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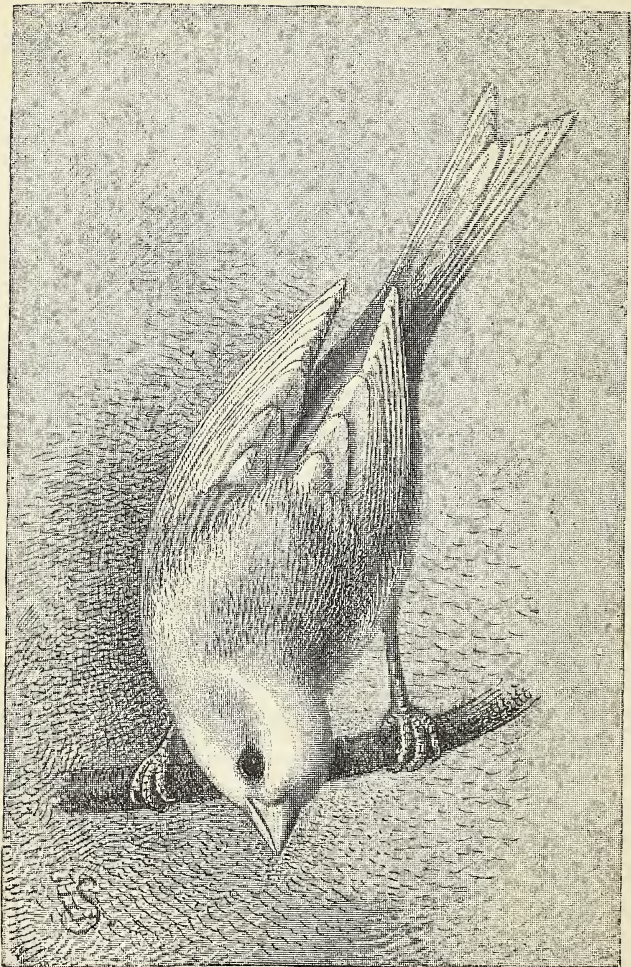
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THE COMMON GERMAN CANARY-BIRD.

CANARY BIRDS:

HOW TO BREED FOR PROFIT OR PLEASURE.

AN EXHAUSTIVE TREATISE ON ALL THE DIFFERENT BREEDS ;

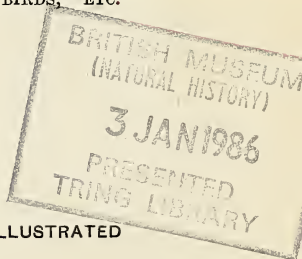
WITH CHAPTERS ON PAIRING, COLOUR, BREEDING, FEEDING
CAGES, NESTING, EGG FOOD, SANITARY MEASURES,
DISEASES TO WHICH THE CANARY BIRD
IS SUBJECT, &c., &c.

11 FEB 1948
PRESENTED



By DR. KARL RUSS,

AUTHOR OF "FOREIGN AVIARY BIRDS," ETC.



AUTHORISED TRANSLATION—ILLUSTRATED

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CANARY BIRDS.

WE may look upon the "Canary" no longer as a strange guest merely, but as a naturalised inhabitant. Although the canary has only been taken from its home in the wild state a little over 300 years, yet it is already to be found among all the civilised nations of the globe.

In Germany, however, it has attained a particular importance, first, because it appears in innumerable households as a tenderly cared-for pet, and, secondly, because it is bred in exceedingly large numbers, and has, in many parts of the country, become an important article of exportation, and a means of subsistence for many.

The Ancestor, or Wild-Bird.—I begin with the description of the ancestor, the canary-bird in its wild state, and shall preface my remarks with a communication of the historical facts, taken chiefly from the excellent work by the traveller and naturalist, Dr. Karl Bolle.

History.—The oldest author who reports anything regarding the canary, is Conrad Gessner, whose book, "*De Avium Natura*" (Nat. History of Birds), appeared in the second half of the 16th century. He had not himself seen the bird, but describes it in accordance with the report of a friend, and calls it "*Canariam Aviculum*," which has been arbitrarily rendered "sugar-bird," because it was said that this stranger was particularly fond of the sugar cane, and because, as a matter of fact, he likes to eat sugar.

Gessner is followed by Aldobrandi (1599-1609), who, in his treatise on birds, merely repeats the statements of his predecessor, but the notification that the male bird is distinguished from the female by the brighter yellow hue of his plumage. Moreover, besides giving a somewhat clumsy picture of the canary, he mentions that canary-grass is the favourite food of this singing-bird. Much better than Aldobrandi's description is that of *Olina*, given in a book published in Rome in the year 1622, and which found its way into various other works. The above-mentioned writers, however, only know the *green* bird, which, in their time, was still being imported by merchants, direct from the Canary Islands.

When the Spaniards, in the year 1478, conquered the Canary Isles, this species of singing-bird became part of their spoil, and thus it was the birds first found their way to Spain; and were from that time sold by the Spaniards to other nations.

The little sugar-bird soon became a notable article of commerce. At first, however, owing to its high price, it gained entrance only into the houses of very rich and great people; and by them it was most carefully tended and was considered the special favourite of the ladies.

For nearly a century the Spaniards succeeded in preserving the monopoly of the trade in canaries, as they exported the males only; wisely keeping the females for themselves. In the middle of the 16th century this monopoly was broken down; for, as *Olina* tells us, a Spanish vessel, bound for Leghorn, and containing among its cargo a considerable number of canaries, perished on the Italian coast; and the birds, liberated in this manner, and probably driven by an easterly wind, flew westward, and settled on the island of Elba. Finding there a very favourable climate, their number soon increased considerably; as the Italians soon found

in the capture and sale of those birds a new source of gain which, it must be owned, they worked to excess. They also successfully commenced to breed the birds, and, from Italy, the breed spread to countries of a more northerly situation, especially to the Tyrol and to other parts of Germany. Thus the breeding and, afterwards, the trade in these birds began to flourish in the liveliest manner. As early as the latter part of the last century, there existed at Tmst ¹ an association which every year after the breeding time despatched buyers to the canary-breeders in Germany and Switzerland in order to buy up the young birds—a practice that continues to the present day. The birds collected in this fashion were then hawked about and traded with as an article of commerce throughout Germany; and even as far back as this they were exported in small quantities to Russia, Constantinople, Egypt, and to England where they sold at fifteen shillings per head; a similar trade later on being developed in the Black Forest and in other parts of Germany. Keeping pace with the progress in the breeding, the trade naturally extended, and steadily increased.

It has, of late, been repeatedly attempted to establish the theory that the bird that has become acclimatised to our regions is by no means descended from the species which, even now, inhabits the Canary Isles in a state of freedom, but that it owes its origin to a continuous cross-breeding between some greenish-yellow varieties of the finch-species which can easily be tamed, and which are domesticated in our country and in other parts of the world; for although, since the commencement of the 18th century, the books treating of the canary-bird have become more and more numerous, yet the precise epoch in which the transition from the green hue to the yellow took place cannot be ascertained

¹ Small place on the Tyrol.

with accuracy : the change having been effected so gradually that no exact period can be fixed upon.

I shall give the scientific description of the wild canary according to the birds which I myself have, in the course of years, had in my possession, and which are to be found in my collection.

The Wild Canary, called "Canario" by the Spaniards and Portuguese, and Canario de Terra by Madeira people, resembles, according to Hartwig, in size, shape, and bearing, the cultivated bird of the ordinary breed of Germany and of the "Hartz;" as to the colouring, it tallies to a great degree with that of the greyish-green canary with a greenish-yellow breast, and without white wings and tail-feathers, so that it requires an accurate and thorough acquaintance with *both* these birds to enable one to discover any reliable marks of distinction between the two. This distinction mainly consists in the fact that, in the wild bird, the whole design of the upper and under part is quite regular (symmetrical), and the head and back present a more greenish-grey, instead of a brownish tone of colouring; further, that the ashy tint or the bluish colour is more strongly accentuated at the sides of the neck or throat, that the white wing and tail-feathers are absolutely wanting; and that the upper part of the beak and the legs are flesh-coloured (not the dark-brown colour of a *horn*).

Scientific Description.—A frontal streak above and beneath the eye, the sides of the head, and a streak at the neck, of a vivid greenish-yellow, the "vertex" of a greyish-green yellow, on the upper and back part of the head, each feather showing a broad, blackish shaft-streak, a second streak at the neck and the cheeks, are of a bluish ashy colour; the shoulders and the upper part of the back are olive-green with a brownish shade, each feather having in the middle a broad, blackish streak, the nether part of the

back more greyish-green ; the croup and the upper coverings of the tail are of a pure yellowish-green ; the wings are of a blackish-grey, delicately-edged on the outside with a greenish-grey tint, and having a broad-fallow point ; second wings with a broad, grey, exterior feather and point ; all the fans are underneath of a bright ashen grey ; the upper wing-covers are of a blackish-grey colour, broadly edged with olive-green and yellow ; the lower wing-covers are white ; the tail-feathers are blackish-grey, edged with fallow-grey at the outer and inner borders, beneath they are of a brighter grey ; underneath, the whole body is of a vivid greenish-golden hue ; the sides are greenish-yellow, streaked downward with a blackish-grey ; the back part of the body is of an almost pure white, as are also the nether tail-covers, the latter, however, have a yellowish reflection (reflex) ; the eyes are brown ; the upper beak of a brownish flesh-colour, while the lower beak is of a yellowish-grey ; the feet and claws of a brownish flesh-colour ; the soles of the feet are of a flesh-coloured white. (I have ascertained that, the older the bird gets, the more will the yellow colour of its plumage, especially at the throat and the lower part of the breast, declare itself ; the brownish colouring at the shoulders and upper part of the back becomes more and more perceptible, while the beak grows more uniformly dark brown and grey. These signs could be positively traced in several living birds which I have before me.) The female bird differs from the male only inasmuch as the greenish-yellow colour is superseded, especially at the breast and belly, by broad, whitish-grey borders around the feathers, so that it will, on the whole, appear more of a subdued greyish-blue colour with only a tone of greenish-yellow ; the forehead and the streak around the eyes have a slight but vividly greenish-yellow reflex, as has also the whole lower side ; but, beginning from the under part of the breast, the colour is of a tolerably

pure, greyish-white. At an advanced age, the feathers of the back are also of a distinct brownish-grey. The length is from 3 to 4 inches, the breadth of the wings from 9 to 10 inches, the tail from 2 to 3 inches; the size is therefore a trifle smaller than that of the tamed bird, or, at all events, the wild one appears more slender. The first plumage of the young bird is (according to Bolle) of a brownish tint, but at the cheeks and the throat it is of a pale lemon colour.

Propagation.—The pairing and nest-building occur in March, usually in the second half of the month; the nest is carefully concealed, but in gardens it may be easily discovered, owing to the constant flying to and fro of the old birds. Usually it is situated the ordinary height of a man, sometimes up to 9 feet, but never lower than 6 feet from the ground. For young, slender trees, the bird seems to have a peculiar predilection, and among these it chooses, from preference, those which are evergreen, or which are the first to be covered with foliage. Böcker states he found the nest in the various fruit and ornamental trees which flourish in the vicinity of Orotava, a town of the Canary Islands, especially in cypress, palm, and orange trees. The nests which Bolle saw were made of vegetable wool; they were neatly shaped, broad below, very narrow above, and elegantly rounded; some were scarcely covered with a blade of grass or a twig of brushwood. Böcker, on the contrary, describes those inspected by him as resembling in size, colour and shape, those of the “wavy-wing,” externally composed of small, fine roots, of dry blades and stalks of grass, and lined with white vegetable wool. He never caught sight of a single nest composed entirely of white vegetable wool.

One egg is laid every day, the average number found in the nest seemed to be five. The eggs are of a pale sea-green, speckled with spots varying from a reddish brown to

a blackish colour ; these spots sometimes unite into a wreath at the blunter end, sometimes, too, they are entirely of one colour, or very nearly so ; in size and shape they resemble those of the tame bird, only that they bulge more at the longer side. The breeding time lasts 13 days, at about that time the young birds are fledged, and they are, for some time yet, fed from the crop by both the old ones, principally by the male bird, according to Böcker, with various seeds of grasses and salads, with the tender leaves of different kinds of salad, the soft kernels and the juice of broken figs. According to Böcker, *three*, and according to Bolle, *four* breedings take place every year. At the end of July the moulting season begins.

W. Hartwig saw at Madeira a nest a little over a yard high in a vine ; he found, however, some high up on cypresses, stout oaks, gigantic fever-trees (*Eucalyptus robustus*), and on strong, leafy, Indian fig-trees (*Ficus comosa*). The nests are always lined for the greatest part with vegetable wool, the outside is adapted to the environs, and therefore difficult to be found. One of my friends noticed the first young birds flying on the 25th of March, and I saw them myself on the 26th. After the last days of March the chirping of the young birds could be heard in every large garden or plantation. Their demeanour in begging for food, their movements, and their deportment, are the same as of our tamed birds. The number of hatching is, for Madeira, two, exceptionally sometimes three per annum.

Song.—While the female hatches, the male sits near, from preference, high, upon yet leafless trees, or on dry twigs, and it is, most frequently, from that eminence, that his song will be heard. The value of that song, says Bolle, has been the subject of frequent dispute ; overestimated and praised to excess by some, it was not commended by

others, who, perhaps, could judge only by the performance of a few imported birds. One is not far from the truth in asserting that the wild canaries sing very much as the tame ones do in Europe. The song of the latter is by no means artificially produced, but, although it may have been, now and then, slightly altered through the influence exercised by the song of strange birds, it has yet, on the whole, remained what it originally was. Certain turns have been transformed and brilliantly developed by education, others have been preserved in greater purity and freshness by the primitive state, but the character of both modes of singing harmonizes perfectly even now, and this circumstance bears testimony to the value of the bird. All linnets, nightingales, or tame canaries, however, are not of equal proficiency as singers, nor can such equality be required of the wild canaries; among these, too, will be found some more and some less powerful. Our decided opinion, however, is this: we have never heard the sounds which resemble the note of the nightingale, or the so-called "rolling," those soul-stirring deep chest-tones, more beautifully executed than by *wild* canaries, and, in the islands, by a few tame ones, which latter had evidently undergone an apprenticeship with the wild birds. . . F. Böcker judges them as follows:—The song of the wild canary, cannot, on the whole, satisfy those who are acquainted with the canary of the "Hartz;" the voice is soft, fresh, and melodious; when several birds sing together, the impression produced is that as if a company of insectivorous birds, especially the various kinds of hedge-sparrows (warblers), were vieing in song with some linnets; at intervals one hears some whistling sounds rapidly uttered, some isolated trills and some "clucking" parts; some incipient rolls will also be heard in the song of the wild-bird. It is true that one hears also occasionally the tabooed "catch" of our canaries of the common breed, not so

shrill, but quite as frequent; all the melodies are short compared to those of the "Hartz"-bird, nor have I heard any *new* melodies; nevertheless, the total impression produced upon me by the song of the wild-bird resulted in the conviction that the latter, in his soft, melodious organ, possesses the means of acquiring, as far as fulness of tone and a moderate length of the strophes are concerned, the song of the canary of the "Hartz," and this might be accomplished even in the first, but certainly in the second generation. Whether the purity and faultlessness of the song of the "Hartz"-bird can be attained in so short a time, will depend on the circumstance whether the young brood can be removed from the old male soon enough to prevent the former from hearing the song of the latter even during the first four weeks of its existence. The type of the song of the single wild-bird is that of the note of the common breed, but, although, in the main, they are concordant, yet various deviations will occur, so that the assertion that each covey has its own song, is not entirely without foundation. At all events there are, among the wild-birds, some which are more, and others which are less, proficient in song; the best singers are those which least frequently "catch," they thrill oftener, they also produce a short "rattle," and, in this respect, they approach the song of a tolerably good "Hartz"-bird. The long-drawn notes, however, of the latter's song are never heard in the open air, nor are they emitted by the *captive* birds of Teneriffe.

According to my opinion, the wild-bird will sing best in the localities where it is most numerous represented; the female bird, however, will utter a few chirping notes even in captivity. The "luring" note of either *sex* is often soft and melodious like that of the tame species, but often, too, it is unpleasantly high. W. Hartwig writes: its song is that of our common breed, but the single notes are not so loud,

softer and better sounding. The food consists, according to Bolle, chiefly, if not exclusively, of vegetable matter, small seeds of a partly farinaceous, and partly oleaginous kind, as well as of tender green leaves and juicy fruit, especially figs, and besides, of all kinds of seeds affected by our indigenous finch species; thus, the weeds known to us by the name of Kreuz Kraut, groundsel and wegebreit, plantain, will be abundantly found there, as well as water-cresses, and the poppy.

We must mention yet another principal article of food, which has acquired the greatest reputation in Europe, and which is generally used for feeding the domestic bird, namely, the "canary-grass" which is indigenous to these isles as well as to all the countries surrounding the Mediterranean; in Germany it is chiefly cultivated on a large scale near Erfurt, and, for a long time, was thought to be the only food for canaries.

In Holland it was cultivated as early as the second half of the 17th century. Water is an imperative want of the canary; he flies often to the drinking-place, and prefers to do so in company with others of his kind; he is very fond of bathing, and wets himself copiously, be he wild or tame. A well-known authority says: The canaries do not eat only the seeds and green leaves of groundsel, sharp sow thistle, mercury (*Mercurialis anuna*), but they also like to eat insects. I often found them occupied in gathering green flies and similar smaller insects from plants. The capture of the wild-bird is very easy; Bolle has, in the islands, seen them taken even in simple nets with only linnets and goldfinches as lurers. Usually, as Böcker affirms, a trap-cage is employed which consists of two lateral divisions, of the traps proper, with a raised stepping-plank, and of a cage for the luring-bird, situated in the middle. This mode of capture is practised in parts abounding in trees, where water is close at

hand, and it is most productive during the early hours of the morning. Bolle has seen 16-20 specimens caught within a few hours, and F. Böcker has made a similar observation.

According to the statement of the latter, only the young birds are generally caught, that is, the capture is attempted only when the young of the first and second brood have taken flight.

The canary is caught much more frequently than other birds of its kind ; not for the purpose of exportation however, but only to gratify the fancy of native amateurs, or at the desire of a stranger for a trifling compensation. At Madeira Hartwig only noted catching by means of a trap cage. When newly caught, the wild birds are extremely restless, and it requires a considerable time for them to relinquish their wildness ; when they are locked up together in narrow cages, they are apt to bruise each other's plumage, but if left unmolested, they are fond of billing, and the young males may easily be recognised by their loud and continuous chirping. Bolle's younger birds began to moult in the latter half of August, but some of them had not quite finished moulting even in December, probably they were those which had been the last to take flight.

The bright yellowish-green appears first on the chest. With regard to the breeding in the islands, Böcker says that this is not of any particular importance. The manner of breeding at Teneriffe is the same as in the small breeding-places at home of our common breeds, and the breeding is always done in small cages made of cane or wire, partly by coupling wild birds with tame ones, in which case, almost without exception, the wild *male* is employed, and partly with cultured birds, as it is done in this country.

There, as with us, one male is allotted to several females ; there, as well as here, complaints are heard respecting an abortive after-breed. Crested and smooth-headed birds are

bred in the same colours of vivid yellow and green, and they are sold at about the same prices ; the usual food is canary-seed, to which, during the breeding, some chopped egg is added.

