar, except that few if any birds breed before mid-April, but in Ireland Ussher has found a nest with 4 eggs as early as March 14, although most birds breed in April, laying a second time towards the end of May.

Measurements. Average of 100 British eggs, measured by the writer, 13.61×10.22 mm., Max. 14.6×9.6 and 14×11 , Min. 12.2×10 and 13.6×9.5 mm. Average weight of 20 eggs, 37 mg. N. H. Foster gives the average weight of 14 full eggs as 745 g.

b. Continental Golderest, *R. regulus regulus* (L.).

Plate 21, fig. 17—20 (Styria).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 7, a—c. Baedeker, Tab. 51, fig. 1. Taczanowski, Tab. XXXIX, fig. 1. Dresser, pl. —, fig. 2.

Local Names: *Woodcock Pilot*, *Herring Sprat*.

Foreign Names: Bohemia: *Králíček obecny*. Denmark: *Gultoppet Fuglekonge*. Finland: *Hippiäinen*. France: *Roitelet huppé*. Germany: *Gelbköpfiges Goldhähnchen*. Holland: *Goudhaantje*. Hungary: *Sárgafejű királyka*. Italy: *Regolo*. Norway: *Fuglekonge*. Poland: *Królik czubaty*. Russia: *Korolek želtogolevy*. Sweden: *Kungsfogel*.

R. cristatus Koch. Dresser, Birds of Europe, II, p. 453 and Man. Pal. Birds, p. 91 (part.). *R. regulus regulus* (L.). Hartert, Vög. Pal. Fauna, p. 394.

Breeding Range: Continental Europe, from the limit of conifers to the Mediterranean, excepting the Iberian Peninsula.

This race is pretty generally distributed over the greater part of the Continent wherever coniferous or mixed woods are to be found. In Norway its northern limit appears to be lat. 67° N. on the W. coast, but in E. Finmark it has been recorded from Vadsö (lat. 70°), and ranges up to about 68° in Swedish Lapland. In Russia it is found in Finland as far as the limits of coniferous woods, and is common in the Olonetz government, but becomes scarcer in that of Vologda, although recorded from the Urals by Sabanäeff. In southern Europe it has not been found breeding S. of the Pyrenees, although not uncommon in some parts of that range. In Italy it is chiefly an inhabitant of the mountains, but is said to be found in Sicily; while in the Balkan peninsula it is doubtful whether it ever breeds in Greece, but it is resident in the mountain forests of Macedonia and Albania. In S. Russia its range extends to the Crimea and the Caucasus. [Formerly it was believed to occur in Algeria, but recent records are wanting: it is however found in Asia Minor.]

Con-
tinental
Europe.

Does not differ from that of *R. r. anglorum*, and like it, is placed by preference in a fir, less often in a juniper or other evergreen bush. It is not uncommon to find nests built year after year in the same tree, sometimes on the same bough.

Nest.

As already described, varying in number from 7 or 8 to 12. In central Europe there are two broods, the first eggs being laid about the end of April and the second brood late in June, but in the N. the breeding season does not begin till May.

Eggs.
Breeding
Season.

Average size of 107 eggs (51 measured by Rey, 47 by Bau and 9 by the writer), 13.42×10.12 mm., Max. 14.2×11 , Min. 12.1×9.7 and 12.3×9.2 mm. Average weight, 40 mg. (Rey); 38 mg. (Bau).

Measure-
ments.

c. Corsican Goldcrest, *R. regulus interni* Hart.

R. regulus interni Hart. Hartert, Vög. Pal. Fauna, p. 396.

Breeding Range: Corsica and Sardinia.

In Corsica it is fairly common in the mountain forests (Whitehead), but is apparently scarce in Sardinia.

[In the Western group of the Canaries is found the Tenerife Goldcrest, *R. regulus teneriffae* Seeb. The eggs are figured in the *J. f. O.*, 1890, Tab. VIII, fig. 9; Cat. Eggs Br. Mus., IV, pl. XIV, fig. 10, and Dresser, pl. —, fig. 3. The nest is found in *Erica arborea* as well as in pine woods. Eggs, 5—8 in number and like those of the other races. Average size of 30 eggs (27 by the writer and 3 by Kutter) 13.78×10.66 mm., Max. 14.7×10.2 and 14.2×11.5 , Min. 13×10.6

and 14×10 . Average weight of 5 eggs, 38 mg. *R. regulus azoricus* Seeb. is resident in the Azores, while *R. regulus tristis* Pleske is found from Transcaspia to E. Turkestan.]

101. Firecrest, *Regulus ignicapillus* (Temm.).

Geographical Races.

a. European Firecrest, *R. ignicapillus ignicapillus* (Temm.).

Plate 21, fig 21—24 (Altenkirchen, Germany).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 6, a—b. Hewitson, I Ed. I, pl. LXXXVII, fig. 3; II Ed. I, pl. XXX, fig. 3; III Ed. I, pl. XXXVIII, fig. 3. Baedeker, Tab. 51, fig. 2. Taczanowski, Tab. LIV, fig. 1. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 53. Dresser, pl. —, fig. 4, 5.

Foreign Names: Bohemia: *Králíček ohnivý*. Denmark: *Rödtoppet Fuglekonge*. France: *Roitelet à triple bandeau*. Germany: *Feuerköpfiges Goldhähnchen*. Holland: *Vuurgoudhuantje*. Hungary: *Tüzesfejű királyka*. Italy: *Fiorrancino*. Poland: *Králík zniczek*. Portugal: *Estrellinha*. Russia: *Korolek krasnogolovoi*. Spain: *Reyezuelo*.

Regulus ignicapillus (C. L. Brehm). Newton, ed. Yarrell, I, p. 456. Dresser, Birds of Europe, II, p. 459; id. Man. Pal. Birds, p. 93. Saunders, Man. p. 59. *R. ignicapilla ignicapilla* (Temm.). Hartert. Vög. Pal. Fauna, p. 398.

Breeding Range: Europe, south of the North and Baltic Seas. [Also in N. Africa and Asia Minor.]

Con-
tinental
Europe.

In the Iberian peninsula Irby records it as a common resident in the cork woods of Algeciras, and probably it will be found to breed in the pine forests of other districts, though hitherto it has only been recorded as a visitor in the winter months. In the Pyrenees and the pine woods of the Landes it is common, and is said to have bred as far N. in France as Rouen (Viellot). It has not been known to nest in the Low Countries or Denmark, and is a somewhat local and scarce summer visitor to the coniferous woods of N. and E. Germany, but is plentiful in some districts of the south and west. In Poland and Lithuania it is scarce, and its distribution in S. W. Russia is still imperfectly known, but it is found throughout Austro-Hungary and in Switzerland. It is resident in the Italian and Balkan peninsulas, and probably breeds in Greece, though the nest has not yet been found there. In the Mediterranean it is found on Mallorca, Corsica, Sardinia and Sicily, while some species of *Regulus* also occurs on Cyprus. [In N. Africa it is common in the cedar and ilex woods of the Little Atlas and Aurès ranges, and is commoner than the Goldcrest in the Taurus range in Asia Minor (Danford).]

In nesting habits it closely resembles the preceding species, building a similar but perhaps slightly smaller and more compact nest of green moss, woven together with hair and spiders' webs and lined with feathers. Like that of the Goldcrest, it is generally suspended beneath the tip of a branch of a fir, well sheltered and hidden by the branching twigs at varying heights. Occasionally a nest is found in a juniper bush, only a few feet from the ground, and it is usual to find the same trees occupied year after year. Diameter of cup. $1\frac{3}{4}$ in., depth $1\frac{1}{2}$ in. Nest.

Usually 7 to 9, occasionally 10, while instances of 11 and even 12 are said to have occurred. Typical eggs are easily distinguishable from those of the Goldcrest by their warm pinkish tinge, which is very noticeable after they have been blown. C. Sachse took one clutch with a white ground and small red spots like a small Wren's egg, but more glossy. As a rule however there is not much variation. Eggs.

In Germany the eggs of the first brood are laid early in May (according to Sachse about 8 days later than those of the Goldcrest), while second broods may be found at the beginning of July. In the Pyrenees the eggs are laid about the end of April and the young are on the wing in the fourth week of May, while in Andalusia they are still earlier, and Irby records young flying on May 15. Breeding Season.

Average of 100 eggs (71 by Rey and 29 by the writer), 13.57×10.28 mm., Max. 14.3×10.5 and 13.8×11 , Min. 12.5×10.3 and 13.5×10 . Bau records an egg 12.9×8.9 mm. Average weight 38.5 mg. (Rey); 37 mg. (Bau). Measurements.

[In Madeira another form, *R. ignicapillus madeirensis* Vern. Harc. is found in the mountains. Its eggs are figured by König, *J. f. O.*, 1890, Tab. VII, fig. 8; Cat. Eggs Br. Mus, IV. pl. XIV, fig. 9, 12; Dresser, pl. —, fig. 6, 7. Its chief haunts are the hillsides covered with giant Heaths and Arbutus. The eggs are 4—6, generally 5, in number, marked with reddish spots, chiefly at the big end on a whitish ground. Average of 18 eggs (16 measured by the writer and 2 by Kutter), 14.32×11.1 mm., Max. 15.4×11.2 and 14.6×11.5 , Min. 13.3×10.4 mm. Weight of 2 eggs: 55 and 50 mg. (Kutter). The breeding season apparently falls in June, and the remarkable nest is not unlike that of *Fr. coelebs*.]

102. Bearded Tit, *Panurus biarmicus* (L.).

Geographical Races.

a. Western Bearded Tit, *P. biarmicus biarmicus* (L.).

Plate 21, fig. 13—16 (Norfolk Broads).

Eggs: Thienemann, Fortpfl. Tab. XVIII, fig. 12, a, b. Hewitson. I. Ed. I., pl. LXXXI, fig. 4; II. Ed. I., pl. XXXII, fig. 3; III. Ed. I.,

pl. XL, fig. 3. Baedeker, Tab. 43, fig. 18. Seebohm, Br. Birds, pl. 12; id. Col. Fig. pl. 53. Frohawk, Br. Birds, I. pl. II, fig. 68. Dresser, pl. —, fig. 13—15. Krause, pl. —, fig. 1—42.

Nest: O. Lee, II. p. 136: Turner, Home Life of Marsh Birds, pl. XVIII—XXI.

British Local Names: *Reed or Marsh Pheasant*. Foreign Names: Bohemia: *Sykora vousatá*. Denmark. *Skjoeg-meise*. France: *Mésange à moustaches*. Germany: *Bartmeise*. Holland: *Baardmannetje*. Italy: *Basettino*. Spain: *Bigotudo*.

Panurus biarmicus (L.). Newton, ed Yarrell, I. p. 511. Dresser, Man. Pal. Birds, p. 158. Saunders, Man. p. 99. *Calamophilus biarmicus* (L.). Dresser, Birds of Europe, III. p. 49. *P. biarmicus biarmicus* (L.). Hartert, Vög. Pal. Fauna, p. 403.

Breeding Range: E. Spain, France, S. E. England, Holland, and Italy.

British
Isles.

Although this interesting bird is known to have bred formerly in Lincoln, Huntingdon, Cambridge, Suffolk, Essex, Kent, Sussex, and probably also in the Thames valley, its haunts are now restricted entirely to the Broads of Norfolk*. For many years there has been a steady decrease in the number of resident birds on the Broads, and Mr. J. H. Gurney estimated the number of nests in Norfolk in 1898 at only 33, but probably this estimate was too low, and of late there has been a decided increase in numbers, due to protection. Interesting details as to its present and former distribution will be found in Mr. Gurney's papers in the *Trans. Norf. and Norw. Nat. Soc.* VI. p. 429 (1899), and *Zool.* 1900, p. 358.

Con-
tinental
Europe.

In Spain this species is common on the Albufera de Valencia, and is also said to occur in the lagoons of N. E. Catalonia: in France it is plentiful in some parts of the Camargue and near Narbonne, and is said also to be found near the mouth of the Gironde. It is very local in Italy, but numerous in certain districts, such as the lagoons of Venetia and the R. Po, and suitable localities in Tuscany, Campania and Sicily. In Holland it is not resident, but breeds in fair numbers in N. and S. Holland, Friesland and Overijsel during the summer months, and according to Dubois also breeds in N. W. Belgium. In Germany it is now no longer resident, but was formerly found in the marshes of the N. from E. Friesland to Holstein and Mecklenburg. Probably also it was this race which formerly nested on the Mansfelder See in Saxony and in Thuringia.

Nest.

Usually placed among the stems of reeds or coarse vegetation not far from the outer edge of the reed bed, in swampy ground, and from 6 in. to 1 ft. above the water level. Booth mentions a nest built into

* A pair or two apparently survived in S. Devon as late as 1888.

the roots of a tussock of rushes, in a field of marsh hay. In wet seasons the nests are liable to be submerged, in which case a second nest is built on the top of the old one. As a rule the nest is neatly concealed, but on a still day the movements of the parent bird when flushed can be detected by the rustling and swaying of the reeds stems, and the site approximately located. The materials used consist chiefly of dead leaves of reeds, sedges, or sometimes flat grasses, with a lining of the flowery tops of the reed and finer grass leaves. A feather or two is not unfrequently found in the lining, and J. M. Goodall found a nest lined with white down, probably that of a call Duck. The cup of the nest is about $2\frac{1}{2}$ in. in diameter. It is usual to find the same locality occupied by a breeding pair year after year.

Generally 5—7 in number, occasionally 8 or 9. Instances have been recorded where 10, 11 and 12 eggs have been found in a single nest, but there is little doubt that they are the produce of two hens. Booth relates an instance where a hen whose mate he had shot, proceeded to lay in the nest of another pair not far away, which already contained 6 eggs, till 11 had been laid. In confinement they will also lay together without quarrelling, and are very prolific. Thus two hens kept by J. Young laid about 50 eggs in one season! He observed that after laying the lining was pulled over the eggs on leaving the nest by the hen, as in the genus *Parus*. Possibly it is owing to this that one or two eggs may often be found completely buried in the lining of the nest. They are quite characteristic: white, with some gloss, sparsely marked with fine scrawls, streaks and spots of liver brown. In shape they are a rounded ovate, some eggs being almost spherical.

In Norfolk nesting begins in March, and the first eggs are laid about April 7 or 8, but chiefly in the third week of the month. (In 1903 M. C. H. Bird found a nest with 3 eggs on April 3, and a nest from which young had flown has been seen at the beginning of May). There is no doubt that three and possibly four broods are reared in a season under favourable circumstances, as young have been seen still in the nest in September both in England and Holland, and Booth found eggs on August 16. Both sexes incubate, and the duration of the period is about 14 days.

Average size of 106 Norfolk eggs (83 by the writer and 23 by Rey), 17.22×13.91 mm., Max. 19×15 , Min. 14.5×13.2 and 15.8×13 mm. Average weight, 108 mg., varying from 95 to 135 mg. (Rey).

b. Eastern Bearded Tit, *P. biarmicus russicus* (Brehm).

Egg: Taczanowski, Tab. LIV, fig. 2.

P. biarmicus russicus (Brehm). Hartert, Vög. Pal. Fauna, p. 405.

Eggs.

Breeding Season.

Measurements.

Foreign Names: Hungary: *Bajszos czinege*, *Szakallas czinege*.
Russia: *Usataja Siniza*.

Breeding Range: Austro-Hungary, the Danube Valley, and S. Russia. [Also Asia Minor, Persia, etc., E. to Manchuria.]

This race is a common summer visitor to the reed beds in the lakes and rivers of Austro-Hungary, and is also plentiful in the Dobrudscha and Bessarabia. Reiser also records it from a marsh on the coast of E. Rumëlia, and on the W. side of the Peninsula Lilford met with it on the Albanian side of the Scutari Lake, but it has not been observed there since. It is also found in S. Russia, and is resident in the low lying marshes near the estuaries of the Terek and Kur in Caucasia. [In Asia its range extends from Asia Minor eastward to Manchuria.]

In its breeding habits it resembles the western race, and the eggs are also similar in type, but those examined are slightly larger on an average. Thirteen eggs from the Velencee See average 17.47×14.06 mm. (Coll. F. C. Selous, May 7 and 30).

Nest, Eggs
etc.

LANIIDAE.

103. Lesser Grey Shrike, *Lanius minor* Gm.

Plate 8, fig. 10—17 (Hungary).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 4, *a—d*. Baedeker, Tab. 52, fig. 4. Taczanowski, Tab. XXXVIII, fig. 2. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 54. Dresser, pl. —, fig. 17—20. Krause, pl. —, fig. 1—36.

Foreign Names: Bohemia: *Tuhýk menši*. France: *Pie-grièche d'Italie*. Germany: *Grauer Würger*. Greece: *Kephalas*. Hungary: *Kis örgébiés*. Italy: *Averla cenerina*. Poland: *Dzierżba czarnoczelna*. Russia: *Sorokoputh*.

Lanius minor Gm. Newton, ed Yarrell, I, p. 205. Dresser, Birds of Europe, III, p. 393; id. Man. Pal. Birds, p. 236. Saunders, Man. p. 149. Hartert, Vög. Pal. Fauna, p. 416.

Breeding Range: S. and Mid-Europe, from the Baltic to the Mediterranean. [Also Siberia to lat. 57° ; Asia Minor, and W. Turkestan.]

This Shrike is a summer visitor to Europe, migrating southward in August and September. Although very common in the Rhone delta, it is only a rare straggler to S. W. France, and is absent from the N., as well as in the Iberian Peninsula. It has not been recorded from Corsica, and Salvadori's statement that it is common in N. Sardinia is probably a mistake. It is somewhat irregularly distributed in Italy and Sicily, but is not uncommon in some districts, such as the Po valley; and

Con-
tinental
Europe.

is also found in the low ground of Switzerland. It does not breed in Belgium or Holland, but occurs throughout Germany with the exception of the district N. W. of the Elbe (Hannover and Westphalia). Its numbers however vary considerably from year to year. Although locally common, and not rare in E. Prussia and Silesia, it is scarce in S. Bavaria, Baden and Württemberg. In the Russian Baltic Provinces it is not rare in Kurland and its range extends to W. Livonia, while in S. Russia it is a plentiful species and is found in Caucasia up to about 5000 ft. It is a characteristic species of Austro-Hungary, and is extraordinarily numerous in some parts of Hungary, extending its range southward to Styria and Dalmatia. It is the commonest Shrike in Montenegro and is also plentiful in the Danube valley (Rumania, Dobrudscha etc.), but is apparently now rather scarce in Greece.

In middle Europe this bird is especially partial to avenues of poplars and other trees by the roadsides, but is also found breeding in deciduous woods, parks and orchards. Here it places its nest at a height of 10 to 25 ft. from the ground, sometimes on the fork of a bough close to the main stem, and in the case of small trees, occasionally at the very top. In the S. of Europe it is frequently built in an olive tree. A characteristic feature of the nest is the use of fresh and green plant stems, especially clover. A few twigs are built into the foundation, while various flowering plants, often aromatic, are woven into the structure, such as *Gnaphalium*, *Thymus*, *Capsella bursa pastoris*, *Stachys*, *Filago* etc. Internally it is also lined with feathers and at times with roots, wool and hair. Diameter of cup, $2\frac{3}{4}$ — $3\frac{1}{2}$ in., depth $1\frac{1}{2}$ —2 in. Nest.

From 4 or 5 to 7 in number, and as a rule easily distinguishable from those of other Shrikes by their more distinctly bluish green ground. They are generally boldly blotched with two shades of colour, olive brown and underlying pale greenish brown. These markings tend very frequently to form a zone. Exceptionally a clutch of eggs may be found with creamy white or yellowish ground spotted with brown and violet. Krause figures five eggs of this type from Brandenburg. Eggs.

In Greece the eggs may be found in the latter half of May, but in the Danube valley the best time is at the end of May and early in June, and in Germany the breeding season is about the same time, though even here clutches have been taken in mid-May, so that the period does not vary much. Incubation is performed by both sexes and is said to last 15 days. The birds are not shy, and are always on the watch to drive away crows or magpies from the neighbourhood of the nest. Breeding Season.

Average of 100 eggs (57 by Rey, 37 by the writer and 6 by Blasius) 25.1×18.24 mm., Max. 28.2×20 , Min. 23×17 and 23.3×16.6 mm. Hartert records an abnormally large egg, 29×19 , and Reiser another, Measurements.

28.8 × 18.7; while Bau mentions a very small egg, 22.5 × 17. Average weight, 257 mg. (Rey): 281 mg. (Bau).

104. Great Grey Shrike, *Lanius excubitor* L.

Geographical Races.

a. Northern Great Grey Shrike, *L. excubitor excubitor* L.

Plate 24, fig. 1—6 (N. Germany).

Eggs: Thienemann, Fortpfl., Tab. XXXI, fig. 1, a—d. Hewitson, I. Ed. I, pl. CVIII, fig. 1; II. Ed. I. pl. XV, fig. 1; III. Ed. I, pl. XX, fig. 1. Baedeker, Tab. 52, fig. 1. Taczanowski, Tab. XXXVIII, fig. 1. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 54. Dresser, pl. —, fig. 6—8. Krause, pl. —, fig. 1—36.

Foreign Names: Bohemia: *Tuhýk šedivý*. Denmark: *Graa Tornskade*. Finland: *Isompi-Lepinkäinen*. France: *Pie-grièche*. Germany: *Grauwürger*. Helgoland: *Groot Verwoahrfinck*. Holland: *Klopekster*. Hungary: *Nagy örgebics*. Italy: *Averla maggiore*. Norway: *Varsler*. Poland: *Dzierżba srokosz*. Sweden: *Större Törnskata*.

Lanius excubitor L. Newton, ed. Yarrell, I. p. 199. Dresser, Birds of Europe, III, p. 375; id. Man. Pal. Birds, p. 228. Saunders, Man. p. 147. *L. excubitor excubitor* L. Hartert, Vög. Pal. Fauna, p. 418.

Breeding Range: Continental Europe, excepting the Iberian, Italian, and Balkan Peninsulas and S. Russia.

Con-
tinental
Europe.

In Scandinavia and N. Russia this bird is only a summer visitor, and is nowhere very common. In Norway scattered pairs are met with even in the birch region of E. Finmark, but it is scarce in the S. of the country, while in Sweden it is perhaps least common in the N. In Russia its eastern limit appears to extend beyond the Urals to the lower part of the Ob valley (lat. 67½°). It is very scarce in the Russian Baltic Provinces, and has not been recorded of late years as breeding in Denmark, but is fairly generally distributed throughout Germany in suitable localities as a resident or partial migrant, though always local. On the moors of Brabant and Belgium it is not uncommon, and is found in small numbers in most parts of France excepting Brittany, Poitou, and the Mediterranean district. In Switzerland it breeds not only in the plain but also in the valleys up to heights of 4000 and even 5500 ft. in the Alps and Jura. A few pairs appear to breed in the valleys on the Italian side of the Alps, while in Austria and Hungary it is tolerably common, and has been known to breed in Carinthia.

Nest.

The haunts chiefly affected by this bird are the edges of forests, clumps of trees on moorlands, and orchards. Here it chooses a site which provides a wide outlook, and generally builds its nest at a con-

siderable height above the ground. A favourite site is far out on the horizontal bough of a big oak, but frequently a fruit tree in an orchard is utilized, and in Brabant it often builds in a pine. Occasionally nests have been recorded in big thorn bushes, and on one occasion on the ground in a bush in Saxony! but this last site is of course quite abnormal. In northern Europe the nest is generally placed in a birch, It is a bulky and characteristic structure, consisting of a foundation of twigs or heather stems, but chiefly composed of dead grasses and moss or leaves, lined with roots, bits of wool and hair, with a thick layer of feathers, which give an untidy look to the nest. Flowers of *Achillea millefolium* are also sometimes used. It is deep and warm, measuring about $3\frac{1}{2}$ —4 in. across the interior, and $2\frac{1}{2}$ —3 in. in depth. The cock bird occupies some commanding perch in the neighbourhood of the nest, and shows considerable courage in driving away birds of prey, crows, etc., especially after the young have been hatched. In some cases the same locality, and it is said even the same site and nest, is occupied year after year.

Usually 5 to 7 in number, but clutches of 8 have been occasionally recorded from Central Europe, and a nest with 9 eggs was found by S. A. Davies on the Muonio River in 1904. They are not subject to much variation, and have but little gloss. The ground colour varies from greyish or very pale greenish grey to greyish buff, blotched and spotted with darker and lighter olive brown and underlying markings of purplish grey. As a rule the markings tend to form a zone or cap at the big end. Krause figures a clutch from Transylvania, with a distinctly green ground, like the eggs of *L. minor*.

In mid Europe the eggs are generally laid during the last fortnight of April or early in May*. If these are taken a second clutch is laid two or three weeks later, and often a third, but as a rule this Shrike is single brooded. C. Sachse however records one case where 4 eggs were found on June 17 after the young of the first brood of the same birds had flown. In Lapland the breeding season is much later, and the eggs are laid late in May or early in June. Incubation is said to last 15 days, and the hen is a close sitter.

Average size of 117 eggs from Germany, Holland etc. (42 by Rey, 38 by Bau and 37 by the writer), 26.28×19.28 mm., Max. 30.5×19 and 28×20.5 ; Min. 23×18.9 and 25.1×18 mm. Average weight 283 mg. (Rey); 302 mg. (Bau). Lapland eggs are slightly larger: average of 34, 26.9×19.7 mm., Max. 29.5×19.5 and 28.5×20.5 ; Min. 26×19 mm. (Wasenius).

* Seebohm's statement that in Brabant the eggs are not laid till late in May is erroneous, and the nests brought to him were obviously second layings.

Eggs.

Breeding
Season.Measure-
ments.

b. **Homeyer's Grey Shrike, *L. excubitor homeyeri* Cab.**

L. excubitor homeyeri Cab. Hartert, Vög. Pal. Fauna, p. 420.

Breeding Range: S. Russia and the lower Danube. [Also W. Siberia.]

Continental Europe. This race appears to be sparingly distributed through S. Russia, but nowhere common, from Moscow southward to the Black Sea. It is known to have bred in Kazan, Charkow, Astrakhan and Uralsk. Probably its range extends also to Rumania and Bulgaria, though according to Reiser definite proof is still wanting. (Eastward it is found in Siberia as far as the Yenesei.)

Nest. A full description by H. Johansen of a nest near Tomsk will be found in the *Ornith. Jahrbuch*, 1900, p. 28.

Eggs. The 7 eggs taken by Johansen averaged 28.3×19.8 mm. in size: Max. 29.5×20 and 28.2×20.2 , Min. 27.3×19.5 . They were somewhat incubated on May 6.

c. **Southern Grey Shrike, *L. excubitor meridionalis* Temm.**

Plate 24, fig. 7, 8 (Malaga).

Eggs: Thienemann, Fortpfl. Tab. XXXI, fig. 3, a, b. Baedeker, Tab. 52, fig. 3. Dresser, pl. —, fig. 15, 16.

Foreign Names: France: *Pie-grièche meridionale*. Portugal: *Picanso*. Spain: *Alcaudon real*.

L. meridionalis Temm. Dresser, Birds of Europe, III, p. 387; id. Man. Pal. Birds, p. 234. *L. excubitor meridionalis* Temm. Hartert, Vög. Pal. Fauna, p. 424.

Breeding Range: The Iberian Peninsula and Provence.

Continental Europe. In the Iberian Peninsula this Shrike occurs locally in suitable districts throughout the S. and E., but has apparently not been observed in the N. W. Its favourite haunts are wild, uncultivated districts, overgrown with patches of scrub and a few trees. In such localities it is not uncommon, especially in Andalucia, Granada, Murcia and Valencia. In France it is resident in the Provinces bordering on the Mediterranean eastward to Nice, and has occurred along the Pyrenean range and in the S. of the country. It has also been met with singly along the north-western coast of Italy (Liguria, Tuscany etc.).

Nest. In Spain many nests are placed in the middle of thick, bramble covered, or thorny bushes, sometimes not more than 2 or 3 ft. from the ground, but generally higher. Sometimes however the nest is placed on the bough of a small tree, much like that of the Mistle Thrush at home, and in such cases is rarely more than 8 or 10 ft. high. It is a bulky, rather untidy-looking structure composed of a few twigs and large quantities of coarse grasses, lined with finer grass and a few feathers.

Feathers, bits of rag, lichens, and generally bits of cudweed are woven into the exterior of the nest. When built on to a bough some clay is also used as a foundation. The internal diameter varies from $3\frac{1}{2}$ to 5 in. In the Camargue this bird is said to be partial to isolated fir trees.

Usually 4 to 6 in number, but 7 have occasionally been met with. As compared with eggs of the Northern form, the spots are as a rule of a much richer and warmer brown. Sometimes the spots are evenly distributed, but well zoned eggs are not uncommon, and some clutches have very bold zones of rich brown on a very light stone coloured ground.

Somewhat irregular, for the first eggs may be found in the second week of March, while on the other hand many pairs do not breed till mid-April, and where the birds have been disturbed, fresh eggs may be taken late in May, and even in early June.

Average of 117 eggs (92 by the writer and 25 by Rey) from Spain. 27.55 \times 19.57 mm., Max. 30.1 \times 20.1 and 26 \times 20.5: Min. 24 \times 18.2. Average weight, 298 mg. (Rey).

[Of the other forms of Great Grey Shrike, the following occur in the W. Palaearctic region. a. Algerian Grey Shrike, *L. excubitor algeriensis* Less. Has occurred in Italy. The egg is figured in the Cat. Eggs Brit. Mus. IV. pl. XII. fig. 16. Breeds in N. Marocco and Algeria, and nests in thorny bushes, laying 4—7 eggs, as a rule, but not always, paler than those of the northern form. Average of 39 eggs (24 by Koenig and 15 by the writer), 26.57 \times 19.31 mm., Max. 29 \times 20: Min. 24 \times 17. Average weight of 13 eggs, 262 mg. (König)*. The breeding season is irregular, as eggs may be found from early in April to early in June. b. Canarian Grey Shrike, *L. excubitor koenigi* Hart. (Plate 34, fig. 12—15). Breeds in the Canaries. Eggs 4—6, generally rather warm in colouring, may be found from March onward. Average of 66 eggs measured by the writer, 25.46 \times 19.26 mm., Max. 28.2 \times 19.3 and 27.3 \times 20.7; Min. 23 \times 19 and 25 \times 18.2. Average weight of 15 eggs, 268 mg. c. Pallid Grey Shrike, *L. e. elegans* Sw. replaces the Algerian Shrike S. of the Atlas in Algeria and Tunis. (Eggs figured in *J. f. O.*, 1896, Tab. VI, fig. 6, a-f.) Average of 81 eggs (39 by König, 33 by Erlanger, and 9 by the writer), 25.81 \times 19.25 mm., Max. 28 \times 20 and 25 \times 21; Min. 22 \times 17. Average weight of 39 eggs, 267 mg. (König). They resemble those of *L. e. algeriensis*, but vary considerably. d. Dodson's Shrike, *L. e. dodsoni* Whit. is found in Middle and South Marocco and also appears to range into Tunis along the mountains. e. Palestine Grey Shrike, *L. e. aucheri* Bp., breeds from the Red Sea and Palestine eastward to Persia and Beluchistan. (Egg figured in Cat.

* The measurements and figures in Rey's work under *L. algeriensis* refer to *L. e. koenigi*.

Eggs Brit. Mus. IV, pl. XII, fig. 14.) The eggs, 4—5, sometimes 6 in number, vary greatly in character, sometimes being very pale and at other times boldly blotched and spotted like those of *L. e. meridionalis*. Average of 56 eggs from Palestine measured by the writer, 26.66×19.47 mm., Max. 30×19 and 27×21.2 ; Min. 24.5×19.3 and 26.4×18 . f. Przewalski's Shrike, *L. e. przewalskii* Bogd. which inhabits Turkestan, the Desert of Gobi, etc., occurs in S. E. Russia in winter occasionally. (The American Great Grey Shrike, *L. e. borealis* Vieill. (Plate 42, fig. 5—10) inhabits the northern parts of N. America, and its supposed occurrence in the Old World is erroneous.)]

105. Woodchat, *Lanius senator* L.

Geographical Races.

a. European Woodchat, *L. senator senator* L.

Plate 24, fig. 10—19 (Magdeburg, Germany).

Eggs: Thienemann, Fortpfl. Tab. XXXI, fig. 8, a—f. Hewitson, I Ed. I, pl. CVIII, fig. 2; II Ed. I, pl. XV, fig. 2; III Ed. I, pl. XX, fig. 2. Baedeker, Tab. 52, fig. 5. Taczanowski, Tab. XXXIX, fig. 2. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 54. Frohawk, Br. Birds, I, pl. III, fig. 109. Dresser, pl. —, fig. 18—25.

Foreign Names: Bohemia: *Tuhyk rudohlavý*. Denmark: *Rød-hovedet Tornskade*. France: *Pie-grièche rousse*. Germany: *Rotköpfiger Würger*. Greece: *Kephalas*. Helgoland: *Road-hôaded Verwôahrfinck*. Holland: *Roodkoppige Klauwier*. Hungary: *Vörösfegu gébics*. Italy: *Averla capirossa*. Poland: *Dzierżba rdzawokarczysta*. Portugal: *Picanso*. Russia: *Sorokoput*. Spain: *Alcaudon*. Sweden: *Rödhuftrade törnskata*. *Lanius auriculatus* P. L. S. Müll. Newton, od. Yarrell, I, p. 215. Dresser, Birds of Europe, III, p. 407; id. Man. Pal. Birds, p. 246. *L. pomeranus* Sparrm. Saunders, Man. p. 153. *L. senator senator* L. Hartert, Vög. Pal. Fauna, p. 434.

Breeding Range: Continental Europe, S. of the N. Sea, Denmark, and the Baltic. [Also N. Africa.]

British Isles. The Woodchat is said to have bred on two occasions in the Isle of Wight, and there is some reason to believe that it has also nested in Hants on at least one occasion.

Continental Europe. It is a very common summer visitor to all the countries bordering on the Mediterranean, and in some districts the breast of the male forms a conspicuous spot of white on the top of almost every bush. In the Iberian peninsula it is abundant except in the northern provinces, and is also numerous in Italy on the low ground, especially in the S., and is one of the commonest birds in the olive groves of Greece. It breeds

commonly on Sicily, and also on Malta and the Balearic Isles. Northward it is found, though in diminishing numbers, as far as Normandy; while it is not uncommon in Brabant, and occurs locally in Germany, especially in the S. and W., though decidedly scarce in the N. Further E. its distribution is less exactly known, but it is found in the Black Sea provinces of Russia and also in the Caucasus. [Also in Asia Minor and the Barbary States, though some authors regard the N. African race as distinct (*L. senator rutilans*). In Crete and Cyprus it is decidedly scarce.]