The cross-breed between the wild cock and the tame hens (called Verdegais on the island of Teneriffe), are said to be often very beautiful and peculiar ; a breeder in Orotava bred some of a vivid brownish-yellow colour. Bolle states he has seen the young of a bright yellow female bird which, on the upper part of the body, was dark green, and from the throat downward, of a pure golden colour, but then, these birds were considered as being extremely rare.

Dr. Bolle designates the wild canary as being, when captive, very delicate and subject to numerous diseases. Böcker, on the contrary, writes : "The wild canary, when once inured, is, according to my conviction, a sturdy bird, and we have succeeded here in preserving him healthy and cheerful for months together, and that under rather unfavourable local conditions, and with very simple treatment. He even endures the manipulation and inspection of the various parts of his body quite as well as the tame bird, and draughts and a variable temperature he will bear even better than the latter does. The young canary, however, in confinement, particularly requires young and not wholly matured seeds, green herbs, as salad leaves, the leaves of the young radish, and, if possible, a small piece of ripe fig. So long as the birds remained under the care of my son, they were quite healthy, although a great number of them had to be kept in the same cage ; old dry canary-seed and the ordinary food given to canaries does not agree with newly-captured birds, and most of them perished through such a diet. He found that they quickly grew thin, while the abdomen was inflated, and, by means of their evacuations, they then spread contagion among other birds ; my son has

lost no wild birds through convulsions. I myself had several of these wild canaries and found them anything but sensitive."

When Bolle visited the islands, the price paid at Santa-cruz, when buying several, was about 3d. per head, newly-caught old males were sold for about a shilling. In Canaria the prices were much higher; presumably because the birds are scarcer in that locality; now, an old bird cost, according to E. Böcker, about four shillings, and a young one, at least 5d. to 6d. The wild birds are said to be lower in price than the tame ones, and from this the writer infers that those sold in the trade as wild-birds are genuinely such.

At the present time, living wild-birds are but rarely imported to Europe; when dealers offer for sale wild canaries exported from St. Helena, those are generally birds of another species, principally the "*Fringilla flaviventris*" (Gml.), and recently also the "*F. canicollis*" (Surns.) or canary of the Cape. In the same manner other kindred finch species are foisted upon buyers as wild canaries. I first saw wild canaries at the Exhibition in Paris in 1867, and in the course of years, I have, as already mentioned, owned them both singly and in pairs, but, unfortunately, I have never bred any.

The Tame Canary.—Let us now turn to the tamed bird and view him under his different aspects as, altered through the influences of captivity, he presents himself before us, in all his various breeds. To begin, we think it astonishing that in, comparatively, so short a space of time, such a thorough change of the colour, shape, and the whole nature of an animal could have been effected; for, not only does the cultured bird appear to us to be taller, more robust, and in some respects quite differently shaped, than the wild bird, but we also behold it in numerous and quite different colours, shape and form. His size is an average length of

5½ inches, the extended wings measuring 12 to 13 inches in breadth, and his tail is about 3¼ inches long. The best mode of reviewing all tame canaries, will be to divide them into three principal groups, the first of which comprises the *German*, the second, the *Dutch*, and the third, the *English* breed.

The German Breed: their Classification.—The German canaries are classified partly according to their colour, and partly according to their song; they are usually divided into “common” German canaries, otherwise called country-breed, and the “ennobled” breed of the “Hartz” (the latter are, even now, erroneously designated as “Saxon” canaries by travelling dealers).

I. The “Common” German Canary “Colour”-Birds.—The colours vary between a dark, vivid gold-colour and nearly orange, and a whitish yellow or an almost pure white; between a yellowish brown passing through the “dun” colour, proper, to a reddish brown, and from a greyish green, through a shade of yellow green, to a blackish green. We distinguish (*a*) bright yellow or golden-coloured birds, which are all the more prized the more they approach in colour to the rich “Orange.” As these present a beautiful appearance indeed, when of a uniform colour all over the body, they are extremely popular, and zealous breeders principally strive to propagate them in breeding absolutely pure as regards colour.

(*b.*) The *straw-coloured*, whose colour is much more pale and whitish, but still very lovely; these are bred the most.

(*c.*) The *white*, which, of course, are not pure white, but only of a very light yellow, and are in great request when it is desired to breed very fine bastards with gold-finches or any other kindred species of the finch.

(*d.*) The *dun-coloured* is something between a yellowish and a reddish brown, and inclines more or less to one or

other of these shades. Fine dun-coloured birds which display this tint only on the upper part of the body, while the lower must be of a deep golden colour, are very rare and much coveted, and fetch a good price; birds of this colour are also called "Elb"-coloured by the people of Berlin.

(e.) The *greyish-green*, whose colour also varies, more or less, between yellow, green, and black, these certainly present the closest resemblance to their ancestors. There exist also canaries of a deep orange colour with a near approach to red; they form a branch of the English breed, which I shall describe further on.

Smooth-headed and *crested*—the common German canaries are further divided into smooth-headed and crested ones, and these are again sub-divided into "tufted," "crowned," and "*tollig*,"¹ "hooded" ones.

Manifold Under-Breeds.—If we consider that, among the coloured canaries, numerous different appellations are again given according to the different colours and marks, it will be admitted that a sufficient number of under-breeds will be forthcoming, the systematic classification of which is not without a certain importance to fanciers, and to which we now turn our attention. Under the head of

(a.) **SPECKLED** are classed:—All canaries which present different colours in irregular designs, and which, owing to the cross-breeding of different coloured birds, are, as a matter of course, most numerously represented, but which are rated as of the lowest value by the fancier of coloured birds, we distinguish: Yellow-speckled—of a fine bright yellow, but disfigured, here and there, by patches of green, grey, or brown; Pale-speckled—of lighter colours similarly marked; Dun-speckled—of a yellow or red-brown and marked in a similar manner; Tiger-speckled—which show

¹ "Tollig" is an idiomatic German expression, only *locally* known, and cannot be adequately translated.

smaller marks spreading, more or less regularly, over the whole body.

ONE-WINGS—whose right or left wing alone is coloured.

HALF-SWALLOWS—displaying, on one side only, the swallow-marks of which we will treat further on.

(b.) Plate (or Disk)-birds, which have a coloured mark on the head only (the more regular that mark is, and the more pure and full the colouring of the body, the higher is the value of the bird). When this plate, or disc, is very small, they are called small-warbler (original) (“*Muckchen*”). Otherwise, they are divided into grey, green, brown and black “plated” birds.

(c.) Grey, green, brown, and black *crested* birds, with a coloured crest or crown which, as well as the body, should be of as even a colour as possible; they, too, are highly prized, and the more symmetrically marked they are, the greater will be their value.

(d.) **Swallows.**—Birds of a dark colour, or such which are coloured only at the head and wings, being otherwise of a pure, yellow tint, are called swallows; we distinguish, according to the colour, grey, green, black, and “dun” swallows, and the more regular the marks, the dearer are the birds; the most prized are the “crowned” *dun* swallows, whose heads are ornamented by a small curly crown (“*Tolle*”) and whose wings are of a reddish yellow, while the remainder of the body must be a very pure, bright yellow. All swallows may be either smooth-headed or crested—those which have coloured wings, while the head and body are a pure yellow, are called wing-swallows.

Albinos—(or White).—We must further mention the “Albinos,” an unsightly error of nature, which fortunately does not frequently occur; these birds are a pure white, with red eyes. This variety (Albinismus) chiefly result, among various animals, from unfavourable conditions of

breeding, is well known to be a morbid one, and the Albinos are, to say the least of it, very delicate. Red eyes, however will sometimes be found even among uniformly-coloured dun swallows.

The Singing Bird, or "Hartz" Canary.—In shape and colour, the Harz-bird does not materially differ from the common canary, although it may be remarked that the former breed produces chiefly birds of a pale yellow, pale green, and a greyish-green colour.¹

According to their mode of singing, the Hartz-birds have been divided into three classes, as follows:—*a.* Nightingale-warblers (orig. "Schläger"), or *glucking*-birds, these, however, have not been taught in their youth by nightingales, and therefore they would more suitably bear the second of these appellations. The name of the bird depends as much upon the length and variety of the melodies, as upon the delicacy of the vocal organ and the beauty of the voice. The melodies must be prolonged in such measure that one can count at least till twelve, possibly till 25, and at the most till 30. Moreover, the songster must not break off his song before he has sung about from 3 to 6 melodies, but must "sing through," *i.e.*, he must perform his song quietly and without excitement, as it were, in a dispassionate manner; he must sing neither too much, nor too little.

In order to inform amateurs of the technical terms current among breeders and connoisseurs, for the indication

¹The question has often been raised, why bright yellow and bright green birds are not popular in the Hartz-breed; and upon this point a dealer has pronounced as follows:—(1) Because such birds are less efficient for breeding purposes; (2) because they do not easily learn to sing well; and, lastly, because it is not easy to distinguish their sex, and also, that they are but seldom regularly marked or speckled; there are both smooth-headed and crested ones among them.

of the separate melodies, I shall enumerate them as follows.—

Trill, “coarse” roll, “rattling” roll, “cracking” roll, “water” roll, “lispings” roll, “whizzing” roll, sharp “cackling” roll, “fine” cackling roll, or “hollow cackle,” also called “fine cackle,” “bass” roll, “hollow” roll (the straight, downward-bent and upward-bent “hollow” roll); the “bell” roll, the “gurgling” roll, “glucking” roll; whistles—“hollow” whistle, “bell” notes, or “nightingale” notes, “glucking” notes, or “gluckers,” “water” flute, “water” gluckers, “cackling” gluckers, “gurglers,” glucking-gurglers.¹

I have begun by enumerating the inferior turns first, and have then gradually mentioned the finer ones. The most splendid sound is produced by deep, long, downward-bent “gurgles;” such a masterly melody sounds like “woo, woo, woo,” or like “boo, boo, boo,” etc., and is much more beautiful than the “nightingale-gurgle.” This again has different degrees and shades, sometimes more soft and fine and sounding less full, but otherwise equally beautiful; when the double “gurgle” is given, the hearer seems to be listening to two different sounds at the same time, and these dissolve one into the other; it then produces a magnificent impression, but is not as delicate and lovely as the splendid single “gurgle.” According to my judgment, a faultless “gurgling-bird” with a deep, fine gurgle (or, better still, with two different gurgles), is the best songster among the “Hartz”-birds; others, however, give the preference to a fine hollow roller. Most of the breeds which dealers bring to us from the Hartz, have usually one or more defects, like “tse, tse,” or “tep-tep,” or “tsit, tsit,” “jap, jap,” etc.²

¹ The above technical, or rather *local*, terms, have been LITERALLY rendered, there being no precise equivalent for them.

² Hence it comes that very inferior birds are called “jappers” for short.

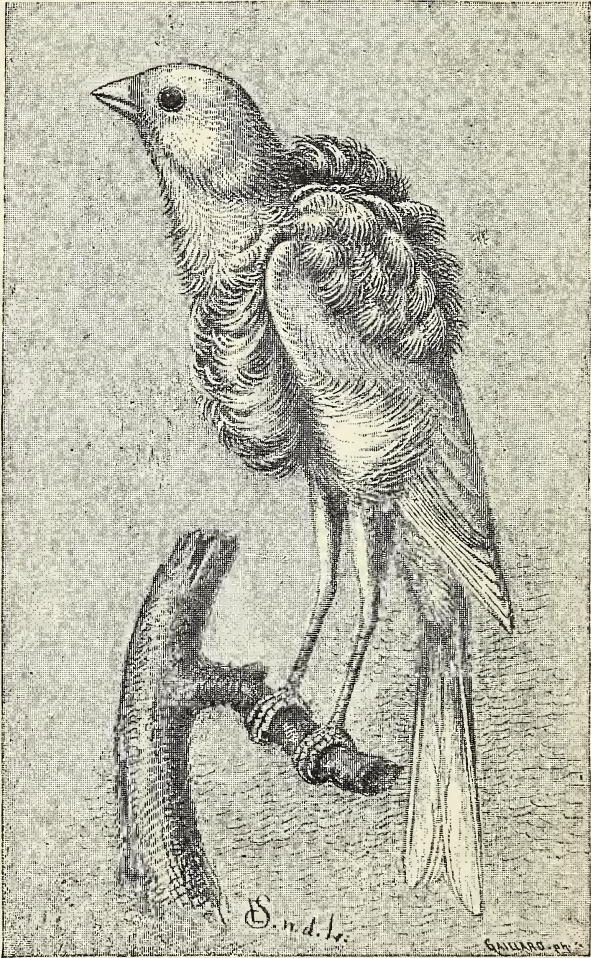
Such pitiful screechings must not be uttered by any "noble" bird, if it is to satisfy the pretensions of a real connoisseur. As regards delicacy of the voice and a noble tone, the most proficient "gurgling-bird" or a fine "hollow-rolling" canary, surpasses every other songster of the air.

Singing-models, whose principal roll is simply the "hollow"-roll, are less esteemed, because the young birds, if they do not succeed in producing the roll, or in articulating the *r* by which, precisely, the rolling is effected and characterised, will be prone to whistle, and thus form a "roll" which is fittingly called a "howling" roll. *The first requirement of a connoisseur concerning a good male bird will be: no disconnected, shrill notes, no sounds produced by the tongue, and no protracted goggings.* The inhabitants of Andreasberg used to say, in those times when their birds still occupied this proud eminence, "A good bird must do nothing but 'roll' or 'toot.'" *It is true that the "goggle" or "cackle" is partly produced by the tongue, but, precisely on this account, it is considered as the most insignificant among the "rolls,"* and must not altogether be used by the warbler in a preponderant fashion, but merely as a recreation. Hollow or soft "goggling," however, sounds already much better; the song, moreover, to be entirely pure and faultless, sounds like "wiss, wiss," or "wist, wist;" a soft whistle resembling the piping of a mouse, "ss, ss," not to mention the sound of "e," a shrill, high-pitched, hard whistle, sounding like "wee, wee," the so-called "bell" whistle (which in Hanover is called a "resting-flute"), or a "pointed" flute, "quee, quee," and a luring note, "dee, dee, dee," we must except as part of the song; they are attributes of even the most excellent breed; not one, not even the most expensive of the birds will be without one or other of these drawbacks. Therefore we designate birds which have contracted only *one* of the defects enumerated

in this selection, and which do not display it oftener than five or six times in the course of their song, as "faultless" or "prime" birds. We will even allow two of these dissonances, provided that they do not occur, separately, more than three or four times during the song of a bird belonging to a first-rate breed; to the listener they soon disappear with the harmony of the remainder of the song; warblers of this stamp, the fancier will call "pure" singers, but if, by chance, they degenerate and repeat these "discords" eight times or more, then they will naturally lose much of their value.

II. The Different Breeds.—To begin with, the Dutch breed is distinguished from the German canary in the following manner: nearly one third taller, more slender, and having longer legs, these canaries are distinguished particularly by lengthened, soft, and, as it were, "split" feathers in different parts of the body, and these furnish another proof of the great deviation from the natural state which may be accomplished by breeding.

The muscles of the legs are more flexible, so that the bird presents itself before us in a singularly erect posture, his back more or less curved, his shoulders drawn up, and with his head kept in a horizontal position; this singular bearing is, at the same time, a mark of thorough breeding. For obvious reasons the Dutch canaries are more delicate and sensitive, they are more frequently and more easily subject to illness, their nesting is less copious and reliable than that of the common German bird, and they have not, in the remotest degree, the power and beauty of song which is the attribute of the "Hartz" canary; nevertheless, they are, by many, much esteemed, and command a high price, (from 15s. to £3 15s. a pair) and the breeding may prove to be very lucrative. The record of this variety of canaries is hitherto unknown, certain it is, however, that such birds



THE PARIS TRUMPETER.

(In possession of J. Wegerth, Frankfort-on-Main.)

were first introduced into the trade by the Dutch, and have been universally propagated since about A.D. 1863; it is not known, however, whether they were first bred in Holland, or in some other country. The first of these canaries (3 males and 5 females) were brought from Strasburg to Berlin in March, 1848, by the major-domo, Mr. Meyer; he caused them to nest, and also crossed them with “Hartz” birds, but finding that they were of little use for breeding purposes, and that, moreover, they were not apt in acquiring good singing, he discarded them after a few years; indeed, in Germany, at the present date, but few of them are bred. The measurements of the Dutch canary are: length, 6 to 8 inches; breadth of wings, 10 to 12 inches; tail, $2\frac{1}{2}$ to $3\frac{3}{4}$ inches.

Under-breeds of Dutch Birds.—The Dutch birds are again subdivided in several classes. (1.) The Dutch *proper*, also called “Trumpeters,” these are tall, slender birds, having a “ruff” of lengthened feathers reaching from the throat, along the chest, down to the middle of the belly, and the bushier the ruff, the purer the breed; similarly, the feathers of the “mantle” are lengthened to such a degree, that they curl downwards over the upper part of the wings, hence they are called “epaulets;” it is from the latter mark, and not from their song, that the name *a*.—“Trumpeter” is derived.

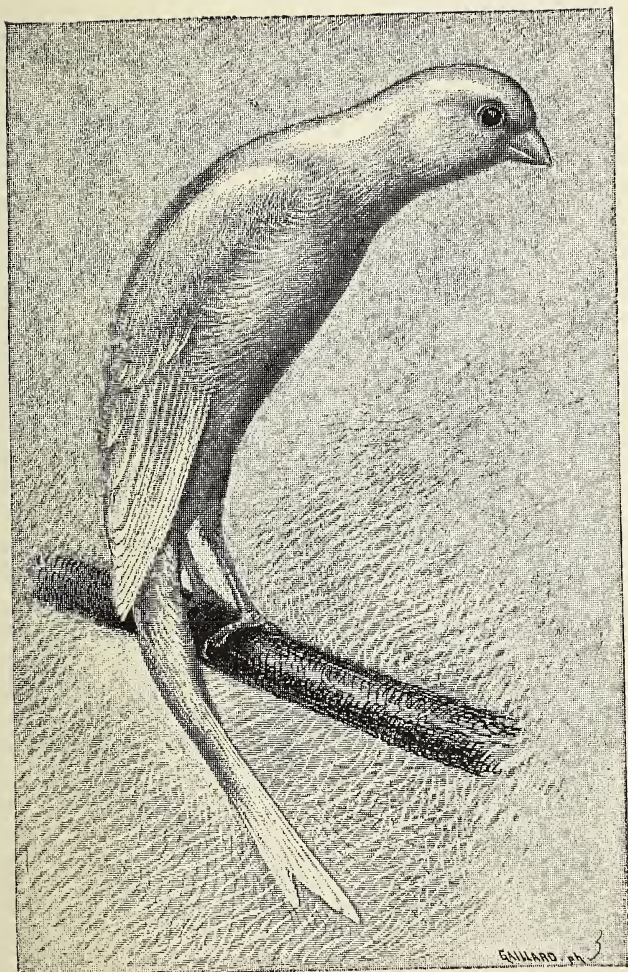
The tallest and most slender of these “trumpeters” are generally distinguished as *b*.—“Parisians,” and if one of them happens to be unusually shaggy, he will be called *c*.—Lord Mayor.