In the great European plain this bird haunts park lands, copses, orchards, etc., and places its nest on the fork of a bough of some tree, generally not less than 12 or 15 ft. from the ground. It is neatly built of roots, stalks, moss, lichens etc., with a few twigs in the foundation, and lined with wool, finer grasses, hair, or feathers. Flowering plants are also frequently interwoven (*Capsella*, *Veronica*, *Stellaria*, etc.) In southern Europe the nest may be found occasionally in bushes only a few feet from the ground, as well as in olive, ilex, pine, orange and other trees. Here frequently cudweed (*Gnaphalium luteo-album*) is largely used as building material, the plants being pulled up by the roots and woven together.* Diameter of cup $2\frac{3}{4}$ in; depth, $1\frac{1}{2}$ —2 in. Nest.

Usually 5—6, occasionally 7 in number. They bear a strong resemblance to those of *L. collurio*, although there is less variation in a series, and the type with a distinctly red ground is not found in *L. senator*. The ground colour is usually pale greenish, occasionally brownish yellow, and more rarely cream colour or almost white. One clutch from Greece (Brit. Mus.) has a pale blue ground, and one or two sets have a salmon pink ground, though not so deep as in the reddest eggs of *L. collurio*. The markings are usually in the form of a zone round the large end, and consist of greyish brown spots and underlying shell markings of grey or lilac. Eggs.

In mid-Europe the eggs are laid in May, often about the middle of the month, but in Brabant seldom before the 25th. In S. Spain many nests may be found with eggs in the last weeks of April, but even there some birds do not lay till mid-May. In Greece Krüper gives mid-May as the average date for eggs. The birds are not at all shy, and the hen sits closely. Incubation is said to last for 14—15 days. Breeding Season.

Average of 100 European eggs (73 by Rey and 27 by the writer), 22.87×16.97 mm., Max. 27×17 and 23.9×17.8 ; Min. 21×15.9 and 22.1×15.7 . Reiser records abnormal eggs measuring 29.1×15.5 , 24.6×18.3 , 20×15 and 19×15.1 . Average weight, 191 mg. (Rey). Measurements.

* In Tunisia Whitaker states that the nests are often studded over with the flowers of *Evax pygmaea*.

König gives the average size of 23 N. African eggs as 23.74×17.17 mm., weight 207 mg.

b. Sardinian Woodchat, *L. senator badius* Hartl.

L. senator badius Hartl. Hartert, Vög. Pal. Fauna, p. 437.

Breeding Range: Corsica and Sardinia.

An abundant summer visitor to the low lying districts of these islands, nesting generally in the cork trees at 8 to 20 ft., during the last days of May and early in June.

Nest built of lichens, flowering grass heads, roots and a few twigs: lined with fibres and a few feathers. The hen sits very closely. White-head found one clutch of salmon coloured eggs out of about 20 nests examined. The 5—6 eggs are rather large: 31 measured by the writer average 23.66×17.46 mm., Max. 26×17.5 and 22.2×18.2 , Min. 22.2×18.2 and 22.3×16.6 .

[Palestine and S. Persia are inhabited by another race, *L. senator niloticus* (Bp.), the eggs of which are figured in the *Ibis*, 1905, pl. XI, fig. 4, 7.]

106. Masked Shrike, *Lanius nubicus* Licht.

Plate 62, fig. 1 (Smyrna, 1. V. 06).

Eggs: Baedeker, Tab. 52, fig. 7. Dresser, pl. —, fig. 26—28, 31. *Lanius nubicus* Licht. Dresser, Birds of Europe, III, p. 417; id. Man. Pal. Birds, p. 247. Hartert, Vög. Pal. Fauna, p. 438.

Breeding Range: Formerly in Greece, but now extinct there. [Also Asia Minor, Cyprus, Palestine and S. W. Persia.]

Formerly this species appears to have been a regular summer visitor to the country near Athens, but according to Reiser there is no definite record of its breeding since 1864. It is included in the British list, an adult male having been obtained in Kent on July 11, 1905. [It is plentiful in Asia Minor, and is the commonest Shrike near Smyrna. Guillemard found it breeding on the northern side of Cyprus, and it is also not uncommon in the wooded parts of Palestine and in the oak woods of Fars, in S. W. Persia.]

Nest.

The nest is very neatly and strongly built, and often has fragments of rag, thread, etc. woven into the exterior, while the interior is lined with fine roots or fibres. It is only about half the size of an average nest of *L. minor* or *L. senator*. Selous describes the nest as usually built in an olive tree, 8—10 ft. above the ground, on a thick branch, in the same situation that a Mistle Thrush's nest might occupy. Krüper however frequently found nests half covered by pendant foliage on an upright bough in olives, pomegranates etc. The parent birds are much shyer and more retiring in their habits than most Shrikes.

According to Krüper it is double brooded, laying 6—7 eggs in the first brood, and 4—5, sometimes only 3, in the second. A clutch of 8 eggs is said to have been taken in Greece. They are very characteristic of the species, although Shrike-like in type, having the ground colour creamy buff (in rare instances very pale, almost white) and a zone of umber brown blotches or spots and purplish grey underlying shell marks round the big end. They vary less than most Shrikes' eggs, but a set from Palestine has a distinctly reddish ground (Brit. Mus.), and both markings and ground colour differ in intensity.

In Palestine eggs may be found from April 10 onwards: Witherby found fresh eggs in Persia on April 20, while Krüper gives the average date for the first brood near Smyrna as mid-May; and the second in June, but some birds begin to lay at the end of April and eggs have been taken as late as July 4.

Average of 100 eggs from Palestine and Asia Minor measured by the writer, 20.73×15.73 mm., Max. 23×16.5 and 22×16.6 , Min. 19×15.2 and 20.5×14.4 .

107. Red backed Shrike, *Lanius collurio* L.

Plate 25, fig. 1—17 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XXXI, fig. 9, a—f. Hewitson, I Ed. I, pl. II, fig. 1—3; II Ed. I, pl. XV, fig. 3, 4; III Ed. I, pl. XX, fig. 3, 4. Baedeker, Tab. 52, fig. 6. Taczanowski, Tab. XL, fig. 1, 2. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 54. Frohawk, Br. Birds, I, pl. III, fig. 104—108. Dresser, pl. —, fig. 1—5. Krause, pl. —, fig. 1—36. Nest: O. Lee, IV, p. 16.

British Local Names: *Butcher Bird*, *Pope*, *Nine killer*, *Flusher*. Welsh: *Y cigydd cefn goch*.

Foreign Names: Bohemia: *Tuhýk obecny*. Denmark: *Tornskade*. Finland: *Pienempi lepinkäinen*. France: *Écorcheur*. Germany: *Rotrückiger Würger*. Greece: *Aetomáchos*. Holland: *Graauw Klaauwier*. Hungary: *Tövisszűrő gébics*. Italy: *Averla piccola*. Norway: *Rödrygget Tornskade*. Poland: *Dzierżba cierniokret*. Russia: *Sorokoput Ivolan*. Sweden: *Brunryggad Törnskata*.

Lanius collurio L. Newton, ed. Yarrell, I, p. 209. Dresser, Birds of Europe, III, p. 399; id. Man. Pal. Birds, p. 237. Saunders, Man. p. 151. Hartert, Vög. Pal. Fauna, p. 439.

Breeding Range: Great Britain, Europe from 64° N. to the Cantabrian Mts., Corsica, Sardinia, Sicily (?), and the N. shores of the Mediterranean. [Also Asia Minor and N. Palestine to N. Persia.]

British
Isles.

The distribution in England of this summer visitor is somewhat irregular, but it is generally to be met with on bush covered commons and waste lands in the midland and southern counties of England and Wales, S. of lat. 53° N. It is however only a rare visitor to Cornwall, and is scarce in Pembroke, but is not uncommon on the Merioneth coast. In Lincolnshire it is rare, and is only a very local visitor in small numbers to the northern counties, though it breeds occasionally in W. Yorkshire, Lancashire, and the Lake District. It has been known to nest on Anglesea, and a few pairs appear to extend their range occasionally to S. E. Scotland, as for instance in 1893, when a pair bred in Lanark. It does not breed in Ireland.

Con-
tinental-
Europe.

In the Iberian peninsula this species breeds only in the N., in Catalonia, Aragon, and the country N. of the Cantabrian range. Tait found a nest on the R. Minho, on the border of Portugal and Galicia. It apparently reaches Europe on migration via Italy. A few pairs are said to breed in the wooded parts of Sicily, and it is not uncommon on the hills of Sardinia and in Corsica, but is scarce in S. Italy. In the Balkan peninsula it is found as far S. as the middle region of the higher mountains of Greece but not in the plains, and in the Caucasus Radde states that it has been observed at a height of 6300 ft. as well as in the low ground. Over the whole of middle Europe it is generally distributed and in some districts very common. In Scandinavia it has occurred in Sweden up to lat. 64° , and is common in the Christiania district of Norway, while it is also numerous in the Russian Baltic provinces and is found in Finland as far as Kuopio, and in Russia up to about lat. 64° .

[In Asia Minor it is a mountain haunting species, and was only found breeding on Hermon and Lebanon in Palestine by Tristram. It is also found in Transcaspia and N. Persia, but probably the birds from Transcaucasia to E. Persia belong to the race described by Buturlin as *L. collurio kobylini*, if really distinct.]

Nest.

Large for the size of the bird, and generally to be found in thorn bushes, clumps of briars and brambles, low and thick, or straggling high hedges, etc. On the Continent it is also frequently found in thick young conifers, and occasionally among the lower boughs of medium sized trees, especially oaks. Collett mentions a nest on a large root among high grass! It is not uncommon to find the nest close to a road or well used path. The usual height is about 3—5 ft. from the ground, but some nests are not more than a foot or so above it and others have been found as high as 9 and even 12 ft. The materials used are generally bents, stalks, roots, etc., with a good deal of green moss, while fine roots, wool, hair, and down are used for the lining. Some

nests from the Continent and Corsica are much more slightly built and contain no moss. Diameter of cup, $2\frac{3}{4}$ — $3\frac{1}{4}$ in., depth nearly 2 in. The same locality is often resorted to year after year.

Usually 5—6, sometimes only 4 and occasionally 7, while a clutch of 8 is said to have been found. They are very variable in colouring, but may be classified according to the ground colour, which varies from pure white to creamy, brownish, greenish, and pinkish. Exceptionally sets have been met with bright greenish and deep reddish ground. The three commonest types are the pink, green and cream, but the proportion varies according to the locality. A clutch of white eggs taken by Major Harington is entirely without markings, but as a rule the eggs are rather sparingly spotted with some shade of brown or red, with underlying blotches and spots of leaden grey, which often tend to form a zone. Eggs with a pink or red ground have almost invariably warm sienna brown or red spots, and those with a greenish ground are marked with umber. The shape is usually rather a blunt, rounded oval, and the texture fine, with slight gloss. Eggs.

Although a few pairs both on the Continent and in England begin to lay about mid May, the majority have full clutches towards the end of May and early in June. Only one brood is reared, but if the eggs are taken, the birds will lay again three or four times if necessary. The breeding season in Greece and Corsica is apparently no earlier than in Middle Europe, but on Mt. Hermon Tristram took full clutches on May 16. Breeding Season.

Rey gives the average size of 360 eggs as 22.1×16.4 mm., Max. 25×16 and 22.6×18.3 , Min. 18.3×15 and 22.2×14 . Average weight 186 mg. The largest 'double' egg measured 26.5×19.3 (250 mg.) and the smallest dwarf 15.7×12 (80 mg.). Average weight of 22 full eggs, 3.239 g. (R. H. Read). Measurements.

Isabelline Shrike, *Lanius cristatus isabellinus* H. & E.

Plate 24, fig. 9 (Kuldja).

Eggs: Dresser, pl. —, fig. 6, 7.

Lanius isabellinus H. & E. Dresser, Birds of Europe, III, p. 413: Man. Pal. Birds, p. 238 (part.) *L. cristatus isabellinus* H. & E. Hartert, Vög. Pal. Fauna, p. 444.

Breeding Range: Steppes of Mongolia and S. Dauria to Dzungaria and E. Turkestan. One specimen obtained on Helgoland, Oct. 25, 1854.

In breeding habits it resembles its allies. Rey gives the average of 9 eggs as 22.84×16.86 mm., Max. 24.5×17.3 and 23.9×17.6 , Min. 21.3×16.9 and 22.2×16.1 . Eggs from the S. of the Issyk Kul, probably of this bird, average 20.6×16.1 (Hartert).

[The eggs of *L. cristatus cristatus* L. (Plate 25; fig. 18—22, Siberia) are also illustrated in the *Ibis*, 1905, pl. XI, fig. 6, 9. Rey gives the average of 31 eggs as 21.92×17.69 mm., Max. 25×18 , Min. 20.3×16.8 ; Average weight of 5 eggs, 190 mg. *L. cristatus phoenicuroides* (Sch.) breeds in Transcaspia, Turkestan etc. (Egg figured in Br. Mus. Cat. Eggs, IV, pl. XIII, fig. 4; Dresser, pl. —, fig. 8—10.) Radde's

Shrike, *L. bogdanowi* (Bian.) has been recorded from the E. Kirghis steppes and Transcaspia. Eggs figured in Dresser, pl. —, fig. 11, 12, 16, 17; *Ibis*, 1905, pl. XI, fig. 1—3. Another species which breeds in the W. Palaearctic region is the Hooded Shrike, *Telophonus senegalus cucullatus* (Temm.), which is found in Morocco, Algeria, and Tunis. Eggs figured by Dresser, pl. —, fig. 32, 33 (not in B. M. Cat. Eggs, IV, pl. XIII, fig. 10, which probably represents an egg of *L. algeriensis*). The eggs of this genus are of quite a different type to those of *Lanius*, being streaked and spotted with sienna and grey on a dull white ground. One egg measures 26.3×18.3 mm.]

AMPELIDAE.

108. Waxwing, *Bombycilla garrula* (L.).

Plate 8, fig. 5—9 (Lapland).

Eggs: Proc. Zool. Soc., 1857, pl. CXXII (nest and eggs). Naumannia, 1858, Taf. I, fig. 5—8. J. f. O., 1859, Tab. I, fig. a, b. Rev. et Mag. de Zool., 1860, pl. 2, fig. 4. *Ibis*, 1861, pl. IV. Baedeker, Tab. 52, fig. 20. Seebohm, Br. Birds, pl. 11; id. Col. Fig. pl. 54. *Ootheca Wolleyana*, Tab. X, fig. 1—25. Dresser, pl. —, fig. 29, 30, 34, 35.

Foreign Names: Bohemia: *Brkoslav*. Denmark: *Sidensvands*. Finland: *Tilhi*. France: *Jaseur de Bohême*. Germany: *Seidenschwanz*. Helgoland: *Siedenswenske*. Holland: *Pestvogel*. Hungary: *Csonttollú madár*, Italy: *Becco frusone*. Lapland: *Pällje rastis*. Norway: *Sidensvans*. Poland: *Jemiolucha jedwabniczka*. Russia: *Swiristiel*. Sweden: *Sidensvans*.

Ampelis garrulus L. Newton, ed. Yarrell, I, p. 523. Dresser, Birds of Europe, III, p. 429; id. Man. Pal. Birds, p. 249. Saunders, Man. p. 155. *Bombycilla garrulus garrulus* (L.). Hartert, Vög. Pal. Fauna, p. 456.

Breeding Range: N. Scandinavia. N. Finland and Russia. [Also the Arctic Zone of Asia and N. America, but S. to lat. 51° in the Rocky Mts.]

Con-
tinental
Europe.

Although Björkmann previously to 1842 described the eggs of this bird accurately, his description of its breeding habits is quite at variance with the facts, so that the whole credit of the discovery of the nesting of the Waxwing is due to John Wolley and his devoted assistant L. M. Knobloch. Full details may be found in the *Ibis*, 1861, p. 92—106, *Ooth. Wolleyana*, I, p. 212—239, so that it is unnecessary here to repeat them. The first full clutch was taken on June 11, 1856 by Knobloch in Kemi Lappmark, and 29 eggs were obtained during that season. In 1857 Wolley himself took a deserted nest on June 16, but only five nests were discovered by his collectors in spite of the utmost exertions.



1, 2 Black Vulture, *Vultur monachus* L.

A. Reichenow



1—4 Common Buzzard, *Buteo buteo* (L.). 5—8 Rough legged Buzzard, *Buteo lagopus* (Brünn.).



1—4 Sedge Warbler, *Acrocephalus schoenobaenus* (L.). 5—8 Aquatic Warbler, *A. aquaticus* (Gm.).
 9—13 Great Reed Warbler, *A. arundinaceus* (L.).
 14—17 Marsh Warbler, *A. palustris* Bechst. 18—21 Reed Warbler, *A. streperus* (Vieill.).
 22—23 River Warbler, *Locustella fluviatilis* (Wolf.).

Reisert, 1914.



1



2



3



4

*Reichert, pinx.*1--4 Great Bustard, *Otis tarda* L.



1



2



3

*Reisert, pinx.*1—3 Crane, (*Grus grus* (L.)).



1—7 Stone Curlew, *Oedinenus oedinenus* L.

Parts I and II now ready.

"The first part of Mr. Jourdain's book makes a further addition to the works on Oology now in progress. The letterpress is excellent and gives a fully detailed account of the nest and eggs of each form, with references to plates already published, — and besides, what is even more important nowadays, a sketch of the breeding range of the different races that have been hitherto described. We may prefer the 12th edition of Linnaeus's 'Systema Naturae' to the 10th, and may be not inclined to follow the author closely as regards nomenclature, but there can be only one opinion as to the necessity of an exact knowledge of the various geographical races; and should their nests and eggs prove to differ, this should assuredly be made known. Moreover, any such differences as exist should be reckoned at their full worth in deciding the difficult question of the validity of the various races. . . . Among the many useful points in the work we may notice the lists of local British and foreign names of the birds, the references to other forms the range of which abuts upon the European area, the measurements of the eggs, and the determination of the approximate weight of the shells. It is of course impossible to avoid occasional slips, . . . but the comparative insignificance and infrequency of these inaccuracies only strengthens our opinion of the general accuracy of Mr. Jourdain's work." — *Ibis*, 1906, p. 722.

"So far as we are able to judge from the first part, this work has much to recommend it. The plates are decidedly good, and the letterpress dealing with each species is adequate and affords much reliable information on a wide range of subjects — reference to literature, local and foreign names, breeding range at home and abroad, description of eggs, breeding season, etc. — and bears evidence of considerable research as well as of first hand knowledge on the part of the author. The work is to be completed in about 10 parts, containing some 140 coloured plates, and promises to be an excellent one in all respects." — *Annals of Scottish Natural History*, 1906, p. 191.

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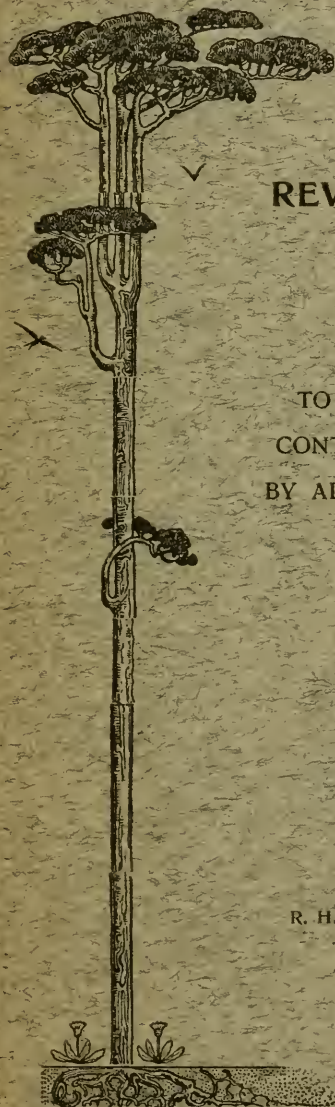
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219762

In the following year however great numbers bred in the district, and 150 nests containing 666 eggs were taken by Knobloch and his assistants. In the same year Dresser found a nest with fledged young on the island of Sandön, 27 miles from Uleåborg, and Keitel also obtained over 20 eggs near the Muonio River, and since that date the eggs have been taken in varying numbers almost annually. The breeding range of this species is now known to extend from the extreme N. of Norway (Varanger Fjord and R. Tana) to about lat. 65° in Sweden, while there is some evidence that a few pairs may breed sporadically even in the S. of Norway, but confirmation of this is needed. In Finland its southern limit is probably the Kuopio district, while in N. Russia Pleske describes it as common in the Olonetz government, N. of L. Onega and by the White Sea, and it is also known to breed in the Archangel government. [It is also found in Siberia and Alaska, as well as along the Rocky Mountains to about 51°. For details see Macoun, Cat. Canadian Birds, p. 556].

Usually found in swampy forest, in conifers (spruce generally but sometimes in Scotch fir or birch), at a height of about 9—15 ft., though in stunted birches it has been known to nest only 4 ft. from the ground. The usual breeding site is not in thick forest, but in somewhat open spaces, among young or stunted trees. Sometimes the nest is placed close to the trunk, but usually out on a bough. The foundation consists of dry spruce twigs, and the materials are generally dark lichens (*Usnea*) interwoven with a little grass. Occasionally a little down, a feather or two, or a little Reindeer hair, are found in the lining. The whole nest is about 7 in. across, while the diameter of the cup is about 3 in. and 2 in. deep.

Usually 5 or 6 in number, occasionally only 4.* In a large series there is considerable variation in shape and size, but most eggs are a somewhat rounded oval. The ground colour is ashy grey as a rule, sometimes ashy blue, and at other times tinged with olive brown. Occasionally it is so light as to be almost white. The markings consist of rounded spots of black, or dark blackish brown sometimes with blurred edges, sparsely distributed over the surface, with underlying blotches or spots of lavender grey. In rare instances bold streaks are found and a clutch in the Cambridge Museum has the markings almost obsolete. An occasional tendency to erythristic colouring is also rarely met with.

Extends from the beginning to nearly the end of June in Lapland, but most eggs are found during the second week of the month.

Average size of 100 eggs (64 by the writer, 25 by Rey, and 11 by Westerlund), 24.03×17.29 , Max. 28.3×18 (Cambr. Mus.) and 24.8×18.8 ,

* One nest with 7 eggs was brought in by Wolley's collectors.

Nest.

Eggs.

Breeding
Season.

Measure-
ments.

Min. 21.1×16.3 and 25×15.7 . A dwarf in the Cambridge Museum is only 16×13.5 mm. Rey gives the average weight as 208 mg.

[BRACHYPODIDAE.

Dusky Bulbul, *Pycnonotus barbatus* (Desf.)

Eggs: Baedeker, Tab. 76, fig. 15. Dresser, pl. —, fig. 1,2.

Pycnonotus barbatus (Desf.). Dresser, Birds of Europe, III, p. 353; id. Man. Pal. Birds, p. 222. *P. barbatus barbatus* (Desf.). Hartert, Vög. Pal. Fauna, p. 460.

Breeding Range: Marocco, Algeria and Tunis. Doubtfully recorded from S. Spain.

The range of this bird appears to extend further S. in Marocco than in Algeria or Tunis, where it is confined to the country N. of the Atlas. It breeds in low trees or in large bushes, building a nest of roots, grasses, etc., with creeping plants woven into the exterior and lined with finer roots. Near the coast of Marocco it haunts gardens and orange groves, but in the Atlas it occurs in the moist woods up to 7000 ft., and in the scrub covered hills of Tunis. The eggs are 3–4 in number, thin shelled, pinkish white in ground colour, irregularly marked with deep red-brown and varying shades of purplish grey over the whole surface. The breeding season is rather late, and eggs may be found in the latter part of May and in June. Average size of 17 eggs measured by the writer, 24.35×16.91 mm, Max 26×17.2 and 24.6×18.5 , Min. 22.1×17 and 24×16.4 .

In middle Egypt another very distinct race, *P. barbatus arsinoe* (Licht.) replaces this form, and in Palestine from the Taurus to the Sinai peninsula, a second species, the Palestine Bulbul, *P. capensis xanthopygos* (H. & E.), is found in gardens and wooded districts. Eggs: Plate 36, fig. 5–8 (Beirut); J. f. O., 1879, Taf. 1, fig. 4, 5; Dresser, pl. —, fig. 3, 4; Cat. Eggs. Br. Mus. III, pl. X, fig. 19 (var.). This bird was formerly erroneously supposed to occur in the Greek Archipelago. The small and neatly built nest is placed on the fork of a tree and covered externally so as to match the adjoining bark. The eggs, 3–4 in number, are variable in colouring, but are generally spotted and streaked irregularly with chocolate red, shading into crimson, and underlying purple grey on a greyish white ground. Some eggs have very bold blotches of colour, while the egg figured in the Br. Mus. Cat. Eggs has the dark markings altogether wanting and is covered with dense lilac mottlings. The breeding season is early, for some have already young in March, while others do not lay till late in April. Average size of 45 eggs (20 by the writer, 17 by Rey, and 8 by Le Roi, Hartert and Müller), 24.14×16.82 mm., Max. 28.8×17.1 and 25.1×17.7 , Min. 21.8×16.6 and 23×15 . Average weight, 173 mg. (Rey); 183 mg. (Le Roi, 3 eggs).]

MUSCICAPIDAE

(including Sylviidae, Turdidae and Timeliidae).

109. Spotted Flycatcher, *Muscicapa striata* (Pall.).

Plate 37, fig. 7—14 (Germany): 41, fig. 9 (Anhalt, 2. VII. 70).

Eggs: Thienemann, Fortpfl. Tab. XXIX, fig. 7, a—c. Hewitson, I. Ed. I, pl. VIII, fig. 2, 3; II. Ed. I, pl. XVI, fig. 1; III. Ed. I,

pl. XXI, fig. 1. Baedeker, Tab. 52, fig. 11. Taczanowski, Tab. XLI, fig. 1. Seebohm, Br. Birds, pl. 9: id. Col. Fig. pl. 51. Frohawk, Br. Birds, I, pl. III, fig. 111—113. Dresser, pl. —, fig. 1—5. Nest: O. Lee, III, p. 108.

British Local Names: *Beam, Wall, Post, Rafter, or Bee Bird, Cherry Sucker, Wall Robin or Chat.* Welsh: *Cylionydd, Gwybedog.*

Foreign Names: Bohemia: *Lejsek sedivj* Denmark and Norway: *Graa Fluesnapper.* France: *Gobe-mouche gris.* Germany: *Grauer Fliegenfänger.* Holland: *Vliegenvanger.* Hungary: *Szürke légykapo.* Italy: *Pigliamosche.* Poland: *Mucholówka szara.* Portugal: *Taralhão.* Spain: *Papa moscas.* Russia: *Pienka.* Sweden: *Grå Flugsnappare.*

Muscicapa grisola L. Newton, ed. Yarrell, I, p. 220. Dresser, Birds of Eur., III, p. 447; id. Man. Pal. Birds, p. 253. Saunders, Man. p. 157. *M. striata striata* (Pall.). Hartert, Vög. Pal. Fauna, p. 475.

Breeding Range: The British Isles and Continental Europe, except N. Finmark, the Murman coast and N. E. Russia. [Also N. W. Africa, but W. Asiatic birds belong to another race, *M. striata neumanni* Poche.]

This familiar little summer visitor is generally distributed in all the wooded districts of Great Britain, but becomes scarce in the N. of Scotland, and does not breed in the Outer Hebrides or the Shetlands. It is said to have nested in the Orkneys, and has certainly done so in Sutherland and Caithness, as well as in Skye and some of the wooded islands on the W. coast of Scotland, such as Mull and Jura. It breeds in Anglesey and the Isle of Man.; and has been known to nest in every Irish county, though somewhat local and not common there.

British
Isles.

It is found in suitable localities throughout the Continent, except in the extreme N. of Norway and N. Russia. In the former country it is only absent from that part of Finmark N. of lat. 70°, but in Russia it breeds in the Kola Peninsula up to 68½°, and is common near Archangel, but appears to be absent from the eastern part of the Archangel government. Southward its range extends to the Mediterranean, and it is also common on the islands, nesting at a considerable height in the mountain forests of Corsica and Sardinia. [In N. Africa it breeds as far S. as lat. 31° in Marocco, also in the mountains of North Algeria and Tunisia, and probably also in Tripoli. Hartert ascribes the Palestine bird to *M. s. neumanni*]

Con-
tinental
Europe.

In England this bird is one of the latest migrants to arrive, and is generally met with in gardens, parks, edges of woods, etc., appearing to prefer the neighbourhood of houses. It is however equally at home high up in the mountain forests of Corsica, breeding in crevices of the

Nest.

broken pines, many miles from any human habitation. In its choice of a nesting site it shows great adaptability. Most nests are placed in a recess or hollow of some kind and partly sheltered from above, but the sites are very variable. Some are placed in a hollow or against the trunk of a tree, supported by the outgrowing twigs, others on projecting beams, on trellis work, or even in or under spouting on houses, while many nests are placed on branches of fruit trees or creepers trained to walls and in holes of walls. A common site is on the hinge of an out-house door; and a good many instances are on record in which the nest of some other species of bird has been taken possession of or built upon. Among these we may mention the Song Thrush, Mistle Thrush, Black-bird, Dipper, Goldfinch, Chaffinch, Hawfinch, Swallow and House Martin. The wisps of flood wrack on trees near rivers are sometimes used as breeding places, and occasionally a nest has been found in a hedge, elder, gorse, or holly bush, in a standard rose tree, or on a ledge of rock. In default of more natural sites the bird has been known to nest in a cup, on a stove (see Yarrell, I, p. 222), inside lanterns, dried hedgehog's skin, or skull of fallow deer, etc. These nesting places are often occupied for many years in succession, and sometimes the remains of the old nest are re-lined and made to do duty again. Where alternative sites are available, the same nest is seldom used twice in one season. The amount of material used varies according to the site, but generally the nest is composed of moss, with a few stalks and roots, and sometimes cobwebs, lichens, and strips of honeysuckle bark, while the lining consists generally of hair, sometimes wool, rabbit down, and fine roots, with occasionally a feather or two.* Few birds will brook more interference with their nesting arrangements, and Gurney (*Zool.* 1858, p. 6238) gives an extraordinary instance of pertinacity in choice of a breeding place.

Eggs.

Occasionally 4, but usually 5 and rarely 6 in number. When a second brood is reared the number seldom exceeds 3—4. The ground colour varies from reddish or yellowish white to pale greenish blue or sea green, which however soon fades. Some eggs are freckled all over with fine red-brown spots and underlying purplish brown markings so as to obscure the ground, others have these markings concentrated into a cap or zone at the big end, while a third type is sparsely marked with fine spots or bold blotches, and sometimes a set is found with a blue ground and entirely devoid of markings. A curious variety in which the colouring matter of the markings is concentrated into one big diagonally placed cap, is figured on Pl. 41. There is little or no gloss on the eggs.

* In towns cigarette papers and wax matches have been used as nesting materials.

This varies little: most eggs are found at the end of May or early in June. In the Mediterranean they may be met with from May 22, and about mid June in the high N. Incubation is performed by the hen, and lasts 14 days, while the young remain in the nest about 12 days after hatching. When a second brood is reared the eggs are laid early in July or occasionally as late as the beginning of August.

Breeding
Season.

Average of 100 eggs (58 by Rey and 42 by the writer), 18.35×13.83 mm., Max. 21.3×14.3 and 19.6×15.1 , Min. 16.4×13.5 and 17.1×13.2 . Bau gives the average of 84 eggs as 18.4×13.6 mm. Average weight, 115 mg. (Rey); 133 mg. (Bau). Average weight of 9 full eggs, 1.990 g. (N. H. Foster).

Measure-
ments.

Brown Flycatcher, *Muscicapa latirostris* Raffl.

Eggs: J. f. O., 1873, Taf. I, fig. 16.

Alseonax latirostris (Raffl.). Dresser, Man. Pal. Birds, p. 352.
M. latirostris Raffl. Hartert, Vög. Pal. Fauna, p. 477.

Breeding Range: E. Siberia to Lake Baikal, Corea, Japan, N. China and the Himalayas as far W. as Chamba, and apparently occasionally in India. Has once occurred in Kent (May 21, 1909). C. Ingram (Ibis, 1908, p. 140), describes the nest as a neat, lichen covered cup, usually placed on the horizontal branch of a tree, close to the hole. Eggs, 4 to 6, but usually 5, pale greyish green, occasionally unmarked, but generally very faintly clouded or washed round the obtuse end with light red. In Japan they are laid about the third or fourth week in May, but in June in Siberia. Average size of 6 eggs (Taczanowski), 16.7×13.5 mm.

110. Pied Flycatcher, *Muscicapa atricapilla* L.

Geographical Races.

a. Common Pied Flycatcher, *M. atricapilla atricapilla* L.

Eggs: Thienemann, Fortpfl. Tab. XXIX, fig. 9, a, b. Hewitson, I. Ed., pl. VIII, fig. 1; II. Ed., pl. XVI, fig. 2; III. Ed., pl. XXI, fig. 2. Baedeker, Tab. 52, fig. 12. Taczanowski, Tab. XLI, fig. 2. Seebohm, Br. Birds, pl. 9; id. Col. Fig. pl. 52. Frohawk, Br. Birds, I, pl. III, fig. 110. Dresser, pl. —, fig. 7,8.

British Local Names: *Coldfinch* (obs.). *Laal Magpie* (Cumberland). Welsh: *Gwybedog du a Gwyn*.

Foreign Names: Bohemia: *Lejsk cernohlávy*. Denmark and Norway: *Broget Fluesnapper*. Finland: *Mustakirjava parmaalintu*. France: *Gobe-mouche noir*. Germany: *Trauer Fliegenfänger*. Holland: *Zwaart*

grauwe Vliegenvanger. Hungary: *Kormos légykapó*. Italy: *Balia nera*. Poland: *Mucholówka żalobna*. Portugal: *Papa moscas*. Russia: *Mucholowka*. Spain: *Cerrojillo*. Sweden: *Svart-och-hvit Flugsnappare*.

Muscicapa atricapilla L. Newton, ed Yarrell, I, p. 229. Dresser, B. of Europe, III, p. 453 and Man. Pal. Birds, p. 254. Saunders, Man., p. 159. *M. atricapilla atricapilla* L. Hartert, Vög. Pal. Fauna, p. 480.

Breeding Range: Europe, from 70° in Scandinavia, 65° in Finland and 57° in the Urals, south to Spain, Italy, and Austro-Hungary: locally in Great Britain.

British
Isles.

The main breeding grounds of this species in Great Britain lie in N. and Mid-Wales, and the N. of England, especially the Lake District and the W. Riding of Yorkshire. In the Midlands and southern counties many isolated instances of nesting are on record, but though some of these are undoubtedly authentic, there is little doubt that many of them are due to confusion caused by mistaking the blue unspotted type of Pied Flycatcher's egg for that of this species. In Wales it is scarce along the N. coast and absent from Anglesey, but occurs locally in the other counties except in the S. and S. W. It is most plentiful in Merioneth, but is also not uncommon in the Usk and Wye valleys, and in many localities in N. Wales, as well as in Salop. In Yorkshire it breeds in some numbers in certain valleys of the W. Riding, and in smaller numbers in the N. Riding, while the Lake District is one of its main haunts. In Northumberland and Durham it is scarce, but it occasionally breeds in Scotland S. of the Forth and Clyde, and has been recorded as nesting in Kircudbright, Dumfries and Midlothian. Hargitt obtained eggs from Inverness in 1864, and in 1890 and 1891 it probably bred in the Moray area.

Con-
tinental
Europe.

In Scandinavia its nesting limit extends to nearly 70° N., and on the Norwegian fjeld it breeds as high as the birch region, but in Finland its range does not extend beyond 65°, and in the Urals only to 57° N. Over the Continent it is generally distributed in suitable localities, but is only locally common, and occasionally absent. Its southern limit extends in the Iberian peninsula at least to Beira, and the elm avenues of Aranjuez. Von Homeyer states that it breeds in the hills of the Balearic Isles, but it appears to be of rare occurrence in Sardinia and is only found on passage in Corsica. In Italy it becomes rare in the southern provinces, but in the N. is found nesting in the plains as well as in the mountains. There appears to be no record of its breeding in the S. Balkan peninsula, where it occurs on migration only, but apparently a few pairs nest in the lower Danube valley.

Nest.

This species is generally found breeding not far from running water, and where holes for nesting purposes are available. For this reason it

is often noticed haunting old oaks or beeches, using natural hollows or Woodpecker's old holes, but will also breed in rotten stumps, sometimes quite close to the ground. Holes in walls of loose masonry, or in the gable end of an empty barn are also favourite sites, while nesting boxes are frequently made use of, especially in Scandinavia. The nest is slight, composed generally of a few dead leaves as foundation, upon which the cup is formed of bents, moss, roots and fragments of the outer bark of the Honeysuckle, lined with fine roots or sometimes *Luzula*. A few feathers, hair, and wool are said to be occasionally found in the lining, and cobwebs are also used at times. (As the same nesting sites are often occupied for many years in succession, it probably pairs for life.) The height from the ground varies from a few inches up to 30 ft. or more. There are instances on record in which eggs have been laid in Blue Tits' nests, and also in which this species and the Redstart have been found laying together.

Usually 6 or 7, sometimes only 5, but 8 and even 9 have been known to occur. They are of a very delicate pale blue, thinner shelled and of finer grain than those of the Redstart. Eggs.

Some eggs are said to show traces of fine reddish spots, but such cases must be exceedingly rare.

In Great Britain the earliest clutches may be found by mid-May, but the best time is the last weeks of May and the first days of June. Only one brood is reared, but second layings may be found in the latter half of June when the first clutch has been taken. The hen sits very closely and will sometimes allow herself to be lifted by hand from the eggs, and when flushed from the nest is soon driven on again by the cock. Incubation lasts about a fortnight. Breeding Season.

Average size of 100 eggs (39 by Rey and 61 by the writer), 17.36×13.44 mm., Max. 19.3×13.5 and 18×14.2 ; Min. 15.7×13.6 and 17×12.1 . A double egg in Reys collection measures 21.7×15.3 and weighs 150 mg., while two dwarfs measure 16×11.1 and 14.8×12.3 . Rey gives the average weight as 92 mg., and Bau as 89 mg. Average weight of 18 full eggs, 1.591 g. (R. H. Read). Measurements.

b. Caucasian Pied Flycatcher, *M. atricapilla semitorquata* Hom.

Muscicapa semitorquata Hom. Dresser, B. of Europe, IX, p. 173 and Man. Pal. Birds, p. 256. *M. atricapilla semitorquata* Hom. Hartert, Vög. Pal. Fauna, p. 483.

Breeding Range: The Caucasus, Asia Minor, Persia.

Radde states that it breeds in the lower Aragwa valley, near Tiflis, and also met with it up to 4000 ft. It apparently also nests in the

forests of the Kirghis steppes and in Transcaspia and is also common in the valleys of the Elburz Mts. Nordmann also describes it as very numerous on the E. coasts of the Black Sea.

A clutch of 6 eggs from the Caucasus averages 18.1×13.24 mm. in size: Max. 18.5×13.3 and 18.2×13.5 : Min. 17.6×13 .

[In the mountain forests of Algeria and N. Tunisia another race, *M. atricapilla speculigera* Bp. is found locally.]

III. Collared Flycatcher, *Muscicapa collaris* Bechst.

Eggs: Thienemann, Fortpfl., Tab. XXIX, fig. 10, a, b. Baedeker, Tab. 52, fig. 13. Taczanowski, Tab. XLII, fig. 2, 3. Dresser, pl.—, fig. 9, 10.

Foreign Names: Denmark: *Hvidhalset Fluesnapper*. France: *Gobe-mouche à collier*. Germany: *Halsband-Fliegenschnäpper*. Hungary: *Örvös légykapó*. Italy: *Pigliamoche a collare bianco*. Russia: *Mucholowska belosheyka*. Sweden: *Halsbands-Flugsnappare*.

Muscicapa collaris Bechst. Dresser, B. of Europe, III, p. 459 and Man. Pal. Birds, p. 255. Hartert, Vög. Pal. Fauna, p. 483.

Breeding Range: Gotland: Central Europe, but rarely in France, and absent from the Iberian and the S. of the Italian and Balkan Peninsulas; extending E. to S. Russia.

Con-
tinental
Europe.

This bird is closely allied to the preceding species and the females are not easily distinguishable, but it appears to be sporadically distributed in the breeding season over much the same districts, except that its range does not extend so far to the N. and W. In Scandinavia it has been recorded from Öland, southern Skåne and near Göteborg, and is known to breed regularly on Gotland and probably also on Borgholm and Ottenby. In Germany it nests sporadically in small numbers, and is most numerous in the S. W., Bavaria, Baden, Hesse to Brandenburg and Silesia, and in France a few pairs are said to breed in Savoie, and also in Holland and Belgium. There is little evidence of its presence in Spain or Portugal, but in Italy Arrigoni states that it breeds in the mountains of Venetia, Lombardy, Piedmont and Liguria, in the Tuscan Apennines and possibly in Calabria. It is found sparingly in Switzerland, Styria, Carinthia, Moravia, Galizia etc., and occurs regularly on passage in Greece, while in Russia it is said to breed fairly commonly in the Crimea and also in the Uman district, and has been recorded as far N. as S. Petersburg, Moscow and Kazan. [It occurs also in Asia Minor, Persia and Palestine, but has not been proved to breed.]

Nest.

Similar to that of *M. atricapilla*: frequently placed in natural holes of trees, especially beech and oak, but also sometimes in old Wood-

peckers' holes and even in a nesting box (Rey). The materials used, chiefly dry grasses, do not differ from those used by the Pied Flycatcher, and the holes may be found at any height from 2½ to 25 ft., but usually from 3 to 7 ft.

Usually 6 or 7, but clutches of even 8 and 9 are said to have been found. They are like those of the preceding species, but no spotted eggs have been recorded. Bau says that the texture of the shell is somewhat smoother and more glossy and when fresh has a somewhat transparent and waxy appearance. Eggs.

In Gotland about June 1, but in Styria eggs have been found on May 9, though this is an exceptionally early date and the usual time is in the latter part of May. The hen sits very closely, but leaves the nest about 6 or 7 am., and may then be watched on. When the young are hatched the parents are so assiduous that the nest is easily found. Breeding Season.

Average of 45 eggs (23 by the writer, 12 by Ottosson and 10 by Bau), 17.25×13.34 mm., Max. 18.5×14 and 17.8×14.7 ; Min. 15.6×12.6 and 16×12.5 . Bau gives the average weight of 10 eggs as 89 mg. Seidensacher gives the weight of unblown eggs as 1.522 to 1.651 g. Measurements.

112. Red breasted Flycatcher, *Muscicapa parva* Bechst.

Plate 37, fig. 5, 6 (Central Europe).

Eggs: Thienemann, Fortpfl. Tab. XXIX, fig. 8, a—c. Baedeker, Tab. 52, fig. 10. Taczanowski, Tab. XLI, fig. 3. Seebohm, Br. Birds, pl. 9; id. Col. Fig., pl. 52. Dresser, pl. —, fig. 11, 12.

Foreign Names: Bohemia: *Lejsek malj*. Germany: *Zwerg-Fliegenschnäpper*. Hungary: *Kis légykapó*. Poland: *Mucholówka rdzawka*. Sweden: *Lilla Flugsnappare*. Russia: *Malaya Mycholorka*.

Muscicapa parva Bechst. Newton, ed. Yarrell, I, p. 224. Dresser, B. of Europe, III, p. 465 and Man. Pal. Birds p. 256. Saunders, Man. p. 161. *M. parva parva* Bechst. Hartert, Vög. Pal. Fauna, p. 485.

Breeding Range: Russia, S. of lat. 61°, Denmark, Rügen, and sporadically in Germany (except in the extreme W.), Poland, and Austro-Hungary. [Also in W. Siberia.]

There is no proof at present that this bird has nested in S. and S. E. Sweden, but is not unlikely that it does so. It is however said to have bred in Denmark, and is met with on Rügen and sporadically in many parts of Germany; but is absent from the extreme W., while in Russia it is not uncommon in the Baltic Provinces and certainly breeds on the R. Swir (Olonetz government). Apparently its range extends through Central Russia to W. Siberia and the Caucasus, and in some Continental Europe.

parts of the country, such as the forests of the Kiew government, it is common. In Bohemia (the Elbethal) it is fairly numerous, and is known to breed in every part of the Austro-Hungarian monarchy, but is not found south of the Alpine chain in Italy, though in the Balkan peninsula it apparently breeds in Bulgaria, but not in Herzegovina, Montenegro, Macedonia or Greece. [Also in W. Siberia, but E. of the Yenesei it is replaced by *M. parva albicilla* Pall.]

Nest. The favourite haunts of this species are beech forests or mixed woods, especially where there is a thick undergrowth, and it is seldom found in pine forest. The nest is by no means invariably in a hole, like that of the Pied and Collared Flycatchers, but is often built close to the trunk on a bough, or where there is an outcrop of small twigs, and has also been found exceptionally in a hole in a rock, in an old stump and in the side of a strawstack! The height from the ground is very variable: occasionally a nest may be found only 3 ft. from the ground, but it is generally higher, and according to Bau is often 15 to 25 ft. high, though other writers give 5 to 10 or 12 ft. as the usual height. The building materials are moss (*Hypnum*), grass stalks, and sometimes a few twigs or bud cases of the beech, lined scantily with hair, and interwoven with cobwebs. Breadth of cup about 50 mm., depth 35 mm.

Eggs. The usual number is 5 to 6, but in some districts 7 are said to have been found. In character they are generally compared to miniature Robin's eggs, but are not unlike some types of Spotted Flycatcher's eggs. The ground colour is very pale bluish green, closely freckled with rusty brown.

Breeding Season. It is a summer visitor to its breeding haunts, arriving in the first half of May and generally laying during the first fortnight of June. Occasionally an early clutch may be found towards the end of May. Only one brood is reared, but if the first clutch is destroyed a second is laid late in June.

Measurements. Average size of 100 eggs (48 by the writer, 46 by Bau and 6 by Rey), 16.62×12.68 mm., Max. 18.2×13.1 and 17.5×13.4 ; Min. 14.6×12.3 and 15.8×12 . Goebel gives the average of 271 eggs as 16.6×13.2 , Max. 18×14 , Min. 15×12 and 16×11.5 . Average weight of 271 eggs, 72 mg. (Goebel); of 46 eggs, 75 mg. (Bau). A double egg measured 21.5×12 (Goebel).

113. Chiff Chaff, *Phylloscopus collybita* (Vieill.).

Geographical Races.

a. Western Chiff Chaff, *P. collybita collybita* (Vieill.).

Plate 28, fig. 6—10 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 10, a—c. Hewitson, I Ed. I, pl. CXVIII, fig. 1; II Ed. I, pl. XXVIII, fig. 2; III Ed. I, pl. XXXVI, fig. 4. Baedeker, Tab. 19, fig. 8, 9. Taczanowski, Tab. XLVII, fig. 3. Seebohm, Br. Birds, pl. 10; Col. Fig. pl. 53. Frohawk, Br. Birds, I, pl. II, fig. 49—51. Dresser, pl. —, fig. 15, 16. Howard, Br. Warblers, pl. II, fig. 19—24. Nest: Lodge, Pictures of Bird Life, p. 366.

British Local Names: *Chip-chop*, *Choice and Cheap*, *Featherpoke*. Welsh: *Siff saff*. Foreign Names: France: *Bec-fin véloce*. Germany: *Zilpzalp*, *Weiden-Laubvogel*. Helgoland: *Lütjswart-futtet Fliegenbitter*. Holland: *Tjif-tjaf*. Italy: *Lui piccolo*. Portugal: *Folosa*. Spain: *Almendrita*, *Mosquilla*.

Phylloscopus collybita (Vieill.). Newton, ed. Yarrell, I, p. 437. Dresser, B. of Europe, II, p. 485 and Man. Pal. Birds, p. 97. *P. rufus* (Bechst.). Saunders, Man. p. 67. *P. collybita collybita* (Vieill.). Hartert, Vög. Pal. Fauna, p. 501.

Breeding Range: The British Isles, except N. Scotland: Continental Europe, from mid Germany and Italy westward, Sicily and Sardinia. [Possibly also in N. Algeria.]

In England the Chiffchaff is a tolerably common summer visitor in wooded districts, although its numbers vary from year to year. It is plentiful in the Devonian peninsula, and common in the Midlands, but is scarce in E. Anglia and prefers low lying and well wooded districts, so that it is practically absent from the Pennine chain and its outlying spurs, as well as from many of the uplands and mountains of Wales. It breeds in Anglesey and in the Isle of Man. In Scotland it is scarce, but has bred in the Forth and Clyde districts and occurs annually in fair numbers on the E. side, south of the Firth of Forth, and on the W. side, S. of Dumbarton. Northward of these districts it appears to be only an occasional straggler. In Ireland it is locally very common and breeds in all woodlands.

British
Isles.

In France it is generally distributed in fair numbers in wooded districts and also in the Low Countries. In Germany the limits of this and the next race are as yet undetermined, but it is probably found throughout Germany except in the eastern provinces. In the S. of France it is resident throughout the year, as is also the case in the Iberian peninsula. In the E. Pyrenees it is found in summer

Con-
tinental
Europe.

up to over 4000 ft., and is abundant in parts of Portugal. A great part of Spain is unsuited to its habits, but it is found breeding as far S. as the cork woods of Gibraltar. In Italy it is found in the breeding season chiefly in the mountains, from Calabria northward, and is said to nest in the hills of Sicily and Sardinia, but is apparently absent from Corsica. [In N. Algeria Witherby found a nest which he ascribed to this species.]

Nest. Much controversy has raged as to the position of the nest, but undoubtedly the normal site is some little distance from the ground, though occasionally it has been found actually upon it. In the British Isles it is usually found among brambles, ferns, rank vegetation, etc., or in bushes, such as holly, yew or laurel, especially where dead leaves have accumulated. It is sometimes built in ivy on a wall, on trellis work, or in gorse bushes. A nest found in Derbyshire was placed some 10 ft. from the ground on trellis against the wall of a house, and Nelson mentions one at the end of a pine branch, 9 ft. high, but these sites are unusual, and the majority of nests are from a few inches to 3 or 4 ft. from the ground. In character the nest differs from that of the Willow Warbler, being as a rule more bulky and containing many more dead leaves in the substructure. Moss, stalks, dry grasses, roots, and sometimes lichens are also used, and the interior is warmly lined with feathers. Interesting notes on the courtship of this species will be found in Howard's *British Warblers*, pt. 2.

Eggs. Usually 6 in number, but clutches of 5 and 7 are sometimes found. The egg is white, more glossy than that of the Willow Warbler as a rule, and finely spotted towards the big end with dark purple brown spots. Frequently the small end is almost unspotted, and occasionally perfectly white eggs are found. Occasionally the spots show a tendency to the red brown type of marking, but many supposed Chiffchaffs' eggs of this type are in all probability only Willow Warblers' eggs. Some violet shell markings are generally present.

Breeding Season. In the southern counties the earliest clutches may be taken at the beginning of May, but in the Midlands seldom before the 12 May, and in Northumberland usually at the end of the month. Some birds undoubtedly rear two broods, but many late nests are only second layings of birds which have lost their first clutch. In the case of birds which I had under observation an interval of from 3 to 4 weeks elapsed between the first and second layings, a remarkable divergence from the habits of other passerine birds. In Germany the eggs are found in May, and second layings early in July (Rey). In Spain the breeding time in the S. is about April 20 (Chapman). Incubation lasts about 13 days, and the young remain 15 days in the nest (Howard).

Average size of 34 eggs from the British Isles measured by the writer, and 66 from Germany by Dr. Rey, 15.45×12.09 , Max. 17.7×12.6 and 17.1×13.7 ; Min. 13.3×10.8 mm. A double egg measures 19.2×13.6 mm. Average weight of 16 full eggs, 1.010 g. (N. H. Foster), while Rey gives the average weight of blown eggs as 62 mg. and Bau as 51 mg.

Measurements.

b. Scandinavian Chiff Chaff, *P. collybita abietinus* (Nilss.).

Foreign Names: Finland: *Tynnyrilintu*. Hungary: *Csil-csal Füzike*. Norway: *Gransanger*. Russia: *Tenkowka*. Sweden: *Gransångare*.

P. collybita abietina (Nilss.) Hartert, Vög. Pal. Fauna, p. 503.

Breeding Range: Scandinavia, E. Germany, Austro-Hungary, N. Balkan Peninsula, and Mid-Russia.

In Scandinavia the Chiffchaff haunts the subalpine zone, especially where deciduous trees prevail. It is found not uncommonly in Norway up to lat. $65^{\circ}10'$ and was recorded by Collett from lat. 67° in 1876. It is however absent from S. Sweden and but rarely breeds in Denmark. In Germany it is the representative form in E. and W. Prussia, Pomerania and Silesia, and in Austro-Hungary occurs in the Danubian valley and is common in Transsylvania. In the Balkan Peninsula it is common in Montenegro, but is only met with in winter or on passage in Greece and Macedonia. It appears to breed in N. and Mid Finland, but in N. E. Russia is replaced by *P. c. tristis*, although not uncommon in the Baltic Provinces and Poland. Eastward its range extends to the Perm Government, and the valley of the middle Volga, but in the S. E. it apparently occurs only on passage, and has not been proved to breed in the Caucasus, though it often occurs there.

Continental Europe.

The nesting habits do not differ from those of the W. race, and the eggs are also similar. The clutch consists usually of 6 eggs, but in Norway 8 have been found (Collett). The average date for full clutches is from mid May to early June. Average size of 27 eggs from Silesia, 15.1×12 (Kollibay): 16 eggs from Poland average 15.1×12.2 (Taczanowski).

Nest and Eggs.

c. Siberian Chiff chaff, *P. collybita tristis* Blyth.

Plate 22, fig. 10 (Altai, 21. V.).

Eggs: Dresser, pl. —, fig. 13, 14.

Phylloscopus tristis Blyth. Dresser, B. of Europe, II, p. 477 and Man. Pal. Birds, p. 98. *P. collybita tristis* Blyth. Hartert, Vög. Pal. Fauna, p. 503.

Breeding Range: N. E. Russia [Also W. Siberia to Transbaikalia].

Con-
tinental
Europe.

In European Russia the range of this bird extends from the Petchora valley eastward, while southward it is found as far south as Perm (Meves) and the Middle and Southern Urals. [In Asia it is found throughout Siberia as far E. as Transbaikalia, in the Altai range, and as far S. as the Karakorum Mts., Ladakh (*J. Bomb. N. H. S. XVII*, p. 112), and Gilgit (*Ibis*, 1881, p. 65).]

Nest.

Seebohm and Popham describe nests from the Yenesei valley as being hollows in the wisps of flood wrack left stranded in the willow bushes after the submergence of the floods, and warmly lined with feathers of the Willow Grouse and Capercaillie. Some nests were however found close to the ground in willow and alder thickets or among rank vegetation. They varied in height from 4 ft. to only a few inches above the ground.

Eggs.

In N. Siberia 4 to 5 is the usual number but sets of 6 and 7 have been sent from the Altai. They much resemble those of *P. collybita collybita*, being finely spotted with dark red, chiefly at the big end.

Breeding
Season.

It appears to be a late breeder on the Yenesei, the eggs being laid about the end of June or early in July, but eggs from the Altai range are dated May and June.

Measure-
ments.

Average of 64 eggs measured by the writer, 14.97×11.9 mm., Max 19×11.2 and 15.5×12.6 Min., 14×11.4 and 19×11.2 . Rey gives the weight of 1 egg as 55 mg.

[In the Canaries are found two more forms of Chiffchaff: *P. collybita canariensis* Hartw. on the Western islands of the group, Tenerife, Gran Canaria, Palma and Hierro: and *P. collybita exsul* Hart. on Lanzarote. *P. c. canariensis* lays only 3 to 4 eggs as a rule, occasionally 5, which are either white or sparsely marked with fine brown spots. They are laid in March and April, and 48 average in size (30 by Koenig and 18 by the writer), 15.52×12.05 mm., Max. 17×12.5 , Min. 13.5×12 and 16×11.5 .]

114. Plain Brown Willow Warbler, *Phylloscopus neglectus* Hume.

Geographical Races.

a. Caucasian Plain Brown Warbler, *P. neglectus lorenzii* (Lor.).

Nest: Lorenz, Beitr. Orn. N. Kaukasus, Taf. II, fig. 2.

Phylloscopus neglectus lorenzii (Lor.). Hartert, Vög. Pal. Fauna, p. 506.

Breeding Range: The Caucasus.

Lorenz describes the nest of this bird, which he found near Kislowodsk at about 4000 ft., as of the usual Phylloscopine type, built of

coarse stalks and lined with finer grasses and a layer of feathers of Chough and Thrush as well as some hair. It contained 5 eggs on May 26, white, marked with dark red brown spots and a few streaks.

b. Hume's Plain Brown Warbler, *P. neglectus* Hume.

P. neglectus Hume. Dresser, B. of Europe, IX. p. 79 and Man. Pal. Birds, p. 98. *P. neglectus neglectus* Hume. Hartert, Vög. Pal. Fauna, p. 506.

Breeding Range: Transcaspia, Turkestan, Persia and Kashmir. Sarudnoi has recorded this race from Transcaspia, Russow and Sewerzow from Turkestan, and Witherby found it breeding in S. W. Persia (Farzistan). He describes the nest as 2 ft. 6 in. from the ground between two thick bushy boughs of a small bush, neatly woven of grass and well lined with feathers. The eggs were 4 in number, and pure white in colour. Incubation had just begun on April 28. Average size of 3 eggs, 15×11.36 mm. Col. Ward (*Journ. Bomb. N. H. S.* XVIII, p. 461) also records 4 eggs taken at Kargil, Kashmir, on May 28 and again on June 22.

115. Willow Warbler, *Phylloscopus trochilus* (L.).

Geographical Races.

a. Common Willow Warbler, *P. trochilus* (L.).

Plate 28, fig. 1—5 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 9, a—c. Hewitson, I Ed. I, pl. CXV, fig. 1, 2; II Ed. I, pl. XXVIII, fig. 3, 4; III Ed. I, pl. XXXVI, fig. 1, 2. Baedeker, Tab. 19, fig. 7. Taczanowski, Tab. LI, fig. 3. Seebohm, Br. Birds, pl. 10; Col. Fig. pl. 58. Frohawk, Br. Birds, I, pl. II, fig. 52—54. Dresser, pl. —, fig. 8—10. Howard, Br. Warblers, pl. II, fig. 25—27, 31, 32. Nest: O. Lee, I, p. 66.

British Local Names: *Willow Wren*, *Peep*. Manx: *Dreïn vane*. Welsh: *Dryw Felen*. Foreign Names: Bohemia: *Budníček větší*. Denmark and Norway: *Löfsanger*. Finland: *Uunilintu*. France: *Pouillot-Fitis*. Germany: *Fitis-Laubsänger*. Helgoland: *Lütj Fliegenbitter*. Holland: *Fitis*. Hungary: *Fitisz füzike*. Italy: *Lui grosso*. Poland: *Gajówka pierwiosnka*. Portugal: *Folosa*. Pussia: *Penotschka*. Spain: *Mosquitero*. Sweden: *Löfsångare*. *Phylloscopus trochilus* L. Newton, ed. Yarrell, I, p. 432. Dresser, B. of Europe, II, p. 491 and Man. Pal. Birds, p. 94. Saunders, Man. p. 69. *P. trochilus trochilus* (L.). Hartert, Vög. Pal. Fauna, p. 507.

Breeding Range: The British Isles and Continental Europe, except N. Scandinavia and Russia, where it is replaced by the next race.

British
Isles.

Although outnumbered in a few districts by other species, for example by the Wood Warbler in W. Merioneth and by the Chiffchaff in W. Pembroke, the Willow Warbler is by far the most numerous and widely distributed member of its genus in the British Isles, and its pleasant little descending song may be heard in the spring in almost every part of the country up to the fringe of the moorlands. It has even been met with in the hills as high as 1500 ft. It breeds on the Isle of Man and on all the wooded islands of the Inner Hebrides, is found locally in the Lews and has bred on Barra, while in 1901 it was recorded as nesting in the Shetlands, and perhaps also breeds in the Orkneys. In Ireland it has been recorded as breeding in every county.

Con-
tinental
Europe.

It inhabits almost the whole of the Continent, but is replaced in N. E. Russia (from the Petschora to Orenburg) by the Arctic form, which apparently occurs also in Finmark. Towards the Mediterranean it becomes scarcer, but breeds near Gibraltar, though rare in the plateau of Central Spain, and apparently does not nest in the Balearic Isles or Corsica, although a few breed in the mountains of Sardinia and Sicily, while it is also absent in summer from the Balkan Peninsula, south of Bosnia and Montenegro, and S. E. Russia. [It has not yet been proved to breed in Marocco or Algeria, although suspected of having done so.]

Nest.

The neatly domed nest, with opening at the side, is often placed in growing grass in a hedge bottom or bank side, as a rule on the ground. Occasionally however it may be found a foot or so from the ground in seedling conifers, bushes or whins, and still more rarely at a considerable height. Von Hugel found a nest 16 ft. from the ground in a fir, and another 14 ft. high is recorded in the *Birds of Lancashire*. Other occasional sites are in trellis or among ivy on a wall, in old nests of other birds, such as Redbreast, Spotted Flycatcher, etc., among heather on edge of moors, in a strawberry bed, etc. The nest is generally well concealed, and often only found by the bird flying off when disturbed. It is built of grasses and stalks, interwoven with green moss, occasionally of dead bracken, lined with finer stalks and roots or a few horsehairs and almost invariably a thick lining of feathers. I have however seen two nests which undoubtedly belonged to this species and which did not contain a single feather. The Willow Wren is much attached to its eggs, and has been known to continue to sit after the nest has been removed bodily or partly destroyed.

Eggs.

Usually 6—7 in number, sometimes 5 and rarely 8. Prof. Salter found a nest in Wales with 12 eggs (*Zool.* 1894, p. 345). Three very distinct types are found. In the first the egg is covered with fine freckles of light reddish brown: in the second the markings consist of blotches of light chesnut; while in the third type, the egg is spotted rather

sparingly with much darker sienna brown. Of these three types the second is much the rarest; while occasionally pure white eggs are found, sometimes in the same clutch as normally marked eggs. The markings are generally evenly distributed over the surface, and eggs of the first two types show very little gloss.

In England the earliest clutches are found about the end of April in the S. of England, and a week or two later in the Midlands and N. of England. In Germany the breeding season commences early in May, and in S. Spain in the second week of April, but in Finland not till late in May. Fresh eggs may be taken in June and July in small numbers, but though second broods may occasionally be reared, these are most probably only second or third layings. Incubation lasts 13 days.

Breeding
Season.

Average of 100 eggs (73 by Rey and 27 by the writer), 15.31×12.38 mm., Max. 17.3×12.7 and 16.6×13 , Min. 13.5×11.2 and 14.2×10.9 . Dwarf eggs measure 11.7×9.4 and 10.6×8.5 . Average weight, 62 mg. (Rey): of 16 full eggs, 1.164 g. (N. H. Foster).

Measure-
ments.

b. Arctic Willow Warbler, *P. trochilus eversmanni* (Bp.).

P. trochilus eversmanni (Bp.). Hartert, Vög. Pal. Fauna, p. 509.

Breeding Range: N. E. Russia. [Also in Siberia, E. to the Kolyma delta.]

This form, which occurs on migration on the E. coast of Great Britain) is apparently found in the N. of Norway (Finmarken), and it is probably also this race which is common along the Murman coast. In the Archangel Government it is common in the Petschora valley and is also found along the Ural range as far S. as Orenburg. [In Siberia it breeds on the Ob, Yenesei, Boganida, Lena and Kolyma.]

Con-
tinental
Europe.

The nest resembles that of the southern form, while the eggs, which are usually 5 or 6, sometimes 7 in number, are usually of the light reddish freckled type. They are generally laid in the last 10 days of June or early in July. 21 eggs measured by the writer from the Petschora and Kolyma, average 15.52×12.19 mm., Max. 18×12.3 and 17.2×12.5 ; Min. 14.3×12 and 15.1×11.6 .

Nest. Eggs
etc.

116. Green Willow Warbler, *Phylloscopus nitidus* Blyth.

Geographical Races.

a) Bright Green Willow Warbler, *P. nitidus nitidus* Blyth.

Phylloscopus nitidus Blyth. Dresser, B. of Europe, IX, p. 83 and Man. Pal. Birds, p. 101. *P. nitidus nitidus* Blyth. Hartert, Vög. Pal. Fauna, p. 510.

Breeding Range: The Caucasus, and perhaps the Crimea. [Also Transcaspia to the W. Himalayas.] Recorded from Helgoland.

Con-
tinental
Europe.

Although Lorenz found this bird breeding in the valleys of Ciscaucasia, he does not appear to have taken any nests and the eggs are still undescribed. It has been recorded from the Crimea in winter and may breed there. [In Asia Sarudnoi records it from Transcaspia, and probably it is found from Bokhara and perhaps Persia to the W. Himalayas.]

b. Greenish Willow Warbler, *P. nitidus viridanus* Blyth.

Foreign Name: Russia; *Panoschka-zelenaya*.

P. viridanus Blyth. Dresser, B. of Europe, IX, p. 87 and Man. Pal. Birds, p. 101. *P. nitidus viridanus* Blyth. Hartert, Vög. Pal. Fauna, p. 510.

Breeding Range: Russia (Baltic Provinces to Perm) and W. Siberia.

Con-
tinental
Europe.

Although formerly supposed to breed only in the E. of European Russia, the range of this bird is now known to extend to the Russian Baltic Provinces (Ehstland, Livland, N. Kurland) and possibly even to E. Prussia, where an example has been obtained in June. Poljakow records it from the Olonetz Govt., and Sabanaejeff from Jaroslaw, and it has also been met with in Moscow, Kazan, Perm, Ufa and Orenburg. Meves observed unfledged young being fed by the parents in the Urals near Tjubuk. [E. of the Urals its range extends through Turkestan, Kashmir and W. Siberia to the Tian Shan and Altai ranges.]

Nest.

The only accessible information with regard to the breeding of this bird in Europe is contained in Menzbier's paper in the *Ornith. Jahrbuch*, 1898, p. 1. Three nests found by Teplouchoff stood on the ground or close to it. They were built of green moss, held together by thin grass blades, and contained inside (presumably as lining) a certain amount of wool. In Asia Brooks found an empty domed nest on a hillside in Kashmir at about 11,000 ft., and Stuart Baker found one with 3 eggs inside a crevice between loose stones by a roadside. It was large and globular, loosely built of moss and a few dead leaves and lined with a mass of white goats' hair. Height about 8 in., breadth 5½ in. Osmaston also describes a domed nest, thickly lined with hair, on a hillside as that of this bird.

Eggs.

Usually 3—4 in number. An addled egg found by Teplouchoff was white, and 4 eggs in my collection from Turkestan are similar to those described by Stuart Baker, being white and almost without gloss, short oval in shape with very fragile shells. Dresser has however

a clutch from the Irish valley, some of which are faintly marked with reddish. Breeding season, late in May and early in June.

Average of 7 eggs (4 by the writer and 3 by Stuart Baker), 14.59 × 11.41, Max. 15 × 12.2, Min. 14.2 × 11.7 and 14.7 × 10.4.

Measure-
ments.

117. Bonelli's Warbler, *Phylloscopus bonelli* (Vieill.).

Geographical Races.

a. Western Bonelli's Warbler, *P. bonelli bonelli* (Vieill.).

Plate 22, fig. 7—9 (Styria).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 12, a—c. Baedeker, Tab. 19, fig. 6. Dresser, pl. —, fig. 17, 18.

Foreign Names: Bohemia: *Budniček horní*. France: *Bec-fin Bonelli*. Germany: *Berg-Laubvogel*. Hungary: *Bonelli Kizike*. Italy: *Lui bianco*.

Phylloscopus bonellii (Vieill.). Dresser, B. of Europe, II, p. 503 and Man. Pal. Birds, p. 96. *P. bonelli bonelli* (Vieill.). Hartert, Vög. Pal. Fauna, p. 513.

Breeding Range: The mountain ranges of S. W. and Central Europe, but replaced in the S. E. by the next form. [Also in N. W. Africa.]