2. “Brabanters.”—They are somewhat smaller than the Dutch proper, the back is less curved, the “ruff” is imperfect, and the “epaulets” are entirely wanting; some fanciers consider them as a distinct breed, while others

judge them to be a cross-breed between tall Parisians and "Hartz"-birds.

3. **The Brussels Birds.**—These are more slender and more slightly built than the Dutch; their backs are exceedingly curved, and they have small and graceful heads; the plumage is smoother, the ruff is but slightly indicated, and here, too, the "epaulets" are wanting; the smaller and more delicate the bird, the more its back is curved (such are called "cats-backs" by fanciers), the more valuable it is. Among these three Dutch varieties, the "nesting" of those called Parisians is least to be relied upon, for they rarely succeed in bringing up more than a fourth part of their young; whilst the Brussels-birds are usually fortunate enough to raise about one-half, and the Dutch about three-fourths of their offspring, at least so it is asserted by most breeders of these birds. In breeding them, careful attention should be bestowed on the preservation of a pure breed, and upon procuring, from time to time, fresh male or female birds, in order to invigorate the breed, as, otherwise, the birds are apt to degenerate.

The Belgian Canary (*Serin Belge*, Postuur-Vogels, Groote Gentsche Vogels), is of a very ancient breed. For about a century there have existed in Ghent, Bruges, Brussels, Antwerp, and in other towns, associations which offer, annually, more or less considerable prizes at the various exhibitions. A good bird of this breed must be very long, his legs must be high, the head small, the neck long, the shoulders high, the neck and shoulders must form a horizontal line so as to impart to the bird a vulture-like air. On the other hand, the shoulders, the back, and the tail must be in a vertical line, so that the tail rests upon the pole upon which the bird stands, and yet it must not press upon the pole; a curved back is faulty; the chest must be strong, and from the latter down to the point of the tail,



THE BELGIAN CANARY-BIRD.

the body must gradually, but regularly, grow narrower, so that it actually forms a symmetrical wedge which should grow pointed in a downward direction. Of great importance, moreover, is a strong abdomen; the tail must be very long and narrow, and must not become broader at the lower part of the body; the legs ought to stand out in strong relief from the body, and ought to form a straight line; if the joint inclines towards the front instead of the back, this, which occurs very often, would not be a defect, provided that the bird does not abuse this posture; the whole plumage must be smooth; if a single feather were to curl backwards, this would be accounted a serious defect. The birds are divided into yellow and white ones. The former are always somewhat more slender, and their plumage fits closely everywhere; the latter are of coarser build, and their plumage is softer. At the exhibitions, prizes are awarded to them in two classes. There are, besides, speckled birds, which, however, are of inferior value. When breeding, yellow and white, or *vice versa*, are always paired. The finest of these birds are always very delicate and sensitive, the eggs are therefore usually taken from them, and given to commoner birds to hatch. Malines-canaries (Serins de Malines) are usually the foster-mothers. These latter birds are a variety which, in Germany, is kept chiefly for their song, and of which very dark specimens are often met with. The breeding of Belgian birds is very uncertain; expert fanciers who, for some twenty or thirty years, have had from forty to sixty pairs, do not, sometimes, breed twenty young in the course of two or three years; on the other hand, it will happen that a beginner will realise a small fortune by this breed. Faultless birds always find customers at very high prices; the mediocre birds will command about £2 10s. a pair, while the superior and the best sell at from £5 to £20. Most of the Belgian canaries which, at the great exhibitions in Eng-

land, were sold at surprisingly high prices, were bred in Germany. One should, however, beware of handling them. If it be desired to remove them from one cage into another, the latter is kept ready, and the birds are driven into it by means of a small rod. The breeding is generally effected in pairs, each couple being located in a separate cage. In his fourth year only, this bird is wont to develop its whole beauty. I greatly fear, however, that the Belgian breed, if new blood cannot be infused into it, will, sooner or later, totally degenerate, so that these fine and noble birds will, despite the incredibly high sums which are paid for them, become wholly extinct. We make no difference here between Brabant and Brussels in Belgium, the latter town being, in fact, the capital of the province of Brabant.

There is another breed that is erroneously called the **Dutch Canary**, but which is *not* known in Holland. At the exhibition at Gravenhage I found some sorry specimens of these, which passed there as "Serins Hollandais," but, for all that, the bird was nothing but the "Serin Frisé" (curly canary). It seems to be a new breed, which is improving yearly, and which seems to become more and more cultivated. Their home is in the province of Hainaut, and also the north of France, where, for some years, they have spread and increased wonderfully. The so-called Dutch canary is larger, sturdier, and coarser than the Belgian bird; it has very long legs, and the body should be as long as possible, and stretched out quite straight. It bears lengthened feathers, which curl when the bird is excited; these feathers, which extend from the back down on both sides, being called "rolls," or "shawl." The feathers of the "rolls" are divided in the middle, the curl to the right or left, and thus unite their points with those of the "jabot." Below the latter, a number of feathers again take a different direction, and clasp both wings (these are called "flan-

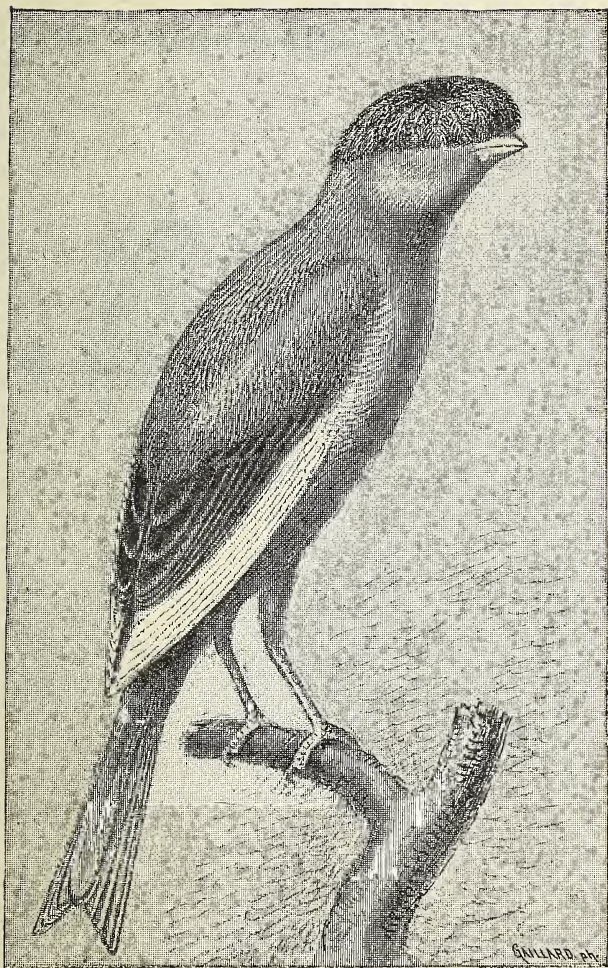
guards"); from the croup, too, some long feathers descend, hanging down from the tail between both legs. Those are called the "étendards" (standards). The so-named Dutch birds are classed as follows:—White, Yellow, and Dun-coloured; and White-yellow and Dun-speckled. The white ones are large, coarse, and densely plumed; the yellow appear to be longer, their feathers are more pointed and fit more closely; the dun-coloured are smaller, weaker, and also rarer. The voice of these birds is very different, for, while some of them will perform a long and melodious song, others, and precisely those which are handsomest and which display the distinctive marks of their breed in the most pronounced manner, utter only one coarse sound, to which they probably owe the name of "trumpeter."

For some years past, the most zealous breeders and fanciers have endeavoured to give their Dutch bird a better posture ("pose"), by crossing it with the Belgian breed. The Dutch birds are vivacious and jealous. However, many young may be bred if one male is placed with two females, and if it can be so arranged that the male is sometimes entirely removed; for when a female is steadily hatching, she will, on hearing the song of the male, in many cases abandon nest and eggs, and will hasten towards him.

English "Colour"-Canaries.—My readers have, hitherto, become acquainted with the Hartz-bird in its simple, outward appearance, which, however, is redeemed by its varied and delightful songs; and further, they have been introduced to the common German canary, whose song is of no value, but which is, not unfrequently, bred in very beautiful tints and designs; and finally, the more singularly formed Dutch canary has been fully treated on; accordingly we may now distinguish all canaries as:

1, Singing-birds; 2, Colour-birds; and 3, Posture-birds; to these has lately been added a group which, from its singu-

larity, may well excite our surprise. We see before us a bird which, over the whole body, is of a uniformly pure dark orange or a reddish-yellow, a colour which might be described as a sort of red, and which, when we contrast it with the bright-yellow bird of German breed, or, still more, with the whitish-yellow Hartz-bird, will strike us forcibly enough, especially when we are told that its colour is artificially produced by feeding the bird with red Cayenne-pepper. This opens an entirely new world for our breeding-process; fancy, with its magic wand, calls up birds which might be dyed, not only orange with Cayenne-pepper, but blue, with indigo, green, with other colouring matters, likewise dark red, black, and, in short, in every possible hue; but even if we adhere to existing realities only we shall find in them quite enough to marvel at. The English "colour" canaries were sent by Mr. A. F. Wiener, of London (1877), first to the exhibition in Berlin, and later, Messrs. Clark & Co., of London, sent them to a very grand exhibition held by the association "Ornis" (1879); on the first occasion 13 specimens were exhibited, and on the second, 60. These birds, too, are divided into several under-breeds, the principal of which is: The *Norwich*-bird—it resembles the Hartz-bird in shape, but its build is somewhat more strong and thick-set, and it is rather larger; the colour, though it may be varied in shade and design, will always be a rich yellow. The orange-red shade is, as mentioned before, obtained by feeding them with Cayenne-pepper. It is particularly to be observed that the colouring, that is, the yellow which spreads over the whole body, appears equally vivid on the lower part of the latter; the movements of the bird are vivacious, and the song is performed with a laudable zeal, but is hardly worth mentioning, at least when compared with the scientific musical warbling of the Hartz-bird. The price is, in general, from 30 to 40s. the pair, and 20 to 30s. for a



THE NORWICH CANARY-BIRD.

(Crested, uniformly marked, with dark umbel.)

single male, according to its beauty. The Norwich species, in its original form, before being fed with Cayenne-pepper, *i.e.*, the clear, yellow, natural Norwich, has been, for a long time, a great favourite in England. Its price is even somewhat higher than that of the redder-toned coloured one, and great care is bestowed upon its breeding; no matter whether they be uniformly yellow or marked in various shades, crested or not, it is always carried out according to the principles of "thorough"-breeding; and it is only when the breed has been kept pure through several generations, when the birds have, to use a technical term, "colour in the blood," that a valuable after-breed can be obtained; the same will be the case as regards the breeding of pepper-coloured birds.

The "Clear Yellow Norwich" bird is of a uniform dark orange colour, almost "postal" red, and its appearance is so singular that we can easily understand why the "fancy" has, in Germany, almost exclusively patronised it. The price is the same as stated before.

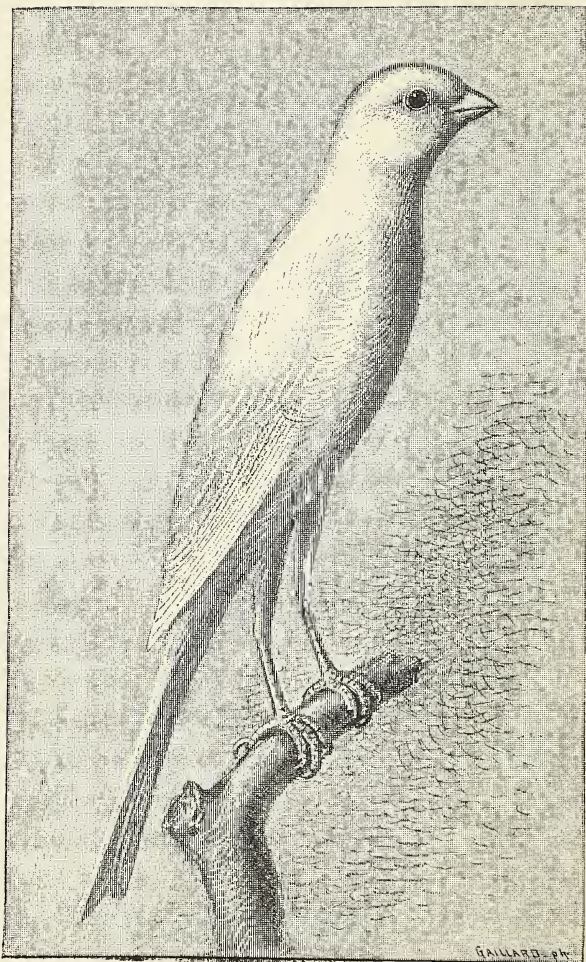
The "*Clear-buff* Norwich" resembles the former, only that the colour is perceptibly brighter, and that the plumage has a whitish reflex. This bird is also very pretty, but it is very little appreciated by German amateurs; the price is identical with the former. The "evenly-marked, buff Norwich" is of a clear orange colour, with perfectly even marks, a fine black-brown streak across, above and below the eye, extending from the nostril to the cheek, and a similar and very symmetrical marking of the wings; the great wing-feathers are of a pure white, delicately edged with yellow, while the middle and the small wings are a blackish brown. These, and similar, as it were, carefully marked birds naturally are met with in numerous varieties.

The "Crested Norwich" are no less frequently bred; these are partly dark or clear yellow, which is their natural

colour, and partly they have a dark or a clear crest, and are marked in every conceivable manner ; thus we have a number of steadily-bred and very popular birds. The "Variegated Crested" is of a clear colour, with a splendid dark crest, a grey neck and mantle, the two latter being united by a broad, clear, cross-streak ; it is marked darkly and in swallow-fashion ; the wings are of the same colours, and between these and the "mantle" there is again a broad, clear band, becoming pointed towards the neck ; the cheek and the whole lower side are of an even, reddish-yellow colour. Another bird, "Variegated Crested Yellow," has a dark crest and neck ; the whole back is of a pepper-reddish yellow. The great feather wings, or fans, are a pure white, the middle and the small ones are black ; the face, the throat, and the front part of the neck are reddish-yellow ; the upper breast, as far down as the belly, is marked with a brownish-black, "flame"-like illustration, and the lower part of the body is again speckled with a reddish-yellow.

I could describe similar birds in manifold varieties, but those mentioned will suffice since they afford us a complete insight into the Norwich breed. The price of the "Crested Norwich" is somewhat higher and amounts to about 30s. to 50s. a pair. The crest, however, must be large and perfectly even. It descends almost over the eye, and must be deeply curled in the middle, and without, however, showing a bald spot. Its colour is either bright or dark yellow similar to that of the bird. If of a mixed grey and yellow it is less valuable, but if a deep grey or almost black it is most highly prized.

The Yorkshire Breed is distinguished from all the rest by a long, slender body, and, in this respect, somewhat resembles the small Belgian canary, nor is its size much larger than that of the last-named bird ; but there must not be, on the whole body, any curled feathers, and, consequently, both



THE PURE YELLOW YORKSHIRE CANARY-BIRD.

the "jabot" and the "epaulets" must be wanting. It is in general a gentle, soft-voiced little bird. I need not describe the varieties of colouring, for they resemble those of the Norwich breed, both in their natural colours and in the pepper-coloured variety, with all their variegated marks, both smooth-headed and crested.

The clear yellow, the clear buff, and the green Yorkshire are particular favourites; the last-named should be an even more or less dark green all over the body, with a blackish streak on the forehead, the eyebrows, the "beard," and the neck. The "mantle" and the back should have narrow shaft-shaped streaks. The "fans" and the tail feathers should be of a deep black with a broad green outer edge. The prices for birds of these breeds vary greatly, (from 15s. to 30s. per head).

The **London-breed**, or, as it is called, the "London Fancy," is very small and delicate, considerably below the size of the Hartz-bird, and is likewise met with in the most varied shades of colour, from a whitish, to a bright yellow, as well as in the pepper-coloured shade; the marking which finds most favour is that known as "swallow," the colour of this mark should be black, or at least a very dark brown; sometimes the uppermost wing, or "fan," is a clear white, producing a pleasing effect; the great wing-covers, as well as the shoulders, are a deep yellow like the shoulders; the small wing-covers are black or brown, but are covered by the yellow in such a manner as to show, quite symmetrically, the "swallow" design; the dark streak at the eyebrows and eyes is totally wanting; unfortunately, however, the fine swallow mark soon bleaches into a light, musty shade, or it becomes mixed with white and grey, that is, speckled. It may be said that, as a rule, such a bird will conserve its whole beauty for about two years at the utmost, and often not so long, but although it may, at the end of that time,

have lost its market-value, about from 50 to 80s., or more, it still remains valuable to the breeder, for it remains available for the acquisition of an irreproachable after-breed. Such a bird can, however, be obtained only by the most careful "thorough" breeding.

The "**Cinnamon**" Canary is distinguished by the deep cinnamon-brown tone of the "canary" yellow; they can scarcely be recognized as a unified breed, for they present themselves in all the various shades of colour which have been mentioned already; the "buff" cinnamon shows the pure, deep, "dun" brown, while the "jonque" cinnamon has no reddish tone in its colouring; it is a pleasing peculiarity of these birds that their whole plumage is of an absolutely even colour; they, too, are capable of displaying all the various marks which have been described, from the streak across the eye, down to the full "swallow" mark, smooth-headed or crested; and they too have, of late, been bred with the pepper-coloured shade. An irreproachable "cinnamon," no matter what his markings be, must, however, always be of an ovenly brown shade; were the bird ever so handsome, it would not obtain a prize at a London exhibition, if the crest, or any other mark, were either black or greenish-grey. The price is 30 to 40s. per pair, or 25 to 35s. for a single, good bird.

The most interesting of all English colour-birds is the "Lizard," whose distinctive mark is, in the first instance, a large, clear-yellow spot on the head; this reaches from the upper part of the beak and the nostrils, above the eye, to the back of the head; the cheeks, the throat, neck and upper breast are, more or less, clear yellow; but the rest of the body, principally the "mantle" and the sides of the breast and belly, are striped, or, more correctly, "scaled" in lizard fashion; every feather is black, or at least dark brown, but broadly edged with white, as are also the great "fans"



THE LIZARD STRIPED CANARY-BIRD.

and the tail-feathers; the lower body, and the upper and lower tail covers are whitish-green, merging into a brownish yellow in the whole shading of the body. Such a "Lizard" canary presents a dainty appearance, and, in my opinion, it is precisely when brought face to face with such a specimen that the expert in colour-breeding celebrates his greatest triumph. It requires extraordinary perseverance to obtain fine, evenly-marked "Lizard" canaries by means of "thorough" breeding. We distinguished the "Golden-spangled Lizard," in a fine, dark-yellow shade, and the "Silver-spangled Lizard," whose plumage has a *ground-tone* of whitish yellow; the prices generally are, 30s. per head, and 50s. per pair.

The "**Manchester Cobby**," when in a state of the highest development, is about double the size of a "Hartz" male; it reaches a length of 8 inches, and exists only in a clear or dark yellow colour, the wings and the points of the tail being of a pure white; it is either smooth-headed or crested, but its crest is not nearly as large or descending as far over the eyes, as is the case with the Norwich birds; in fact, it extends over the forehead and the pericranium only, leaving the back part of the head entirely free; as a matter of course, it should be even and neat. The body is slender and stretched, the legs are long, and the tail is likewise of surprising length; the whole plumage lies rather smoothly, and none of the feathers are curled. According to the views of English fanciers, a perfect "Manchester Cobby" has a value entirely out of proportion to that of all other canaries; the bird sent to the exhibition by Mr. Wiener, which, it is true, had already gained prizes at nine exhibitions, was noted at £10 12s.; the others varied between £3 15s. to £4 for the male, and from 30s. to 45s. for the female bird. This is the description of the most prominent English canaries; it is true that there are various other breeds.

We might mention the birds which are designated as Mealy; in appearance they look like dusted and bleached Buffs of the various kinds already described.

Colour-Breeding.—The *modus operandi* of English is as follows:—When the moulting-season approaches, that is, at the age of six or eight weeks, the young birds, upon whose breeding and pedigree the greatest care has been bestowed, are isolated in a similar manner as the young Hartz singing-birds are in Germany; each one is placed in a separate cage, and twenty or thirty, or more of these, put in a row, form a sort of frame; as a rule each cage is laquered black, and ornamented with gold ridges; these young birds, the same as those of the Hartz species, are covered up, but not as in Germany, with linen or light stuffs, but with heavy and costly coverings, so as to keep the daylight off; the pepper food is prepared in the following manner:—A teaspoonful of the best, fresh, red, cayenne-pepper, carefully pulverised, is mixed with a hard-boiled, grated egg, and a corresponding quantity of sweet biscuit, the latter must be slightly moistened, and the pepper will be carefully mixed with it, and, finally, the grated egg is added, so that a crummy, but not heavy mixture, be the result.

The inhaling of the sharp pepper should be carefully avoided, as otherwise, serious consequences might ensue. German breeders mostly use bread, prepared with eggs, instead of biscuit; of this mixture, which the birds swallow without reluctance, a little will have to be given at first, then more, and finally as much as ever they like to eat, while, at the same time, the bodily nourishment is withheld as much as possible. They must also be kept thoroughly clean, must be prevented from soiling or injuring their feathers, and should be carefully shielded from the rays of the sun; for they are very sensitive to variations of temperature and are altogether very delicate. Not all

young birds, however, take the red colour in an equal measure. It is, on the contrary, necessary that the colouring matter should already, as breeders express it, "lie in the blood." In England, all sorts of artifices are, moreover, employed, all seeds are occasionally withheld, and they are fed on the pepper mixture only; they are also somehow sewn up in cotton. Taken as a whole, the English colour-canaries find little favour on the Continent; it is only the Norwich bird, of a pure, dark pepper-red, that has attained to a certain degree of popularity. At all events it may be considered as very interesting, the production of really handsome colour-canaries, for handsome they undoubtedly are.

Demand and Supply.--It is well known, that, in Germany, canaries are bred in exceedingly large numbers for the London market, and also, that considerable and ever increasing quantities of them are already being exported to other foreign countries. Although it is difficult to state fixed numbers without a reliable authority, yet we will not be far from the truth in asserting that, in the whole of Germany, from 450,000 to 600,000 canaries are being annually bred at the present time; 50,000 of these are said to come from the province of Hanover alone,¹ and, naturally, a great many more from the Hartz; next comes Thuringia, then follow different other parts of Germany, as, for instance, the city of Berlin, further, Belgium and Switzerland rank more or less high in the production of canaries.

The greatest exporter is in Germany the wholesale-dealer, C. Reiche of Alfeld, near Hanover, whose mode of doing business is described in the appendix; besides a few other wholesale dealers, who likewise export to North and South America, England and Russia, as well as to other

St. Andreasberg, alone, breeds and exports 40,000 to 50,000 males.

countries, there are also many second-hand dealers, who, annually, buy up a more or less considerable number of canaries and retail them to trade fanciers far and wide all over Europe. The extraordinary extent to which, within the last decade, the fancy for canaries, as well as the breeding of, and the trade in them, has developed is astonishing.

When we consider that the birds bred in Germany find a rapid sale, and that the supply is always quickly exhausted, we are justified in supposing that a far greater quantity would also be bought up at the same prices.

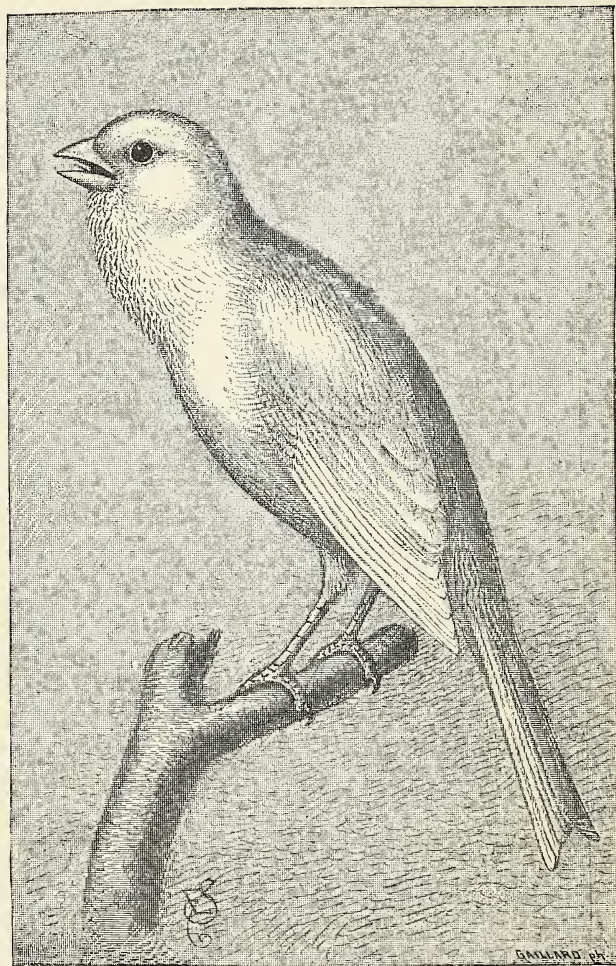
And in order to still increase the profits drawn from this source, and from the breeding of other domestic birds,¹ I endeavoured to summarize, in a short and comprehensive manner, all the experiences gained and promulgated up to our time.

Purchase.—As regards the common canary, there is little to be said in that respect. It is found everywhere, and its song more or less shrill, leaves little to be said. It is different as regards carefully-bred colour-birds; the fancy for them is not as yet very widely spread, and the finest and most valuable birds are always difficult to obtain; still they are very much sought after. Regarding Dutch canaries in all their varieties, let the reader consult the description given on page 27.

Good sources to breeds for the acquisition of birds are: Mr. L. van der Snickt in Brussels, Jean Delacroix in Roubaix, and Donny-Sapin in Bruges. English canaries are obtained mostly from the London fanciers' shops, and from the wholesale dealers — C. Jamrack or S. Abrahams.

¹ Proper instructions for the latter will be found in Dean & Sons Practical Handbook, by Sabin.





THE HARTZ CANARY-BIRD (OR GERMAN WHISTLER).

The purchase of Hartz-birds requires a detailed comment, and we will therefore review it in all its aspects.

When wholesale-dealers buy, they usually send their agents to the towns of the Hartz, especially to St. Andreasberg, Duderstadt, Worbis, Rossla, and to the adjacent hamlets, and dealers at second-hand are in the habit of annually resorting there; as a rule the birds are already sold by previous arrangement, and noted dealers acquire their birds from the same more or less proficient breeders.

It is customary in the Hartz that the winged merchandise is already bargained for, and partly prepaid, in the spring even before it exists, and is then fetched away towards October or at the beginning of that month, for at that time all young birds are being bought up, whether they are of any use or not. Under such circumstances the breed cannot but suffer; the causes for this I shall explain.

Formerly the dealers used to come three times a year, that is, first towards the middle of November (Michaelmas), then a second time in December (Christmas), and finally in February, for the selection and the fetching away of the birds. The young cockerels are mostly "heard" (their voices critically examined) on the spot, and this is the reason why the dealers always put in an appearance personally for the removal of the birds; again, for other purchasers, dealers, and amateurs, the business of "hearing" the birds is done by persons who practise it as a means of livelihood, and are called "out-stickers" (original *Ausstecker*). These men undertake, at the same time, the "sorting" of the young birds, *i.e.*, the selection and distinction of them according to their sex, colour, and value in general. (The reader is requested to read the chapters "Hearing" and "Recognition of the Sexes.") From an inspection of the

abdomen, they also ascertain the mode of feeding which has been practised up to that time, at least they can draw general conclusions in that respect. Summer rape-seed and egg-food produce yellow flesh (fat), but "roll" and canary-seed will, on the contrary, give white flesh—and it is important to know this, since it is absolutely necessary to be informed of the kind of food which has been habitually given to birds which a dealer intends to buy.

Great caution must be exercised in the case of *Schimmel*-birds;¹ these birds have a great deal of white on the "vertex" (top of the head), breast, and back, because the points of the feathers lack the peculiar yellow tint which is proper to the male; the ring around the throat, too, especially at the upper throat, appears like that of a female; in fact the male is to be recognized only from the vividly yellow colouring of the forehead. As a contrast to the "Schimmel" birds, all other cocks, both young and old, display a very vivid and even yellow colour over the whole of the head even if the rest be very pale; a whitish-grey spot on the top, be it ever so small, with these birds is indicative of the female sex.

A "selector" (orig. *Ausstecker*) gets a remuneration of 6s. to 7s. 6d. per diem. One of the most renowned was the recently deceased L. Seifert of St. Andreasberg, who was also the owner of a good breed of canaries.

All sudden transitions in the feeding as well as in tending should be carefully avoided, in fact the whole treatment of so delicate a creature as the Hartz-bird unfortunately is should be particularly attended to.

Those who live near St. Andreasberg, says Böcker, and who do not grudge the trouble and expense of the journey,

¹ *Schimmel* (white horse) cannot be otherwise translated.

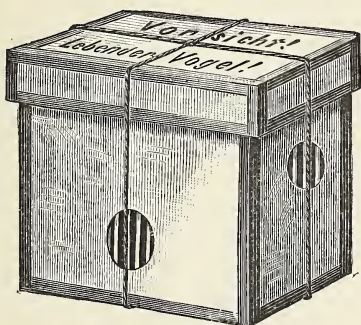
can, by going there in the beginning of October, that is, before the dealers have fetched the birds away, obtain single good songsters at reasonable prices, provided that they be efficient connoisseurs ; but, if such is not the case, they run the risk, even in the best establishments, of bringing home very mediocre birds, for such are to be found even there, chiefly owing, in my opinion, to the protracted sitting in fledging-cages. Not every bird can endure so lively a company ; the disturbance is too great, and the inducement to imitate one or even several defects of another songster, is greater still ; were each bird seated in a small separate cage, a degenerate songster could be more easily detected, and removed in time. A written order will also procure birds from some breeders ; the prices charged by the latter for good birds are sometimes anything but low.

The prices of the young canaries vary, in the autumn, according to the district, and also to the fact whether the birds are bought singly or in great numbers. They fluctuate from 1s. to 3s. per head ; birds of finer breeds will fetch from 6s to 10s. each ; females cost only from 6d. to 1s. ; but in the winter, when the dealers have taken the birds away, the prices rise from 3s to 4s. for an ordinary male, and 1s. 6d. to 2s. for a female bird. Males of the finer breeds, especially of the best Hartz birds, as well as the handsomest, evenly marked colour-birds, will then fetch from £1 10s. ; and in special cases as much as £2 5s. to £3 15s., even £4 and more. Scarcely 10 years ago, fairly good birds could be obtained at the Hartz for 10s. to 15s., and the very best for £2, *i.e.*, or, at the utmost, for £4 a piece. Dutch birds are mostly sold in pairs, according to their quality, for 15s. to 30s. the couple. The prices of the English colour-canaries are indicated elsewhere, where they are also described.

The sending of individual songsters is now effected in a

better manner than was formerly the case ; but it is notorious that the sending of the canaries purchased, often in many hundreds, is, even now, carried out in the same manner as in olden time when the Hartz birds were carried about by hawkers. In Germany single valuable songsters are sent by post on many days' journey, in the same way as is done with all foreign birds, in transport cages more or less practically constructed. Such a cage has wire railings on the front side only, here the drinking-vessel is fastened, while the seeds are often simply strewed on the bottom, or, which is better, put into a receptacle placed there for that purpose ; before the wire railings, a covering of dense linen is nailed fast, into which a proportionate aperture is cut, to enable the bird to see while eating and drinking. In the winter, if the weather be mild, birds may be transported without risk up to Christmas, and again in the middle or at the end of February. A linen covering will be sewn around the whole cage ; straw is put between the linen and the wires, and a piece of window-glass is fastened over the peep-hole. In constructing transport-cages care should, above all, be taken—particularly when the journey is long and the transport occupies several days—that no water can escape or be thrown out of the drinking-vessel which would cause the bird to sit in the wet, and thus endanger its life. Specially constructed drinking-vessels have, for this reason, been introduced. The Post Office Secretary has, in the "German Postal Guide," issued instructions for transport, from which we quote the following :—"A small cage made of wooden chips (that is, the Hartz-cage), as a rule 5 inches long and 6 inches high, receives the bird, after having provided food and water, which are put in the vessels arranged for that purpose in the interior of the cage ; usually only one bird is transported in each cage and case. The food consists of the so-called "scft food," *i.e.*, grated roll which

is abundantly moistened and then pressed into the receptacle; the water being retained in the vessels by means of well-cleaned sponges.



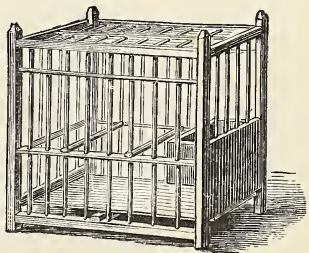
TRANSPORT CAGE.

Canaries bred in Germany are invariably accustomed to these cages, and will, therefore, even in a subdued light, easily discover the feeding and drinking vessels; the cage, thus furnished and containing the bird, will then be placed into a case made of paste-board, closely fitting and square, on the bottom of which an additional and sufficient quantity of summer-rape-seed is strewn; these cases are made of strong material, and all the corners are pasted over with linen. They have two little windows, the first at the long side, about $\frac{1}{4}$ inch from the ground, the second at an equal height above the drinking-pot. The first is to facilitate the discovery of the food, the second the finding of the water. For the construction of these windows apertures of about the size of a florin are cut into the card-board, and a piece of glass is inserted and pasted over them. In order to make the glass firmly adhere (a sliding down of the latter would

cause a draught injurious to the bird), some gypsum-chalk is mixed with the glue, whereby very good results have been obtained. The superficies of the cover is generally provided with a printed sheet, having in the four corners drawings of birds, and bearing the inscription thereon "Living bird," in large letters and repeated several times. When the weather is very cold, some soft after-math or hay is, in addition, placed between the cage and the inner walling of the case. In such packing, already well-known to the German Post Office officials, and sure therefore of their care and consideration (stringent injunctions having been issued to that effect), the birds traverse considerable distances, the journey often occupying three to four days, without a renewal of the food or water. Even in direct communication with England, and therefore across the sea, the most favourable results have been obtained. Instead of the card-board cases, wooden ones have now and then been used, but the post offices have persistently discouraged the practice; wooden cases necessitate, from the very beginning—that is, at time of packing—an arrangement which is injurious, because terrifying to the bird. We allude to the hammering in of the nails, in fastening the cover. Again, it *is not* easy to mark them sufficiently, so as to prevent a hasty treatment by throwing, or setting them on end; they do not concentrate the heat as well as the paste-board cases do; and in a concussion, possibly occasioned by shunting, etc., they are not as elastic, nor are they apt to deaden the blow as well as the card-board. It is also not advisable to employ wooden boxes one side of which is open, and railed in with wire, because the above-mentioned drawbacks partly apply to them also, and because the inevitable draught would greatly endanger the birds. They do not, moreover, prevent the introduction of unsuitable food which, through mistaken pity, is given to the bird on the road. Great importance is

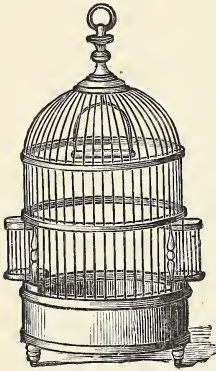
attached to this latter circumstance by careful breeders, who therefore specially fasten slips of paper to the transport-cases, warning the public against giving the birds any unnecessary or unsuitable food. Merely surrounding the cases with paper, is absolutely useless and objectionable, such packing being not sufficiently durable, conspicuous, or free from draughts ; and rendering it difficult to declare the value of the package. Card-board cases manufactured out of the best materials, by bookbinders, in Germany, cost, in the smaller form, for one bird $3\frac{1}{2}$ d., for two birds 6d., for three about $7\frac{1}{2}$ d., for four birds 1s., and for twelve 1s. 6d. The expenses incurred by this mode of packing are therefore extremely moderate. During transport the recipient is to feed the birds with summer rape-seed ; the males to be fed, besides this, with egg-food, consisting of one third egg and two thirds stale, grated wheat-bread ; the two ingredients to be well mixed. As soon as the males have become accustomed to vessels for feeding and drinking, they must be kept in a subdued light, for the purpose of improving their song ; no females must be kept in the same room with the males.

Dwellings.—Nothing is so important for the well-being of each bird as its dwelling and the inner arrangements of the same ; although, if we consider that, in the shops of bird-sellers, young canaries may be kept well and healthy in the very small Hartz-cages (in which they are also transported, often hundreds of miles), we marvel at the pliant nature of these birds. Yet, a true friend of nature will not allow unfavourable conditions to develop into a system, but



HARTZ-CAGE.

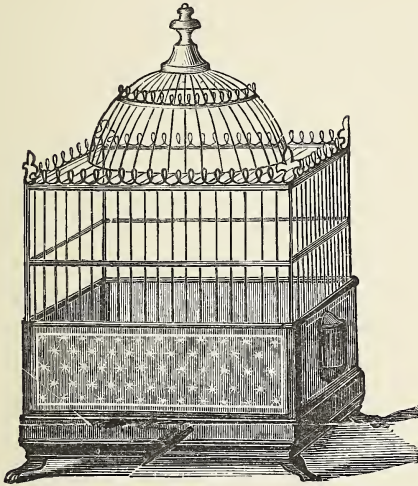
will, on the contrary, endeavour to arrange the dwellings of his pets as comfortably as may be feasible. First of all, the cage should be as roomy as possible, while the shape is not of any material consequence; only that round or "tower" cages should be carefully avoided, because, in them, all birds are uncomfortable, and many of them even become giddy and dazed; moreover, these cages are not easily hung up everywhere, especially against walls, so that the song of the bird is heard in the immediate proximity, and this is often unpleasant, and, sometimes in the case of the common canary, positively unbearable. The cage for the single canary should be from 12 to 20 in. high, 12 to 20 in. long, and from 8 to 11 in.