Bonelli's Warbler is generally distributed throughout the hilly parts of the Iberian Peninsula, from Gibraltar to the Cantabrian range and the Pyrenees. It also occurs in the hillsides of southern and western France up to about lat 46½ on the W. coast, and is said also to be found near Metz and Paris. In Belgium Aplin records meeting with a pair near Dinant, while it is distributed over the whole of the Alpine district, and is especially common on the southern slopes of the Jura. In the Engadine it breeds up to nearly 6000 ft. Northward its range extends into Lothringen, Würtemberg, Bavaria and N. E. Bohemia (Riesengebirge). It is found locally in Lower Austria and also in the Tyrol, Styria, Carinthia, etc., and is not uncommon in the hills of N. Italy, but becomes local in the S., and only occurs on passage in Sicily. It is not recorded from Corsica, and only on passage from Sardinia, but is found in the Balearic Isles. [In N. Africa it breeds in the Atlas range up to 5000 ft, and also in certain wooded mountains of Algeria and Tunisia, but has apparently a very restricted range.]

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tinental
Europe.

Less carefully concealed that that of the other Leaf Warblers, the nest is generally built on the ground in a slight depression, and is of the type usual in this genus. It is usually placed on a sunny hillside wooded with conifers, beeches or oaks, and is built of dead leaves, dry grasses, bents and a little moss, lined with fine bents, roots and a few

Nest.

hairs, but no feathers. Occasionally it is built among ferns or growing plants at some little distance from the ground. The song of the male is distinctive: it resembles that of the Wood Warbler to some extent, but is shorter, consisting only of 3 or 4 notes, constantly repeated, without the long drawn 'Whiou, whiou', which the Wood Warbler introduces at intervals.

Eggs. Usually 5 or 6, sometimes only 4 and rarely 7 in number. They are much like those of the Wood Warbler, being thickly spotted with dark liver brown of different shades, sometimes with a violet tinge, on a white ground, with little or no gloss.

Breeding Season.

In Central Europe it is a late breeder, and eggs may be found in the last 10 days of May and early in June, but in S. Spain the season is somewhat earlier, probably about the second and third weeks in May. Tristram took eggs in Algeria between May 20 and June 4, but apparently has not recorded them in his notes on Algerian ornithology. Only one brood is reared, but second layings may be found late in June occasionally. Incubation lasts about 13 days.

Measurements.

Average of 69 eggs (54 by the writer, 10 by Rey and 5 by Bau), 15.23×12.33 , Max. 17×13.1 and 13×16.6 , Min. 14×11.5 and 14.8×11.2 . Average weight of 10 eggs, 69 mg. (Rey), of 5 eggs, 69.6 mg. (Bau).

b. Eastern Bonelli's Warbler, *P. bonelli orientalis* (Brehm).

P. bonelli orientalis (Brehm). Hartert, Vög. Pal. Fauna, p. 514.

Breeding Range: The mountains of the Balkan peninsula: possibly also Bukowina, Transsylvania and the Crimea. [Also Asia Minor, Palestine and probably Cyprus.]

Continental Europe.

This is the only *Phylloscopus* which is known to breed in Greece. Reiser describes a nest found by him with young on May 26. 1898 as the first record for Greece, but Krüper took eggs as far back as May 10, 1880, not far from Athens and also in the Parnassus. Its range is evidently very imperfectly known at present, for it is not recorded by Mac Gregor from Macedonia or by Reiser from Bulgaria or Montenegro although Kadich describes it as common in the warmer valleys of Herzegowina. It has occurred in E. Hungary in August and probably breeds in Transsylvania. It is also said to breed in Bukowina and has been recorded from the Crimea. [In Asia Minor it is tolerably common, and breeds in Palestine, and possibly also on Cyprus.]

Nest etc.

Probably in its breeding habits it does not differ from the western race. The eggs are apparently laid in Greece about May 10. Average size of 6 Greek eggs, 15.53×12.55 , Max. 16.3×12.6 , Min. 14.5×13 and 16.2×12.2 .

118. Wood Warbler, *Phylloscopus sibilatrix* (Bechst.).

Geographical Races.

a. Northern Wood Warbler, *P. sibilatrix sibilatrix* (Bechst.).

Plate 28, fig. 11—14 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 11, a—d. Hewitson, I Ed. I, pl. CXVIII, fig. 2, 3; II Ed. 1, pl. XXVIII, fig. 1; III Ed. I, pl. XXXVI, fig. 3. Baedeker, Tab. 19, fig. 5. Taczanowski, Tab. LI, fig. 2. Seebohm, Br. Birds, pl. 10; id. Col. Fig., pl. 53. Frohawk, Br. Birds, I, pl. II, fig. 55. Dresser, pl. —, fig. 11, 12. Nest: O. Lee, III, p. 36.

British Local Names: *Wood Wren, Oven Bird, Yellow Wren*. Welsh: *Dryw Felen*. Foreign Names: Bohemia: *Sjkwavka*. Denmark and Norway: *Grönsanger*. France: *Pouillot siffleur*. Germany: *Waldlaubsänger*. Helgoland: *Gühl Fliegenbitter*. Holland: *Fluiter*. Hungary: *Sisegö füzike*. Poland: *Gajówka świstunka*. Russia: *Beresowka*. Sweden: *Grönsångare*.

Phylloscopus sibilatrix (Bechst.). Newton, ed. Yarrell, I, p. 427. Dresser, B. of Europe, II, p. 497 and Man. Pal. Birds, p. 95. Saunders, Man. p. 95. *P. sibilatrix sibilatrix* (Bechst.). Hartert, Vög. Pal. Fauna, p. 515.

Breeding Range: The British Isles and Continental Europe, excepting N. Scandinavia and N. Russia, where it is absent, and the Mediterranean basin, where it is replaced by a somewhat doubtfully distinct race.

This is the latest to arrive of the Leaf-Warblers in our islands, and is also the most local in distribution. A few pairs are generally to be found wherever woods of deciduous trees (especially beech and oak) are to be met with, and in some parts of England and Wales, such as the woods of Northumbria and W. Merioneth it is exceedingly plentiful, quite outnumbering the Willow Warbler locally. On the other hand it is practically unknown in W. Cornwall and W. Pembroke, and is everywhere rather irregularly and locally distributed. It has bred in the Isle of Man, and has apparently increased its range in Scotland of late years. Its northern limits appear to be S. E. Sutherland, Caithness and W. Ross, while A. C. Chapman has recorded its presence in treeless N. Uist! (Cf. *V. F. of N. W. Highlands* etc., p. 64 for details of increase in Scotland). To Ireland it is a very scarce visitor, but has been known to breed in Queens Co. and Galway, and is observed annually in Co. Wicklow.

British
Isles.

Though absent from Norway, it occurs in Sweden, up to about lat. 63°, but only in S. Finland. It is however exceedingly common in the forests of N. Germany and in the Baltic Provinces, extending

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eastward to Archangel, and the Kazan Government. It is also distributed over middle Europe, but towards the basin of the Mediterranean appears to be replaced by the Southern race, although the boundaries of the two forms are not yet defined. Apparently however the Northern form does not extend further S. than the middle of France and the Alpine and Transsylvanian chains.

Nest. Placed generally on a hillside partly covered with bracken and wooded thinly with deciduous or mixed timber. It is built on the ground and is not easy to see, as the materials used, dead grasses, bracken and perhaps a little moss, are difficult to distinguish from the surroundings. It is of course domed and the opening is somewhat flattened, while the interior is neatly lined with fine grasses, and occasionally, but not always a few horsehairs. Feathers are never used. Exceptionally Aplin has recorded a nest in a diagonal cleft across the face of a large boulder: another, without a dome, was built under shelter of a tree root, while in a third case a pair are said to have bred some distance down an rabbit hole! Rey states that in the German forests most nests face east, but this does not apply to the broken and hilly country where this bird often breeds with us. The song of the male is not much guide to the position of the nest, but the hen can often be put off the eggs by beating, and is generally feeding between 6 and 7 am. Her alarm note, a high pitched, 'Tee, tee', is characteristic, and she can easily be watched on again to the eggs.

Eggs. Generally 6 or 7 in number, sometimes only 5, while 8 have occasionally been found. They are thickly spotted and finely speckled with dark red brown, with a slight purplish tinge and sometimes ashy violet shell markings can also be distinguished. In some sets a good deal of the white ground is visible, but generally the markings are evenly distributed, frequently tending to form a zone or confluent blotches at the big end. They can only be confused with those of Bonelli's Warbler, which are however slightly smaller on the average.

Breeding Season. The time appears to vary little and the last ten days of May and the beginning of June appear to be the best time for full clutches both in the British Isles and Mid-Europe, but a few pairs may be found with eggs by the middle of May. Only one brood is reared in the season. Incubation lasts about 13 days.

Measurements. Average of 100 eggs (67 by Rey and 33 by the writer), 15.87×12.39 mm., Max. 18.3×13 and 17.5×13.5 , Min. 14.4×12 and 15.2×11.4 . A dwarf egg measures only 12.4×9.7 (Coll. R. H. Read). Average weight of 42 eggs, 72 mg. (Rey). R. H. Read gives the average of 17 unblown eggs as 1.227 g.

b. Southern Wood Warbler, *P. sibilatrix erlangeri* Hart.

Foreign Names: Italy: *Lui verde*. Portugal: *Folosa*. Spain: *Mosquita*.

P. sibilatrix erlangeri Hart. Hartert, Vög. Pal. Fauna, p. 516.

Breeding Range: Not clearly defined, but probably the countries forming the basin of the Mediterranean in Europe, and N. W. Africa.

This race, barely distinguishable by the yellower colouring of the male, is apparently found breeding in small numbers in the cork woods of S. Spain, though over the greater part of that country it is only known as a migrant, and rarely occurs in Portugal. It also is the representative form in S. France, but specimens from the Pyrenees have not been critically examined. In Italy it breeds in the hilly districts of the N. and Central Provinces, but not in the S., and though it has been recorded in Sardinia, I can find no proof of its breeding there.* In 1909 I met with a single pair which were evidently breeding in S. Corsica, but was unable to find the nest. In the Balkan Peninsula it is found from Dalmatia to Servia, but only occurs on passage in Greece. It is uncertain which form is found in the Caucasus. [There seems little doubt that it breeds in N. W. Africa, from Marocco to Tunisia, although no nests appear to have been recorded.]

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tinental
Europe.

Apparently in their breeding habits the southern birds do not differ from those of the northern race.

Nest, Eggs
etc.

119. Eversmann's Warbler, *Phylloscopus borealis* (Blas.).

Plate 34, fig. 20 (Siberia).

Eggs: Dresser, pl. —, fig. 19, 20.

Phylloscopus borealis (Blas.). Dresser, B. of Europe, II, p. 509 and Man. Pal. Birds, p. 99. *P. borealis borealis* (Blas.). Hartert, Vög. Pal. Fauna, p. 517.

Breeding Range: Finmark and N. Russia. [Also N. Siberia.] Has occurred at Fair I. and Suleskerry.

Collett has given an interesting account of the breeding of this bird in Finmark (*Ibis*, 1886, p. 217). He found it nesting in scattered pairs among the stunted birch woods along the valleys of the larger rivers flowing into the Porsanger, Tana and Varanger Fjords. In N. Russia it occurs along the Murman coast of the Kola Peninsula, and has been obtained on the N. shore of L. Onega, while Meves also met with it breeding in the Onega valley. Eastward it is found in the valleys of the Dwina, Mezen and Petschora and apparently reaches the

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* Probably Brooke's note in the *Ibis* for 1873 refers to Bonelli's Warbler, as Bonomi does not mention the Wood Warbler

N. of the Perm Government. [In Asia its range extends right across the northern part of the Continent to the Kolyma delta, Korea, Ussuria and Kamtschatka.]

Nest. Apparently this bird does not arrive at its breeding haunts in Finmark and the Murman coast till the latter part of June, when the monotonous song of the cock may be heard all day among the birch trees. The nest is placed on the ground on wooded slopes: it is domed and loosely built of dry grasses and stalks with some moss, on a foundation of dead birch leaves. The lining consists of fine grasses only, without any hair or feathers. The cock sings at some distance from the nest, and does not show any anxiety with regard to it.

Eggs. Apparently 6 or 7 in completed clutches. Very few authentic eggs are available for comparison, but two sets in Messrs. Dresser's and Bunyard's collections show a good deal of the white ground and are sparingly marked with bold spots of dark red brown. The clutch taken by Seebohm on the Yenesei is very different in character, being spotted with faint reddish or pink, but the nest was similar to those found by Collett.

Breeding Season. Collett estimated the dates for the first eggs in the three nests found by him as July 9, 10 and 11 and probably the usual time is from the last week in June to the second week of July.

Measurements. Average of 7 Lapland eggs, 16.38×12.7 mm., Max. 17.1×12.7 and 16.9×13 , Min. 15.7×12.5 . Seebohm's clutch of 5 eggs averages 16.26×12.5 .

120. Yellow browed Warbler, *Phylloscopus superciliosus* (Gm.).

Eggs: Seebohm, Br. Birds, pl. 10; id. Col. Fig. pl. 53.

Phylloscopus superciliosus (Gm.). Newton, ed Yarrell, I, p. 443. Dresser, B. of Europe, II, p. 469 and Man. Pal. Birds, p. 104. Saunders, Man. p. 61 (*part.*). *P. superciliosa superciliosa* (Gm.). Hartert, Vög. Pal. Fauna, p. 518.

Breeding Range: Siberia, from the R. Ob to the Sea of Okhotsk, and S. to lake Baikal.

Dis-tribution. This bird is of frequent occurrence in W. Europe on the autumn migration. Its breeding haunts are among the woods of the Siberian valleys. Finsch has recorded it from the R. Ob; Seebohm, Popham and others have found it very common on the Yenesei, and it is also known to occur on the Lena, Kolyma, and many other rivers east to the R. Anadyr. It is apparently absent from Kamtschatka, but is found in the Stanovoi Mts., and in small numbers in Corea, as well as in Transbaikalia, Kultuk, S. E. Mongolia etc.

Neatly concealed among the moss on the ground in the Yenesei valley, and built of dry grasses like the other Leaf Warblers' nests, neatly lined with reindeer and roe deer hair. In Dauria Dybowski found the nest in *Rhododendron* scrub. Nest.

These are 5—7 in number, white, thickly spotted at the big end, in the form often of an irregular zone of dark and lighter red brown markings. Seebohm found eggs on June 26 on the Yenesei. Eggs etc.

Average size of 4 eggs in the Brit. Museum, 14.8×11.2 mm. Measurements.

[A southern form of this species, Hume's Yellow browed Warbler, *P. superciliosus humei* (Brooks), breeds in the Altai and Tian Shan ranges, Turkestan, and Kashmir (Eggs figured in Br. Mus. Cat. Eggs. IV, pl. X, fig. 5, 6, and Dresser, pl. —, fig. 21—23). For nesting notes by Brooks see *Ibis*, 1872, p. 24, etc. The eggs, usually 5 in number, laid late in May or early in June, are like those of the N. race, and 44 measured by the writer average 14.23×11.2 mm. in size: Max. 15.2×11.2 and 14.7×12 , Min. 13.2×11.2 and 14.1×10.4 .]

121. Pallas' Willow Warbler, *Phylloscopus proregulus* (Pall.)

Plate 34, fig. 11 (Alexander Mts.).

Eggs: J. f. O., 1873, Taf. I, fig. 10.

Phylloscopus proregulus (Pall.). Dresser, B. of Europe, IX, p. 73 and Man. Pal. Birds, p. 105. Saunders, Man. p. 63. *P. proregulus proregulus* (Pall.). Hartert, Vög. Pal. Fauna, p. 523.

Breeding Range: E. Siberia, from the R. Lena to the Pacific, and N. to the Stanovoi range, but replaced by *P. p. newtoni* S. of the great deserts of E. Asia.

This bird has occurred once in Norfolk as well as on Helgoland and in Orenburg in E. Russia. Its breeding haunts are in the mountain forests of E. Siberia, from L. Baikal to the Stanovoi range. Dybowski found it nesting in Dauria on the boughs of old moss covered pines, close to the trunk, generally about 9—12 ft. from the ground. The materials used were green moss and dry grasses, while the nests were domed and lined with feathers and hair. Distribution,
Nest, etc.

From 5 to 6 in number, spotted with dark red, generally in the form of a zone round the big end, and a few ashy shell markings on a white ground, and little or no gloss. Eggs.

Dybowski found eggs in mid June. He states that the hen begins to sit as soon as the first egg is laid; so that sometimes fresh and incubated eggs may be found in the same nest. The hen is a very close sitter and can be caught on the eggs. Breeding
Season

According to Dybowski the eggs vary in size from 15×10.5 to 14×11 mm. Measurements.

[The southern race, *P. proregulus newtoni* Gaetke, breeds in the Himalayas from Kashmir to Butan and also in Chuanche and Gansu. Egg figured, Dresser, pl. —, fig. 24. Captain Cock describes the nest as domed partially and built of moss and lichens, lined profusely with feathers and fragments of thin birch bark, and placed on boughs of pine trees from 6 to 40 ft. above the ground. Eggs 5, like those of the *N.* race. Average size (10 eggs) 13.82×10.77 , Max. 14.2×11.3 , Min. 13.5×11 and 14×10.3 . Breeding season, end of May and early June in Kashmir. *Phylloscopus subviridis* (Brooks) has once been obtained in E. Russia. It breeds in Afghanistan, Kashmir, etc. Cf. Ibis, 1909, p. 124.]

122. Radde's Bush Warbler, *Herbivocula schwarzi* (Radde).

Lusciniola schwarzi (Radde). Dresser, Man. Pal. Birds, p. 127. Saunders, Man. p. 73. *Herbivocula schwarzi* (Radde). Hartert, Vög. Pal. Fauna, p. 530.

Breeding Range: From mid Siberia E. to Ussuria and Saghalin. (Has once occurred in Lincolnshire, Oct. 1, 1898).

Dis-
tribution,
etc.

The range of this species is stated by Pleske to extend from Kultuk, on L. Baikal to Ussuria and Saghalin, but Godlewski records it as singing in early August between Irkutsk and Tomsk. Schrenk met with it on the Amur, and Nicolski in the forests of S. W. Saghalin.

It arrives at its breeding haunts early in June, and haunts thick scrub, but as yet no information is available with regard to its nest and eggs, which are still unknown.

123. Cetti's Warbler, *Cettia cetti* (Marm).

Plate 21, fig. 27—30 (Andalucia).

Eggs: Thienemann, Fortpfl. Taf. XXI, fig. 3, a, b. Naumannia, 1858, Taf. 2, fig. 5, a—i. Baedeker, Tab. 19, fig. 24. Dresser, pl.—, fig. 35, 36, 41, 42. Krause, pl. —, fig. 1—36.

Foreign Names: France: *Bouscarle*. Greece: *Aedonaki*. Italy: *Rusignuolo di fiumi*. Portugal: *Rouxinol bravo*. Spain: *Mascareta*. *Cettia cettii* (Marm.). Dresser, B. of Europe, II, p. 639 and Man. Pal. Birds, p. 137. *C. cetti cetti* (Marm.). Hartert, Vög. Pal. Fauna, p. 537.

Breeding Range: The Iberian, Italian and Balkan Peninsulas, S. France, and the Mediterranean Islands; probably S. Russia. [Also N. W. Africa and Asia Minor: has occurred in Sussex, May 12, 1904.]

Con-
tinental
Europe.

This short winged and skulking species is widely but locally distributed in the Iberian peninsula wherever there are thick bramble brakes or tamarisks close to the banks of rivers and streams, and also in the swamps, especially where there are bushes growing, from the Bay of Biscay to the Mediterranean. It is found also in southern France N. to the Indre Department, but more especially in those bordering the

Golfe du Lion. In N. Italy it is very scarce, but breeds in Liguria, Tuscany and Campagna in suitable spots, and is apparently only of accidental occurrence in the S. It is recorded from Mallorca, plentiful in the low ground in Corsica and in Sardinia, and, locally common in Sicily. In the Balkan peninsula it is found in Dalmatia, Herzegovina, Montenegro, and in small numbers in the valley of the lower Danube, while it is also known to be resident in Macedonia, Albania, and Greece. Here it is to be met with not only in the plains, but also by the brush grown watercourses up to 3500 ft. Probably it is also this form which occurs in S. Russia, the Crimea and the Caucasus; and it is certainly resident in Crete, Cyprus, Asia Minor, and Palestine. It breeds in Tunisia and Algeria north of the Atlas, and also in Marocco.

The usual site for the nest is among the trailing branches of Nest. bramble thickets, often interspersed with *Smilax*, in swampy woods or overhanging watercourses and among tamarisks near the banks of rivers. In the latter site the nest may be found without difficulty, and is usually not far from the ground, but among brambles it is often placed over the water and is curiously inconspicuous, and difficult to find. In the open swamps and marshes some birds nest among the coarse vegetation, suspending the nest like a Reed Warbler's, from the stems of adjacent marsh plants such as Willow Herb. The nest is very neatly made and recalls those of the Tree Warblers, being somewhat conical in shape and very deep. It is built of dead grasses, leaves, and bits of sedge, mixed with plant down and roots, harmonizing well in colour with dead brambles, and the deep and neatly hollowed cup is lined with fine grasses mixed with down, and horsehair or feathers in varying quantities. Externally it has rather an untidy look, and might easily pass for an accumulation of flood wrack. Rough dimensions are: depth $4\frac{1}{2}$ —6 in., diameter of cup, 2— $2\frac{1}{2}$ in, depth of cup, 2— $2\frac{1}{4}$ in. Although the bird is difficult to observe on account of its skulking habits, its presence is easily detected by the extraordinarily loud, ringing notes of its brief song.

Almost always 4 or 5 in number. In most collections eggs may Eggs. be seen varying in colour from pale brick red and pink with a dull purplish tinge, to deep brick red and rich mahogany brown. Unfortunately the colour is fugitive, and the paler eggs are often merely faded specimens. Many eggs show more or less distinct zones of darker specks round the big end. The amount of gloss varies, but is not as a rule great.

In S. Spain and Corsica the last week in April and the beginning Breeding
Season. of May are the best times for the eggs of the first brood, while those of the second are found at the end of May and early in June. In Asia Minor Krüper found the first clutches in the latter part of April and two broods are also reared there.

Measure-
ments.

Average of 100 eggs (85 by the writer and 15 by Rey). 18.03×13.90 , Max. 19.6×14.3 and 18.5×14.5 , Min. 17×13.5 and 17.1×13.2 . Rey gives the average weight as 94 mg., and Bau as 92 mg. [An Eastern form of this species, *C. cetti cettioides* Hume, which breeds in Transcaspia, the Kirghis steppes, Turkestan and N. Persia, lays similar but apparently rather larger eggs, if one may judge from the few specimens examined. Average of 4 eggs from Persia, 20×14.5 .]

124. Moustached Warbler, *Lusciniola melanopogon* (Temm.).

Plate 28, fig. 22—25 (Dinnyés, Hungary, V. 92).

Eggs: Dresser, pl. —, fig. 19—21.

Foreign Names: Germany: *Tamariskensänger*. Hungary: *Fülemüle sitke*. Italy: *Forapaglie castagnolo*
Lusciniola melanopogon (Temm.). Dresser, B. of Europe, II, p. 605 and Man. Pal. Birds, p. 128. *L. melanopogon melanopogon* (Temm.). Hartert, Vög. Pal. Fauna, p. 540.

Breeding Range: E. Spain, Italy, Sicily, Hungary and possibly also the Balkan Peninsula. [Also said to be resident in Lower Egypt.]

Con-
tinental
Europe.

The breeding range of this species is not yet thoroughly worked out, but there seems little doubt that it is resident in the lagoons of E. Spain, such as the Albufera of Valencia, and possibly also in the province of Gerona, although wrongly identified eggs have been sent from Spain as those of this bird. Crespon regarded it as resident in Gard, in southern France, but it has not been reported by more recent visitors to the lower Rhone. It is however known to breed in fair numbers locally in Italy, especially in the Maremma of Tuscany and the Roman Campagna and possibly also in Liguria and Venetia. In Sicily Lynes found it breeding plentifully at a small lake near the E. coast (Pantana di Lentini) and it has also been recorded from Messina as resident. It breeds in considerable numbers in Hungary in reed and sedge grown morasses and lakes, and possibly also in Dalmatia and Bosnia. In Greece although it has been met with in the winter, it has not yet been proved to breed. [Shelley obtained specimens at Damietta, and believed it to be resident there, but confirmation of the statement is needed.]

Nest.

On the Velence Lake the nest is generally built underneath the knots tied by the fishermen by binding the heads of the reeds together as beacons, and neatly suspended by basket handles. Where such sites are not to be found it breeds among the rushes, sedge or old reeds, from 1 ft. to 2 ft. 3 in. above the water. In Sicily Commander Lynes describes the nests as sometimes placed in small bushes growing in shallow water, or among bases of reed clumps at edges of clearings. The

nest has been compared to those of both Reed and Sedge Warbler: it is built of dead grasses, roots, fragments of sedges from the floating scum and bits of tamarisk down, etc., lined neatly and smoothly with grasses, bits of reed flower, and sometimes a feather or two is woven in. Some nests have quite a large number of feathers of Purple Gallinule, Water Rail, and Little Bittern in the lining. Dimensions: depth from 3 in. upwards, diameter $3\frac{1}{4}$ in., diameter of cup, $1\frac{3}{8}$ —2 in., depth $1\frac{3}{8}$ in.

Usually 4, occasionally 3 or 5, and 6 have occasionally been found in Hungary. They closely resemble those of the Sedge Warbler, but when fresh have generally a greenish tinge and are as a rule lighter in colour. The fine speckles of olive brown and ashy shell markings are evenly distributed over the surface, generally showing the pale greenish (or occasionally light yellowish brown) ground, but in a few cases are so thick that the ground is quite obscured. Many eggs have a black hairstreak at the big end.

In Hungary the eggs may be taken from mid-April onward to the end of May and even in June, and two broods are reared. In Sicily Lynes found young on the wing and fresh eggs (presumably second broods) on June 6—8. Both sexes take part in incubation.

Average of 86 eggs (45 by the writer and 41 by Rey), 17.86×13.12 , Max. 19×13.1 and 18.3×14.1 , Min. 16.3×12.3 and 17×12 .

Average weight, 83 mg. (Rey); 85 mg. (Bau).

[The Eastern form of this species, *L. melanopogon mimica* Mad. breeds from the Volga delta and the Kirghis steppes eastward to Persia. The eggs do not differ from those of the Western form.]

125. River Warbler, *Locustella fluviatilis* (Wolf).

Plate 29, fig. 22, 23 (Breslau, 20. VI. 81 and 15. VI. 86).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 6, a—c (*errore*); Taf. IC, fig. 11, a, b. Heckel, Verh. d. Z. B. Ver., Wien, 1852, Taf. fig. 1—3 and Naumannia, 1853. Taf. II. Baedeker, Tab. 19, fig. 19. Taczanowski, Tab. XIV, fig. 1. Dresser, pl. —, fig. 33, 34, 39, 40.

Foreign Names: Bohemia: *Rákosník říční*. Finland: *Virtakerttu*. Germany: *Fluss-Rohrsänger*, *Fluss-Schwirl*. Hungary: *Berki tücsökmadár*. Poland: *Gajówka strumieniowa*. Russia: *Retschnaja kamyschefka*.

Locustella fluviatilis (Wolf). Dresser, B. of Europe, II, p. 102 and Man. Pal. Birds, p. 135. Hartert, Vög. Pal. Fauna, p. 547.

Breeding Range: Germany (chiefly in the E.), Austro-Hungary, and Russia N. to about 60° , but everywhere local.

In Germany the River Warbler has long been known to inhabit certain marshy districts in the E. provinces, such as E. Prussia (especially

Eggs.

Breeding Season.

Measurements.

Continental Europe.

near the Kurische Haff), Pomerania, Mecklenburg, Brandenburg locally, Posen, Saxony (near Leipzig) and Silesia (the Oder, Neisse, Bart-schniederung etc.). It is also recorded from Anhalt, Thuringia and Bavaria (near Erlangen), while recently specimens have been obtained in W. Germany also at various points on the Rhine (Cf. Le Roi, Vögel Rhein-provinz, p. 274). In Austro-Hungary it breeds in Moravia, Lower Austria, Hungary (in some numbers locally), Galizia, probably Transsylvania, and certainly Croatia and Slavonia. In Russia its northern limit extends to the middle of Finland and about 60° N. in the Urals; while southward it ranges through mid-Russia (common near Moscow and S. Petersburg), the Baltic Provinces and Poland, and E. to Orenburg and Perm, but Pleske thinks that it only visits S. Russia on migration; although it has been obtained in the Crimea early in August. (Cf. Lindner, *Ornith. Monatsschr.*, 1897, p. 214 for further details).

Nest. Well concealed, like those of the other *Locustellae*, and placed either on or not more than 18 in. from the ground, generally in thick willow or other bushes, especially when overgrown with rank grass, not always in the neighbourhood of water. The reeling note of the male is louder than that of the other members of this genus, and somewhat dis-syllabic in character. The nest is built of coarse grasses and leaves of reed and is rather loosely constructed on a foundation of a few dead leaves, with a lining of finer grasses and roots and sometimes a little horsehair. Height 3—3½ in., outer diameter, 4½ in., diameter of cup, 2½ in., depth 1½—1¾ in.

Eggs. Usually 5, sometimes only 4 and rarely 6. They vary considerably in colour, shape and especially in size. The ground colour is white, sometimes tinged with pink and showing some little gloss, while fine spots of reddish brown, greyish red, or brown are distributed fairly evenly over the surface, together with a few ashy shell markings. At the big end there is often a tendency to form a zone, and the spots are often a little bigger.

Breeding Season. In Germany from the beginning of June to the end of the month is the usual time. The earliest dates of which I have notes are, one from Hungary with eggs on May 15. and one with young from Uman, Russia, about June 7; but these dates are exceptional, and few eggs are found before the end of May. The hen is not a close sitter, and does not as a rule allow herself to be surprised on the nest, but slips off quietly when approached.

Measurements. Average of 100 eggs (79 by Hartert, 18 by Rey and 3 by the writer), 20.4×15.12 , Max. 22.3×16 and 20.9×16.8 , Min. 18×14 . Average weight of 18 eggs, 124 mg., varying from 102 to 142 mg. (Rey).

126. Savi's Warbler, *Locustella luscinioides* (Savi).

Plate 28, fig. 15—17 (Hungary).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 12; IC, fig. 12, a—c. Hewitson, II Ed. I, pl. XXV;* III Ed. pl. XXXI, fig. 2. Naumannia, 1853, Taf. II, fig. 6. Baedeker, Tab. 19, fig. 20. Taczanowski, Tab. XLVI. Seebohm, Br. Birds. pl. 10; id. Col. Fig. pl. 52. Frohawk, Br. Birds, I, pl. II, fig. 64. Dresser, pl. —, fig. 31, 32, 37, 38.

British Local Name: *Night Reeder* (obs.). Foreign Names: Bohemia: *Rákosnik slavikovy*. France: *Fauvette des Saules*. Germany: *Nachtigall - Rohrsänger*. Holland: *Nachtegal - Rietzanger*. Hungary: *Nádi tücsökmadár*. Italy: *Salciajola*. Poland: *Brzęczka*. Russia: *Kamyshchefka solowjinaja*.

Locustella luscinioides (Savi). Newton, ed. Yarrell, I, p. 389. Dresser, B. of Europe, II, p. 627 and Man. Pal. Birds, p. 136. Saunders, Man. p. 91. *L. luscinioides luscinioides* (Savi). Hartert, Vög. Pal. Fauna, p. 548.

Breeding Range: Continental Europe W. of the Rhine, Holland, Italy, Sicily, Austro-Hungary, Poland, Mid- and S. Russia, and the Danubian States; formerly in the English Fens. [Aso N. W. Africa, and possibly Lower Egypt.]

Formerly this bird bred in the Cambridgeshire fens (Milton, Burwell, and Wicken fens) as well as in Huntington (Wood Walton), and Norfolk (Surlingham and probably other broads). Details will be found in Newton's article, but here it is sufficient to state that the last British nest was taken in Norfolk in 1856. It is also said on very slight evidence to have bred in Essex and other counties.*

British
Isles.

In Spain it is not uncommon locally in the marshes of the lower Guadalquivir, and also in certain lagunas of southern Andalusia, while it is said to have bred at the Albufera (Valencia), and near Coimbra in Portugal. In France it appears to be confined to the Camargue, the marshes of the lower Loire, where it is common, and probably the Garonne. In Holland it is commoner than is generally supposed, breeding in the reed beds of the Maas, on the Naarder Meer and in the wilder parts of Friesland. In W. Germany its presence in the Rhine Province was only recognized in 1904. In Austro-Hungary it breeds in Galizia and is very common in some of the marshes of the great Hungarian plain, and also nests in Croatia, Slavonia and Transsylvania. In Russia it is confined to the central and southern districts, from Poland E. to Orenburg and the mouth of the Volga, where it is common, and S. to Odessa, but apparently not the Caucasus. In the Balkan states it is not un-

Con-
tinental
Europe.

* It may possibly have revisited Norfolk in recent years, but at present there is not enough evidence to warrant more than this suggestion.

common in the Danube valley, while in Italy it is exceedingly local, but occurs in suitable districts of Lombardy, Venetia and Æmilia, as well as in Tuscany (Massaciuccoli), and Sicily (Catania). [It also breeds in Algeria: possibly in Marocco, while Shelley says it is resident in the Fayûm, though it is more likely to winter there: and according to Severtzow nests in Turkestan.]

Nest. The approximate site of the nest may be located to some extent by the actions of the singing male bird, which utters its monotonous reel from the top of high reeds in the vicinity, with widely opened bill and swelling throat. It is however very difficult to find, being always hidden from above, sometimes but little above water level among masses of broken down reeds, and at other times among the big clumps of dead and matted sedges, perhaps 18 in. above the water, but only to be found by laboriously parting the thick mass of dead vegetation. The nest itself is smoothly and neatly rounded internally, and has been well compared to that of a miniature Rail or Waterhen. According to Newton the material used is the dead leaf of *Glycerium*, but some nests appear to be built of fragments of dead, brown, reed and sedge leaves.

Eggs. Usually 5, sometimes 4 or 6. They are oval in shape, closely speckled all over with fine spots of grey brown, less frequently reddish brown, and violet shell markings, on a ground, which is sometimes hardly visible, of greyish white, sometimes with a faint reddish tinge. Occasionally a blackish streak is found at the big end, where the markings are generally thickest, and often an egg is found with a distinct zone.