TOWER CAGE.

deep; but the size may be somewhat smaller or larger. Cages wherein everything, except the sitting-poles, are of metal, being the most appropriate, but one should utterly avoid the handsome-looking brass cages, because moisture which the bird spills while drinking or bathing, may easily produce verdigris and thus cause poisoning. Small, prettily lacquered cages of zinc, or composed entirely of tin wire, are best. The thinner the wire is, the plating should be the more closely worked, for on no account should the bird be able to put his head through. The platwork had best be round or loop-shaped, of a width of $\frac{1}{4}$ inch, although a handsome stave-railing will look better. The sitting-poles should be made of a wood which is not too hard; the pole should also be neither too thin, nor too smoothly rounded. Linden or hazel-wood will be most suitable, and it should be of a thickness of about $\frac{1}{2}$ inch, so that the bird's foot can only

just clasp it ; and I consider it advisable that a thinner pole should be placed above, and two thicker ones below, facing



CAGE FOR SINGLE BIRD.

each other, or *vice versa*. The door should close in a downward direction ; the drawer should always be made of metal, and had best be closed by a descending lid, so that, while being cleansed or fed, the bird cannot escape. The feeding and drinking-vessels will be best placed in revolving projectures from which the food cannot be strewed about. In order to avoid the room getting dirty, a small bath-room has been constructed, which is temporarily fixed to the cage, and the drinking-vessel is so arranged that the bird is unable to use it for a bath. The varnish should consist of harmless lacquers, which must dry in so thor-



DRINKING
VESSEL.

oughly that the bird cannot peck any off. The colour is, of course, a matter of choice, but a dark colour will be preferable, because the bird will stand out in better relief from it. The most beautiful and most to be recommended are the cages which have on each side above the drawer a pane of ground glass about a hand high. As for the rest, the arrangements of such cages are pretty universally known.

Aviaries.—The greatest number of canaries are bred in aviaries, or, which is the same thing, in large cages which often contain up to 150 heads, and can be located within the dwelling-rooms. Very few birds are bred in small cages. According to the size of such an aviary, three, five, or more males are placed together with five or six females for each male; in no case two males only should be put into a cage, because they usually quarrel, and wage a continuous war with one another, so that the hatching is frustrated, while a third male always separates the combatants. It is therefore deemed necessary to have the males always in odd numbers, but the same end will be served by having more than two males. Whatever be the name given to such an apartment, it is materially always the same thing, and experienced breeders are of opinion that a really profitable breed can best be obtained in aviaries and not in small cages, although favourable results are occasionally obtained in the latter. Böcker, touching upon this subject, says the detached hatching cage has that advantage over the aviary, that the individual bird can be more easily watched and removed, if unfit for breeding; but, on the other hand, it has some drawbacks, as, for instance, only one or two females can, in the former, be allotted to each male, while, in the latter, the number of females can be increased to three or four, then the feeding consumes more time and the breeding is more restrained. The young birds bred in an aviary, generally

prosper, for they get stronger, and become the more proficient singers, the longer they can move in a vast space. Even such young as had been caught, at an early stage, from out of the aviary, and had been transferred to a separate cage, were, although treated in every respect like the hatch-birds of the first brood, left far behind as regards singing by those of the second and third brood, and, without exception, they became but mediocre singers; while some of their brethren, who had been born later, surpassed their tutors. I have always arranged a separate breeding-cage for one female and one male only; where there are two females, the cock will sing much less and will often forget his finest melodies, and the breed was, as a rule, not much more fruitful than was the case with a single pair. This applies also to observations which I have made in the case of other breeders.

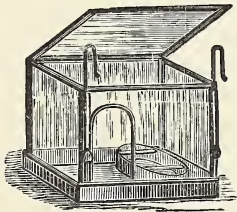
As regards the aviaries, the space of the enclosure should be in proportion to the number of birds located in it; the more roomy the space which can be allotted to them, the less will they be disturbed, and the better will they breed. If possible, the aviary should be situated towards the morning-sun; the noon-tide, or evening sun, being less favourable; and in a room situated in the direction of midnight, the birds will seldom prosper. In damp and cold rooms, and in such as are deprived of sunshine, diarrhœa, abdominal inflammation and other diseases will declare themselves much more frequently and with greater virulence. Bars before the windows facilitate the free passage of fresh air; on cold days the windows should be closed in the evening so that the half-fledged young may not perish during cold nights, as is frequently the case in the month of May.

Prevention of Escape and of Draughts.—It is very practical where small aviaries are concerned, and almost in-

dispensable when the cages are strongly stocked, to place a curtain of a suitable stuff, but not a net before the door, completely covering the latter, so that, upon entering the room, no bird can escape. This arrangement will also prevent, or at least mitigate, the draught, which is always dangerous.

Interior appointments.—The room should be lavishly provided with flying-poles, trees, and with dense bushes. The ground, at the sides below the bushes, should be strewn round about with dry foliage and moss, and in the middle, where the drinking and bathing-vessel stands, the ground thickly covered with sand.

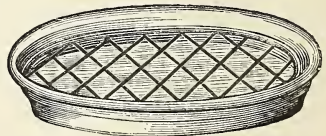
The **bathing-trough** must be flat and roomy, and must



SQUARE BATH.

in no case be too deep, lest some awkward young bird be drowned in it; a large bottom made of zinc, or some similar material, should always be placed beneath it so as to prevent the ground from absorbing the water spilled while bathing, as otherwise a disagreeable smell, and unhealthy effluvia, would be the consequence. If it is only intended for a drinking-vessel and not for a bath, a trellis of strong iron-wire upon three feet is to be placed in the trough.

in no case be too deep, lest some awkward young bird be drowned in it; a large bottom made of zinc, or some similar material, should always be placed beneath it so as to prevent the ground from absorbing the water spilled while bathing, as otherwise a disagreeable



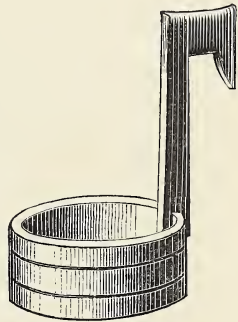
FLAT BATH.

All feeding and drinking-vessels should be of china or glass. In the large breeding-establishments in the Hartz, these vessels are large earthen pots of 4 to 5 inches in diameter, which are generally provided with a perforated lid to protect them against any filth that might fall in, so that the birds cannot bathe at all times, but only about mid-day,

when the warmth is insufficient, and the lids are removed for that purpose; then, a thorough wetting of the plumage will have no injurious consequences even for a hatching female.

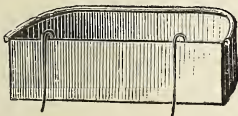
The drinking-pots used in the Hartz cost about 6d. apiece, and the feeding-vessels in use in that locality are made of wood, and are in size 12 to 18 inches long, 2 inches deep, and 2 to 2½ wide.

As a useful feeding-vessel of wood, may be considered the well-known piece of household furniture as shown in cut, especially for a large hatching-case. The holes in the bottom must be filled with cement, which, of course, must be quite dry before the vessel is used. Plain tin feeding and drinking vessels are to be seen at the dealers in various shapes, and may be hung up conveniently anywhere.



WOODEN FEEDER.

All feeding-pots are only half-filled with seeds, and owing to this very little food is lost; such seeds as are split, nevertheless, are either gathered by the weaker birds which have been driven away from above, or they are given to the females, or carefully collected, washed, dried, and crushed to make oil of. All soft food is naturally given in china

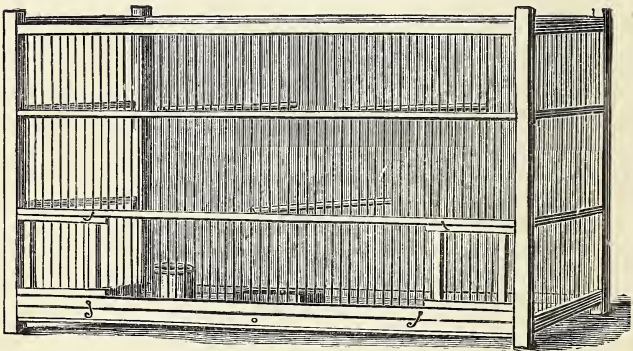


vessels. Where there are no mice, it will be well to heap up loose boughs, to at least half the height of the room. Into this, all young and feeble birds will climb, whilst, if remaining seated on the floor, in a temperature of, at least, 1-2 degrees

less, they easily catch cold in the abdomen. According to

Böcker, it will be well to take the young birds which have remained alone in the nests, out of them, and to place them there where the others sit closely pressed together and mutually warming each other; the sitting-poles (page 58) must be placed throughout the space in gradual elevation, so that the birds cannot sally one another. The nests are generally put into small Hartz-cages which are fastened plentifully to the walls at a distance of, at least, 12 inches from each other, not concealed in the bushes, and yet not fixed in places where there is too much light, in such a manner that the birds cannot pull them down. It will be found, moreover, that all canaries will, from preference, choose the highest nests, and it will therefore be advisable to place all nests at the greatest possible elevation.

The cages for Dutch canaries, which during breeding are



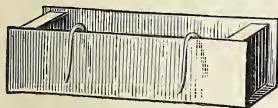
BREEDING CAGES.

very quiet and often very weakly, and are usually bred in separate cages, need only be of a simple quadrangular shape with a gently vaulted roof, and with the same appointments as those used for single songsters, only they should be double the size of the former. Better still, for the purpose of

breeding these species of canaries, as well as for all colour-birds and bastards, are the so-called "box" cages which are already being pretty generally introduced, and in which some breeders have achieved extraordinary success. A cage of this kind consists of a box made of very light wood, and it has, at least, twice the circumference of the cage allotted to a single bird, and is railed in on one side only, while the three side-walls, as well as the roof and the floor, are constructed of boards. The drawer of zinc must, as in the former cases, be easy to open and to shut, and must have a flap descending over it; the feeding and drinking-vessels are simply placed on the bottom of the drawer. The whole interior space is thickly coated with white, resp. black, lacquer, and the outside is varnished according to fancy, but generally green; the nests are fastened against the back and at each of the sides; and there is an easy slide or a descending flap suffi-



HARTZ DRINK-
ING VESSEL.



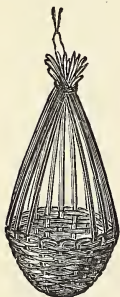
DRINKING VESSEL.

ciently large to make the nests easy of access and observation. The box-cage therefore resembles, in all essentials, the ordinary breeding-cage, only

with the exception that it is closed on three sides.

Arrangements for Nesting.—The nests themselves consist in small, but not too small, wooden baskets of the well-known size (as in the cut), loosely lined, inside, with soft tissue paper, among which a pretty large quantity of insect-powder is thrown, and the whole is then sewn over with linen. These basket-nests, which are from $3\frac{1}{2}$ to 4 inches in diameter, and about $2\frac{1}{2}$ inches deep, are more to be recommended than the somewhat cheaper straw or paste-nest, because they are more durable and more easily cleaned than the latter. They are also more practical than

the elaborate nests sold by dealers, and consisting in a hollowed-out block of wood, the nesting-mould of which is pasted over with a fine, thinly-haired skin, and surrounded



BASKET
NEST

by a sheltering ridge. These nests are altogether too elaborate, and disturb the bird in its natural functions. I have also seen small flower-pots fastened in the cages used by Hartz breeders, which served as a substitute for the more usual basket, straw, or paste-board nests. Into these pots clean pieces of linen had been put, which were covered over with soft cow-hair, and, upon this groundwork, the birds continue to build their nests. In some instances, wooden boxes of 4 inches square are also being used for that purpose.

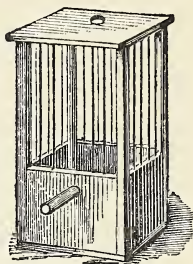
The bottom of the nest is covered over, to the thickness of from 2 to 3 inches, with ashes and with insect-powder, as a preventive against mites. Upon this layer, another of finely-sifted sand is placed, and the latter is again covered with tender moss, enough to half fill the box ; on this layer of moss, the birds are then expected to build the cavity of the nest. The best of these nesting-boxes should have, 2 inches above the ridge, a cover on which other birds could sit without disturbing the hatching



BASKET NEST.

hen ; this also prevents filth from falling in, soiling the eggs, and thereby rendering them unfit for use ; the boxes must also not be too low, because the pairing of the birds frequently takes place upon the nest. It is also advisable to surround the boxes, at the sides, with a protective wrapper of stout paper or thin card-board, leaving an aperture at the front only. The females not only prefer to nest in it, but they are also protected against the intrusion of other birds, and they are also prevented from

mutually pilfering the building material already collected. The back part of the cage, which is placed immediately against the wall, may be without a railing, so as to facilitate the removal of rotten eggs and dead young birds. A precisely similar arrangement is made in the Hartz cages, where the nests are disposed. According to Breyman, the best nests for Dutch canaries are small boxes, open in front, and roofed with a network of wide meshes; these boxes should be about 5 to 6 inches deep and wide, and firstly half-filled with boiled, and then carefully dried, hay.



HARTZ NEST.

Two nests, at least, must be provided for each female, for most of them begin to build and to lay again after a fortnight, even if the first young are not yet quite fledged. After each completed or abortive brood, the nest, as well as the box or cage, must be carefully scalded out with boiling water, and then as carefully dried—the building materials being burnt. All young and old birds being greatly tormented by vermin, such as mites, bugs, moths, etc., if one does not carefully prevent it, everyone should use the best *Persian insect-powder* obtainable at a chemist's or druggist's shop, which should be used unsparingly, and it should be strewed abundantly between the seams in the crevices, and walls of the nesting-boxes, cages, etc., and it should likewise be blown upon the walls where the latter are suspended.

Materials for Nest-building.—Flexible hay-stalks, hogs-bristles, soft, filmy moss, short flakes of cotton, fringed-out linen-threads, 1 inch long, and feathers, are generally given for that purpose. Loose cotton, tufts of wool, and “charpie” threads should never be used for building, for,

with the former, the birds generally cover the eggs in such a manner that they get spoiled, and, from the two latter, they often wrap sharp films around their feet, causing the latter to suppurate and to become inflamed, in which case the bird naturally leaves his brood. Soft feathers of a white colour should be abundantly provided. The Hartz breeders usually allow only "charpie" threads for the building of the nest, which is mostly garnished with moss. *Must* recommends particularly the use of lime-covered goat-hair from the tanneries (these hairs are steeped in lime-milk, and well-dried afterwards), because mites do not settle in them. The building materials are mostly placed in an old cage, having several doors or holes, and being covered with a lid, and such a cage is then put into the aviary, being thus secured against soiling. Only trifling quantities of fringed-out linen threads, or feathers, are thrown on the ground by way of encouragement.

Food and Feeding.—The food for German canaries in general consists chiefly of a mixture of rape-seed, canary-seed, and crushed hemp-seed, no matter whether it be anxiously provided with one or the other or with all of these. Whether all sorts of dainties are offered him or not, it will, in every case, delight the person entrusted with his care, by his joyous song, by his thriving condition, and by his affectionate bearing, provided always that his treatment be not entirely opposed to the laws of nature, for it is a thoroughly sturdy and durable bird. Under the most favourable conditions he will reach an age of 20 years and more, but this applies only to the single, caged songster, while breeding birds seldom exceed 6 or 8 years.

The usual, and at the same time the most suitable, food for Dutch and English colour canaries is the canary-seed. The former get also some hemp-seed, but to the latter it is said to be injurious if regularly supplied. The food for the

single songster, and also for the female, except at the breeding-time, should be regulated with care, so that the birds grow neither too full and fat nor too weak and faint. As a strengthening, supplementary food for emaciated birds, the hard-boiled eggs of fowls, or egg-bread are given, also stale, well-soaked, and then well-squeezed wheat-bread, wholemeal bread or biscuit. In the latter case the bird should be refreshed by green herbs, salad, water-cresses, etc., also with sweet fruit, slices of apple and pear. A small piece of sugar or a small piece of rock salt given now and then will be a harmless dainty for the songster, but the indiscriminate giving of dainties should be strictly avoided. It will be advisable, however, to give the bird, from time to time, a little poppy-seed and some huskless oats. The genuine Hartz bird ought to get only prime, summer rape-seed, and a small dose of biscuit or of egg-food described further on; this will be required in order to preserve the songster in full vigour.

If a fancier procures a young bird, egg-food as well as rape-seed should be given fresh, twice a day; nor should it in any case be withdrawn or even diminished before the bird has attained its full strength and vigour. No Hartz-bird should be given green herbs, least of all while the bird is young, because it easily produces diarrhœa.¹

Feeding during Breeding Time.—In respect to this matter the views of bird-breeders again widely differ, and the reason for this is that the different breeds and the particular requirements of each have, first of all, to be considered. The common German canary is also fed during

¹ Many connoisseurs and breeders do not consider green food injurious to the Hartz canaries, on the contrary, they consider it as beneficent. We would, however, advise to give only groundsel, plantain, mignonette, tradescantia, and perhaps salad, but only of best quality, and not in large quantities.

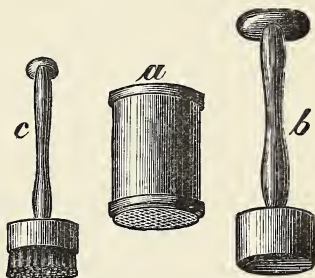
breeding time (with only the addition of hard-boiled egg, well minced) with some stale, soaked, and then well-dried, wheat-bread. In the feeding of the Hartz canaries during the breeding, exclude, as much as possible, all kinds of foreign seeds ; only poppy and canary seed, and very rarely hemp, are sometimes given as medicine and for the purpose of strengthening the bird.

The best sweet rape-seed is given dry, in the usual manner, and also moistened, or, better still, boiled or scalded in hot water, then, in both cases, it will be rubbed between a linen cloth until it rolls, that is, until it is airless and dry to the touch. Böcker proceeds in the following manner : “The rape-seed is poured into a small tin sieve and constantly stirred while hot water is poured over it ; when the latter is drained, the seed is spread out on a coarse, linen cloth, and in ten minutes it is so dry that it ‘rolls.’ It has then lost some of its hardness and has acquired an improved taste ; and the birds like it better, they do not scatter so much of it about.” Böcker’s egg-food, which has become very popular with breeders, consists of equal parts of hard-boiled egg, and of wheat-bread, the latter being, at least, eight days old, and which, having been moistened with pure water, is then carefully squeezed out dry. This

After the example of English breeders, Mr. Brandner considers good hemp-seed as an excellent supplementary food for Hartz canaries. He even thinks that it may be altogether substituted for egg-food ; he seems, however, to overlook the fact that the conditions of the two localities are wholly different, and that our delicate Hartz-birds are totally distinct from their sturdier colour-birds. For my part, I should rather advise that hemp be altogether avoided in feeding the former ; if it be absolutely necessary to use it as food for colour-birds and others, it ought, as a matter of course, to be crushed, and each dose, as it becomes necessary, will have to be pounded afresh, because, otherwise, and specially in hot weather, the oil contained in the grains becomes easily rancid.

mixture is so carefully mingled together, that no separate morsels of egg, or of bread remain. As a substitute for the stale bread, the "egg-bread," which we describe on page 74, is frequently given, but, in that case, one gives, as a matter of course, less egg, resp. "egg-bread." In great breeding establishments, where the preparation of the egg-food would take a long time, they employ an egg-pounding or an egg-squashing machine.

This consists of a plain cylinder (*a*) which is open at the top and closed at the bottom by a metal sieve, of a ram (*b*), and of a metal-brush (*c*). The hard-boiled egg is taken out of the shell, then put in the cylinder and pressed by means of the ram through the sieve.



ARTICLES FOR PREPARATION
OF EGG FOOD.

It comes out in a crumbling form, available for the food. The brush serves for cleaning inside and outside; its price is 2s. Brandner also greatly recommends Maizena-made biscuit instead of the egg-food, although the experiments made with those biscuits by other breeders, have led to totally different results. The above-named writer says: "It (the biscuit) far surpasses the egg in every respect, and saves much time; the cake, while still fresh, is only dipped into the water and then squeezed out. If it be more than six to ten days old, it should be allowed to soak in the water for three to five minutes; a cake can be preserved, even in summer, for eight days, and in winter as long as twelve days, provided that it be not locked away hermetically, or before it is dry."

To procure it from a confectioner will, of course, be much more expensive than the use of eggs, but if the preparation

of it (instructions for which are to be found further on) succeeds, it will come cheaper by a third. "Children's" biscuit scarcely moistened can also be used instead of egg-food for raising young birds, especially if the females do not like the former kind. Böcker feeds the birds during breeding-time, exclusively, with the best rape-seed and with fine egg-food, green herbs and canary-seed. He feeds all males with egg-food all the year round. He says: "From the beginning of March I give the soft food in greater quantity, and for every 20-30 birds I give an egg per day, and several times a week a little canary-seed, and, besides, the dry summer-seed, some which has been damped and pressed should also be given; egg-food is given twice, and, where there are any young, even three times a day regularly, not after 5 p.m., however, but rather as early in the morning as possible. All females, even the least reliable among them, feed their young copiously toward evening, and are apt to overdo this, especially with soft food, so that the *young are suffocated* during the night."

The best method, in my opinion, is to offer each kind of food in a separate vessel, lest the birds become too particular in the choice of their food, and throw out that which does not suit their taste. Variety in food, says Böcker, is not without influence upon a vigorous development, and upon the even colouring and regular marking of the plumage, but it easily spoils the voice, and had best be omitted in the case of Hartz-birds.

Materials of Food for all Canaries.—Summer rape-seed is not easy to obtain in a suitable condition. It is generally mixed with winter rape-seed, cole-seed, and, most frequently, with the seed of the ground-ivy, and these seeds, especially the last-named, are downright poison for the delicate Hartz-birds.

Good summer seed should be full grained, of a dark

violet-brown, and should have a sweet, nutty, and mildly spiced taste.

The remaining varieties of seed may, with careful attention, be distinguished as follows:—

Winter-rape-seed and cole-seed have darker, blackish-brown, and much larger grains, the taste of which is decidedly bitter. For the purchase of the best summer seed, unadulterated with ivy-seed, one should apply only to absolutely reliable seed shops, the owners of which are reputed to be efficient, as well as honest, tradesmen. The canary-seed, or, more correctly, canary grass-seed, also known as “shiny” or “pointed” seed, must be dry, clear-yellow, shiny, and must have very large grains. It must not have a musty, or otherwise disagreeable smell; it is a wholesome and palatable food for many species of birds, among others also for the common German, as well as the Dutch and English canary.

Hemp-seed must be pure and have large grains. It must also be free from a rancid or musty smell, and must have a sweet, and by no means a sharp, taste. It should be neither too fresh, nor too old; it is considered to be an excellent and strengthening food, not only for German and Dutch canaries, but also for all other birds belonging to the finch species, as food for younger birds. It will, of course, have to be crushed, but no more at a time than is required for one meal, because it is subject to becoming rancid; the older birds will split the grains for themselves. Some fanciers boil the hemp-seed, but I do not consider this method as equally wholesome.

Poppy-seed, both blue and white, is principally given as a medicament in cases which will be further detailed under the head of “Diseases.”

The colour, in each case, must be pure. The grains must be perfectly ripe and well-dried. Their smell must be neither

damp, mildewy, musty, nor otherwise disagreeable, and they must not taste either rancid or sour.

Oats, which, by the way, the birds prefer to peck out of the whole bushel, and which they like to unhusk for themselves, must be of a clear, whitish-yellow colour, full-grained and unmixed with black grains or with weed-seed. They are often given without the husks, and then they are usually in first-rate condition, but also much dearer.

Green-herbs.—All canaries are fond of “*senecio vulgaris*,” “*stellaria media*,” and of the “*plantago media*,” while yet green, but one should beware of mixing these herbs with foreign and noxious vegetable matter.

Sepia-shell (*ossa sepiae*) comes from the marine sepia, or “ink-fish,” and is obtained from the apothecary’s or the druggist’s; it consists of animal lime, permeated with salt, and is willingly taken by all birds. A morsel of it is squeezed between the bars of the cage. The shell must be pure and clean, and must not have a putrid smell. The preparation of yolk-food is indicated on page 91. One should beware of using any other but quite fresh eggs for that purpose. As bird-food, fowls’ eggs are decidedly preferable to any other. The egg should be boiled 8 to 10 minutes at the most. Condensed yolk and egg-preserves have lately been extensively used, and both are wholesome if in good condition.

Egg-bread.—This is a mixture of the finest wheat-flour, and an egg, well beaten up (yolk and white together). Both are kneaded into a dough by means of a sufficient quantity of water. Then shape into small loaves and briskly bake. It should afterwards either be grated fine or soaked in water, and well squeezed before giving it as food. I may add that it will keep for months.

Maizena-biscuit.—The white of 11 eggs is beaten into

a stiff froth, then the yolk rapidly stirred into it, the beating to be continued all the while. Thereupon 80 grs. of sugar and 140 grs. of "Maizena" (fine American Maize-flour) are sifted into it; the whole is then poured into a tin mould, which has been well smeared with butter and strewn over with rusk, and then baked three-quarters to one hour in a rather fiercely-heated oven. (Brandner.)

Drinking-water.—As a rule, fresh water is given twice a day, which, however, must, during the cold weather, have been kept in a can covered with paper and placed in a heated room for some hours. Where the drinking-vessels and bathing-troughs, previously described, are in use, it should not be omitted to renew the water immediately after the bath, and to cover the bathing-trough.

Warmth.—Hartz-canaries of the finest breeds are bred in a very high temperature, and this is especially the case at St. Andreasberg. The breeding establishments there are kept up to 68-70 degrees, Fahrenheit; and during breeding time, the warmth is often increased to 81 degrees, and in the moulting season it is kept, at least, to the same heat, and is afterwards gradually diminished to 65 degrees.

It will be well to accustom the birds to the ordinary temperature of rooms, for even the most delicate songster will best thrive in it. At moulting-time the temperature should, however, be kept somewhat higher, but if the room is too hot, the moulting will begin too early, and often interrupts the progress of the breeding; the birds will also suffer too much through the premature change of feathers. In the breeding-rooms for German canaries an average warmth of 15 degrees will be sufficient.

Sanitary Measures.—Besides the food, the birds should always be given some lime, mortar from old walls, because of the salt in it, Sepia-shell (*see* page 74), or some

calcinated oyster-shell, and principally at breeding-time, chalk or the finely-pounded shell of raw eggs will be added. The sand which is strewed over the bottom of the drawer or the aviary, must never be damp, or, worse still, permeated with ground water; river-sand is best, the grains of which are not too coarse. If nothing but some sharp river-sand can be procured, it should be well dried first, and then mixed with good garden-mould to about one-third of the whole. The single canary, no matter of what breed, must, as a matter of course, be kept strictly clean; the drawer of the cage had best be scraped out every morning, or, at least, every second or third day, and then strewn with fresh sand. If a wooden drawer be once neglected, it should be scalded out with hot water, then carefully dried, so that the boards do not get warped. Some wood-ashes or insect-powder should then be thinly spread over it, covered with newspaper and thickly strewn over with sand; the aviary or moveable hatch must be cleansed in a similar manner; the dirt must never be allowed to accumulate in such a manner that it smells, or that the birds soil their feet.

Bathing.—A bathing-trough is occasionally, and particularly in summer, put into the cage of a singly-kept singing-bird, and is removed after the bird has bathed in it. During breeding-time the birds, both old and young, are to be protected with especial care against draughts and wet, against sudden and excessive variations of temperature, bad food or water, putrid herbs, etc. Altogether, cleanliness, fresh, pure air, and light, are, as is the case with human beings and with most animals, the first requisites for thriving. If the weather be mild, the windows should be kept open day and night.

Vermin.—When a bird gets mites (bird-lice), he should, in the places where he cannot cleanse himself, that is, the head,

shoulders, and upper part of the back, be thinly rubbed over with glycerine, over which some insect-powder is blown by means of a goose-quill. The powder is quite harmless as far as the bird is concerned, and may therefore be strewn into the whole of the plumage only. Care should be taken that it does not penetrate into the eyes, nostrils, or the beak; the bird may also be carefully pencilled over with tincture of insect-powder. A weak solution of carbolic acid (one part of carb. to 100 parts of water) may also be used for brushing over the parts which are infested by vermin; then, on the next day, the bird gets bathing-water, the cage is either changed or cleansed by scalding with hot water, and is then placed on another spot. In order to ascertain whether a bird has bird-lice, the places mentioned before should be inspected. This will be done by blowing the feathers upward, so that the small, red insects will be discernible to the naked eye. The cage may also be covered with a white linen cloth over night, and in the morning the mites will be more or less numerous found upon the cloth. The brushing over of the cages with petroleum, benzine, or turpentine, should be omitted, because the smell of all these remedies is excessively repugnant to the birds. It has also been tested that the plan of providing hopping-twigs made of cane, affords no relief, because, although, on beating these out every morning, bird-lice will be found upon them, yet too many will still be left upon the bird. As most of the mites hide themselves during the day in crevices and slits and only touch the birds in the night, moreover, breed in these hiding-places, it is of the greatest consequence to have only metal-cages and to keep them as well as the drawer extremely clean. The poles should be tipped at both ends with a drop of linseed-oil or liver-oil, as every fatty liquid is deadly to the mites; but the oil must always be speedily removed by scalding, lest it be-

come rancid, and exhale a bad odour. Euclayptus oil takes longer to become rancid than other oils. When young birds in the nests become infested with bird-lice, their growth will be considerably stunted, nor will they thrive in a general sense. Another Hartz-cage with a precisely similar nesting basket should then be substituted; the basket should be quilted with linen, some building-materials (but not such as have already been used) be firmly and smoothly pressed into it, and powdered over with the best insect-powder; the young birds then cautiously lifted out of the old nest and placed into the new, then remove the old nest and burn all the old nesting-materials; and the basket and cage, etc., must be scalded out with boiling water. Before hanging the new nest with the young in their former place, however, the surface of the wall must either be washed with hot water and then dried, or, better still, it will be thinly covered with rape or linseed-oil, and insect-powder blown over it. The brushing with tincture of insect-powder is also effective.

Mice.—Even in the choice of the room destined for the birds, care should be taken that no rats or mice, not to mention larger beasts of prey, can gain access to it; all holes, and the larger crevices, should be filled up with a mixture of pointed and finely pounded fragments of glass, and sand, which is free from dust; small pieces of brick are then inserted, and the whole will be carefully covered with cement. Should mice get in despite these precautions, and cause havoc among the food, eat up the nestlings, or do other damage, the destroying them will be a very difficult task; poison cannot conveniently be employed because the birds are too easily endangered by it, and as for traps, the astute rodents will rarely venture into them after some of their kind have been caught; I know of no other expedient in such a case, than to try to effect the destruction by means of poisoned wheat, which should be put in some concealed

spot as, for instance, a cage accessible only by some holes drilled into the back part of it, and which should stand in some dark corner, or that, nesting-time once over, the room be thoroughly secured against these intruders.

Dr. Steinhausen proposes that a box of middle size, filled with soft straw, nailed up on all sides, and provided only with a narrow, oblong aperture at about half its height, be placed in a corner of the room close to the wall, so that not even the smallest bird can slip in, while the nimble mouse can easily glide into it. After a few weeks, the box should be carefully carried out, stopping up the hole, a funnel be inserted into the latter, and hot water poured into it until the box is full. Dr. Steinhausen, on one occasion, on opening the box, found about 30 drowned mice in it, and he thinks that, if this process is repeated from time to time, the bird-room may be freed from these ugly pests.

Choice of Breeding-birds, and their Treatment.

—In accordance with the different ends pursued by breeding, it will be necessary, also, to start from different points of view, whether it is intended to breed distinct colours, or to preserve a breed in all its purity of colour, or, without reference to any colour and marks, to breed proficient songsters only. In each case the respective breeding birds will have to be chosen differently.

In order to produce an excellent breed of canaries, that is, to raise a family of sturdy birds which either sing delightfully, or have a rich and full plumage, or are of a distinct and beautiful colour, the following rules should be observed. The pairing of kindred birds must be avoided, that is, brothers and sisters, or parents with their offspring, because by sterility, some diseases, infirmities, debilitated breed, and even some vices, may become hereditary through consanguinity; and also because the foundation to degeneracy and to the total deterioration of the breed may thereby

be laid.¹ Grey, or yellowish-green birds are considered to be the healthiest, most durable, and the most prolific; they are also said to be the most reliable breeders, but, as a rule, their voice is more gruff than that of the yellow birds. They are, not unfrequently, bred out of clear-yellow parents, and must then be considered as having reverted to the original colour; the straw-coloured are likewise said to be sturdy and durable; while light-yellow birds, and those whose colour borders on white, are looked upon as being effeminate. More delicate still are the bright-yellow or golden-tinted birds, which, owing to the thinness of their plumage, are particularly prone to catching cold, and thus to contract diseases. In order to obtain prime breeding-birds, very strong and healthy females should be chosen from among the great quantity of birds being brought into the market in autumn. It need scarcely be said that a proper conformation of the abdomen should be the first object of consideration; diseased and weakly females, and such whose luring-note is unpleasant, should be carefully eliminated, particularly in the case of Hartz canaries. An experienced breeder of my acquaintance annually sells the females and replaces them by young ones of the previous year, but only such as come of the first brood. In this he trusts to his perspicuity, and, as a rule, he picks out good breeding-birds. Lenz is of opinion that a young male and an old female obtain excellent results, and states that "females of last year produce two to three broods of three to five eggs each, while older ones will give from three to four, with three to six, or even seven eggs."

¹ The question whether consanguinity is really of such ruinous consequence or not has been led of late to lively discussions, but has not been decided with certainty pro or contra. For the breeder, prudence will always be advisable.

Böcker, too, says young males and old females will, as a rule, raise more males than other pairs, as, for one thing, older females breed and feed better than young ones.

The first hatch produces more pointed and oblong eggs, according to popular belief more cocks; the second, more rounded eggs, more females. The two following broods are usually much less copious than the preceding ones. Other breeders, on the contrary, allege that birds of different ages produce only a weakly progeniture, but this has not been proved. It is generally believed that males and females, between two and four years old, will "nest" best, and that, after having attained an age of four to six years, they are scarcely fit for breeding. In the Hartz, males are not employed for breeding longer than three years at the most, and such a bird then is called a "mere tramp" (orig. "Schiertramper"), no longer capable of breeding, and also receding in song. Every single bird intended for the hatch must, moreover, be quite free from any blemish, both as regards his health, and the shape of his body; a careful inspection before pairing will therefore be necessary; the breast, abdomen, "anus," plumage, and the feet must be closely inspected. Any bird that is sickly, too lean or too fat, whose abdomen is soiled, or which, in any other way, is unfit or suspicious, should be kept out of the hatch, because every disease becomes hereditary in the most injurious manner, and, in the case of delicate Hartz-birds, one should beware of using, for the purpose of breeding, any bird that is hoarse, short of breath, or otherwise sickly, even in a minor degree; otherwise the whole progeniture may easily perish through consumption. If the tail be torn out, or the plumage otherwise defective, this will be no bar to efficient breeding, still it will be better to pluck out all defective feathers about six weeks before breeding-time, so that they may be set in with their full plumage; the feet must also be cleaned, and if the

nails of the claws are too long, they must be cut ; the claw is held up to the light, and, with sharp scissors, the nail is cut away in such a manner that the transparent quick be not touched ; by this process the birds will be prevented from tearing filmy materials, and with them, the eggs and young birds, out of the nest.

Selection for the Breeding of Colour-birds (“ Thorough ” Breeding).—Experienced breeders have established the fact that, for colour-breeding, *the choice of the male is decisive, while the female must be of a uniform colour*; so, for instance, in order to breed bright-yellow birds with a green crest, one takes a male of that colour and mark, and pairs it with a green and smooth-headed female. The more purely such birds have been bred “ thorough,” *i.e.*, the more generations they have been bred thorough in purity, the purer will the after-breed be. A yellow pair, no matter of what descent, whether of green or grey, will raise young among which there will be one yellow male ; this male will, in the following year, if paired with a yellow female in a separate cage, again raise a brood among which a yellow young will likewise be found ; this last yellow bird, paired with a yellow female, which has also been purely bred through two generations, will never produce any other young than such as are of a pure yellow colour. If three or four such couples have been collected and placed into a movable hatch, it need not be feared that birds of a different colour will ever be bred ; but, in order to be sure of this, it will be necessary to raise the ancestors of such a colony in the strict seclusion of a separate cage. The same holds good where birds of one colour are concerned, that is, for bright yellow, straw-coloured, white, green, grey, and dun-coloured, but not for “ marked ” birds. These latter are more subject to accident, and one may be glad if, among four or five broods, one can obtain a “ specimen,” that is, a very finely

marked bird ; in this case, also, it is of great importance that two purely-bred birds are coupled, for instance, a fine-crested, green cock, with a straw-coloured hen, then the greater part of the young will always resemble the old ones, *i.e.*, they will also be evenly green or yellow. If, however, a mixing of colours takes place, one "specimen" (select bird) will usually be the result ; such "selections" are then used for the propagation of rare markings. Green and dun-coloured birds are never intermingled, *i.e.*, these two colours never appear together on the same bird ; if paired together, they will only produce young which display each colour separately. As for the remainder, it is alleged that the following pairings are pretty sure to be successful. Black plats and green plats are bred out of a similar male and a clear-yellow female. Green or black "swallows" are produced by a grey or blackish-green crested male and a smooth-headed, bright-yellow female ; dun-coloured "swallows" will be bred in like manner by a crested "dun" male with a gold-coloured, smooth-headed female ; and grey, green, or black-crested birds are raised of a male of that kind, and a bright-yellow or straw-coloured female. Dr. von Glöden bred bright-yellow young (besides some of a dun-colour) out of a yellow male and a dun female. All these statements are, of course, to be considered as general rules only.

Breeding of Crested Birds.—As regards the crest, we need only observe that the breeding-bird should have one which is full in feather, and evenly upright, not compressed on one side, or thin or bald in the middle, or at the neck ; birds which have such a blemish, should not be used for breeding, because their young would be partly or entirely bald ; nor should two crested birds be paired, because they seldom produce handsome young, but generally bald-headed ones. In this particular, however, breeders have also had diverging experience. Dr. v. Glöden bred some

magnificent crested birds (besides some defective and bald ones) out of a male with a very fine, and a female with a defective crest, as well as out of a well-crested pair. This, also, is an established fact within the province of bird-breeding, yet it cannot be raised to the standard of an absolute rule. Young birds whose hoods present a scurvy appearance are, singularly enough, called "green beaks."