Breeding Season. In central Europe eggs may be found from about the middle of May to early June, but in England and Galizia few eggs have been taken before the end of May, while in Andalusia Irby says that the breeding season is rather variable, but took 13 nests (all with eggs except one) between May 4—13. Some birds however nest much earlier, for I found a nest with young a few days old on April 30 in the Marisma. Wodzicki says that both sexes take part in incubation and sit very closely. From the difference in the nesting dates it seems probable that in some cases two broods are reared.

Measurements. Average of 100 eggs (96 by the writer and 4 by Hartert), 19.68×14.55 , Max. 21.5×15 and 20.7×15.4 , Min. 17.5×13.6 . Cerva records a dwarf, 17×8 . Average weight of 8 eggs, 108 mg.

[A paler Eastern form, *L. luscinoides fusca* Sev.), breeds in Transcaspia and Turkestan.]

127. Pallas's Grasshopper Warbler, *Locustella certhiola* (Pall.).

Plate 34, fig. 16, 17 (Darasun, Dybowski).

Eggs: Taczanowski, J. f. O., 1873, Taf. I, fig. 4, 5. Dresser, pl. —, fig. 22—24.

Locustella certhiola (Pall.). Dresser, B. of Europe, II, p. 633 and Man. Pal. Birds, p. 133. Hartert, Vög. Pal. Fauna, p. 550.

Breeding Range: Siberia, from Tomsk and the Yenesei E. to the Amur mouth. Has occurred on Helgoland (1856), and the Rockabill, Ireland (Sept. 28, 1908).

Seebohm found this bird frequenting the marshes and swampy woods in the wide river meadows by the Yenesei, and more recently Johansen has recorded it from Tomsk, while Dr. Theel met with it up to lat. 62° N. It also breeds in the Altai district; in Transbaikalia, where Dybowski obtained eggs, near Irkutsk (Radde), and according to Przewalski very commonly in Ussuria as well as in the Hoang-ho valley. Dis-
tribution.

Built close to the ground in a tussock of grass in wet and moss grown meadows with a growth of long grass. Sometimes it is described as built on a hummock of moss, but well concealed by the grass. It is usually found by the sitting bird flying off close to the feet of the passer by. Nest.

Usually 5, less often 4 or 6 in number. They are thickly covered as a rule with very fine and almost confluent pinkish brown specks, which generally form a zone at the big end, and occasionally a dark hair streak. In some eggs the colour appears to be a uniform brownish pink, perhaps because the ground is completely obscured, but the colour is rather fugitive. Eggs.

In the Baikal district from mid June onwards, but in early June in Ussuria and the Amur, where fledged young were found early in July. Breeding
Season.

Average size of 16 eggs (9 by Taczanowski and 7 by the writer), 18.88 × 13.76, Max. 19.7 × 14 and 19 × 14.2, Min. 18.3 × 13.3. Measure-
ments.

128. Grasshopper Warbler, *Locustella naevia* (Bodd.).**Geographical Races.****a) Western Grasshopper Warbler, *L. naevia naevia* (Bodd.).**

Plate 28, fig. 18—21 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 8, a—c. Hewitson, I Ed. I, pl. LXX, fig. 3; II Ed. I, pl. XXV, fig. 1; III Ed. I, pl. XXXI, fig. 1. Heckel, Naumannia, 1853, Taf. II, fig. 4, 5. Baedeker, Tab. 19, fig. 21. Taczanowski, Tab. XLV. Seebohm, Br. Birds, pl. 10: Col.

Fig. pl. 52. Frohawk, Br. Birds, 1, pl. II, fig. 63. Cat. Eggs. Br. Mus., IV, pl. VIII, fig. 21 (var.). Dresser, pl. —, fig. 25—30. Howard, Brit. Warblers, pl. II, fig. 7—18.

British Local Names: *Reeler*, *Cricket Bird*. Welsh: *Y. Troellwr bach*. Foreign Names: Bohemia: *Rákosník zelený*. Denmark: *Busksanger*. France: *Becfin locustelle*. Germany: *Heuschreckensänger*. Holland: *Sprinkhaan-Rietzanger*. Hungary: *Réti tücsökmadár*. Italy: *Forapaglie macchiettato*. Poland: *Trziniak swierszczyk*. Russia: *Swertschok*. Sweden: *Gräshoppsångare*.

Acrocephalus naevius (Bodd.). Newton, ed. Yarrell, 1, p. 384. *Locustella naevia* (Bodd.). Dresser, B. of Europe, II, p. 611 and Man. Pal. Birds, p. 131. Saunders, Man. p. 89. *L. naevia naevia* (Bodd.). Hartert, Vög. Pal. Fauna, p. 551.

Breeding Range: The British Isles, and Continental Europe, south of the Baltic and about lat. 62° in Russia, but absent from S. Spain, S. Italy, and the Balkan Peninsula, and replaced by the Eastern race in S. E. Russia.

British
Isles.

The numbers of this species in a district vary considerably from year to year, and while in one season it may be almost plentiful, next year perhaps not a single pair will be found. It is moreover everywhere local, partly no doubt owing to the necessity of suitable breeding sites. It is fairly though irregularly distributed throughout England and Wales, but is scarce in Cornwall, and is perhaps most numerous in the valleys of Durham and S. Northumberland, on the Solway littoral, and in the Broad district. It is by no means confined to the low ground, but also haunts the heather covered slopes of the Pennines, and the Welsh hills up to about 1500 ft. It is found also in Anglesey, and in the Isle of Man. In Scotland it is found sporadically over the counties S. of the Firths of Forth and Clyde, but only sparingly further N., although it has been recognized not only in N. Argyll, but as far as Arisaig on the W. coast, in the Moray district, on the Upper Forth and in the Tay area. In Ireland it is more general, and is locally common, except on the western seaboard.

Con-
tinental
Europe.

In the Iberian peninsula although occurring on passage in some numbers and probably wintering in the S., there is no reason to believe that it breeds S. of the Cantabrian range. Northward of this it is not uncommon and is found in suitable districts in most parts of France, more especially in the N. W. Though scarce in Belgium, it is found in Holland near the coast as well as in Brabant, and may be met with locally throughout the great plain of central Europe. In Denmark it only breeds in the S., and has been obtained in Scandinavia only in Jaedderen and near Kristiania. Eastward it is found in the Baltic

provinces, in Finland in one or two localities only; was recognized by Meves in the Onega district, and breeds regularly in the S. Petersburg Government. In S. E. Russia it is however replaced by the next race. In Austro-Hungary it is known to breed in most parts, Bohemia (rarely), Lower Austria, Hungary (locally common), Galizia, Transsylvania, Slavonia, W. Tyrol, etc. In Switzerland it chiefly haunts low ground, but is occasionally met with in valleys up to about 4500 ft., while in Italy it is absent from the southern provinces, but breeds in Trentino, Veneto and Lombardia and has been noticed in spring in Liguria, Nizzardo and Piemonte.

Generally most carefully concealed, and often so hidden by long grass and scrub that it can only be found after most painstaking search, even when the site is approximately known. In the broads of Norfolk it often utters its reeling note from a reed, like Savi's Warbler, breeding close to the water, but inland many pairs nest on dry hillsides, where there is good cover, far from any water. On the slopes of the Pennines. I have met with it in long heather on the fringe of the moors; and osier beds, plantations of saplings with long grass, water-meadows, commons and tangled hedge bottoms, are all likely spots. As a rule the 'reel' may be heard between 8 pm. and a few hours after sunrise, but also at times in the middle of the day. (For interesting notes on the courtship and breeding habits H. E. Howard's *British Warblers*, Pt. I, p. 1—25, should be consulted). The nest usually rests in a grass tussock, close to the ground, but occasionally as much as 18 in. or 2 ft. above it, among thick brambles or undergrowth. On the continent it is said to be sometimes placed in a cornfield, but in the British Isles only in the adjacent hedge bottoms. A little moss, a few leaves, and bits of bracken have been found in the foundation, but the actual nest is built almost entirely of dead leaves of grasses and some stalks, and is fairly substantial, but not particularly neatly constructed. Outer diameter about 4 in., diameter of cup 2—2½ in, depth 1½—2 in. In this nest the hen sits with beak and tail pointing almost perpendicularly upwards, but is not easy to see, as the nest is generally quite hidden from above by rank grass or scrub.

Typically 6, but sometimes only 5. Most books give 7 as found occasionally, but I can only find one nest recorded with this number. They are generally thickly and uniformly speckled with very fine reddish brown spots on a creamy or pinkish white ground, and have little gloss. Sometimes the spots form a zone usually at the big end, and a purple or almost black hair streak is also not infrequently met with. Violet grey shell markings are not always present, but are sometimes conspicuous. In one very pretty variety in A. W. Johnson's collection there is a zone

of pink spots round the big end on a creamy ground: while J. M. Goodall has a set with bold purplish red blotches (figured in Howard's *British Warblers*, pl. II, fig. 7), and R. J. Ussher took a somewhat similar set in Ireland.

Breeding
Season.

The earliest dates recorded appear to be May 12 in the S. of England, and May 14 in the northern counties, but the great majority of eggs are taken between May 25 and June 5. Late nests may be found in July and even up to Aug. 6 (Nelson), but as O. Grabham states that no fewer than 30 eggs have been taken from a single pair, it seems probable that many supposed second broods are really only second or third layings. Ussher however states that a second brood may be found late in July or early in August in Ireland. Incubation lasts about 16 days (Howard), and is performed by the hen, who sits very closely and when flushed generally runs like a mouse for some distance, only taking wing to the nearest cover. The young leave the nest during the day when only a few days old and forsake it altogether about the ninth day, before they can fly.

Measure-
ments.

Average size of 100 eggs (63 from England by the writer and 37 from the Continent by Rey) 17.64×13.59 , Max. 20.3×14.2 and 19.1×14.8 , Min. 16.1×12.5 . The English eggs are as usual slightly larger than the German. Average weight, 94.5 mg. (Rey); 96 mg. (Bau).

b. Eastern Grasshopper Warbler, *L. naevia straminea* Seeb.

Locustella straminea (Sev.). Dresser, B. of Europe, IX, p. 652 and Man. Pal. Birds, p. 132. *L. naevia straminea* Seeb. Hartert, Vög. Pal. Fauna, p. 553.

Breeding Range: From the Urals (Orenburg) and the Caucasus, E. to Transcaspia, Turkestan and the Altai range. Possibly also in the Himalayas.

Probably differs little in habits from the Western race, but little seems to have been recorded on the subject. Lorenz found it up to about 4500 ft. on the N. side of the Caucasus, and Severtzow says that in the Pamirs he met with it at the end of July on brook swamps at nearly 15,000 ft., where it was probably nesting. Three eggs taken in the Tian Shan range by Ottosson's collector resemble those of the Western race and average 17.86×43.7 mm. in size.

129. Temminck's Grass Warbler, *Locustella lanceolata* (Temm.).

Plate 34, fig. 19 (Transbaikalia).

Egg: Cat. Eggs Br. Mus., IV, pl. IX, fig. 9.

Locustella lanceolata (Temm.). Dresser, B. of Europe, II, p. 617 and Man. Pal. Birds, p. 132. Hartert, Vög. Pal. Fauna, p. 553.

Breeding Range: Onega R., N. Russia (Meves). Has occurred near Cattaro, Nov. 1907. [Also Siberia from Tomsk to Kamtschatka, N. Yezo, Saghalin and the Kuriles.]

The only instance in which this bird has been obtained in Europe during the breeding season took place on July 9, 1869 near Possad on the R. Onega, when Meves shot a singing male bird. When Pleske's account of its distribution (*Ornithographia Rossica*, p. 629) was written, it was not known to breed W. of Kultuk, near L. Baikal, but has now been recorded from Tomsk by Johansen and has probably been overlooked.

After arriving in its breeding haunts about mid June, the male 'reels' nearly all day. The nest is built in marshy places, on a moss hillock overgrown by coarse grass and sheltered from above by a grass tussock. It is well concealed and as the bird sits close, is very hard to find. The materials used are dry grasses and stalks as a rule, but leaves of *Vaccinium* or Moss may be used in the exterior. Outer diameter, $3\frac{1}{2}$ in., cup $2\frac{1}{2}$ in., broad and $1\frac{3}{4}$ in. deep. Nest.

Eggs 5, thickly marked with reddish brown on a rosy ground with grey shell markings, especially towards the big end. They are laid towards the end of June. Eggs.

Average size of 4 eggs taken by Dybowski, 17.4×12.95 , Max. 17.8×13 : Min. 17×13 and 17.4×12.8 . A clutch of 6 eggs from the Baikal district taken by Ruckbeil, and ascribed to this bird, are slightly larger, averaging 17.9×13.8 , but can only belong to this species or *L. fasciolata* (Gray). One egg weighs 90 mg. (Rey). Measurements.

130. Great Reed Warbler, *Acrocephalus arundinaceus* (L.).

Geographical Races.

a. European Great Reed Warbler, *A. arundinaceus arundinaceus* (L.).

Plate 29, fig. 9—13 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 5, a—c. Baedeker, Tab. 19, fig. 10. Hewitson, III Ed. I, pl. XXXII, fig. 3, 4. Taczanowski, Tab. XLIII, fig. 1. Seebohm, Br. Birds, pl. 10; id. Col. Fig. pl. 52. Howard, Br. Warblers, pl. I, fig. 25—34. Dresser, pl. —, fig. 43—46. Nest: R. B. Lodge, Pictures of Bird Life., p. 227.

Foreign Names: Bohemia: *Rákosník velkij*. Denmark: *Rördrossel*. France: *Rousserolle*. Germany: *Drossel-Rohrsänger*. Holland: *Groote Karakiet*, *Rietlijster*. Hungary: *Nádírigó*. Italy: *Cannareccione*. Poland: *Trzciniak drozdówka*. Portugal: *Chinchofoes*. Russia: *Trostjanoidrosd*. Spain: *Carrizalero*. Sweden: *Trastsångare*.

Acrocephalus arundinaceus (L.). Newton, ed. Yarrell, I, p. 364. Dresser, B. of Europe, II, p. 597 and Man. Pal. Birds, p. 119. *A. turdoides* (Mey.). Saunders, Man. p. 83. *A. arundinaceus arundinaceus* (L.). Hartert, Vög. Pal. Fauna, p. 556.

Breeding Range: Middle and South Continental Europe, from the Baltic and Gulf of Finland to the Mediterranean, and from Andalusia E. to Orenburg, but replaced by the Caspian race in S. E. Russia. [Also in N. W. Africa, Asia Minor and W. Siberia.]

Con-
tinental
Europe.

It is very curious that a species, which breeds in such numbers on the opposite side of the Channel and whose northern range extends to the Gulf of Finland, should only be a rare accidental visitor to the British Isles. It is abundant in the reed beds of Portugal, and in the S. of Spain, but becomes very scarce in the plateaux of the interior, although it is found in the lagoons of the E. coast. In France it is fairly general in all suitable ground and is very common in some parts of Holland and Belgium. In Germany it is most numerous in E. Prussia, Pomerania, parts of Silesia, the Mark, Mecklenburg, Brunswick and the lower Rhine, but becomes scarce in Schleswig, although a few pairs have been found breeding in Denmark. In Switzerland it is confined to the low ground, and in Italy is found in the marshy districts of the N. and Central Provinces, but is scarce in the S., although not uncommon in the lakes and marshes of E. Sicily. Corsica and Sardinia are only visited on passage. Eastward it is found in almost all parts of Austro-Hungary where reed beds exist, in Poland, the Baltic Provinces to the islands in the Gulf of Riga and to about lat. 57° N. in the Urals. In the Balkan Peninsula it is common in the Danubian states, and breeds in the marshes of Herzegovina, Albania and in Corfu, but apparently not in Macedonia, while only a small proportion stay through the summer in Greece. [Also breeds in W. Siberia (Johansen), Asia Minor, probably in Palestine, and in some numbers in N. W. Africa, especially in parts of Algeria.]

Nest.

The presence of this bird in reed beds is very easy to detect on account of its extremely loud and rather harsh song, which becomes almost deafening when uttered simultaneously by a dozen or more males. Unlike most bird songs, it can be very accurately represented by words, *Karra, karra, karra; karee (or Keeit) karee karee; charra, charra, charra*, etc. The nest is a copy on a larger scale of that of the Reed Warbler, but is even more neatly constructed. It is built round 3 to 5 reed stems growing close together at heights varying as a rule from 2 to 4 ft. above the water, which it almost always overhangs. One nest only have I seen which was well concealed among rank marsh vegetation (not reeds), and within a foot of the water. Occasionally however nests

are found among the twigs of Willow or Sallow bushes both in Germany and Italy, as much as 7 or 8 ft. from the water, or even at some distance from it. One is recorded in the *J. f. O.*, 1881. p. 313, as being 12 ft. above the ground. In shape the nest is cylindrical, built of leaves of grasses, reeds and sedges, with roots interwoven, and reed blossoms worked into the foundation, lined with stalks, reed blossoms, or plant down and sometimes a few horsehairs or a feather or two, forming a deep cup. Height about $5\frac{1}{2}$ — $6\frac{1}{2}$ in., outer diameter, 4— $4\frac{1}{2}$ in., inner diameter, $2\frac{1}{2}$ in.

Generally 4 or 5, sometimes 6, and occasionally only 3 in number. Eggs.
In appearance they approach to the Marsh Warbler type, but are of course much larger. The ground colour is as a rule bluish or greenish sometimes with an olive tinge, very boldly blotched (especially towards the big end) with dark umber brown or blackish brown. There are generally some smaller spots as well, and underlying shell spots and blotches of ashy grey or paler olive. A pretty variety has a distinctly blue ground: another has only a few fine grey and black spots, sometimes in a zone, on a whitish ground: while a third variety has a cap of dark umber shading into a belt of pale olive at the big end, on a greyish white ground. In shape they are a somewhat blunt oval and show little gloss as a rule.

This varies to some extent according to the season, and the resultant growth of the reeds, and some pairs will be found nesting a fortnight or so before the majority. Breeding Season.
In Holland the best time for eggs is about the second week in June, and about mid June in E. Germany, but clutches may be taken there occasionally as early as the third week in May. In N. Italy full sets may be taken from May 19, and in S. Spain from about May 15. Incubation is said to last 14 days, and the young soon leave the shelter of the nest, climbing with extraordinary activity among the reed stems while still unfledged. Only one brood is reared in the season.

Average of 100 eggs (60 by Rey and 40 by the writer), 22.56×16.24 ,
Max. 24.8×16.3 and 23×17.2 , Min. 20.9×16.2 and 21.2×15.3 .
These measurements are however sometimes exceeded: abnormally long eggs measure 26.2×15 (coll. H. M. Wallis), 25.5×16 , etc. Average weight, 178 mg. (Rey). Measurements.

b. Caspian Great Reed Warbler, *A. arundinaceus zarudnyi* Hart.

A. arundinaceus zarudnyi Hart. Hartert, Vög. Pal. Fauna, p. 558.

Breeding Range: The mouth of the Volga and the Kirghis Steppes. [Also Transcaspia and Turkestan.]

Apparently does not differ in habits from the Western form. Average size of 5 eggs, 23×15.5 mm.

[Still further E. is found *A. arundinaceus orientalis* (T. & S.), breeding in China, S. E. Siberia and Japan, which lays smaller eggs. Average size of 28, 21.04×15.24 , Max. 22.5×15.5 and 22×16.2 ; Min. 20×14.8 and 21.1×14.5 . In Egypt, the Red Sea district and Palestine, another allied species breeds. the Clamorous Reed Warbler, *Acrocephalus stentoreus stentoreus* (H. & E.) Eggs figured in J. f. O., 1868, Taf. II. fig. 2 and Heuglin, Orn. N. O. Afrika, Taf. XLIII, fig. 13—15. They are similar to those of the European Great Reed Warbler: average size of 4, 21.9×16.05 . An Eastern form of this species breeds from Transcaspia to India and Ceylon, *A. stentoreus brunnescens* (Jerd.). Eggs figured by Dresser, pl. —, fig. 47, 48. Average size of 8 eggs, 21.96×15.45 .]

131. Reed Warbler, *Acrocephalus streperus* (Vieill.).

Plate 29, fig. 18—21 (Saxony).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 7, c, e, f (rest = *A. palustris*). Hewitson, I Ed. I, pl. LXX, fig. 1; II Ed. I, pl. XXV, fig. 3; III Ed. I, pl. XXXII, fig. 1 (2 = *palustris*). Baedeker, Tab. 19, fig. 11—15. Seebohm, Br. Birds, pl. 10; id. Col. Fig. pl. 52. Frohawk, Br. Birds, I, pl. II, fig. 56, 57. Cat. Eggs Br. Mus., IV, pl. VIII, fig. 20 (var.). Howard, Br. Warblers, pl. I, fig. 13—18. Dresser, pl. —, fig. 7—9. Nest: O. Lee, IV, p. 56.

British Local Names: *Reed Wren or Sparrow*. Welsh: *Aderyn y cyrs*. Foreign Names: Bohemia: *Rákosník oběcný*. Denmark: *Rørsanger*. France: *Rousserolle éffarvatte*. Germany: *Teich-Rohrsänger*. Holland: *Kleine Karakiet*. Hungary: *Userregő poszáta*. Italy: *Cannaiola*. Poland: *Trzcionka*. Russia: *Trostnikowaja Kamyschefka*. Sweden: *Rörsångare*. Spain: *Pinzoleta*.

Acrocephalus streperus (Vieill.). Newton, ed. Yarrell, I, p. 369. Dresser, B. of Europe, II, p. 567 and Man. Pal. Birds, p. 117. Saunders, Man., p. 79. *A. strepera strepera* (Vieill.). Hartert, Vög. Pal. Fauna, p. 560.

Breeding Range: England, S. Sweden, and Continental Europe S. of the Baltic, but eastern limit in Russia as yet uncertain.

Owing to the fact that this bird is chiefly confined in the breeding season to the reed grown banks of sluggish streams or still water, it is necessarily somewhat local everywhere, and is entirely absent from mountainous districts where the streams flow rapidly and there are few or no reeds. It is however quite common in some favoured spots, especially in the S. and S. E. Counties of England, many pairs nesting within a short distance of one another. It does not breed in Cornwall and is scarce in Devon, except at Slapton. It is also absent from the S. W. Counties of Wales, but breeds in Brecon (Langorse Lake), and in a few localities in N. Wales, where however it is scarce as well as very local.

It nests in some numbers in the meres of Salop, Cheshire and Staffordshire, but only in the Trent valley in Derbyshire, and very locally in Notts, although there are a few records of its breeding in Lancashire and it is supposed to have nested in Cumberland. On the E. side, though scarce in Lincolnshire, it certainly breeds in Yorkshire, especially in the E. riding, while a few pairs are to be found in the N. and W., and it has bred once in Durham according to Tristram.

On the Continent the northern limit of this species extends to the S. shores of Lake Wener in Sweden and the southern Russian Baltic Provinces, while its eastern range extends to Volhynia and Kiew, where it is common. Either this or the Eastern form, *A. strepera macronyx* (Sev.) also occurs on the Lower Volga and the Kirghis Steppes, but the limits of the two forms are not yet defined. It breeds wherever suitable marshy breeding places are available over the greater part of Europe, south to Andalusia, Italy and Sicily, but not in Corsica and Sardinia, and also breeds in the Balkan Peninsula to Greece and Thessaly. [No eggs have yet been taken in N. W. Africa, but Hartert believes that it breeds on Lake Fetzara, Algeria; and Krüper records it from Smyrna.]

Con-
tinental
Europe.

Characteristic: usually built among reeds at a height of from one to three feet above the water level. Occasionally it may be found among coarse marsh vegetation in England, and in Andalusia Irby noticed many nests on dead stems of Willow herb, while in some districts many nests are built among osiers or in the branches of other trees and bushes, up to 10 or even 20 ft. from the ground. Lilacs, snowberries, alders, elders, and laurels are often chosen for this purpose, and though in some cases the nest is built over water, it has also been found at considerable distances from the nearest stream. In shape the typical nest is somewhat cylindrical and deep internally, so that the bird has been known to incubate eggs when the wind has been strong enough to blow the reeds almost to the water's edge. The materials used are chiefly dry grasses, fragments of duckweed, and old reed flowers, lined with fine grasses or reed tops and occasionally a feather or two, a bit of wool and a little horsehair. The cock accompanies the hen while building, but does not share the work, and in suitable spots it is usual to find several pairs nesting not far from one another.

Nest.

Usually 4, sometimes 5 and very rarely 6 in number. They are greenish white in ground colour, blotched and marbled, sometimes closely and occasionally sparingly with dark olive brown and ashy grey, while some markings are so dark as almost to be called black. Another but much scarcer type has an almost pure white ground, boldly spotted with brown or greenish brown. Major Proctor has two sets of this type, which have only pale markings of greenish grey and lilac. Some eggs show

Eggs.

rich brown caps at the big end, and in others the markings are entirely of smoky brown without a tinge of green.

Breeding
Season.

The first eggs are laid in England during the last ten days of May, but the breeding season is rather variable and many birds do not lay till early June. This is also the case in Central Europe, but in Andalusia eggs may be found quite early in May. When the first laying is taken the birds build again at once, and a second and if necessary a third clutch may be found at intervals of about ten days. As fresh eggs and young have frequently been found in August, it is evident that a second brood is sometimes reared, in the south of England at any rate. Incubation lasts 13—14 days (Naumann) and is apparently performed by the hen.

Measure-
ments.

Average of 100 eggs (55 by Rey and 45 by the writer), 18.2×13.62 , Max. 21.4×14.2 and 19×14.6 , Min. 16.3×12.4 . A dwarf egg measures 14.7×10.8 . Average weight, 90.5 mg. (Rey), 89 mg. (Bau). Average weight of 20 full eggs, 1.633 g. (R. H. Read).

[The Eastern form, *A. strepera macronyx* (Sev.), apparently breeds from Transcaspia and Turkestan to Baluchistan and the Altai.]

132. Marsh Warbler, *Acrocephalus palustris* (Bechst.).

Plate 29, fig. 14—17 (Halle à Saale).

Eggs: Thienemann. Fortpfl. Tab. XXI, fig. 7, a, b (and d)* Hewitson, III Ed., pl. XXXII, fig. 2.* Baedeker, Tab. 19, fig. 16. Taczanowski, Tab. XLIII, fig. 2. Seeböhm, Br. Birds, pl. 10; id. Col. Fig. pl. 52. Frohawk, B. Birds, I, pl. II, fig. 58—60. Howard, Br. Warblers, pl. I, fig. 19—24. Dresser, pl. —, fig. 10—12. Nest: Kearton, Br. Birds' Nests, p. 466.

Foreign Names: Bohemia: *Rákosník bahní*. Denmark: *Sumpsanger*. France: *Rousserolle verderolle*. Germany: *Sumpfrohrsänger*. Holland: *Bosch-Rietzanger*. Hungary: *Énekes nádiposzáta*. Italy: *Cannaiola verdognola*. Poland: *Lozówka*. Russia: *Kamyschefka*.

Acrocephalus palustris (Bechst.). Newton, ed. Yarrell, I, p. 373. Dresser, B. of Europe, II, p. 573 and Man. Pal. Birds, p. 118. Saunders, Man. p. 81. Hartert, Vög. Pal. Fauna, p. 562.

Breeding Range: S. England, and Continental Europe, S. of the Baltic and about lat. 59° in Russia, but scarce in S. Italy and absent from the Mediterranean Isles and Greece. [Perhaps S. to Palestine.]

British
Isles.

Until recently the breeding range of this species was supposed to be restricted in England to Somerset, Gloucester, Oxford and Cambridge, but later observations prove that it a visitor in small numbers to

* Figured as *Acrocephalus streperus*.

Kent, Sussex, Surrey, Hants, Wilts, and Worcester. Possibly it also breeds in Norfolk, and it will probably be recorded sooner or later from Dorset and Berks.

On the Continent it is pretty generally distributed in suitable localities south of the Baltic, but it not numerous in Denmark. In Russia its northern limit extends to Reval in Ehstland, and the Governments of Twer, Jaroslaw, Kazan and Orenburg. It is known to breed in France south to the Pyrenees, but the evidence as to its status in the Iberian peninsula is very conflicting. There are however three clutches of eggs from the Malaga district in the British Museum, one of which was obtained from H. Saunders; although in his *Manual* he says that as yet no specimens are forthcoming from the Spanish Peninsula, contradicting statements in the *Ibis*, 1871, p. 215 and Dresser's *Birds of Europe*. It is scarce in S. and Middle Italy, rare on passage in Sardinia and absent from Corsica, while in the Balkan Peninsula although it breeds plentifully as far south as Macedonia it is still not definitely recorded from Greece. It is rare in the Caucasus, but apparently is found in Transcaucasia and also in the Volga delta. [Recently Schmitz reports having taken the nest in Palestine, and Loche met with it in Algeria, where it may breed, though proof of this is still lacking.]

Con-
tinental
Europe.

The favourite haunts of this species are osier beds, and swampy ground overgrown with rank vegetation, such as meadow sweet (*Epi-lobium*), or nettles, and bushes, but it is by no means confined to such spots and may also be found breeding in hedge bottoms, dry ditches, etc., at the edges of fields at a considerable distance from water. The nest somewhat resembles that of the Warblers in appearance and is shallower than those of the other *Acrocephali*, but is recognizable by the 'basket handles' by which it is attached to the stems of the surrounding vegetation. It is generally from 2 to 4 ft. above the ground, and is built of dry grasses, lined with fine rootlets and a few horsehairs. The diameter of the cup is about 2—2½ in., and the depth about 2 in. The cock usually sings in the neighbourhood of the nest till the work of building begins, when the song almost ceases for a time.

Nest.

Although it has been stated that the number varies from 5 to 7, all the authentic records with which I am acquainted agree in placing it at 4 to 6. The bluish or greenish or greenish white ground is more conspicuous than in typical Reed Warblers' eggs, and the markings are more scanty and bolder, and consist of irregular spots and blotches of olive brown and underlying violet grey, with occasional small spots or streaks of almost black. Characteristic fine specks of olive brown are also nearly always present.

Eggs.

In the south of England most eggs are laid during the second or third week in June, while in Switzerland Bau says that the usual date

Breeding.
Season.

is from 10 to 15 June. Mc Gregor took a clutch in Macedonia on May 21 and Schmitz reports eggs in Palestine on April 14, but in Germany and Holland eggs are rarely found before the first week of June. Only one brood is reared, and incubation lasts 13 days (Bau), 14—15 (W. W. Fowler), and is performed by the hen, who is relieved by the cock for part of the afternoon.

Measure-
ments.

Average of 130 Continental eggs (54 by Rey, 45 by Bau and 31 by Hartert), 18.83×13.67 . The largest eggs recorded appear to be 21.5×14 (Noack) and 17×14.8 (G. v. Boxberger): Min. 17×14.8 (L. v. Boxberger) and 18×10 (Hartert). Dwarf eggs measure 10.5×9 , 11×9 etc. Average weight, 100.4 mg. (Rey). British eggs average a little larger, 19.13×13.8 mm.

133. Blyth's Reed Warbler, *Acrocephalus dumetorum* Blyth.

Plate 26, fig. 19 (Altai).

Eggs: Cat. Eggs Br. Mus., IV, pl. IX, fig. 1, 4. Dresser, pl. —, fig. 4—6.

Foreign Names: Finland: *Viitakerttu*. Russia: *Ssadowaja Malinofka*. *Acrocephalus dumetorum* Blyth. Dresser, B. of Europe, II, p. 561 and Man. Pal. Birds, p. 116. Hartert, Vög. Pal. Fauna, p. 563.

Breeding Range: Chiefly in N. E. Russia. [Also W. Siberia to the Himalayas and the Altai range.]

Con-
tinental
Europe.

In Europe the range of this species is confined to Russia, where it has been met with as far west as the S. Petersburg government, while probably its northern range extends to Archangel, and its southern limit beyond the governments of Novgorod, Twer, Moscow, Tula, and east to Orenburg. [In Asia it is found in W. Siberia, Transcaspia, Turkestan, the Altai range, Bokhara, and the Himalayas.]

Nest.

Hulton and Anderson describe Indian nests as domed, with an entrance at the side and built in thick bushes: built of coarse dry grasses and lined with finer bents, but rather loosely put together. On the other hand Pleske quotes Bianchi and others as having taken nests in Russia resembling those of the Marsh Warbler, built of stalks and leaves of grasses, with some admixture of leaves, down or cobwebs, and lined with hair in small or large quantities. Diameter of cup, 2—2½ in., depth 1¼—1½ in. The song of the male is rich and the alarm note a sharp 'Tick, tick'.

Eggs.

Usually 4 or 5, occasionally 6. They are very variable: some eggs are pale pink in ground colour, blotched or spotted irregularly with violet grey and pinkish brown: others are white, similarly marked with olive brown and violet: a third type is also white, with fine rufous specks,

while a fourth is closely mottled with violet grey, umber brown and perhaps a blackish spot or so and has the greyish ground almost obscured. There is a fair amount of gloss.

Eggs may be found in Russia from about the second week of June to the end of the month, but earlier in the Himalayas. Breeding Season.

Average of 52 eggs (28 by the writer and 24 by Pleske), 17.6×13.7 , Max. 19.5×15 , Min. 16.2×13.2 and 17.5×12.75 . Measurements.

134. Paddy-field Warbler, *Acrocephalus agricola* Jerd.

Plate 22, fig. 30 (Turkestan).

Eggs: Dresser, pl. —, fig. 1—3.

Acrocephalus agricola Jerd. Dresser, B. of Europe, II, p. 559 and Man. Pal. Birds, p. 115. *A. agricola agricola* Jerd. Hartert, Vög. Pal. Fauna, p. 564.

Breeding Range: S. E. Russia. [Also from Transcaspia S. to E. Persia, E. to Nepal and the Altai range. Replaced in China by *A. agricola concinens* (Swin.)]

Like the preceding species this bird is only known to breed in Europe within the boundaries of Russia, but has a different range, being chiefly confined to the S. and S. E. Pleske states that it breeds in the Crimea, the Kirghis steppes and the Astrakhan district, Orenburg and Perm. It may possibly also be found breeding in the Dobrudscha, as a specimen was obtained there on April 18. [In Asia its range extends from Transcaspia, Turkestan, and the Altai range to Tsaidam, Tibet, and the Himalaya range, while southward it has been found breeding at Seistan in E. Persia.] Con-
tinental
Europe.