The Preparations for Breeding consist in the following items: The birds are, from the beginning of autumn, to be fed with the best seeds in a manner adapted to strongly nourish, without unduly fattening them; dainties should be altogether avoided. It is further advisable to cause the birds, be they in cages or in aviaries, to become as tame and confident as possible, before the breeding-time, so that, if approached, they will not at once take flight from the nests, tearing out the eggs or the young birds, or crush the latter. The taming of a bird ought never to be attempted by coercive measures, such as hunger, thirst, etc., but, on the contrary, it should always be treated with the same degree of gentleness and kindness; it should never be scared or frightened, and tameness and confidence will be the natural result of such treatment. Before permitting the birds to enter the aviary, each male, with the female allotted to him, must have been kept for about a fortnight in a separate cage, in order to effect the pairing; the completion of the latter will become manifest by billing, mutual feeding from the crop, and a soft, tender chirping. Such a union is then of lifelong duration. Such preliminary pairing is only necessary, however, when it is intended to produce a pure and distinct breed or colour. If, on the other hand, a very copious breed is contemplated, one will allow the birds, after having carefully selected them, to fly at once into the aviary; but it will be advisable to assemble all males and females in the same cage about a month be-

fore the "coupling" for the purpose of "nesting," so that they may become used to each other and not begin to quarrel in the aviary.

Period of the "Coupling."—Wild canaries, as mentioned previously, begin to breed in the middle of March. Our cultured birds begin their nesting much earlier; and where a space is provided which may be easily heated, the hatch may be established in the middle of February. The breeding-room will, in that case, have to be evenly heated early and late, by day and by night, as uniformly as may be feasible, because, if exposed to considerable variations of temperature, the females will be subject to sickness caused by stress of labour, and the males to abdominal inflammation, from which causes both of them often perish.

Warmer or colder climates will therefore have to be taken into careful consideration (especially in breeding delicate Hartz-birds), or, as is done in the Hartz, couple them about carnival-time, and, by means of careful and strong and even heating, protect the birds from similar dangers. A space which cannot be heated should, in cold climes, never be peopled with its feathered inmates before the month of April.

Pairing.—As a general rule, a space of 1.50 to 2 cubic metres are allotted to one male and three females for the purpose of "coupling," and where a larger space is at disposal the allowance will be correspondingly increased. With regard to the number of females, the opinions of breeders are widely different.

The success obtained in the Hartz breed proves, it is true, that one male may conveniently "nest" with four, or more successive females, and may be attended by favourable results. Mr. L. Martin goes rather too far in asserting that polygamy may have possibly an enervating, *i.e.*, debilitating effect upon the canary. R. Maschke likewise defends monogamy.

It will probably be most correct to consult the peculiarity of each individual bird, and to allot to males of the larger breeds, which generally are more quiet, feeble or indolent, one female only, while two or three will be given to birds belonging to the smaller and more vivacious breed, according to their degree of mettle and vivacity.

Böcker even says, backing his opinion by practice, that a healthy and lively male may very well be coupled with four, five and even six females. Altogether, it will be advisable to place a larger number of females into the aviary rather than to bring fresh and strange hens into it, an emergency which may be necessary owing to death or other disasters, or subsequent to the ejection of brawlers or marplots, or of other unsuitable females. This would be the signal for the renewal of bickerings and quarrels, and all broods, and even the fledglings, are placed in peril, every kind of nesting is interrupted and delayed for a considerable time.

Nesting (Laying, Duration of Breeding, Development of the Young).—We will consider we now have a well-appointed aviary, and soon a busy life begins. Most of the females will choose a nesting-apparatus, but not unfrequently one of them will build her nest in the shrubs, where she may be left to nest in peace, provided that the nest be firm enough, so that the eggs or the young birds cannot fall out of it; otherwise a new nest-basket will be fastened in the same place, and the building materials already collected, will be put into it. The same will be done if a female happens to build on the top of the basket. Sometimes two females share a nest between them, even although there be no lack of building-places. In such a case another nest is placed, close to the former, and in this the eggs of one of the females will be put. These eggs will always be distinguishable by some difference in the colour, from those of the

other brood-hen. One should, however, beware of touching the eggs with one's bare fingers; they should be taken out with a spoon made of *horn* or *wood*. Mr. Götschke, a member of the Bird Society, Berlin, has in the simplest manner contrived a pair of small feathering pincers, made of thin wire and forming a loop on both sides, by means of which the egg can be conveniently and securely lifted out. The layings of the canary-hen consist of four to six eggs, which are somewhat variably coloured and marked; they may be lighter or darker; and have whitish, or sea-green, reddish-brown, or violet spots or streaks, and they are generally marked with a wreath of spots at the blunter end. These eggs are laid almost regularly at a fixed time; in most cases daily, or on alternate days, and in 13 to 15 days, according to the greater or lesser degree of warmth, they will be hatched. Such eggs as remain lying in the nest three or four days beyond the hatching-time, are usually spoiled, and must be removed, as well as dead young birds, and to that end the above-mentioned pincers will be particularly handy.



PINCERS.

The female covers her young, which are usually quite naked, but not quite blind, their eyelids only being closed up to eight or ten days; then the male principally undertakes the further feeding. On the 18th or 21st day, the young birds are so far fledged that they can leave the nest, but for all that, they are still being fed by the male, and must not be removed until the next young are again fledged—in no case before the 25th or 26th day. The longer they remain in the nest, however, the sturdier will be their growth; the sooner they take flight—sometimes as early as the 15th or 16th day—the greater will be the dangers to which they are exposed.

Supervision of the Broods.—If, in the beginning, males and females hotly quarrel, if they chatter angrily and bite each other, this does not much matter, for peace is usually restored after a short time; but if there be among the number some individual disturber who will absolutely not yield and will continually bite the others, or worse still, destroy the nests, devour the eggs, and kill the fledglings, such evil-doers should be caught and inexorably removed altogether. Eight days after the “coupling” of the brood birds, I generally have some eggs in the different nests, the nesting-boxes having been previously numbered; a simple register is kept wherein the day on which the first egg has been laid in each respective nest has been noted. After the lapse of nine or ten days, I ascertain whether the eggs are impregnated; those which are not, I remove. I also sometimes change two nests into one, but, in all other respects, I endeavour to disturb the hatching-hens as little as possible. After the fledging of the young, a rapid daily inspection of the nests is indispensable, at least, during the first few days.

If it be found that some females do not feed their young well, so that compared to others of their age they are stunted in growth, such females should repeatedly be driven out of their nest, for it frequently happens that young hens are so fond of their warm nests that they are loth to fly out, and thus neglect the feeding of their young. Towards the end of nesting-time, it will sometimes occur that older females pluck out the feathers, or bite the beaks and feet of their own, or of strange young birds. Wagner thinks that this evil may be simply prevented by keeping the old birds abundantly supplied with other feathers, for these they will then carry into their nests, and will peck the quills.

The supply of oats in their husks among the food for the

birds, also serves for the necessary exercise of the beak, but great attention will still be required, for I find such male-factors are usually incorrigible and generally incurable, and if they be not banished from the breeding-cage without mercy, perpetual disturbance, loss, and annoyance, will be the result. Brandner recommends that the tails of the young be brushed over with liquid gum-arabic. This will have the effect of glueing the tails together, and later, when the young are able to defend themselves, the gum will be removed while the birds are bathing. The young will, besides, be put into another cage, which will be placed in the bird-room, or fastened on the outside of the hatching-cage, so that the male may continue to feed them, while the female cannot injure them. If a bird is seen to tug or peck at some fixed thread, at the nesting-linen, etc., the object should be speedily removed so that the bird may not contract the habit of destruction or fritter away his time. It may be easily observed how some birds are quite indefatigable in this, and how, for hours and even days, they will continue to pluck although convinced of the uselessness of their labour, and how, on account of this, they will neglect building, nesting and hatching. Such distractions should not be permitted even in the case of single songsters.

Disturbance.—Birds in the hatch-coop, as well as single singing-birds in cages, but particularly the cockerels kept in covered cages, should never be frightened by a hasty entrance or scared by rapid movements, for these delicate creatures, if frightened, are easily subject to convulsions and other accidents; for this reason it should also be avoided, as far as possible, to seize or handle a canary; while feeding or watching them, one should never allow oneself to be betrayed into any ebullition of temper, by their naughtiness, losses, etc. The introduction of strangers into the bird-room should further be avoided while the busy

nesting is in process, especially if such strangers are wearing clothes of a striking pattern or colour, or furs, etc., the sight of which may cause excitement among the birds. It is believed that through the influence of thunderstorms, shooting, slamming of doors, hammering, etc., the young birds in the eggs will die, and yet canaries will thrive in the shops of carpenters and other mechanics amid the most violent hammering and other noises. If the young die in the eggs or while yet quite small, neglect on the part of the females will invariably be found to be the cause. During violent thunderstorms, especially at night, the females, scared by the lightning, will fly away from the nest and thus chill the eggs and their young, or will sometimes crush them by the force and rapidity with which they take flight. This may be prevented by carefully lowering or shutting the window-blinds or shutters, where such are provided in the bird-rooms. If a nocturnal thunderstorm is apprehended, the thunder does not disquiet the birds; further, a brightly burning lamp has, in such cases, been placed into the bird-room, in order to calm the birds and to facilitate their finding the way back again to their nests, but it would then be necessary that they were already accustomed to such a light.

Artifices.—Some fanciers do not give any building materials to birds nesting in baskets quilted with linen, because the females are prone to tear them out, and thus to endanger the eggs. By such interference with the natural course of nesting, however, as well as by a number of singular artifices, the birds are either scared and rendered distrustful, or they are caused to be indifferent and neglectful as regards their brood. In every kind of bird-breeding, I consider it best to give, as much as possible, free play to the natural propensities of the birds; therefore, it is superfluous, to say the least of it, to remove and preserve the eggs after each laying, and to substitute for them eggs made of

wood, or ivory, or chalk, or to expose the eggs, on the sixth day of breeding, to a transparent light, in order to ascertain whether they are impregnated or not. By the former process, it is true, one will effect a simultaneous fledging of the young birds, and the latter investigation will show pretty accurately how many young may be counted upon in each brood; but I can only award the right to either of these proceedings only to very expert breeders, who, by many years' experience, have acquired the coolness and the assurance necessary for such intimate intercourse with the birds; with all others such an economy in breeding will incur the risk of spoiling their best nesting-birds.

Foster-Mothers — Feeding by Hand. — When females belonging to a valuable and delicate stock or breed do not themselves hatch or feed their young, the latter, or even the eggs, are taken away from them and given to other more robust females of less delicate breeds, into whose nests they will be distributed for the purpose of being hatched and raised. Therefore, those who wish to breed very select canaries, should always have a proportionate number of ordinary, well-breeding females at hand. If, in the case of a young female dying, or beginning a second brood—although the fledglings cannot yet eat alone—no foster-mother is available, then the raising of the young becomes a difficult thing. They are fed up by giving them, by means of a spoon-shaped quill, or a small painting-brush, a mixture of stale, soaked bread and of egg-yolk; this will be given about ten times a day in doses of three to four spoonfuls. As the young grow up, a little finely-grated rape or poppy-seed will be gradually mixed with the above-named food, and they are then fed as often as they call for it, and as copiously as they wish. During this process, the young birds should be carefully covered up with loose cotton.

This feeding by hand is very troublesome, however, and

may sometimes be avoided, but only in the case of newly-fledged and nearly independent young birds, by placing the soft food as well as the soaked seeds, on the ground. It need not be said that there must not be any mice in the room. Young birds, as is well-known, pass much of their time on the floor, and, rather than starve, they will, of their own accord, attack the food placed there for their use. In such cases it is fortunate if one of the bigger birds, as happens sometimes, takes pity on the forsaken brood, and experiments should be made for that purpose. Females of a mixed breed are said to be particularly good foster-mothers ; but, unfortunately, it often happens in establishments for the breeding of the finest and most delicate Hartz-birds that the females feed badly and starve their young, although they do not let them actually die of hunger. The breeders are then compelled to aid in the feeding ; and many valuable canaries have, of late, been raised in this laborious manner. But this process is seldom or never beneficial to the breed.

Fledged Young.—Despite the greatest care, many young sicken and die about the time when they become independent, and the old birds cease to feed them. In these cases the illness is, without doubt, attributable to the change of nourishment, and the finer the breed, *i.e.*, the more delicate the birds, the less able will they be to bear the sudden transition. I think that the young, even of the most delicate breeds, may be brought up by being accustomed to the best rape-seed, egg-yolk, and moistened wheat-bread, mixed with sepia-shell (but not too much of either), and this, even while the feeding by the males is still going on. They should then be placed in a warm, sunny spot, and guarded, as much as possible, against draught, wet, and steam ; further, the fledged young should never be lifted out with a so-called “catcher,” but only with a catching-cage

over the water, because, in the former case, too much disturbance is being caused, and many a young bird is injured. In the Hartz, the birds are caught in the bird-room of an evening; firstly, it is noted where each single bird sits, and it is then caught with both hands. This is also sometimes, but the practice is not good, done by day, closing the windows first. After being captured, they are taken into another room, or, at least, into a spacious cage, but, in every case, they must be taken away from the old birds, so as not to hear them any more, because otherwise, they will always lure in their direction and will suffer through longing for them. The most appropriate mode to favour the healthy development of the young males, will be to allow them to fly about in the bird-room until the moulting is completely over. Böcker says: Eight days after fledging, when they begin to eat alone, they also commence to practise their song. Those whose object it is less to obtain a copious yield than to train good singers, should leave his young in the hatching-room instead of placing them in the fledging-cage, provided that they have put their best songsters in the hatching-room, as I strongly advise them to do. The young females I remove from the hatch after they have begun to eat alone, and the old ones after they completed breeding, about the commencement or the middle of August, so that they may not, by their unmelodious strophes, spoil the singing of the young males. At the age of a month, or even later, the first change of feathers begins, always excepting the tail and the wings, which take several months to change.

During the whole moulting-season, they must be carefully tended, kept particularly clean, and preserved against all evil influences. Towards the beginning or the middle of October, after the moulting of the old birds is entirely completed, the other birds are caught, placed singly in

cages and lodged in a well-heated room, the cages being hung above, or beside one another.

As a rule, at the Hartz, such young birds as are destined for sale are kept in covered and shaded fledging-cages, while those which are intended for one's own use, are placed in a wooden partition contrived on purpose.

Recognition of the Sexes.—According to Lenz, young birds belonging to the bright yellow breeds, may, even while yet in the nest, be distinguished, as regards their sex, by the fact that the males have around the eyes and the beak rings of a darker colour, which are clearly perceptible, and this mark will remain decisive even after they are fledged. Among the pale-yellow or greyish-green birds, no doubt, the male is easily recognised by the high colouring around the beak, at the forehead, the cheeks, and the throat, as well as by the vivid colour of the back. This holds good before and after the first moulting. After that time, the male has a double and the female a single, somewhat broad, white ring around the throat. In order to find this out, the head of the bird will be pressed down upon his breast. According to the brothers Müller, the males may be further distinguished by the greater strength and breadth of their nether beak ; and also by their more slender shape, their broader head and tail, their longer legs and their bolder bearing. As for the rest, one may, if one possesses some experience and the necessary perspicacity, judge from the fact that the male is always more slender, and also more thick-headed and broader-tailed ; that it has longer legs, that its plumage is dense, and that, around the eyes, it is rather more vividly coloured. For the unexperienced purchaser, however, the distinction based upon mere ocular inspection will always be a difficult matter, especially with bright yellow birds, where even expert dealers are not always sure of the correctness of their judgment. The

latter usually examine the full-fledged birds at the rump and form their opinion as to sex accordingly ; for the "tenon" of the male is clearly developed, and protrudes in an oblong rotundity with a perceptible leaning to the front, while that of the female is less prominent, broader, and inclining more towards the back. The bird is held in the palm of the hand, laid on its back, and the feathers are softly blown asunder. This sign is tolerably reliable even with some other birds, and possibly with all, excepting those which are very fat, nor can it be perceived while the birds are moulting, or shortly afterwards. To the inexperienced eye, the detection of those marks is, as already observed, a difficult task, and they can be known only after numerous experiments and comparisons. If, on the other hand, it be attempted to distinguish them according to colour only, one is exposed to the well-known fraud of fancy dyeing. Expert dealers always carry about them soft white rags, which, being moistened and gently rubbed over the plumage, instantly reveal the yellow dye. The easiest and safest method to distinguish the males is unquestionably through their song, for, while the males even when only a few weeks old strongly inflate their throat when beginning softly to chirp or "study," as it is called, the feathers standing on end the while, the females, on the other hand, even later on, utter only some half-stuttering notes and instantly let their heads droop again.

Marks of Age.—The age of grown-up canaries is revealed by the, more or less, robust claws, and by the stronger development of the scales of the feet and toes, which, with increasing age, become always of a darker shade of black, and are then called "tops." In Thuringia, the latter mark, however, is not thoroughly reliable ; a rather safer sign is a hook at the point of the beak, which may be easily noticed. Sometimes it happens that even young

birds of the preceding year have, as early as the end of March, scales so strongly protruding that any one, not very accurately informed, would take them to be older, nay, even aged birds; the smaller scales only, which are at the toes of the bird, are really decisive, for these are not easily removed, and are, therefore, as well as the cut or uncut claws, to be minutely observed. In purchasing, one can hardly avoid getting—instead of birds one or two years old—old birds which have been set aside by the breeder; and these are detected by the fact that, after the moulting in autumn, they, without any preliminary “study,” at once burst out into full song. Such a bird is, at least, three years old, if not older.

Duration of the Breeding-time and Annual Nesting.—It is not advisable to let each separate pair nest more than three times consecutively, nor that the hatches should be allowed to go on later than June; young, one-year-old males being removed from the bird-room when the female has had her second brood. Good breeding-birds are, of course, allowed to nest in each successive year, and it is alleged that the birds, both male and females, die of grief and longing, or rather of excitement, if, in the ensuing year, they do not find an opportunity for nesting; this, however, is not quite correct, provided only that the bird, which is not to be used for breeding, but to be kept as a singing-bird, be, in the spring of the same year, hung up in such a manner that he cannot hear the nesting females, and that much green-herb be given to him, and that he be fed moderately. If this be observed, he will thrive and sing very assiduously, especially if he has the opportunity of hearing another good singer; such males are usually hung outside the window, but this should not be done in the case of delicate Hartz-birds.

The Yield of the Brood is generally computed at

ten ; in more unfavourable cases at five or eight, but rarely at more than fifteen cockerels from each breeding-cock ; as a rule, however, the result will be greatly in arrear of the stated maximum performance. Brandner assumes only eight to nine males, from a cock with three hens in the hatching-cage, and, under the same conditions, six to seven only, in the flying-hatch. According to Maschke, one old cock will produce six to eight cockerels at the most, and that is if four females be allotted to him, two young from each hen. He says each female lays, on an average, fourteen eggs in three to four hatchings. Of these, eight would produce males, and six females, but with the disheartening result that three-fourths of the eggs are useless.