Generally built in marshes among reeds and other water plants, and attached to them like the nests of the Reed Warblers, which they much resemble. Davidson describes nests found in Kashmir as solid cups, from 1 to 3 ft. above the water, built of rough grass, with an intermixture of reed fibre and catkins, lined with finer grasses and sometimes a feather or two. This agrees with descriptions of nests from the Kirghis steppes, about 5 in. high, inner diameter $1\frac{5}{8}$ in., depth $2\frac{1}{2}$ in., but differs widely from Brooks' account of an empty nest in a rose bush. Nest.

In Kashmir generally 4, but 5 have been recorded from other districts. Some eggs are said to resemble those of the Reed Warbler, and are blotched and spotted all over with greenish brown and pale grey and a few very dark specks, on a greenish grey ground. Kashmir eggs on the other hand show much more of the white or bluish white ground, and are only sparingly marked, chiefly at the big end, with olive brown and underlying grey. They show hardly any gloss. Eggs.

Breeding Season. The eggs are laid in June as a rule: Sarudny took eggs at Seistan on June 2 and on the Kirghis steppes they have been found on June 7, but in Kashmir Davidson found 7 nests with eggs on June 22 and Rattray took eggs on the 19th.

Measurements. Average of 20 eggs (18 by the writer and 2 by Pleske), 17.14×12.93 , Max. 18×13.1 and 17.6×14 , Min. 16×13.3 and 16.5×11.7 .

135. Sedge Warbler, *Acrocephalus schoenobaenus* (L.).

Plate 29, fig. 1—4 (Denmark).

Eggs: Thienemann, Fortpfl. Taf. XXI, fig. 10, a—c. Hewitson, I. Ed. I. pl. LXX, fig. 2; II Ed. pl. XXV, fig. 2; III Ed. pl. XXXI, fig. 3. Baedeker, Tab. 19, fig. 17. Taczanowski, Tab. XLVII, fig. 2. Seebohm, Br. Birds, pl. 10; id. Col. Fig. pl. 52. Frohawk, Br. Birds, I, pl. II, fig. 61, 62. Howard, Br. Warblers, pl. I, fig. 7—12. Dresser, pl. —, fig. 16—18. Nest: O. Lee, III, p. 144.

British Local Names: *Sedge Bird* or *Chat*, *Chamchider*, *Mock Nightingale*. Welsh: *Dryw yr hêsg*. Foreign Names: Bohemia: *Mysak*. Denmark and Norway: *Sivsanger*. Finland: *Ruokokerltu*. France: *Bec-fin des joncs*. Germany: *Schilfrohrsänger*. Holland: *Rietzanger*. Hungary: *Foltos sitke*. Italy: *Forapaglie*. Poland: *Rokitniczka*. Russia: *Kamyshchafka*. Sweden: *Säfsångare*. Spain: *Buscarla*.

Acrocephalus schoenobaenus (L.). Newton, ed. Yarrell, I, p. 376. Dresser, B. of Europe, II, p. 597 and Man. Pal. Birds, p. 123. Hartert, Vög. Pal. Fauna, p. 566. *A. phragmitis* (Bechst.). Saunders, Man. p. 85.

Breeding Range: The British Isles and Continental Europe, excepting the extreme N. and the three southern peninsulas. [Also in Asia E. to the Yenesei, and possibly N. W. Africa.]

British Isles. Very generally distributed in England and Wales, except on the high lying moorlands and mountains. In Scotland it becomes less numerous in the N., although increasing its range in Moray and now plentiful in Dee, and is rare in W. Ross and very local in Sutherland, being everywhere confined to ground below about 800 ft. It is found in the Isle of Man and some of the Inner Hebrides, has bred in Skye and occurs in Barra, and also breeds in the Orkneys, but not in the Shetlands. It is one of the commonest Irish birds, somewhat unevenly distributed, but breeding in every county (Ussher).

Continental Europe. Its distribution in Scandinavia is curious, for it is rare in S. Norway, but commoner further N., ranging up to lat. 70° , while in Sweden it is chiefly confined to the middle and S. In Russia it is tolerably common in S. Finland, while a few pairs reach N. Finland and Lapland, and it has even been recorded from Enare and the Kola peninsula. Further

eastward it ranges to Archangel, and lat. 68° on the R. Petschora. It is unnecessary to trace its distribution through Central Europe, as it is found in all suitable breeding ground. To the southward there is no definite record of its breeding in the Iberian peninsula, and it occurs on passage only in Corsica and Sardinia, but it is locally common in Italy, but becomes rare or absent in the southern provinces and Sicily. In the Balkan peninsula also it is found in Greece only on passage, but breeds abundantly as far S. as Macedonia; and though possibly only met with on migration in the Crimea, it is said to nest locally in the Caucasus. [In Asia it is found up to 67° on the Ob and Yenesei, as well as in the Altai and N. Turkestan, while there is reason to believe that it may breed in Algeria and Tunisia.]

Although generally it shows a preference for marshy spots and the neighbourhood of water, yet occasionally this species may be met with breeding in hedgerows and among coarse vegetation some considerable distance away from it. It is often built close to the ground, although in hedges it is frequently found 4 or 5 ft. high and exceptionally has bred as much as 10 ft. above the ground in Yorkshire, Rutland and N. Wales. It is often well concealed by rank grass or other vegetation and it is as a rule much flatter than the Reed Warbler's nest, and not suspended, although in one or two cases it is said to have built a suspended nest like its congener. The materials used are moss and dead grass as a foundation, with walls of stalks and bents mixed with willow down, thickly lined with hair as a rule, sometimes a few feathers or flowering grass tops. Diameter of cup, 1½ m. The work of nest building is performed by the hen only. Nest.

As a rule 5 or 6, but 7 are occasionally found. In general appearance they resemble the rather larger eggs of the Yellow Wagtails, being so finely and thickly speckled with varying shades of ochreous brown or greyish brown that the yellowish or greyish ground is sometimes hardly visible and the eggs appear to possess an almost smooth greyish brown surface. At other times the markings form a more or less distinct zone. Streaks and smudges of very dark brown often occur at the big end, or almost black hairstreaks like those found on the eggs of the Yellow and Grey Wagtails. A scarce and beautiful variation is the pink type, which has occurred in several districts, while white eggs have also been found, sometimes with a few blackish markings. Eggs.

The usual time for full clutches in Great Britain varies according to locality from about May 20 to June 10. In Scandinavia the eggs are laid in early June and in Central Europe from mid May to the end of the month or early in June. Exceptionally clutches have been taken as early as May 9 in Lancashire and there is no doubt that second Breeding Season.

broods are sometimes reared, for young are not infrequently found in the nest in August, and even in September. In an incubator the eggs hatched on the 15th day (W. Evans), and the young leave the nest when about 10 days old (H. E. Howard).

Measure-
ments.

Average of 100 eggs (51 by the writer and 49 by Rey), 17.73×13.45 mm., Max. 20.5×13.2 and 19.6×15 , Min. 15.7×13.4 and 17.2×12.4 . Dwarf eggs measure 12.2×9.2 , 12.8×9.6 etc. Average weight, 102 mg. (Rey), 99 mg. (Bau).

136. Aquatic Warbler, *Acrocephalus aquaticus* (Gm.).

Plate 29, fig. 5—8 (S. France).

Eggs: Thienemann, Fortpfl. Tab. XXI, fig. 11, a—c. Baedeker, Tab. 19, fig. 18 (errore). Seebohm, Br. Birds, pl. 10; id. Col. Fig., pl. 52. Howard, Br. Warblers, pl. 1, fig. 1—6 [? 2]. Dresser, pl. —, fig. 13—15.

Foreign Names: Bohemia: *Rakósnik vodni*. Denmark: *Vandsanger*. France: *Fauvette des marais*. Germany: *Binsen-Rohrsänger*. Hungary: *Csikofejű sitke*. Italy: *Pagliarolo*. Poland: *Gajówka wodniczka*. Russia: *Kumyschewka wertljawaja*. Spain: *Arandillo*.

Acrocephalus aquaticus (Gm.). Newton, ed. Yarrell, I, p. 380. Dresser, B. of Europe, II, p. 591 and Man. Pal. Birds, p. 122. Saunders, Man. p. 87. *A. aquatica* (Gm.). Hartert, Vög. Pal. Fauna, p. 568.

Breeding Range: Central and southern Europe, S. of the Baltic, but apparently wanting from the Iberian and Balkan peninsulas.

British
Isles.

[Although it is by no means improbable that it has bred in the British Isles, there is as yet no satisfactory evidence that it has done so].

Con-
tinental
Europe.

The evidence as to the breeding of this species is far from satisfactory. In some cases it has probably been confused with the Sedge Warbler, or overlooked altogether. Saunders doubts its breeding in Spain, yet Irby's work contains a reference to a nest found by Verner in Andalusia. It does however certainly nest in France, somewhat sparingly in the Camargue, and locally in suitable spots further N., especially in the départements of Somme and Nord, La Brenne etc. A few pairs breed in the Low Countries, and in some parts of N. Germany, such as the Mark Brandenburg, it is locally common, and in Silesia it is not uncommon, while it nests sparingly also in Schleswig-Holstein, S. Jutland and Zealand. In S. Germany it is generally rarer, but is common in Poland, E. of the Weichsel, and ranges E. to the middle Urals (lat. 56°), but evidence from S. E. Russia is unsatisfactory. It is sparingly distributed in Switzerland, but has been found nesting at over 3000 ft. It is found in Galizia and is not rare locally in Hungary, but is apparently

not found S. of the Danube, although it breeds in Herzegowina and in Italy it is said to range S. to Sicily and to be common in Lombardy, Venetia and Tuscany. Brooke stated that it bred in the marshes of Sardinia, and Wharton records it from N. E. Corsica in late April, but later records are lacking. [Tristram records it as breeding in Algeria, but eggs taken there resemble Reed Warbler's somewhat, although he does not mention that species, and though it probably breeds in N. W. Africa, confirmation is desirable.]

The few descriptions of the nest available depict it as generally built among grass grown willow bushes or clumps of sedges, not far from the ground and seldom more than 18 in. above it in swampy ground, on banks of streams etc. The nest is said to be rather smaller and deeper than that of the Sedge Warbler, built of grasses and bents, with cobwebs and plant down interwoven, and lined usually with horsehair and sometimes a few feathers. It also generally contains macerated leaves. Nest.

Vary in number from 4 to 5 or 6. As far as one can tell from the small series of thoroughly authentic eggs examined, they cannot be distinguished with any certainty from the eggs of the Sedge Warbler, which they closely resemble. The ground colour is pale greenish yellow, closely speckled with stone coloured or brownish yellow, varying in depth of colour, but usually light, and sometimes darker at the big end or forming a zone of darker markings. Shell smooth. Eggs.

Said to breed about a fortnight earlier than the Sedge Warbler by Naumann: in Poland from mid May (Taczanowski), and in Switzerland from mid May to early June. Breeding Season.

Average size of 52 eggs (17 by the writer and also by Hocke, 11 by Proctor and 7 by Blasius). 17.11×13.01 , Max. 18.3×14 and 17.5×15 , Min. 15×13.7 and 17.6×11.8 mm. Bau gives the average of 36 eggs as 16.7×13 , and the average weight as 88 mg. They are thus smaller and lighter on the average than those of the Sedge Warbler. Measurements.

137. Icterine Warbler, *Hippolais icterina* (Vieill.).

Plate 28, fig. 26—29 (Leipzig).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 13, a—d. Baedeker, Tab. 19, fig. 1. Taczanowski, Tab. LI, fig. 1. Seebohm, Br. Birds, pl. 10; id. Col. Fig., pl. 52. Dresser, pl. —, fig. 25—28. Howard, Br. Warblers, pl. II, fig. 34, 35.

Foreign Names: Bohemia: *Sedmihlásek*. Denmark and Norway: *Bastard Naktergal*. Finland: *Kultarinta*. France: *Bec-fin à poitrine jaune*. Germany: *Gartenspötter*. Holland: *Spotvogel*. Hungary: *Geze*.

Italy: *Canapino maggiore*. Poland: *Gajówka szczebiotliwa*. Russia: *Ljesnaja Malinowka*. Sweden: *Gulbröstad sångare*.

Hypolais icterina (Vieill.). Newton, ed. Yarrell, I, p. 360. Dresser, B. of Europe, II, p. 521 and Man. Pal. Birds, p. 107. Saunders, Man. p. 75. *Hippolais icterina* (Vieill.). Hartert, Vög. Pal. Fauna, p. 570.

Breeding Range: Continental Europe, except N. Scandinavia and Russia, W. France, and the Iberian and Balkan peninsulas. [Also W. Siberia and probably Algeria.]

[Although it is a fact that one (or more) species of this genus has bred on several occasions in the S. of England, there is no definite proof as yet, beyond the presence of eggs which might belong to this species or *H. polyglotta*.] It is remarkable that it should be so little known in England, for its range extends in Norway up to lat. $67\frac{1}{2}^{\circ}$, well within the Arctic circle. In Sweden it is chiefly confined to the southern part and the islands of Gotland and Öland, but is found up to about lat. 63° , while in Finland it occurs as far as Kuopio and in N. Russia ranges to Archangel and lat. 57° at least in the Urals. Its southern limit in Russia coincides with that of the birch, but isolated instances of its occurrence have been recorded from the N. Caucasus, Crimea, Odessa etc. Throughout middle Europe it is generally distributed in fair numbers, but becomes scarce S. of the Danube valley, although a few pairs breed in Bulgaria and Montenegro and it is tolerably common in S. Dalmatia. In Italy it is generally distributed and is said also to nest in Sicily, but has not been found breeding in Sardinia or Corsica. In France it is only found in the E. and S., and is absent from the N. W., from the mouth of the Garonne and the départements Charente, Vienne, Cher, Nièvres and Seine et Marne almost to Calais (L. Bureau). In the Low Countries, Denmark and Germany it is common and has twice bred on Helgoland. [The nest has been taken in W. Siberia about 57° N. and 74° E., and it is almost certain that it breeds in Algeria and Tunisia, for Hartert shot a female in N. Algeria with enlarged ovary on May 24.]

Nest.

The neatly constructed nest is generally placed in the fork of slender twigs of some shrub, such as syringa or lilac; sometimes in a tree or tall hedge, as a rule between 4 and 8 ft. high, but sometimes as much as 30—40 ft. from the ground and occasionally only a foot or two above it. It is rather deep, and firmly built, but very light. The materials vary according to locality, but generally consist of vegetable down, dry grasses, sometimes bits of wool, lichens or moss, interwoven with fine strips of birch bark, fibre or roots, and lined with grasses, roots and a few hairs. In some cases (especially in the N.) feathers are used in the lining. Birch bark is freely used to decorate the exterior as a rule,

so that the nest looks very white.* A typical nest measures $3\frac{3}{4}$ in. high and $3\frac{1}{2}$ in. broad; diameter of cup, $2\frac{5}{8}$ in., depth $1\frac{5}{8}$ in. Each pair has its own district, and the extraordinary song of the cock at once calls attention to the locality.

Usually 4 or 5, sometimes 6 in number, with the characteristic dull rose coloured ground, varying in depth somewhat and sparingly marked with sharply defined black spots and streaks with an occasional hair line. Greyish shell markings are also sometimes met with. They can generally be distinguished from eggs of *H. polyglotta* by their larger size, but vary a good deal in this respect.

Eggs.

In middle Europe eggs are occasionally found at the end of May, but as a rule not till early in June, while in Scandinavia the usual time is about mid June, sometimes not till the end of the month. Incubation is performed by both sexes in turn for 13 days., the male bird sitting during the afternoon (Naumann).

Breeding Season.

Average size of 142 eggs (95 by Rey and 47 by Bau), 18.35×13.4 , Max. 20.6×13 and 19×14.1 , Min. 17×13 and 18.1×12.4 mm. Average weight, 91 mg. (Rey); 92 mg. (Bau).

Measurements.

138. Melodious Warbler, *Hippolais polyglotta* (Vieill.).

Plate 15, fig. 7—9 (Madrid, Spain).

Eggs: Dresser, pl. —, fig. 29, 30. Howard, Br. Warblers, pl. II, fig. 33.

Foreign Names: France: *Fauvette polyglotte*. Portugal: *Folosa*. Italy: *Canapino*. Spain: *Almendrita de verano*.

Hippolais polyglotta (Vieill.). Dresser, B. of Europe, II, p. 517 and Man. Pal. Birds, p. 108. Saunders, Man. p. 77. *Hippolais polyglotta* (Vieill.). Hartert, Vög. Pal. Fauna, p. 571.

Breeding Range: The Iberian peninsula, France (except in the N. E.) and Italy. [Also N. W. Africa.]

[Like the preceding species this bird has also occurred in England in spring, and there is reason to believe that it has bred occasionally, but further confirmation is required. Cf. *Ibis*, 1897, p. 627 etc.]

In the Iberian peninsula this species is common, but on the whole less numerous than the W. Olivaceous Warbler. It is fairly well distributed over the greater part of Spain and Portugal on suitable ground, except N. of the Cantabrian range, where it has not yet been recorded, but is more common in the southern and eastern provinces than in the

Continental Europe.

* Rey met with two nests in a large rookery which were almost covered with Rooks' feathers.

central plateau. In France it is said by Bureau to be found everywhere except in the N. E., and is only absent from the following départements, Somme, Pas-de-Calais, Nord, Aisnes, Ardennes, outer Meuse, Meurthe et Moselle, Vosges, Haut Saône and Doubs. In Italy it is somewhat irregularly distributed, but is probably found along the western side, and is not uncommon in Tuscany, while it is found in Venetia and up to S. Tyrol, as well as in Sicily. It is absent however from Sardinia and Corsica, and is only a straggler to the rest of Europe. [In N. W. Africa it breeds in Tunisia, Algeria, and Marocco, at least as far as the Rio de Oro on the W. Coast.]

Nest. The favourite haunts of this bird in S. Europe are wooded gullies and watercourses, or banks of rivers, though Lynes occasionally also found it nesting in cistus scrub on the hillsides. In Algeria Hartert found it frequenting tamarisks and beds of huge nettles. It builds its neat nest in bushes of all kinds, willow, alder, oleander, arbutus, broom, etc., generally from 3 to 5 ft. from the ground. The nest is compactly and smoothly built of dry grasses and willow catkins or thistledown, with a dead leaf or two woven in., and is lined with down, long rootlets and a few hairs or rarely a few feathers. Diameter of cup nearly 2 in., depth, $1\frac{1}{2}$ — $1\frac{3}{4}$ in. The song of the male is sweeter and less forced than that of the Icterine.

Eggs. In Europe 4 or sometimes 5, while 6 are said to have occurred rarely, but in N. Africa the clutch consists sometimes of 3 only. The eggs have the same rose red ground as the Icterine's, but are often brighter in tint and generally smaller, while the markings are similar, but the surface is dull and without gloss.

Breeding Season. Although a few pairs have eggs in S. Spain by May 12, the majority do not lay till about May 20. Apparently two broods are reared and the eggs of the second hatch may be looked for about the third week of June. In Algeria eggs have been taken after the third week in May.

Measurements. Average size of 100 eggs from Spain and Algeria measured by the writer, 17.72×13.22 , Max. 19.2×13.6 and 18.6×14.5 , Min. 16.1×13 and 17×12.3 mm. Weights of 3 eggs, 90, 80 and 80 mg. (Koenig).

139. Olive-tree Warbler, *Hippolais olivetorum* (Strickl.).

Plate 22, fig. 26 (Greece).

Eggs: Thienemann, Fortpfl. Tab. XIX, fig. 14, a—c. Baedeker, Tab. 19, fig. 3. Taczanowski, Tab. LII, fig. 1. Dresser, pl. —, fig. 31, 32.

Foreign Names: Greece: *Stritsída*, *Tirtirli*. Italy: *Canapino levantino*.

Hypolais olivetorum (Str.). Dresser, B. of Europe, II, p. 527 and Man. Pal. Birds, p. 109. *Hippolais olivetorum* (Str.). Hartert, Vog. Pal. Fauna, p. 572.

Breeding Range: The Balkan peninsula, locally (Dalmatia, Greece and the Archipelago). [Also Asia Minor and N. Syria.]

Although not universally distributed this species is common in many parts of Greece, especially on the low ground and foot hills, where olive groves prevail. Krüper also records it from Naxos and Erhard from the Cyclades. It is however very scarce in Macedonia and has only once been obtained in Bulgaria, but its distribution in the Balkan peninsula is probably still imperfectly known, for it is now known to be locally common in the Gulf of Cattaro, in S. Dalmatia (Kollibay), and also breeds in Montenegro (v. Führer). [In Asia Tristram found it nesting in N. Palestine and Krüper describes it as tolerably common near Smyrna. Tristram's breeding record from Algeria is erroneous.]

It is an extraordinarily wary and shy species, spending its time in the tops of the olive trees, where it would be very difficult to detect if it were not for its loud and rich but rapid and monotonous song, which is frequently uttered while in motion. The nest is neatly built among the smaller twigs of an olive or other tree, sometimes as low as 1 ft. from the ground, but usually from 2 to 9 or 10 ft. high. It is built of grasses, roots, gnaphalium stalks, mixed with down and covered externally with cobwebs, lined with yellow down and a few roots or hairs. Diameter of cup, $3\frac{1}{4}$ —4 in., depth $1\frac{1}{4}$ —2 in. Lindermayer states that it is built in about 12 days: in Greece it is generally found in olives, but also in pomegranates, almonds, laurels, figs, mulberries etc., and in Dalmatia commonly in oak forest. Here Grossmann noticed in a summer when the foliage was devoured by caterpillars, that it bred in large colonies of some hundred pairs, a pair nesting in almost every tree.

Sometimes 3 but more usually 4. The ground is a much paler and more delicate rose than that of the Icterine's egg, which otherwise it closely resembles, although that of the Olive-tree Warbler is larger and heavier. The rounded black spots are sparingly distributed and rarely show any tendency to a zone. The surface is without gloss.

It is a late arrival in its summer haunts, seldom laying before the last days of May and early June in Greece, although clutches have been taken at the end of the third week of May. Dalmatian clutches are dated June 11 and 15, and in Asia Minor Selous took clutches at the end of May.

Average of 100 eggs (42 by the writer, 29 by Reiser and 29 by Rey), 20.12×14.77 . Max. 22.5×14.7 and 20.5×15.7 , Min. 17×13.5 mm. Rey gives the average weight as 127 mg. and Reiser (29 eggs) as 117 mg.

Con-
tinental
Europe.

Nest.

Eggs.

Breeding
Season.

Measure-
ments.

140. Olivaceous Warbler, *Hippolais pallida* (H. & E.).

Geographical Races.

a. Eastern Olivaceous Warbler, *H. pallida pallida* (H. & E.).

Plate 22, fig. 27, 28 (Attica, Greece).

Eggs: Thienemann: Fortpfl. Tab. XIX, fig. 15, a—c. Baedeker, Tab. 19, fig. 4. Reiser, Orn. Balc. III, Taf. III, fig. 10—12. Dresser, pl. —, fig. 35, 36.

Foreign Names: Greece: *Tirtirli-homichros*, *Myiocháphtes*.

Hippolais pallida (H. & E.). Dresser, B. of Europe, II, p. 537 and Man. Pal. Birds, p. 110. *Hippolais pallida pallida* (H. & E.). Hartert, Vög. Pal. Fauna, p. 574.

Breeding Range: The Balkan peninsula, Greek Islands and Crete. [Also Asia Minor, Palestine, Egypt, and E. to Persia as well as N. to Transcaspia.]

Con-
tinental
Europe.

In Europe this race is confined to the Balkan peninsula, where it is the commonest Warbler in the southern part. In Greece it is very generally distributed on the low ground, breeding in the valleys and not ranging higher than the limit of the olive. It is also plentiful on the Greek islands, especially on Naxos, and on Crete. Northward it becomes scarcer in Macedonia, but is the characteristic Warbler of Albania and is very common in S. Dalmatia, S. Montenegro, and in the coast region of Herzegowina, and has been recorded from Bulgaria and E. Roumania. [It breeds abundantly in Egypt and Nubia, as well as in Palestine, Mesopotamia, Asia Minor and Cyprus; while its range also includes Persia, Transcaucasia, Turkestan, Bokhara and Transcaspia.]

Nest.

In Greece the nest is generally found among the drooping outer boughs of the olive, concealed by the pendent leaves, but in Montenegro it is found in wild pomegranates, willows and tamarisks, rarely higher than 3 ft., and in Cyprus among brambles and bushes near streams. In Egypt many nests are built in clumps of flowering plants or shrubs. The nest is a typical Tree Warbler's, built of fine grasses, roots, fibre and strips of bark, mixed with down of various kinds and bits of wool, the whole being compactly woven together, and lined with wool, down and fine roots, with an occasional feather or horsehair. Diameter of cup, $1\frac{3}{4}$ in, depth $1\frac{1}{2}$ —2 in.

Eggs.

Generally 4, sometimes only 3, while 5 are said to occur very rarely. They are quite, without gloss and have a pale greyish ground, sometimes with a slight reddish, violet or yellowish tinge, and dark blackish brown spots (generally rounded) and specks, with occasional streaks or hair lines at the larger end. Reiser obtained a variety with a single large blackish spot on a flesh coloured ground.

In Greece eggs may be taken from mid May to early June, and after the first week of May in Cyprus, while in Asia Minor from May 12 to the beginning of June, and from the beginning of May in Persia. Incubation is performed by the hen alone and lasts 13 days (Reiser); during the whole day the cock sings in the neighbourhood of the nest. The hen sits very closely and may be touched as she sits (D. Bate). Only one brood is reared, and the parents migrate south at the end of July from Greece.

Breeding Season.

Average of 105 eggs (63 by Rey, 26 by Reiser and 16 by the writer), 17.38×13.33 , Max. 19.5×13.8 and 17×14 , Min. 15.9×12.3 and 17×12.1 mm. Average weight 80 mg. (Rey); 79.7 mg. (Reiser).

Measurements.

b. Western Olivaceous Warbler, *H. pallida opaca* Cab.

Plate 32, fig. 15—17 (Spain).

Eggs: Baedeker, Tab. 19, fig. 2. Dresser, pl. —, fig. 33, 34.

Foreign Name: Spain: *Pinchahigos*.

Hypolais opaca (Licht.). Dresser, B. of Europe, II, p. 531 and Man. Pal. Birds, p. 110. *Hypolais pallida opaca* Cab. Hartert, Vög. Pal. Fauna, p. 575.

Breeding Range: S. and E. Spain. [Also N. W. Africa, N. of the Atlas.]

In Spain, although locally very common, this species appears to be confined to the southern and eastern provinces, and apparently does not penetrate to the high plateau of the interior or the N. It breeds at least as far W. as Huelva, but has not been recorded from Portugal, and is common in parts of Andalucia, Murcia and Valencia. As a straggler it has occurred in the Riviera and perhaps also in S. France. [In N. W. Africa it is a common summer visitor to the well watered districts of Morocco, Algeria and Tunisia, N. of the Atlas range, but in the oases of S. Algeria is replaced by a paler form, *H. pallida reiseri* Hilg.]

Continental Europe.

In Spain the nest is generally placed in trees or bushes near river banks, as a rule from 4 to 15 ft. from the ground, but one found by me in a garden in Jerez was nearly 30 ft. high. It is woven round the forking twigs, and its built of thistle and other downs, together with fine roots, grasses etc., lined with down or sometimes bits of wool and a few hairs. I have seen feathers also used occasionally. The cock is not shy and sings very persistently near the nesting place. Diameter of cup, $1\frac{3}{4}$ in., depth $1\frac{3}{4}$ —2 in.

Nest.

From 3 to 5 in number, but generally 4, while 6 are said to have occurred in Spain. In colour they have a greyish white or dove-

Eggs.

coloured ground, and are spotted, sometimes boldly and sometimes only lightly, with blackish brown. As a rule the markings are rather larger and bolder than in the Eastern race, but many clutches are quite indistinguishable, and both are equally devoid of gloss.

Breeding
Season.

In Spain the best time is about the second week in June, but I have seen an exceptionally early nest with eggs on May 13, and clutches are not infrequently found at the end of May. In N. Africa the breeding season begins earlier, and eggs may be found in May and June.

Measure-
ments.

Average of 100 eggs (87 by the writer and 13 by Rey), 18.69×13.51 mm., Max. 20.1×13.6 and 20×15 , Min. 17×13 and 18.4×12.3 . Average weight, 92 mg. (Rey). [A third form, *H. pallida reiseri* Hilgert, is found in the Oases of S. Algeria.]

141. Booted Warbler, *Hippolais caligata* (Licht).

Plate 22, fig. 29 (Kirghis Steppes).

Eggs: Thienemann. Fortpfl. Taf. XXI, fig. 9 (errore). Dresser, pl. —, fig. 43, 44.

Foreign Name: Russia: *Kamyschewka milowidnaja*.

Hypolais caligata Licht. Dresser, B. of Europe, II, p. 541 and Man. Pal. Birds, p. 113. *Hippolais caligata* (Licht). Hartert, Vög. Pal. Fauna, p. 575.

Breeding Range: East Russia, from Olonetz east to Perm and south to Astrakhan. [Also W. Siberia to the Yenesei, Transcaspia, Turkestan and Kashmir.]

Con-
tinental
Europe.

This bird is a summer visitor, whose northern limit extends to the Latscha Lake in the Olonetz Government (Meves), while it is not uncommon in Moscow and Tula and also in the district between the rivers Oka and Volga. Eastward it is found in the Perm and Orenburg Governments on the S. W. slopes of the Urals, while it is distributed through the basin of the middle Volga southward to Saratow and the Kirghis steppes in the Astrakhan Government. [In Asia it is now known to be found in Transcaspia, Turkestan, the Altai range, Bokhara, and W. Siberia up to at least 61° N. in the Yenesei valley and E. to Krasnoyarsk, as well as in Kashmir.]

Nest.

Sarudny writing from the Orenburg district, describes the nest as built either close to or actually on the ground in dry meadows overgrown with *Caragana* and *Astragalus* bushes, generally on the edge of a thicket or in single bushes in valleys. Nests from other sources are built in twigs like those of other Tree-Warblers. They are neatly built of grasses, stalks etc., lined with finer materials, such as fine grasses, horsehair, willow and duck down, etc. Average width of cup $2-2\frac{1}{2}$ in., depth $1\frac{1}{4}-1\frac{1}{2}$ in.

From 4 to 6 in number, long oval in shape and decidedly smaller than those of other Tree Warblers. When fresh they are pale pink, with blackish spots, chiefly at the big end, and a few purplish shell markings. There is practically no gloss on these eggs. Eggs.

In middle Russia the usual time for full clutches is about June 8, while in Orenburg the first eggs are found at the beginning of the month and the young are fledged early in July. Breeding Season.

Average of 45 eggs by the writer, 15.57×12.24 , Max. 17×13 and 15×13.5 , Min. 14×11.3 . Rey gives the average weight of one clutch as 70 mg. Measurements.

[Two other species of Tree Warbler occur in the W. Palaearctic region, Upcher's Warbler, *Hippolais languida* (H. & E.), and Sykes' Warbler, *H. rama* (Sykes). The eggs of Upcher's Warbler are figured in the Cat. Eggs Br. Mus., IV. pl. X, fig. 2; Dresser, pl. —, fig. 37, 38. Breeding Range: Palestine, Persia, Transcaspia, Turkestan, Baluchistan and Afghanistan. The nest is a neat cup with cobwebs and down interwoven and is placed in bushes from 3 to 6 ft. from the ground. Eggs, 4 to 5 in number, delicate mauve when fresh, are marked with small spots and streaks of deep chocolate brown and are like those of *H. olivetorum*, but slightly smaller. In S. Persia, the eggs were nearly hatching at the end of May, but Tristram found eggs on Hermon as late as June 4. Possibly this was a second brood as eggs are said to have been taken there at the end of April. Average size of 16 eggs by the writer, 19.04×13.8 , Max. 20.4×14 and 20×14.5 , Min. 18.2×14 and 18.5×13.2 . Eggs of Sykes' Warbler are figured in P. Z. S., 1874, pl. LXXIX (nest); Dresser, pl. —, fig. 39—42. Breeding Range: Transcaspia, Afghanistan, Baluchistan, Persia Turkestan S. E. Mongolia, Kashmir and Sind. Nest: usually about a foot from the ground in tamarisk, saxaul or other bushes, built of bents and sedge with a lining of fine grasses, down, horsehair etc. Eggs, usually 4 or 5, sometimes 6 and even 7 in number exceptionally. They are dull white with a faint greenish or greyish tinge, and are covered with a tracery of nearly black lines as well as the usual markings and often have a well marked zone. Breeding season according to Russow, May 25 — June 1. Average size of 20 eggs by the writer, 14.78×12.41 , Max. 16.6×12.5 and 16.3×13 , Min. 14.7×12 and 15.2×11.8 .]

142. Barred Warbler, *Sylvia nisoria* Bechst.

Plate 27, fig. 20—23 (N. Germany).

Eggs: Thienemann, Taf. XX, fig. 3, a—c. Baedeker, Tab. 51, fig. 14. Taczanowski, Tab. XLVIII, fig. 1. Seebohm, Br. Birds, pl. 10; id. Col. Fig., pl. 52. Dresser, pl. —, fig. 45, 46.

Foreign Names: Bohemia: *Pénice vlasska*. Denmark: *Brystvatret Sanger*. France: *Fauvette epervière*. Germany: *Sperber-Grasmücke*. Helgoland: *Kat-Ünger*. Hungary: *Karvalyposzáta*. Italy: *Bigia padovana*. Poland: *Pokrywka jarzebata*. Russia: *Podoreschnik*. Sweden: *Hökfärgad sångare*. *Sylvia nisoria* (Bechst.). Dresser, B. of Europe, II, p. 435 and Man. Pal. Birds, p. 73. Saunders, Man. p. 51. *S. nisoria nisoria* (Bechst.). Hartert, Vög. Pal. Fauna, p. 578.

Breeding Range: Central Europe, S. of the Baltic and Gulf of Finland and E. of the Rhine, but absent from the S. of the Italian and Balkan Peninsulas. [In W. Asia it is replaced by *S. nisoria merzbacheri* Schal.]

Continental Europe. In Scandinavia it is found in S. Sweden in Skåne, Blekinge, S. Kalmar lan, Öland, and Gotland, and perhaps also in Asker in Norway. In Russia it breeds on Drumsö near Helsingfors in Finland and its northern limit extends to the Governments of S. Petersburg, Jaroslaw and Kazan, but only in small numbers, though it becomes more numerous in middle Russia and ranges S. to Bessarabia, Poltawa, Charkow, the Crimea, and in smaller numbers even to Astrakhan and the N. Caucasus. In Germany its distribution is irregular and it is absent from some districts, but is found locally E. of the Rhine valley, and is not scarce in Mecklenburg, Brandenburg, Saxony, Anhalt and Pomerania, and is especially common in Prussia, but local in Silesia, and fairly common in the South, though always local. It is tolerably common in Austro-Hungary, but has not been proved to breed in Switzerland, and nests in the N. and N. E. provinces of Italy, and in the Balkan peninsula in Montenegro, Dalmatia, Bulgaria and the Dobrudscha, where it is locally common. In France it is of very rare occurrence, but breeds in small numbers in Holstein and Denmark. [The range of the Asiatic form, *S. n. merzbacheri* Schal., may extend from Asia minor to Persia and Turkestan, but needs defining.]

Nest As a rule this species haunts the outskirts of woods, commons, and rough ground overgrown with bushes, such as blackthorn, rose, bramble etc. The nest is generally well hidden, from 1 ft. 6 in. to 6 ft. from the ground, but has been found exceptionally as high as 25 ft. Two or three pairs may often be found nesting not far from one another. The rather flat nest is somewhat roughly built externally, but is a typical Warbler's, built of grasses and roots, with some cobwebs or down interwoven, and lined with horsehair and sometimes fine roots. Bau notes that it frequently breeds close to the Red backed Shrike, and that the alarm notes of the two birds are very similar.

Eggs. Usually 5, but occasionally 6 or only 4, which latter number is often found in second layings. The ground colour is pale yellowish, milky white or greyish, closely speckled with pale leaden or brownish grey. In some eggs the markings are very faint and barely visible, while in others they are darker and form a zone. Hartert found one set near Pillau with large red brown spots and streaks. Generally they show a fair amount of gloss.

Breeding Season.

In Sweden from the last week of May to mid June: in Germany

during the second half of May and exceptionally as early as May 8 (Rey). Bau says that incubation lasts 14 days and that the male relieves the female during the mid-day hours, while the young remain in the nest for another fortnight.

Average of 113 eggs from Germany (Rey), 21.07×14.41 , Max. 22.8×15.6 and 22.5×16.3 , Min. 19.5×14.5 . Double egg. 23.9×17.2 : dwarf, 12.5×10 . I have seen an egg 23.2×16.6 . Average weight, 158 mg. (Rey). Measurements.

143. Orphean Warbler, *Sylvia hortensis* (Gm.) [*S. orphea* auct.]*

Geographical Races.

a. Western Orphean Warbler, *S. hortensis hortensis* (Gm.)

Plate 27, fig. 25 (Spain).

Eggs: Dresser, pl. —, fig. 37—39 (not typical). See also p. 300, note. Nest: R. B. Lodge, Bird Hunting, p. 55.

Foreign Names: France: *Caravasse*. Italy: *Bigia grossa*. Spain: *Canaria*, *Pinzoleta*.

Sylvia orphea Temm. Newton, ed. Yarrell, I. p. 423. Dresser, B. of Europe, II. p. 411 and Man. Pal. Birds, p. 85. Saunders, Man. p. 45. *S. hortensis hortensis* (Gm.) Hartert, Vög. Pal. Fauna, p. 580.

Breeding Range: S. W. Europe. [Also N. W. Africa.]

In the Iberian peninsula it appears to be confined to the southern half of the country in Portugal, and breeds abundantly in Algarve. In Spain it is found in all the central, eastern and southern districts, and is very common in the wooded hills and olive groves of Andalucia. In France it is entirely absent from the N. W., although it is said to breed sparingly in La Brenne, but occurs in south and mid-France and in small numbers as far as Luxemburg and Metz. A few pairs breed in W. Switzerland, near Geneva and in the Valais. In Italy it breeds chiefly in Liguria, Piedmont and Lombardy, but also occurs in Venetia and near Firenze. It is said also to be found, though rarely, in Sicily, but not in Corsica or Sardinia, and Homeyer only met with one in the Balearic Isles. [In Africa it breeds commonly in the wooded parts of Algeria and Tunisia, but becomes scarce in Marocco, though some certainly breed in the Maroccan Atlas and also in Tripoli.] Continental Europe.

Generally built among the branches of medium sized trees, such as olives, oaks, cork-oaks, pines, oranges, etc., usually near end of a branch at a height of about 8 to 15 ft., but sometimes not more than 4—5 ft. Nest.

* An unfortunate change which may produce much confusion in the future, but rendered necessary by the adoption of strict priority.

high in bushes. Rey found a nest in tall *Erica* near Lisbon and Koenig found one in *Juniperus oxyderus* in Algeria. It is a typical Warbler's nest, fairly neat and compact, built of stalks of grasses and weeds, interspersed with bits of down, and lined with fine roots or grasses and sometimes fibre or a little hair. Diameter of cup $2\frac{3}{4}$ — $2\frac{1}{4}$ in., depth $1\frac{1}{4}$ — $1\frac{3}{4}$ in.

Eggs. Usually 4 or 5, sometimes only 3. Noble records a nest with 7 fresh eggs, which must have been the produce of two hens. They vary in shape but are typically of a rounded oval, with a very pale greenish white ground when fresh, which however fades in time to almost pure white, and are marked with very dark umber brown spots, streaks, and an occasional scrawl, generally softened at the edges like brand marks, and also marked with paler umber blotches and small spots and ashy shell markings. Most of the spots are concentrated towards the big end. Oates describes the eggs as very glossy, but this does not agree with my experience of Spanish eggs and probably refers only to those of the next race.

Breeding Season. In S. Spain eggs may be found from the beginning of May onward, but the best time is about the middle of the month. Rey gives the breeding season in S. Portugal as extending from the end of April to the end of June. S. of the Atlas range in Tunisia the breeding season begins earlier in April. Though eggs may be obtained till early in June it seems doubtful whether two broods are reared in Europe, as stated by Arrigoni.

Measurements. Average of 100 eggs (81 by the writer from Spain and 19 by Erlanger from Tunisia) 19.01×14.41 , Max. 21.5×14.5 and 19×15.5 ; Min. 17.5×13.6 and 20.3×13.2 . An abnormally large egg (not a Cuckoo's) measures 22.3×17.3 . Average weight of 9 Spanish eggs, 118 mg. Koenig however gives the average of 11 eggs from Algeria as 127 mg., which seems unusually heavy. Rey has a dwarf egg either of this or the next form, 11×9 mm.

b. Eastern Orphean Warbler, *S. hortensis crassirostris* Cretzschm.

Plate 27, fig. 24, 26, 27 (Greece).

Eggs: Thienemann, Fortpfl. Taf. XX, fig. 1, a—c. Hewitson, III Ed., pl. XXXV, fig. 3. Baedeker, Tab. 51, fig. 10. Seebohm Br. Birds, pl. 10; id. col. Fig. pl. 52 [Possibly some of the above figures may apply to the W. race, as localities are not given]. Reiser, Orn. Balc., III, Taf. III, fig. 7—9. Dresser, pl. —, fig. 40, 41 (? 41, 42). *Sylvia jerdoni* (Blyth). Dresser, Man. Pal. Birds, p. 86. *S. hortensis crassirostris* Creta. Hartert, Vög Pal. Fauna, p. 581.

Breeding Range: From Herzegowina and S. Dalmatia to Greece. [Also Asia Minor, Syria, Persia, Turkestan, Afghanistan and N. W. India].

In the Balkan peninsula this race is common in S. Dalmatia and Herzegowina and is found near the Lake of Scutari in Montenegro. It probably breeds also in Albania and is not rare on Olympus, while it is widely distributed in Greece, not only on the low ground but also in the mountains, and is very common in the Parnassus, and is also found in the Cyclades. In S. Russia and the Crimea the evidence of its occurrence is unsatisfactory. [It breeds in the wooded districts of Palestine, and is common in Asia Minor, occurs in the mountains of S. Persia, in Turkestan, S. Afghanistan (common near Quetta) to Gilgit and the N. W. Provinces of India.]

Con-
tinent-
al
Europe.

Although the bird is of a skulking disposition, the nest is generally easy to find, being often placed near the top of a small bush, or else about 6 to 12 ft. high in some small tree. It is fairly substantial for a Warbler's nest, built chiefly of bents, dry stalks of *Gnaphalium*, grasses and a little down or a few hairs.

Nest.

Usually 4 or 5, but Selous found several clutches of 6 in Asia Minor. As a rule they are easily distinguishable from those of the W. form, as was originally pointed out by Baldamus. Typical eggs have a very light greyish or greenish ground, almost white, and are sparingly marked, chiefly at the big end, with small spots of greyish or brownish and ashy shell markings. The dark brown spots and brand marks of Spanish eggs are generally absent, although one or two sets have been found with brown blotches. Reiser describes a variety as resembling the type of *Mot. alba*. There is generally more gloss than in Western eggs.

Eggs.

Arriving in Greece and Asia Minor about the end of March or early in April, eggs may be found from the end of April onward, but mostly about the third week of May: while in Syria the season extends from May 6 to June 6. In S. Persia Witherby found eggs on May 17. Krüper's observations show that apparently the hen alone incubates, the cock singing his powerful song some distance off.

Breeding
Season.

Average of 100 eggs (78 by the writer and 22 by Reiser), 20.02×14.92 , Max. 23.3×15.1 and 20.6×16.5 , Min. 18×14.4 and 20.4×14.1 . They are therefore larger as a rule than Spanish and African eggs. Average weight of 21 Greek eggs, 137.8 mg, varying from 115 to 180 mg.

Measure-
ments.

144. Garden Warbler, *Sylvia borin* (Bodd.) [*S. hortensis* auct.]

Plate 27, fig. 1—5 (Germany).

Eggs: Thienemann, Fortpfl. Taf. XX, fig. 2, a—c. Hewitson, I Ed. I pl. XIII; II Ed. pl. XXVII, fig. 3: III Ed., pl. XXXIV, fig. 3, 4.

Baedeker, Tab. 51, fig. 11. Taczanowski, Tab. XLIX, fig. 1. Seebohm, Br. Birds, pl. 10: id. Col. Fig. pl. 52. Cat. Eggs. Br. Mus., IV. pl. VIII, fig. 13. Frohawk, Br. Birds, I. pl. II, fig. 42—44. Dresser, pl. —, fig. 16—18. Howard, Br. Warblers, pl. III, fig. 13—18. Nest: O. Lee, IV p. 44.

British Local Names: *Nettle creeper*, *Peggy* (gen.). Foreign Names: Bohemia: *Pénice slavíkova*. Denmark and Norway: *Havesanger*. Finland: *Lehtokerttu*. France: *Fauvette des jardins*. Germany: *Garten-grasmücke*. Helgoland: *Grü Ünger*. Holland: *Tuinfluit*. Hungary: *Kerti Poszáta*. Poland: *Pokrywka ogrodowa*. Russia: *Travnik*. Sweden: *Häcksångare*. Spain: *Pinzoleta*.

Sylvia salicaria (L.), Newton, ed. Yarrell, I. p. 414. Dresser, B. of Europe, II. p. 429. *S. hortensis* Bechst. Dresser, Man. Pal. Birds, p. 78. Saunders, Man. p. 49. *S. borin borin* (Bodd.) Hartert, Vög. Pal. Fauna, p. 582.

Breeding Range: The British Isles and Continental Europe, excepting the extreme N. of Scandinavia and Russia and the S. Italian and S. Balkan peninsulas. [Also N. W. Africa and W. Siberia.]

British
Isles.

In England this species is generally distributed, but its numbers vary in different seasons and in some districts of S. England it is much less numerous than the Blackcap (e. g. Berkshire, where the proportion is about 1 to 10), while on the other hand in the Midlands and N. it is decidedly more plentiful. In Cornwall it is confined to the valleys of the Tamar and Lynher and is scarce in N. Devon; while in Wales it is scarce and local along the N. coast from Carnarvon and Anglesey to N. Flint and Denbigh, becoming commoner in wooded valleys further S., but absent from Pembroke, though known to breed in Cardigan, Brecon, Radnor and Glamorgan. In Scotland it is by no means general, but is commoner than the Blackcap in some of the southern areas (Solway, Forth and Clyde), and has bred in Tay, but is only of accidental occurrence in Dee and on the Outer Hebrides, and apparently absent from the mainland N. of the Great Glen. In Ireland its distribution is curious, for it visits localities in all four provinces, though very local and little known. It has however been proved to breed in Fermanagh, Sligo, Roscommon, Longford, Down, Kerry, Clare, and Tipperary, and probably in other districts also.

Con-
tinental
Europe.

In Scandinavia the Garden Warbler has been found breeding up to 70° N. in Norway and to 67—68° in Sweden. In Russia its N. range includes S. and Mid. Finland, the Olonetz Government, the Archangel district and to lat 62° in the Urals. South of these localities it seems to be generally common as far as Caucasia and the Crimea, though scarce

in Transcaucasia. It is also of general occurrence in suitable country over the whole of central and W. Europe. Southward its range extends to S. Spain and Portugal and Irby records it as nesting in the Gibraltar cork woods, but in Italy it is chiefly known on passage, though a few pairs breed in the hills of the Po valley and in the Apennines and it is said to nest in Sicily, but it is absent from Corsica, and rare on migration in Sardinia. In the Balkan peninsula it breeds in Montenegro, Herzegowina, and Epirus (Lilford), but is not known to nest in Greece, Macedonia and apparently Bulgaria, except in the hills of the Dobrudscha. Although for the greater part of its range it chiefly haunts low ground, it ranges up to 5500 ft. in the Pyrenees, and 3000 ft. in the Carpathians and Caucasus. [In N. W. Africa Irby states that it nests near Tangier, Hartert states that it breeds in considerable numbers near Hammam Meskoutine and Algiers, and Whitaker believes that it must breed in Tunisia: eggs ascribed to this species from Gafsa are however those of *S. hortensis* (*orphea* auct.) In Asia it is found in W. Siberia to Krasnoyarsk, and also in Transcaucasia, while it has been obtained in Persia in May, and is said by Tristram to breed in Palestine, though this requires confirmation.]

Generally placed lower down in bushes than that of the Blackcap, Nest. and often found in gardens, shrubberies etc. The usual height is from 1 ft. 6 in. to 6 ft., but exceptionally nests have been found 10—14 ft. from the ground in trees. Several nests have been found in tall ferns, while others are recorded in rows of peas, among tares in fields, in ivy on walls, and often in gooseberry or currant bushes. Perhaps the most remarkable site is that recorded by von Homeyer from Hiddensöe, at the bottom of a deep hole in sandy ground, probably an old mouse hole! The nest is slightly constructed of long dead grasses and stalks bent round, lined with finer grasses and a few hairs. It is rather more substantial than that of the Blackcap. Diameter of cup about $2\frac{1}{4}$ — $2\frac{3}{8}$ in. depth. $1\frac{3}{8}$ in.

Usually 5, occasionally only 4 or rarely 6 in number. They are Eggs. generally but not invariably to be distinguished from Blackcap's by slightly larger size, greater gloss, lighter surface markings and distinct grey shellmarkings, while the distinctly red type rarely if ever occurs. Probably the few cases in which it is said to occur are due to errors in observation. Ground colour, either pure white or yellowish or pale greenish, spotted and blotched sometimes with light shades of olive and brown, sometimes also with darker markings and soft edges. One variety is almost white; another has big yellowish patches on a white ground, a third has brand spots like a Waxwing's egg on a greyish ground (Rey)

and others have zones of small spots round the big end. As the hen sits very closely identification is not difficult and is indispensable.

Breeding
Season.

Although eggs have been taken as early as the middle of May and once on May 9 in S. England, the usual date is towards the end of the month or early in June. Rey says in Germany eggs are seldom found before May 10: often up to the end of June or July. In Spain Irby found eggs on May 10. Only one brood is reared and the late nests are apparently those of birds which have been robbed. Incubation lasts 13 days: Bau says the male relieves the hen in the middle of the day.

Measure-
ments.

Average of 100 eggs (50 by Rey and 50 by the writer), 20.05×14.69 , Max. 23×14.8 and 19×16 , Min. 18×14.6 and 19×13.4 . A double egg measures 23.8×16.4 (Rey) and dwarfs measure 14.5×12 , 16.2×13.2 etc. Average weight, 140 mg. (Rey.)

145. Blackcap, *Sylvia atricapilla* (L.)

Plate 27, fig. 11—15 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XX, fig. 1, a—d. Hewitson, I Ed. I. pl. XLII fig. 3; II Ed. pl. XXVII, fig. 1,2; III Ed. pl. XXXIV, fig. 1,2, Baedeker, Tab. 51, fig. 12. Taczanowski, Tab XLVIII, fig. 2. Seebohm, Br. Birds, pl. 10: id. Col. Fig. pl. 52. Frohawk, Br. Birds, pl. II. fig. 38—41. Cat. Eggs Br. Mus., IV. pl. VIII, fig. 114. Dresser, pl. —, fig. 19—21, Howard, Br. Warblers, pl. III, fig. 1—12. Nest: O. Lee, IV. p. 126.

British Local Names: *Blackcap Peggy*, *Coal Hoodie*. Welsh: *Penddu*. Foreign Names: Bohemia: *Cernohlávek*. Denmark and Norway: *Munk*. Finland: *Mustapää-Kerttu*. France: *Fauvette à tête noire*. Germany: *Mönch-Grasmücke*. Holland: *Zwartkop*. Hungary: *Barátka poszáta*. Italy: *Capinera*. Poland: *Pokryteka czarnogłowka*. Portugal: *Tutínegra real*. Russia: *Tschernogolowka*. Spain: *Pulverilla*. Sweden: *Svarthufvad Sångare*.

Sylvia atricapilla L. Newton, ed. Yarrell, I. p. 418. Dresser, B. of Europe, II. p. 421 and Man. Pal. Birds p. 84. Saunders, Man. p. 47. *S. atricapilla atricapilla* (L.) Hartert, Vög. Pal. Fauna, p. 583.

Breeding Range: The British Isles, Continental Europe (except the high North), and the Mediterranean Islands. [Also the Cape Verde Isles, the Azores and in N. W. Africa, Asia Minor, Palestine and W. Persia.]

British
Isles.

In England this species is on the whole generally distributed but is much commoner in some of the home counties than further north, and is scarce in W. Cornwall, Lincolnshire and the Solway coast; while in

Wales it is not common in Pembroke and rare also in the greater part of Carnarvon and Anglesey. In Scotland it is chiefly confined to the areas of Solway, Tweed, Clyde, Forth and Tay, but is not so common as the Garden Warbler. It has also bred once in Dee, occasionally in Moray, and also in W. Ross, as well as on Jura, while it is reported as having bred in the Orkneys and once tried to do so in the Shetlands. In Ireland it is widely, but very sparingly distributed, and is commonest in Wicklow, but has bred also in Dublin, Kildare, Cavan, Fermanagh, Sligo, Galway, Mayo, Tipperary, and probably several other counties.

In Scandinavia it is only sparingly distributed to about lat. 66° in Norway and middle Sweden, and on the Dovre and Fille fjeld ranges as high as 3800 ft. It is not scarce in Finland, but has not been found further N. than between Uleåborg and Torneå, and reaches to 62° on the Dwina, the Wiatka government, and about 60° in the Urals. [East of the Urals it becomes rare, but has been recorded from Omsk]. South of these limits the Blackcap is generally distributed in suitable localities throughout the Continent to the Mediterranean, where it is resident; breeding in the Alps up to 5500 ft., in the Caucasus to 6600 ft., while in the E. Pyrenees it has been found nesting up to 3200 ft. It also breeds in most of the Mediterranean islands, the Balearic Isles, Corsica, Sardinia, Sicily and Cyprus. [Also nests in the Cape Verde Isles, the Azores and N. W. Africa, but only N. of the Atlas range, and is replaced by *S. atricapilla heineken* Jard., in Madeira and the Canaries: while its range extends to Asia Minor, Palestine, Transcaucasia, and in small numbers to W. Persia.]

Although on the average the nest is placed rather higher than that of the Garden Warbler, this is by no means always the case, and Rey found near Leipzig that out of some 200 nests examined nearly all were lower. Nests 10 to 12 ft. high have occasionally been found in England and in Andalusia I have taken eggs quite 25 ft. from the ground. But the usual site is among undergrowth, brambles, briars, honeysuckle, etc. in woods, young plantations or country lanes: sometimes in bushes, especially the snowberry, or hollies, alders, and rhododendrons. It is also said occasionally to be placed among long matted grass and nettles close to a tree. The nest is slightly built, neater than the Garden Warbler's and rather lighter, composed of stalks and bents, lined with finer grasses, roots and often (but not always) horsehair. Other materials sometimes used are honeysuckle bark, moss, wool, cobwebs and cocoons. Diameter of cup about 2 in., depth about 1¼—1½.

Usually 4 or 5, but in the Mediterranean district, sometimes only 3, and clutches of 6 occur now and then, especially in N. Europe. They vary considerably, but the ground colour is generally some shade of

Nest.

Eggs.

pale buff or stone, clouded and blotched with yellowish brown and grey shellmarks, while usually there are also much darker spots, streaks and scrolls of sepia to sienna brown, with indistinct edges. Some varieties are almost white, either without markings, or faintly marked with grey or fine red specks. The well known red variety has a distinctly pale salmon pink ground with reddish brown or pinky red markings. Though rare in England, it is not uncommon in some parts of the Continent and Rey estimates the proportion of red clutches in Germany at about 6 per cent. Transition stages also occur between the red and brown types.

Breeding
Season.

In Germany the breeding season lasts from the beginning of May to July and two broods are often reared. In the S. of England clutches may occasionally be taken in the last days of April, but in the Midlands and northern counties the second half of May is the best time, and on the borders few pairs lay before the first week in June. In the S. of Spain eggs have been taken by the middle of March. In my opinion only a small proportion of British breeding birds can be double brooded. Full and interesting accounts of the courtship of this species will be found in Howard's *British Warblers*, pt. 3, p. 5. Incubation lasts about 15 days (Howard); the cock frequently taking part, and both birds sit very closely.

Measure-
ments.

Average of 100 eggs (50 by Rey and 50 by the writer), 19.3×14.56 , Max. 21.5×15 and 20.6×15.5 , Min. 17×13 . Abnormal eggs measure, 24.2×16 , 22.9×15 , 14.7×12.1 , 12.9×11 , etc. Average weight of 14 full eggs, 2.22 g. (R. H. Read); blown eggs average 131 mg. (Rey).

[In Madeira and the Canaries another subspecies is found, *S. atricapilla heineken* Jard. (Eggs figured in Cat. Eggs B. Mus, IV pl. VIII, fig. 10: Dresser pl. —, fig. 20.) The eggs of this race are laid in April and are subject to extraordinary variation, being frequently boldly marked with reddish brown spots and grey shell marks on a white ground, or finely spotted with blackish and pale violet. The clutch usually consists of 3 or 4 eggs: average size of 25 (17 by Koenig and 8 by the writer), 19.06×14.17 , Max. 21×15 and 20×16 : Min. 17×13 and 16×12 .

146. Whitethroat, *Sylvia communis* Lath.

Geographical Races.

a. European Whitethroat, *S. communis communis* Lath.

Plate 27, fig. 6—10 (Germany)

Eggs: Thienemann, Fortfl. Tab. XX, fig. 6, a.—d. Hewitson. I Ed. I, pl. XLII; II Ed, pl. XXVII, fig. 4: III Ed. pl. XXXV, fig. 1, 2. Baedeker,

In order to avoid discrepancies in nomenclature between the text and plates, the remaining four plates will be issued in later parts of this work.

F. C. R. Jourdain.

Tab. 51, fig. 9. Taczanowski, Tab. XLIX, fig. 2. Seebohm, Br. Birds, pl. 10; id. Col. Fig. pl. 52. Frohawk, Br. Birds, I, pl. II, fig. 32—34. Cat. Eggs B. Mus.; IV, pl. VIII, fig. 11. Dresser, pl. —, fig. 1—3. Howard. Br. Warblers, pl. III, fig. 25—36. Nest: O. Lee, II, p. 62.

British Local Names: *Peggy*, *Nettle Creeper*, *Splitstraw*. Welsh: *Llwydfron*. Foreign Names: Bohemia: *Pénice popelavá*. Denmark: *Tornsanger*. Finland: *Harmaakerttu*. France: *Babillard grisette*. Germany: *Dorn-Grasmücke*. Greece: *Tsirobákos*. Holland: *Grasmusch*. Hungary: *Mezei poszáta*. Italy: *Sterpazzola*. Norway: *Graasånger*. Poland: *Pokrzywka popielata*. Russia: *Sawirucha*. Sweden: *Törnsmugg*. Spain: *Pinzoleta*.

Sylvia rufa (Bodd.) Newton, ed. Yarrell, I, p. 406. Dresser, B. of Europe, II, p. 377. *S. cinerea* Lath. Id. Man. Pal. Birds, p. 74. *S. cinerea* Bechst. Saunders, Man. p. 41. *S. communis communis* Lath. Hartert, Vög. Pal. Pauna, p. 586.

Breeding Range: The British Isles; Europe, except N. Scandinavia and N. Russia. [Also N. W. Africa and Asia Minor.]

Next to the Willow Warbler this is by far the commonest and most generally distributed of our British Warblers, and is found throughout England and Wales, except on the high moorlands and mountains. In Scotland it is also common and has extended its range of late years. On the E. side it is found in fair numbers in suitable localities in the Moray area, and ranges at least to the Dornoch Firth and is thinly distributed along the E. coast of Sutherland; while on the W. side it haunts the valleys of W. Ross. It breeds on Skye and in many of the Inner Hebrides, and was first recorded with certainty as breeding in the Outer Hebrides (Barra) in 1900. In Ireland it is very plentiful and general.

British
Isles.

The northern limit extends in Norway to about lat. 65°, and in Sweden to about lat. 62°, and on the fjeld the Whitethroat ranges as high as the conifer limit. It inhabits S. and Mid-Finland to Ijö and Kuopio, and eastwards breeds near Archangelsk and up to about lat. 63° N. in the Urals. The limits of this race and *S. c. icterops* in S. E. Russia are not easy to define, but the E. form certainly replaces this in Transcaucasia. In the Balkan, Italian, and Iberian peninsulas it is found breeding to the extreme south locally; it also nests in Sardinia, Sicily, and possibly in Corsica and Cyprus. Over central Europe it is generally distributed and in the Alps is found commonly up to 3600 ft., and exceptionally to 5400 ft. [It breeds also in N. Algeria and Tunisia (Whitaker); and it is common in Asia Minor.]

Con-
tinental
Europe.

Generally placed quite low down, often almost touching the ground

Nest.

in small bushes overgrown with rank grass, among coarse vegetation, nettles, etc., in hedgerows and bramble thickets. Exceptionally cases have been recorded of nests at a considerable height: one 12 ft. high in a whitethorn and one 16 ft. high in an elder are mentioned in the *Zoologist* for 1875 and 1876. The nest varies in the amount of material used and is sometimes very slightly built, but always has a noticeably deep cup. It is built chiefly though not entirely, by the male, and is constructed of dry grasses and a few roots, well lined with horsehair which is nearly always black, and strengthened with cobwebs and fragments of down or wool. The male usually builds one or more incomplete nests in addition to that actually used. Diameter of cup, $2\frac{3}{8}$ in.; depth $1\frac{1}{2}$ —2 in.

Eggs. Usually 4 or 5, sometimes 6 in number, but a clutch of 7 eggs of the pink type is said to have occurred in Yorkshire. Remarkable variations in colour occur at times. Typical eggs have a greenish or stone coloured ground, and are finely speckled with ochreous and leaden spots or blotches, but sometimes the brownish markings take the form of large blotches and occasionally dark caps or zones are found, and their colour ranges from oil green, olive, umber and ochreous to bluish black. The scarce erythristic type has a pink or salmon coloured ground and is marked with red-brown and grey spots, while among the more remarkable varieties may be mentioned, (a) pure white, unmarked; (b) pale bluish, unmarked; (c) bluish white, with a few ashy markings; and (d) two wonderful sets in the Rey collection, not unlike Marsh Warblers' eggs, blotched with dark brown and dark ash on a pale blue ground.

**Breeding
Season.**

In S. England nests may be found from the beginning of May, though generally later, while in the Midlands eggs are not laid till mid May, often not till the last week. In Germany from May 7—10 to the end of July (Rey) and apparently two broods are reared. Most of our English birds are single brooded, though exceptionally eggs may be found in July and even young in August. In Scandinavia the eggs are usually laid early in June. Curiously enough the breeding season in the Mediterranean Basin is not particularly early, and in Greece the eggs are laid in May and about May 12 in Andalucia. Incubation lasts 11—12 days as a rule, and the young remain about 11 days in the nest. Howard's observations on the habits of this species (*Br. Warblers*, pt. 4) should be consulted.

**Measure-
ments.**

Average of 100 eggs measured by Rey 18.1×13.8 , Max. 20.3×14.8 and 18.2×15 , Min. 16×13.2 and 17×12.6 . Bau's average for 66 eggs is 18.8×13.9 . A dwarf egg measures 15×7 (R. H. Read). Average weight of 14 full eggs, 1.905 g. (N. H. Foster). Rey gives the average weight of blown eggs as 114 mg. and Bau as 113 mg.

b. Eastern Whitethroat, *S. communis icterops* Ménétr.

Eggs: Dresser, pl. —, fig. 4.

Sylvia communis icterops Mén. Hartert, Vög. Pal. Fauna, p. 587.

Breeding Range: Caucasia. [Also from Palestine and Transcaspia E. to Persia, Turkestan and W. Siberia.]

In the Caucasus it breeds up to 6000 ft. but the limits of the two races are not yet clearly defined. In Palestine it is a plentiful resident, but the W. form occurs also in autumn. From Transcaspia and Persia its range extends eastward through Turkestan and W. Siberia to the Altai range and the R. Yenesei.

Dis-
tribution,

In breeding habits it resembles the western race, but the eggs are extremely variable and clutches of the red type occur very frequently. The greenish ground colour is often replaced by white or creamy, spotted with ochreous and lead colour. In Palestine eggs are laid from the beginning of April onward, and in Turkestan during May. Average size of 17 eggs measured by the writer, 18.45×14.36 , Max. 19.3×14.5 and 19×15 , Min. 17.2×14.3 and 17.6×13.4 .

Nest. Eggs
etc.

147. Lesser Whitethroat, *Sylvia curruca* L.

Plate 27, fig. 16—19 (Germany).

Eggs: Thienemann, Fortpfl. Tab. XX, fig. 11, a d. Hewitson, I Ed. I, pl. XIII; II Ed. pl. XXVII, fig. 5, 6; III Ed. pl. XXXV, fig. 4. Baedeker, Tab. 51, fig. 8. Taczanowski, Tab. L, fig. I. Seebohm, Br. Birds, pl. 10; id. Col. Fig. pl. 52. Frohawk, Br. Birds, I, pl. II, fig. 35—37. Dresser, pl. —, fig. 7—9. Howard, B. Warblers, pl. III, fig. 19—24. Nest: O. Lee, IV, p. 158.

British Local Names: *Peggy*, *Hazel Linnet*. Welsh: *Llwyd ffon fach*. Foreign Names: Bohemia: *Pénice podkkròvní*. Denmark and Norway: *Graesmutte*. Finland: *Hernekerttu*. France: *Bec-fin babillard*. Germany: *Zaun-Grasmücke*. Holland: *Braamshuiper*. Hungary: *Kis poszàta*. Italy: *Bigiarella*. Poland: *Pokrzywka piegza*. Russia: *Peresmeshka*. Sweden: *Årtsmygg*. Spain: *Parlanchin*.

Sylvia curruca L. Newton, ed. Yarrell, I. p. 410. Dresser, B. of Europe, II. p. 383 and Man. Pal. Birds p. 76. Saunders, Man. p. 43. *S. curruca curruca* (L.) Hartert, Vög. Pal. Fauna, p. 588.

Breeding Range: Great Britain and Continental Europe, except N. Scandinavia and N. Russia, and the Iberian peninsula. [Also Palestine, Asia Minor, and Persia to the Caucasus.]

This species has a much more limited range in the British Isles than the Common Whitethroat. As a breeding species it is unknown in

British
Isles.

Ireland, and in England and Wales is absent from Cornwall and very scarce in Devon, only becoming common in E. Somerset and E. Dorset. It is also practically unknown or only of extremely rare occurrence in the W. of Wales, from Anglesey and Carnarvon S. to Pembroke and Carmarthen. In the N. of England it is only thinly distributed in Yorkshire and Lancashire, and only breeds occasionally in Durham and Northumberland, while it is scarce and local in the Lake district. In Scotland it is also decidedly scarce, and it is doubtful whether it is anything more than an accidental visitor to any area N. of the Solway district, although a nest (with 7 eggs!) is said to have been taken in W. Ross, and it has visited Fair Island and the Orkneys on migration.

Con-
tinent-
al
Europe.

In Norway its northern limit is about 65° N., and in Sweden from 64° to 65°, while on the Dovre fjeld its vertical range extends to 3500 ft. From the N. end of the Gulf of Bothnia it is thinly distributed in N. Russia as far as Archangel and about lat. 60° in the Urals. In S. E. Russia it appears to breed in the Caucasus, but the limits of the W. race are not clearly defined and possibly these birds may belong to the next race. Throughout the rest of the Continent it is fairly general, but becomes very scarce in S. Italy and apparently is only a rare winter visitor to the Iberian peninsula beyond the Pyrenees, except possibly in the province of Gerona. On the other hand a few pairs breed in the pine forests of the Greek mountains as well as in Macedonia. It is only a scarce migrant to Sardinia, but Whitehead found it breeding in Corsica, and the evidence with regard to Sicily is somewhat conflicting, though it is said to nest there. Its numbers vary in different localities and in some districts, such as Transsylvania, it is extremely abundant, far outnumbering the Common Whitethroat. [In Asia Minor it is generally distributed, but commonest in the mountains, and visits Crete and Cyprus on migration. It also breeds commonly in Palestine according to Tristram, and apparently in the mountains of Persia].

Nest. In England often found in thick hedges, bushes, shrubberies, etc., generally rather low down, from 2 ft. 6 in. to 4 ft. from the ground. The nest is smallish, built of dry stalks and grasses, lined with roots and fibre alone in many cases, but sometimes horsehair is freely or sparingly used. Cobwebs and down are also used to fasten the outer material together. It is always much flatter than that of the Common Whitethroat, but there is much variation in the amount of material used and the thickness of the walls. Diameter of cup, 2—2½ in., depth, 1½ in. Rey records a nest built almost entirely of *Erica vulgaris* in Germany.

Eggs. From 4 to 6 in number, usually 5, and quite characteristic. (Ten eggs have been found in a nest, but were obviously the produce of two

birds). The ground colour is white or pale cream, sparingly blotched and spotted, generally with a more or less distinct zone or cap at the big end, with purple grey shell marks and surface spots varying from pale brown to deep sepia. Many of the markings have softened edges and some sets show a good deal of the white ground; while occasionally a clutch may be found without any markings.

In England the first eggs are found towards the beginning of May, and have been recorded at the end of April, but the more usual time in the Midlands is from mid-May onward: on one occasion I found eggs as late as July 12, but think it probable that one or two previous layings had been destroyed and that it is not double brooded. In Germany eggs are usually found from the beginning of May till June, and second layings to the end of the latter month (Rey). The hen is a close sitter, and the period of incubation probably lasts from 11 to 12 days; but when laying or while building the nest is readily forsaken.

Average of 100 eggs by Rey, 16.5×12.6 , Max. 18.7×13 and 17.7×14.2 , Min. 14×12 and 15×11.5 . A double egg (S. Derbyshire), measures 22×12.2 mm. Average weight of 19 full eggs, 1.437 g (R. H. Read); blown eggs average 85 mg. (Rey).

[In Asia the European race is replaced by the Eastern Lesser White-throat, *S. curruca affinis* Blyth, which is found in Siberia (and according to Pleske also in the Kirghis steppes) ranging E. to Transbaikalia and Manchuria, and according to Whitehead and others, S. to the Kurram valley and Kashmir. Suschkin has described the form from the S. E. Kirghis steppes under the name of *S. c. halimodendri* Suschk. A third race, *S. c. minula* Hume, breeds in Transcaspia, Amu Darya, Afghanistan, etc. Egg figured in Cat. Eggs B. Mus., IV, pl. X, fig. 3 (Afghanistan). Average size of 11 eggs from the same locality, 17.93×12.9 mm. Dresser figures eggs of *S. c. affinis* Blyth from Kashmir on pl. —, fig. 10—12. For nesting notes see Ibis 1880, p. 59; 1898, p. 16. An allied species, the Himalayan whitethroat, *S. althaea* Hume, breeds in Transcaspia, E. Persia, Bokhara, parts of Turkestan, Gilgit, and N. W. Kashmir. Eggs from Transcaspia figured by Dresser pl. —, fig. 5,6. The distribution of these forms in W. Asia is however as yet very imperfectly known and requires further study].

148. Desert Warbler, *Sylvia nana* (H. & E.).

Geographical Races.

a. Asiatic Desert Warbler, *S. nana nana* (H. & E.).

Sylvia nana (H. & E.). *part.* Dresser B. of Europe, IX, p. 648 and Man. Pal. Birds, p. 79. *S. nana nana* (H. & E.). Hartert. Vög. Pal. Fauna, p. 590.

Breeding Range: Transcaspia E. to Turkestan and Alashan: Persia, Baluchistan and N. W. India. Has once occurred in European Russia.

Inhabits the bush grown steppes of Transcaspia and ranges E. through Turkestan to Alashan. Loudon describes it as common in the Kara Kum desert. Tristram says it is found at the S. end of the Dead Sea, so probably it occurs in the N. Arabian deserts as well as in S. and E. Persia, Baluchistan and the wastes of Sind, Bahawalpur and Rajputana to the S. of the Punjab. Sarudny found a nest with young in a tamarisk bush, which resembled a Reed Warbler's. Eggs still undescribed.

b. Algerian Desert Warbler, *S. nana deserti* (Loche.)

Eggs; J. f. O., 1896, Taf. VII, fig. 1.

Sylvia nana deserti (Loche). Hartert, Vög. Pal. Fauna, p. 591.

Breeding Range: The Algerian and Tunisian Sahara to Tripoli. Has occurred once in Italy.

Dis-
tribution.

Hartert describes this bird as haunting the desert plains between Tuggurt, Quargla, and Gardaia to the dunes between Biskra and Umasch in Algeria: on Djebel Dekaris and near Galb-el-Assued in Tunisia and near Oumsinerma in E. Tripoli.

Nest.

Where the dunes are sparsely covered with small bushes and dwarf shrubs of various species this delicate and beautiful species makes its home, building a deep nest, not unlike that of a Reed Warbler in shape, in some bush. Hartert describes the nest as about $3\frac{1}{2}$ ft. from the ground and somewhat conspicuous. It is composed of grasses, stalks and leaves, interwoven with *Gnaphalium* blossoms and softly lined with down, wool, cobwebs or bits of thread. Diameter of cup, $2-2\frac{1}{2}$ in., depth $2\frac{1}{3}-3\frac{1}{4}$ in.

Eggs etc.

Probably 3 in number. The ground colour is white or pale greenish, spotted with pale olive brown and pale bluish grey shellmarks and fine spots, chiefly at the big end. Size (2 eggs) 14×11 mm, weight 69 and 59 mg. (Koenig); three eggs in the Tring Museum measure 16.5×12.4 , 16.2×12.4 and 15.4×12 . (Hartert *in litt.*)

Breeding
Season.

Koenig took a nest with two eggs on Apr. 13, and Rothschild and Hartert found two empty nests, on which the birds were sitting on Apr. 14, but also found one with three eggs on May 6 at El Oued.

149. Rüppell's Warbler, *Sylvia ruppeli* Temm.

Pl. 26, fig. 20. (Asia Minor, F. C. Selous.)

Eggs: (The figures in Thienemann, Fortpfl. Taf. XXII, fig. 1, a, b, and Baedeker, Tab. 51, fig. 13 are erroneous). Reiser, Orn. Bal., III, pl. III, fig. 3, 4. Dresser, pl. —, fig. 22—24.

Sylvia ruepelli Temm. Dresser, B. of Europe, II, p. 417 and Man. Pal. Birds, p. 86. *S. ruppeli* Temm. Hartert, Vög. Pal. Fauna, p. 592.

Breeding Range: Greece. [Also Asia Minor, Crete, Palestine and probably Cyprus.]

In Greece this species has been recorded from several localities in the Peloponesus (Messenia, Lakonia and Arcadia), and also in Acarnania and Attica. It is however not common, but is no doubt often overlooked. [In Asia Minor it is almost the commonest warbler near Smyrna, and Danford says it is not uncommon on the hillsides near Anascha in the Taurus. Tristram describes it as a scarce resident in Palestine. It is a common summer visitor to Crete and breeds there, and probably also nests in Cyprus.] Dis-
tribution,

In the breeding haunts of this bird, the females are rarely seen and are very skulking in their habits. The nest is placed in a bush of some sort, and is not particularly hard to find. It is somewhat substantial for a Warbler's nest, and is built of bents and grasses, lined with horse-hair. Nest.

Usually 4 or 5, pale greenish or greyish in ground colour, thickly mottled all over with small yellowish or olive brown spots and underlying grey mottlings, sometimes so as to almost hide the ground colour. A tendency to a cap or zone at the big end is sometimes apparent. In general appearance these eggs approach most closely to those of the Spectacled Warbler. Eggs.

Krüper states that on one occasion he found a full clutch near Smyrna on April 7, and that the usual season begins in mid April, but this may be a misprint for May, as the bird does not reach its nesting quarters till very late in March, and Lynes found it beginning to build in Crete about April 25, while Selous found many nests in Asia Minor between May 14 and 28. Breeding
Season.

Average of 28 eggs (25 by writer and 3 by Reiser), 17.92×14 , Max. 19.3×14.6 and 19×14.8 , Min. 17×13.3 and 17.5×13.2 . Average weight of 2 eggs, 85 mg. (Jourdain): of 3 eggs, 108 mg. (Reiser). Measure-
ments.

150. Sardinian Warbler, *Sylvia melanocephala* (Gm.)

Plate 22, fig. 19—23 (Provence).

Eggs: Thienemann, Fortpfl. Taf. XX, fig. 7, a, b. Baedeker, Tab. 51, fig. 4. Taczanowski, Tab. LIII, fig. 1. Dresser, pl. —, fig. 25—29.

Foreign Names: France *Fauvette mélanocéphale*. Italy: *Occhiocotto*.

Portugal: *Tutinegra dos vallados*. Russia: *Slavka chermogolovaja*. Sardinia: *Cabu de moru*. Spain: *Palmerilla*.

Sylvia melanocephala Gm. Dresser, B. of Europe, II, p. 401 and Man. Pal. Birds, p. 83. *S. melanocephala melanocephala* (Gm.). Hartert, Vög. Pal. Fauna, p. 593.

Breeding Range: S. Europe, in the countries bordering on, and the islands in the Mediterranean. [Also in the Canaries, N. W. Africa and Syria, where it is represented by local races.]

Con-
tinenta
Europe. In the Iberian peninsula this species is chiefly confined to the provinces bordering on the S. and E. coasts of Spain. Here it is plentiful among the brush covered foothills and low ground, but does not penetrate far into the central plateau. In Portugal it is chiefly confined to the S., and has not been recorded N. of the Douro: it appears also to be absent from the district N. of the Cantabrian range in Spain. In S. France though common in some parts of Provence, it was not observed in the Camargue by Eagle Clarke; while in Italy its distribution is somewhat irregular, and though a common resident near the Ligurian coast, the Marches and Apulia, is only accidental in the Po valley. On the E. side of the Adriatic it is found in S. Dalmatia, Herzegovina, Montenegro, Epirus, and probably also Albania, but never far from the coast: while it is also resident in Corfu, and in Greece, but only in small numbers. It nests also in many of the islands of the Greek Archipelago. It is said to breed also in Turkey, but the records from Bessarabia and Kiew in Russia require confirmation. In the Mediterranean it is characteristic and common in the Balearic Isles, Corsica, Sardinia, Sicily, Malta, and Crete. [Probably it also breeds in Asia Minor, but it is best known there as a winter visitor, and its very scarce and local in Cyprus. See also note at end on the forms inhabiting the Canaries, N. W. Africa, Syria etc.]

Nest. Usually placed from 2 to 4 ft. from the ground, often in a thick bush in some sheltered spot close to a wall and well concealed, but occasionally quite conspicuous. It is said sometimes to build in trees, and in Malta generally nests in branches of carob trees, close to the ground. The nest is neatly and substantially built, with thick walls: it is composed of dead stalks and grasses mixed with bits of down, sometimes also dead thistle leaves, lined in some cases with finer grasses and bents, at other times with rootlets or horsehair. Diameter of cup 2—2½ in., depth 1½—2 in.

Eggs. Usually 4 or 5, sometimes only 3, while Lilford states that 6 have been found. They vary in the most extraordinary way. Many eggs are finely speckled all over with pale ochreous and ashy grey on a pale

stone coloured or yellowish ground. These eggs are not unlike White-throat's or Sedge Warbler's and the ground varies to pale yellowish green, while the spots sometimes form a zone and range to brown in colour. The second principal type has a creamy white to bluish grey ground and is sparingly and boldly spotted and blotched with leaden shellmarks and brown or ochreous. This type is much less common and some eggs are very handsome. The third type is erythristic, the ground being creamy or very pale sienna, sometimes thickly and finely marbled and speckled with sienna brown and grey shellmarks, and in rare instances boldly blotched with deep sienna red. Eggs of the second type bear some resemblance to the boldest type of *S. curruca* eggs, while the third type approaches that of *Locustella naevia*. Erythristic eggs are not at all uncommon in Spain, but appear to be unrecorded from Greece.

Like many residents in the Mediterranean area, it is an early breeder and the first eggs may be found in S. Spain and Malta about March 12—16, but the second half of April is perhaps the best time, although probably 2 or 3 broods are reared in the season and fresh eggs may be found throughout May and June and according to Hansmann, even in August. The cock has been seen incubating by Irby and Lynes.

Breeding
Season.

Average of eggs (61 from Spain and Corsica by the writer and 39 by Rey), 17.86×13.6 , Max. 19.3×14.2 and 18.2×14.5 , Min. 15.3×13.4 and 16.8×13.1 . Average weight, 95 mg. (Rey).

Measure-
ments.

[In the W. Canaries a somewhat smaller race, *S. melanocephala leucogastra* (Ledru) is found; while in Syria and W. Persia the representative form is Bowman's Warbler, *S. m. momus* (H. & E.). Average of 3 eggs from Persia, 17.57×13.1 . Possibly also the birds from N. W. Africa and the E. Canaries are subspecifically separable. From Marocco to Tripoli it is a common resident and is said occasionally to breed in long grass in Algeria, but more usually in thorny bushes, from April to July.

The Palestine Warbler, *Sylvia melanothorax* Tristr. breeds apparently only on Cyprus, although possibly it may be found in Palestine, where Tristram obtained a pair. Eggs figured by Dresser, pl. 106, fig. 3. The nest is built in low thorn bushes and the eggs, 4 in number, are laid in May. The ground colour is greenish, and they are marbled and spotted with yellowish brown and violet grey shell marks, sometimes showing a distinct zone at the big end. Average size of 12 eggs, 17.28×13.3 . Max. 18.3×13.5 and 18×14 , Min. 16.5×12.3 .]

151. Ménétries' Warbler, *Sylvia mystacea* Ménétr.

Plate 26, fig. 21 (Persian Gulf, A. G. Tomlinson).

Eggs: Cat. Eggs Br. Mus. IV, pl. X, fig. 4. Dresser, pl. 106, fig. 2.

Sylvia mystacea Mén. Dresser, B. of Europe, IX. p. 59. and Man.

Pal. Birds, p. 80. Hartert, Vög. Pal. Fauna, p. 595.

Breeding Range: S. Caucasus and Transcaucasia. [Also from Persia and Transcaspia to Afghanistan and Turkestan.]

Dis-
tribution.

This species was first recorded by Ménétries from the lower Kur valley in Transcaucasia and Radde obtained specimens at Lenkoran, while Ssatunin has more recently shown that its range extends further in the S. Caucasus. [In Persia it is common in the Elburz range at 4000 ft. and is also found in the central and southern parts of the plateau, while in 1908 A. G. Tomlinson found it breeding on the Kairun R. and near Bussorah, at the head of the Persian Gulf. It is the commonest warbler in Transcaucasia and also ranges E. to parts of the valleys of Syr and Amu Darya and N. Afghanistan.]

Nest.

Generally low down in a bush, but sometimes 3 ft. from the ground in scrub or in sapling date bushes. The nest is rather slight, built of stalks and grasses, lined fine grasses and roots. (Sarudny describes it as built of tamarisk twigs, bents, and down, lined finer bents, vegetable filaments and a few horsehairs.)

Eggs.

From 4 to 5, very pale stone colour or with a faint greyish tinge, finely spotted or marbled with underlying leaden shellmarks and ochreous brown spots and fine specks, Four clutches examined show very little variation, but Sarudny's description, if correct, points to the existence of other types.

Breeding
Season.

Tomlinson took clutches on April 9 and 27, Witherby on May 2 and incubated eggs on May 31, the two latter at over 5000 ft.

Measure-
ments.

Average of 18 eggs by the writer, 17.31×13.1 , Max. 18.2×13.5 , Min. 16.3×13.3 and 16.6×12.5 .

152. Subalpine Warbler, *Sylvia cantillans* (Pall.) [*S. subalpina* auct.]

Geographical Races.

a. Western Subalpine Warbler, *S. cantillans cantillans* (Pall.).

Plate 26, fig. 22 (red type, R. Guadiana, Commr. Lynes).

Eggs: Seebohm, Col. Fig. pl. 53 (red type).

Foreign Names: France: *Bec-fin passerinette*. Italy: *Sterpazzolina*. Spain: *Cagachin*

Sylvia subalpina Bon. Dresser, B. of Europe, II, p. 389 and Man. Pal. Birds, p. 81. Saunders, Man. p. 53. *S. subalpina subalpina* Temm. Hartert, Vög. Pal. Fauna, p. 596.

Breeding Range: The Iberian Peninsula, S. France, Italy, occasion-

ally in Switzerland, Corsica, Sardinia, and Sicily. (Has once occurred in S. Kilda and once on Fair Island.)*

In Spain this species seem to be local, and chiefly confined to the maritime provinces, from Catalonia to Andalucia, but it also occurs in some districts of the central plateau, and Saunders obtained eggs near Madrid. In Portugal it is common in the S. (Algarve), but is apparently absent from the N. of the country; though plentiful in the lower Guadiana valley (Lynes). In France it is found in Languedoc and Provence and ranges northward into Savoie. In Switzerland it has bred occasionally near Geneva, and once near Neuchâtel, while in Italy, although met with commonly in Tuscany and Liguria, it is rare in the Po valley, Piedmont and Lombardy, but breeds in the southern provinces. In the W. Mediterranean it is common in Corsica and the small islands lying between it and Italy, and is also not rare in Sardinia and plentiful in suitable localities in Sicily, but absent from Malta. To all these localities it is a summer visitor only.

Continental
Europe.

The nesting sites vary from 1 to 5 ft. above the ground, but usually 2—3 ft. high, sometimes in gorse, cistus, brambles, and myrtle bushes, or else in sapling ilex and other trees. Most nests are rather slightly but neatly built of dry grasses or bits of dead thistle leaves, lined often only with finer bents, but sometimes also with horse or pig hair. The structure is strengthened by cobwebs, and plant down is often interspersed; and in some nests dark reddish brown fibrous matter is used as lining material. Average diameter of cup $1\frac{3}{4}$ — $2\frac{1}{4}$ in., depth $1\frac{1}{4}$ — $1\frac{3}{8}$ in.

Nest.

Almost invariably 3 or 4, but Lynes found a single nest in Spain with 5 eggs. Almost all the eggs which I have seen from Corsica and Sicily are of one type, being greyish or pale greenish white, finely speckled and spotted, chiefly at the big end, with ochreous or umber and underlying inky violet or pale grey markings. There is a certain amount of variation in depth of colour in the spots, and lightly marked eggs are exceptional, while one set in the British Museum shows a great deal of the white ground, and a distinct zone of dark spots is not uncommon. From Spain however the erythristic type is very prevalent, with pinkish white ground either spotted with reddish brown and lavender or boldly blotched with deep chesnut red, chiefly at the big end. There is little or no gloss.

Eggs.

The first eggs may be found in Spain from the second week in April onward till early in June, so probably two broods are reared. In

Breeding
Season.

* The statement in Dresser's and other works, that this species breeds in the Canaries, is due to an error by Bolle, who confounded it with *S. conspicillata*. Cf. Koenig, *J. f. O.*, 1890, p. 371.

Corsica the earliest date appears to be the first week in May, and eggs may be found at the end of the month, but in Sardinia Brooke records young on the wing on May 12. Incubation must be usually performed by the hen as Lynes only once found the cock on the nest.

Measure-
ments.

Average of 69 eggs measured by the writer, 16.48×12.93 , Max. 19.1×13.7 , Min. 15×12.1 . Average weight of 4 incubated eggs (unblown), 1.555 g. (R. H. Read).

b. Eastern Subalpine Warbler, *S. cantillans albistriata* (Brehm).

Plate 22, fig. 16—18 (Parnassus).

Eggs: Thienemann, Fortpfl., Tab. XX, fig. 9, a, b. Baedeker, Tab. 51, fig. 7, Dresser, pl. —, fig. 13—15. *S. subalpina albistriata* (Brehm). Hartert, Vög. Pal. Fauna, p. 597. Cf. Dresser *l. c. partim*.

Breeding Range: The Balkan Peninsula, in the S. and W., the Cyclades and probably Crete. [Also Asia Minor.]

Con-
tinental
Europe.

Along the rocky coast of Istria, Croatia and Dalmatia, where there is cover, this is the first warbler to return in spring, and is a common breeding species. It is also found in the scrub covered foot-hills of Montenegro and the Karst district of Herzegovina, as well as in many of the islands in the E. Adriatic. Probably it occurs also along the Albanian coast, and in Greece seems to be pretty generally distributed in the macchia zone on the bases of the mountains. Krüper also records it as breeding on Naxos and other islands in the Cyclades, while it certainly visits Crete and probably breeds there. [In Asia Minor Krüper found it common in summer near Smyrna, but it has only once been recorded from Cyprus, and has not been found breeding in Palestine.]

Nest.

Resembles that of the previous race, and like it is placed in thick bushes, sometimes quite close to the ground, and at other times a foot or so above it.

Eggs.

Usually 4 or 5, much resembling those of the W. form, but in the greenish type the markings are rarely dark and are generally evenly distributed, while the fine grey shell markings are characteristic. Erythristic types occur not infrequently but are less boldly and handsomely marked than the finest Spanish eggs.

Breeding
Season.

Krüper once found eggs on April 20, but the more usual time is from the beginning of May onward till early in June.

Measure-
ments.

Average of 60 eggs (33 by the writer, 12 by Rey, 9 by Reiser and 6 by Kollibay), 17×13.21 , Max. 18.2×14 , Min. 15×13 and 16.4×12 . Average weight of 12 eggs, 93 mg. (Rey); 9 eggs, 84 mg. (Reiser).

[A third form, the African Subalpine Warbler, *S. cantillans inornata*

Tsch., inhabits N. W. Africa, breeding from Marocco to Tripoli, not only along the coast but also up to about 7000 ft. in the mountains. Average of 9 eggs taken by Koenig and Erlanger in Tunisia in May, 17.9×13.55 , Max. 19×14 , Min. 16×12 . Average weight of 5 eggs, 94 mg. (Koenig). For nesting notes see *J. f. O.*, 1892, p. 398.]

153. Spectacled Warbler, *Sylvia conspicillata* Temm.

Plate 26, fig. 23 (Malta).

Eggs: Thienemann, Fortpfl. Taf. XX, fig. 8, a, b. Baedeker, Tab. 51, fig. 6. Dresser, pl. —, fig. 32.

Foreign Names: France: *Babillard à lunettes*. Italy: *Sterpazzola di Sardegna*. Spain: *Friolencos*. *Sylvia conspicillata* Marm. fide Temm. Dresser B. of Europe, II, p. 393 and Man. Pal. Birds, p. 80. *S. conspicillata conspicillata* Temm. Hartert, Vög. Pal. Fauna, p. 598.

Breeding Range: Locally in Spain, S. Portugal, S. E. France and Italy; the islands in the W. Mediterranean. [Also N. W. Africa, Palestine and probably Cyprus.]

In the Iberian peninsula this species is found commonly in Algarve in S. Portugal, but has only been recorded a few times from the rest of the country. In Spain however it is local in Sevilla, fairly common in Granada, and also breeds in Murcia and Valencia, while according to Lilford it is found also in the plains of the central plateau, not far from Aranjuez. In France it breeds in the Camargue, but is confined to the desert plains of the Crau and Bone, and is said to occur locally in S. E. France as far as Savoie. In Italy it is scarce and is chiefly found in the S., but is said to breed in the Roman Campagna as well as in Calabria. In Corsica Whitehead found it nesting, and it is said to be not uncommon in Sardinia and in the mountains of Sicily, while is the commonest warbler in Malta. [In N. W. Africa it is common in some districts, but local in Marocco and Algeria and more general in Tunisia, while it is also found on Fuertaventura. In Palestine it is found on the bare highlands of Judaea and the Jordan plain, while it is chiefly known as a visitor on migration to Cyprus. Curiously enough it has not yet been recognized with certainty from Greece or Crete.]

Con-
tinental
Europe.

In the Camargue Eagle Clarke found a nest well hidden in a clump of sea blite, while Whitehead's nest was 3 ft. from the ground in heath on a brush covered hillside. It is common among the low bushes in the Salt lake district of Algeria, and in S. Tunisia von Erlanger found many nests in the patches of scrub between cultivated land. They are

Nest.

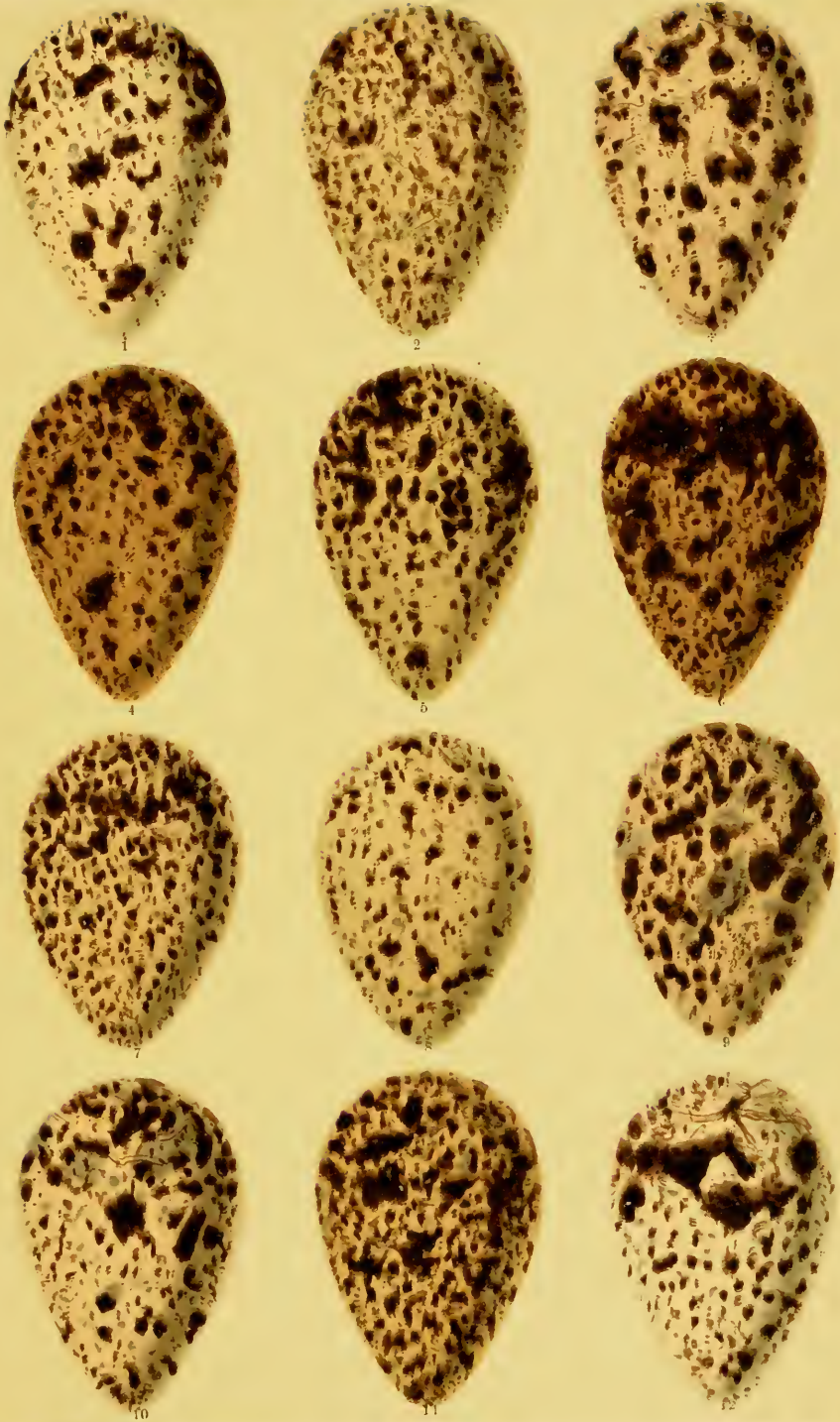
substantially built of grasses, interwoven with dead thistle leaves and stalks of various plants and bits of thistle down, lined with fine roots, down, and a few horsehairs. Diameter of cup $2\frac{1}{2}$ in., depth $1\frac{1}{2}$ — $1\frac{3}{4}$ in. The foundation is more solidly built than in the case of the other Mediterranean warblers.

Eggs. Usually 4 or 5 in number, sometimes only 3. They are greenish white, often closely freckled all over with fine spots of greenish grey or greyish brown. Sometimes the markings tend to form a darker cap or zone at the big end, and some eggs show pale leaden markings, or a fine blackish hair line or two.

Breeding Season. In Malta two broods are reared, for fledged young have been found by March 24 (Stenhouse) and also in May and June (C. A. Wright), while in Tunisia the season extends from the middle or end of March to June (Whitaker). In Corsica and on the N. Shores of the Mediterranean, where it is a summer visitor, the breeding season is probably rather later, and the few nests of which I have records were taken in May.

Measurements. Average of 53 eggs (20 by Erlanger, 14 by Bau, 14 by the writer and 5 by Koenig), 16.71×13.06 ; Max. 18.6×13.7 , Min. 15.5×12 . The average of 109 eggs quoted in Dr. Hartert's *Vög. Pal. Fauna*, p. 599, included measurements of 83 eggs from the Canaries by an oversight. Average weight, 88 mg. (Bau).

[A darker race, known as *S. conspicillata bella* Tsch., breeds in Madeira, the Canaries and the Cape Verde Isles. Eggs figured by Dresser, pl. — fig. 31, 33—36. In Tenerife eggs may be found from March onward, but in some of the islands of the Cape Verde group it breeds even in November! In nesting habits it does not differ from the Eastern form, but Alexander found nests in lavender bushes as much as 7 ft. above the ground. In Madeira Schmitz states that most eggs are laid in May in the mountains and that the nest is always lined with wool and sometimes also with roots. Average of 29 eggs from Madeira, 16.9×13.09 , Max. 17.6×13.5 and 16.8×14 , Min. 15.5×11.5 . Average weight of 16 eggs 70 mg. (Schmitz). Average of 83 eggs from the Canaries (57 by Koenig and 26 by the writer), 16.31×12.51 , Max. 18×12 and 17×13 , Min. 15×12 and 17.1×11.5 . The clutch is usually 4, less often 3 or 5. Tristram's Warbler, *Sylvia deserticola* Tristr. breeds in the Atlas and Aurès ranges in N. W. Africa. Eggs figured in J. f. O., 1896, Taf. VII, fig. 2; nest and young, *t. c.*, 1895, Taf. II. Meade-Waldo records it from the Atlas Mts. in Morocco, from above the tree limit up to 9000 ft., while Koenig found it common in the Aurès range in Algeria and Whitaker describes as not uncommon among the maquis covered hills of N. Tunisia. The nest is generally placed in a rosemary bush, and is built of stalks and bents interspersed with down and lined with flowers of *Aerva javanica* and sometimes hair. The eggs are usually 4 in number, greenish white, with slight gloss, thickly covered especially towards the big end with olive or dark brown spots, blotches, etc., which sometimes form a zone. Eggs may be taken from the beginning of May. Average size of 15 eggs (8 by Whitaker and 7 by Koenig), 15.6×12.47 , Max. 16×13 , Min. 15×12 . Average weight of 7 eggs, 81 mg. (Koenig).]



1-12 Redshank, *Totanus totanus* (L.).

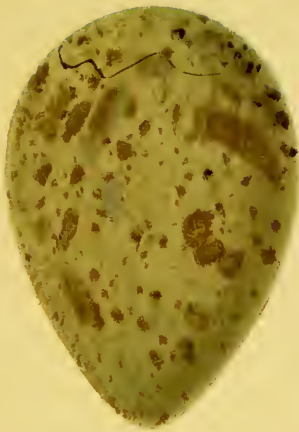


1—10 Dusky Redshank, *Totanus fuscus* (L.).





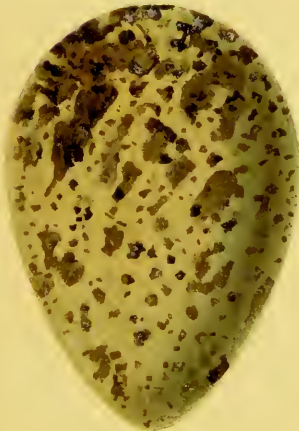
1—8 Black-tailed Godwit, *Limosa limosa* (L.).



1



2



3



4



5



6

1—6 Whimbrey, *Numenius phaeopus* (L.)



M. Reichenow, pinx.

1—9 Noddy, *Anous stolidus* (L.).

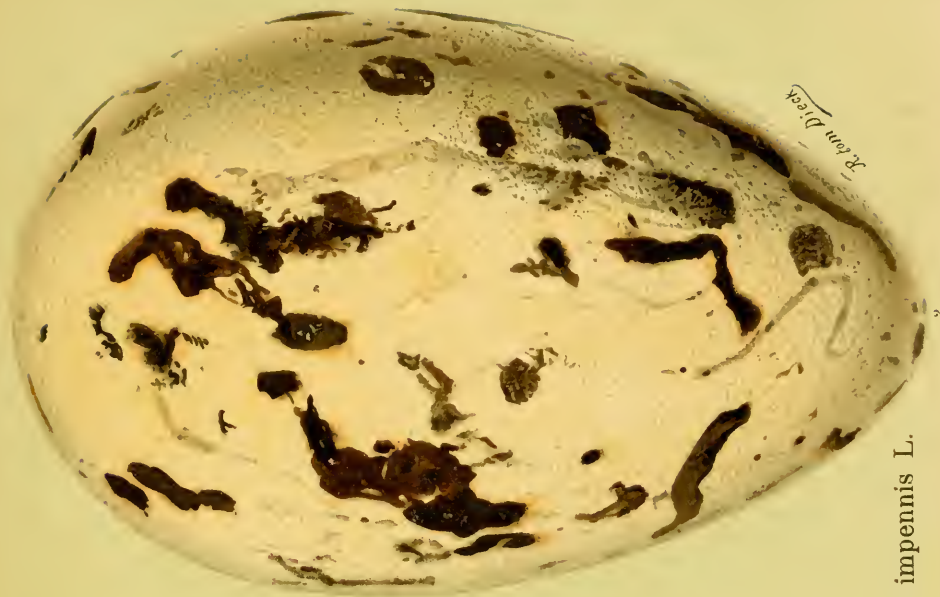


A Reichert. pinx.

1—8 Adriatic Gull, *Larus melanocephalus* Natt.



1—5 Great black backed Gull, *Larus marinus* L.



Reyn. Direct

1, 2 Great Auk, *Alca impennis* L.



JW Frohawk



Alca impennis

2



Alca impennis

1

1, 2 Great Auk, *Alca impennis* L.