Hibernation of Breeding Birds.—The breeding-time once completed, the males are placed in separate cages, and all the females by themselves, in a very spacious cage. During the winter the hens may also be permitted to fly about in their nesting-rooms, from which, however, the soiled sitting-poles, the nests, etc., will first be removed. Experience has taught us that the common canaries may safely be hibernated in an unheated room, and that they will even be the healthier and fresher for it. They should be abundantly fed with seeds, also with hemp, and, in cold weather, given fresh drinking-water three times a day, the latter having been kept for some hours previously in a heated room ; moreover, the drinking-vessels, which must be kept scrupulously clean, must be so arranged that the birds cannot bathe in them ; a net of tinned wire, standing on feet of the same material, being placed in the large water-basin, the loops of the net so wide, however, that the birds cannot remain with their heads sticking in them, and so get drowned. The females of the Hartz-breed may, and indeed should, regularly hibernate in a cool room, but should not, like the common German canary, be kept in a room which

has not been heated at all, for the variation of temperature, between eighteen and even twenty-four degrees of warmth during nesting-time, and ten degrees in January, might still be fatal to them. The hens of the other delicate breeds, as, for instance, the Dutch, may winter in the same manner as the Hartz-birds. The females of the latter breed should, even in winter, towards February, daily get some egg-food, so that, when the time for breeding comes, they are robust and inclined for pairing. Some grains of hemp should also be given them among the rape-seed.

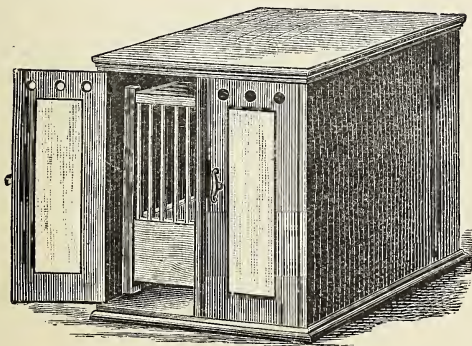
The Education or Training of Young Birds.—“The training of young birds,” says Böcker, “is, in my opinion, the most important and the most interesting part of the whole business. It is a source of pleasure and often, also, one of great annoyance.” The following may be accepted as general rules :—The more numerous and the more proficient the singing-models are, the more concordant their song is, the better are the prospects of obtaining excellent young birds ; two models whose song does not agree at all, will but seldom form good singers. The defects of the old birds are transferred to the young, but even a young bird which has a single discordant note, such will crop up annually, despite every care on the part of the breeder, and may, within a few days, corrupt the whole company. Such birds as these should be removed from the hatch at an early stage, and disposed of as soon as possible, or they should, at least, be put into a dark cage and in a cold room, so that their song is reduced to what is called “composing.” This will sometimes, but very rarely, have the desired effect. It will further be advisable to suspend the “models” near each other, so that they may mutually support each other. The better among the young are then placed near them, while the inferior ones are located at a greater distance. Birds which are hung immediately below one

another, will, mostly, sing exactly alike; and the song of young birds of the same stock and of the same brood, has, as a rule, the same stamp, being subject, however, to many variations in the case of individual songsters. Very few young surpass their teachers, only about one-half of them will usually attain to nearly the same proficiency as is possessed by the "models;" the others are not worth notice. They either depart from the "rolling," or they do not achieve the desired duration and roundness of the melodies. As soon as the cockerels begin to "study," they are transferred to a "tutor" and lodged separately in small cages about half as large again as the "Hartz-cages" (rarely twice as large)—6 inches broad, 7 inches high, and 9 to 10 inches long, called singing-boxes. In these cages the songster then stands, usually in a wire cage which just fits in. The so-called "singing-cupboard" is arranged in a similar manner. It has nine to fifteen compartments for the reception of the wire cages containing the songsters. Each compartment of the cupboard, as well as each separate singing-box, may be darkened by means of a gauze curtain, or a door of ground glass, or by a wooden door, as the breeder or caretaker sees fit. Mr. H. Lubeck has proposed the construction of an acoustic singing-box, which consists of a thin, curved lath of pine wood, 28 inches long and 6 inches broad, both ends of which are nailed to a board about 14 inches long and 6 inches broad, closed at the back also by a crescent-shaped board, provided with a wire railing in front, and in all other respects appointed like an ordinary cage; it is said that, heard from such a box, the song has a very powerful and pleasing effect. The teacher should be an old male belonging to the same breed, and should be an excellent singer, otherwise the young will learn nothing, but rather corrupt the old bird. On the other hand, one may set several old birds

of the same stock, *i.e.*, with precisely the same kind of song, as teachers over a great number of young birds. The whole company, *i.e.*, the family, will then mutually improve each other until a wonderful collective performance is reached. Care should be taken, however, that one of the teachers be not inferior to the others, because the young always adopt the inferior, and therefore easier rolls; and each family should be kept entirely separate. Further, I urgently caution my readers against placing a proficient Hartz-bird as teacher among young birds of an inferior descent, for the latter will, in no case, learn anything worth mentioning, but they will, on the contrary, corrupt the old and valuable songster. In conclusion, it should not be forgotten that each young bird must, in the second year after moulting, be again brought to the same teacher, or to another of a precisely similar family, for by the third year only will the young bird be an efficient and reliable singer. The most valuable breeding birds will also make the most proficient teachers.

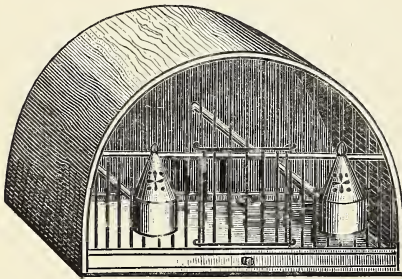
Darkening the Cages.—When the apprenticeship of the young birds is completed, and they have become accustomed to the small cages, that is, about four to six weeks after fledging, they should be gradually accustomed to “shading,” “covering,” or “darkening” of the cage. The latter is covered with a green or white cloth, so that the upper part, or the front only, remains open, or the door of the singing-box or the cupboard is gradually shut so that the bird cannot see the others of his tribe nor be deterred from “studying” by any absorbing influence; then the fourth side also will be gradually covered up and the resting-place of the bird will be more and more darkened. On the face of it, this may appear to be a great cruelty, but a closer observance of the bird will show that the vocal artist is very comfortable and devotes himself contentedly,

may, enthusiastically, to the perfecting of his song; in an uncovered cage, on the contrary, the young bird will often become a vociferous screamer instead of a delicate singer, and this will be particularly the case when many young birds are kept together. The loudest singers are generally suspended in the lowest positions, and the egg-food is occasionally withdrawn, while the other birds are enabled, precisely by that kind of nourishment, to follow their teachers in the most complicated "rolls" and melodies: a constant and attentive supervision of such vocal students is indispensable. Young birds which have been, at an early stage, separated from their teachers, or such as have been trained by but mediocre old birds, or, worse still, by females not belonging to the Hartz-tribe, will, although they may subsequently be placed under more efficient teachers, seldom become first-rate vocalists. In the former case, the bird, falling into the hands of an experienced guardian, and being kept aloof from all disturbing influences, may become proficient despite those unfavourable conditions, but he may also, as often happens, forget his finest melodies, or omit



SINGING CAGE.

them owing to the want of emulation of other good singers. In the second of these cases, one should beware of a proceeding by which a good tribe may be irretrievably spoiled, to wit: if it be attempted to breed select Hartz canaries out of females belonging to a more common stock, in order to invigorate them and to refresh their blood (a proceeding which, unfortunately, is anything but rare nowadays). This external success will, it is true, be obtained, but the young birds will, by no means, be as gifted as the old cocks. In the same way young birds which, after being placed into separate cages, will remain silent for weeks, or even months, will always be, and remain, bunglers in song. The best way for improving such birds will be to place them, together with a teacher, into another room; here they should be hung up as far apart as possible, whereupon they



SPECIAL ACOUSTIC CAGE.

will, in most cases, forthwith begin to sing. On the other hand, such birds as will sing in a prolonged and assiduous manner, and which, while singing, strongly inflate their head, sitting quietly and opening their beak as rarely

as possible, give promise, as is generally believed, of becoming good singers; for the deep gurgling notes, as well as the sonorous "hollow" and "bow rolls," as well as the deep chest tones, are generally performed with the beak closed, while high and thin notes are uttered with the open beak. In the middle, or at the end of November, sometimes even a month earlier, the best among the young birds will sing

completely. Such as are not fully developed at the end of December, will then but rarely become good singers. It is understood, however, that in the course of time the song will become more perfect.

Examination.—Buyers, dealers, and fanciers in the proper sense of the word, “examine” the young canaries, *i.e.*, they listen to their song and, amidst the singing of hundreds of birds, they will accurately distinguish the value of each individual songster—a task which requires, not alone great practice, knowledge, unerring judgment, and an accurate musical ear, but for which taste, above all, is necessary.

Nocturnal Singers.—The bird in its cage is, during the day, placed into a dark room, or his cage may be darkened by means of a dense cloth or of card-board, and he will be kept without either food or water. If he is subsequently taken into a well-lit room, and food and drink is supplied to him, he will sing as though it were broad daylight. This process must be continued for several days, and care must be taken to feed the bird sufficiently in the evening so that he may not be assailed by the pangs of hunger during the night; moreover, most male canaries will, in the evening, begin to sing of their own accord if placed in dwelling-rooms or other localities where anything lively is going on, and a bird which has once contracted this habit, will also always sing anywhere, as soon as darkness is replaced by artificial light.

Speaking Canaries.—Of late, the canary has shown himself to his patrons in a new and peculiar capacity, displaying a gift which was scarcely expected to be found among his attributes, *i.e.*, as a Speaking bird. The gift of being able to imitate human words has been hitherto confined to parrots, crows, ravens, or starlings, but now it is

also extended to a finch, viz., the canary. Considering that this new phase certainly claims our attention, I shall here summarise all the information hitherto collected on this subject, and, to my intense satisfaction, I am fortunate enough to be able to describe a speaking canary from my own personal observation. On the 23rd of April, 1883, I called upon the wife of Councillor Gräber of Princes' Street, Berlin, in order to see and to hear the small artist for myself. The lady regretfully observed that my call would likely be in vain, as the bird did not seem disposed to speak on that day. In the meantime she told me that she had received it when it was quite young, that it sang very prettily at first, but, having finished moulting, it suddenly became mute. This lasted a long time, and she often spoke to the bird saying, "Do sing, little birdie! How do you say widewidewitt?" "You may imagine my astonishment when, for the first time, the bird repeated the words which I had uttered. I scarcely believed my senses, and did not at all know what to make of it. When I told my husband what had occurred, he said, 'Take care not to let other people hear of this, or we shall be laughed at;' for not long ago, we ourselves had ridiculed the allegation that somebody had heard a canary speak." While the lady was giving me this information, the bird in question began most zealously to sing, and in the middle of his song it sounded as follows: "Widewidewitt." "How do you sing, birdie, mine?" "Sing, oh, do sing, birdie, widewidewitt." Again and again it repeated it, and the words sounded always clearer to me, until the lady laughingly remarked, "It seems as if he wanted to display all his art in your presence, for he has not, for a long time past, practised it with so much ardour." It is a robust, slender, pretty (although not regularly marked) bird of the common German species, and is distinguished by the great vivacity

of his movements. His song is inartistic, not by no means shrill or unpleasant, though our critical connoisseurs would at once class him among the "schappers." He speaks to his mistress only, and is not at all tame, but, on the contrary, very shy with other persons. Of course the canary does not articulate the words with a human sound, but rather weaves them into the midst of his song; thus the words mentioned above sounded quite like a harmony, and at the first moment one had to be keenly attentive, but, by degrees, they grew to be clearly intelligible, and we could hear the words with full distinctness, so that it was quite unnecessary to ascertain their meaning beforehand. It was in England where the first speaking canary was discovered. I only received a short time ago, through Mr. I. Abrahams of London, the well-known wholesale dealer in birds, the respective communication. In the year 1858 Mr. L. Leigh, Sotheby, mentioned at the meeting of the Zoological Society in London, that a canary which had been fostered by hand, when three months old, surprised one day its mistress by repeating the caressing words which had been addressed to it, and that it learnt by-and-bye other words. For hours he pronounces various words in different connexions, imitating the human voice.

Free Flying of Canaries.—Although it can only be looked upon as play, I will yet indicate to amateurs a proceeding by which the birds may be accustomed to fly in and out of their cage. A large canary-cage, in which there is a nesting pair, should be placed in a suitable room, an attic, for instance, inside the window, which is provided with a slide and can be opened on warm days, so that the birds get used to the air, until by degrees they can bear all its variations. As soon as the pair has young birds, the latter are taken out of the cage, and placed upon the nearest trees (three or four days after they are fledged); and when they have

been sitting there about an hour, they begin to answer the luring of the old ones. Soon afterwards they come flying to the cage to get fed. A sitting-pole will then be constructed in front of the cage on which they may sit comfortably while being fed ; and by the side of the hatching-cage, another cage is placed which has a trap-door and is convenient for capturing birds into this latter cage. Good food is strewed, so that the young birds get accustomed to seek it there, while, gradually, they learn to eat without assistance. In this manner the young birds are allowed to fly to and fro for about eight or ten weeks, and those which are fledged in the meantime, are then added. Towards October, as soon as the nights begin to get cold, the whole colony is captured, and all the young birds are locked up in a spacious room or in a large flying-cage, in which they can move about freely without losing their elasticity of wing. In the next spring, they are placed, in pairs, into hatching-cages which are put into various garret windows, and so contrived as to permit feeding from within, and opening towards the outer side. As soon as a female begins to hatch, the door is opened and the male is allowed to fly out, but the feeding takes place inside the cage only. From this time, one need not be anxious concerning the return of the birds, for their experience of the previous summer has accustomed them to flying in and out, and their sojourn in the open air has so strengthened them that they can bear any change of weather. The second and third brood will usually be produced on the trees, and it is then doubly pleasant to see them arriving in company with their young in order to feed. In the autumn they are naturally recaptured, and again liberated in the following spring. It is to be deplored that this process is practicable in such localities only where the birds can be protected against all depredators—especially against birds of prey, magpies,

and destructive animals of a larger size, such as cats, etc.

Mule (or Bastard) Breeding.—It is notorious that canary females will, under favourable conditions, consent to breed with birds of any other kindred finch species. It is believed that such breeding can only be attended with really good results when effected in separate cages. The same applies to canaries of the Dutch breed. According to Lenz, the *modus operandi* for breeding bastards is as follows:—Seeing that, in the hatch, a male will sing but little, in a disjointed manner, or not at all, it will be best not to couple it with a female, until the latter begins, of her own accord, to carry materials into the nest. This done, three females should be placed into a cage divided into three parallel partitions, but in such a manner that they cannot see one another. For the sake of convenience, one may also place the three cages in a row. As soon as the females begin to carry, the male will be permitted access to one of them; then it will, by means of green herbs, etc. be, after about six hours, enticed to the second, and, after a similar lapse of time, to the third. The nesting-space must, of course, be so arranged that he can, without inconveniencing the female, wander from one to the other; a habit which is not slow to contract. A breeder of bastards whose communications may be relied on, assures us that one single act of copulation between a goldfinch male and a canary hen, will suffice for several eggs, and even for a whole laying. The advantage of thus separating the females consists in this, that they cannot quarrel together; further, that they are not disturbed while hatching; and lastly, that the male will pass but little time with the female, and can devote his leisure to singing. The male must, however, be hung in such a position that he cannot see the hatching females. Even when a male is set to nest with one female only, it may be

lured away while the latter is hatching, and may be put into a separate cage. This separation of the sexes is always necessary when breeding bastards, especially with goldfinches, and still more with greenfinches, for the males but too frequently destroy the brood. Opinions greatly differ with regard to bastard-breeding, but it is generally established that, with great patience, attention, and intelligent care, very favourable and extremely interesting results may be obtained. It should be observed that successful broods have been effected only when canary-females have been coupled with males of another species, while, on the contrary, goldfinch females, etc., will much less easily nest with canary males. (Instances where canary males have produced bastards with goldfinch, linnet and other females, have, however, been reported lately.)

It is said, very plausibly, that bastard-breeding succeeds best in the open-air. The cage is placed in a position where it is safe from draughts, rain, and beasts of prey; and the birds are fed with such food as the males prefer when in a state of liberty. For the raising of young—egg-food, soaked bread, and chrysalis of ants, are likewise given. Good results can only be obtained when the cocks are young and have been taken from the nest and fed-up. Each of these will, in autumn, be placed together with the hen, separately from the other birds, so that they may get used to one another. In order to obtain a fine bastard, who displays the marks of his male parent, it will be necessary that the females be of one colour only, preferably of a bright or a whitish yellow.

Goldfinch-bastards generally learn to sing well and melodiously, and are persevering. Such as are marked with a "swallow" pattern, and have the head and the wings of the same colour as the male, while the rest of the body is of a clear yellow, are greatly in request. Those which,

on a yellow ground, bear all the marks of the goldfinch, more or less plainly, are much more common, but the rarest and most valuable are those which are of a pure whitish-yellow, with only a red mark on the head. Linnet-bastards are either simply of a brownish-grey, or yellow with grey spots, without a vestige of red. They are not handsome, but their sonorous, flute-like note is very pleasant. Greenfinch-bastards, which are either grey-green, or yellow with greenish-grey spots, do not sing particularly well, and are neither handsome nor graceful. "*Girnitz*" bastards, greenish-grey, or spotted yellow and grey, of smaller size and with a short, thick beak, have also no song worth mentioning. Siskin-bastards, grey, or yellowish-green, rarely spotted and also small, are said to be able to learn to sing very well, and to be persevering.

Fridrich asserts that, although in rare cases only, bullfinch-bastards may be bred and raised from a male bullfinch and a large canary female, or, *vice versa*, a young bullfinch hen and a large and robust canary cock; but crested birds should be avoided because the crest does not look at all well upon a thick head. The song is said to be low but very pleasing.

According to the brothers Müller, these rare bastards are bred in the following manner. One takes a hatching-cage which is divided in two by a grated partition; the bullfinch is placed in one of these divisions, and the canary hen in the other. The cage must stand by itself in a room, so that the pair can see or hear no other birds. In a favourable case, the bullfinch will soon feed the female through the railing. As soon as the pair are firmly joined, the railing will be replaced by a wooden partition in which there is a small door which may be closed, so that the birds cannot see one another. They will now be continually luring each other, and one feeds them for a few days with an exciting

food (hemp or egg-mixture), but keeps them still apart so as to augment their desire, and only when the longing has reached a very high degree, the bullfinch will, by the door, be admitted into the division occupied by the female, whom he will endeavour to force into copulation. In this manner impregnated eggs may be obtained which may then be hatched and raised by other birds.

Other kinds of Bastards.—In a like manner, bastards have been raised from mountain-linnets, “lemon” and “hemp” finches, field sparrows, etc., etc. A number of foreign finches are also qualified for bastard-breeding. Numerous breeders have already obtained bastards between canaries and the grey “girlitz,” or the grey “noble” finch. Mr. Bödicker of Stettin has bred some from a gold siskin or American goldfinch and canary hens. Lately some particularly handsome bastards have been repeatedly bred from the black-headed siskin of the West Indies. Besides these, the yellow-fronted “girlitz,” the “Hartlaub” siskin, the Cape canary, and many kindred birds, even the “Nonpareil” and the Indigo bird, are adapted for this sort of breeding.

Diseases.—Every canary, but particularly the Hartz-bird, is, when the care for his health is neglected, threatened by numerous diseases, and the reason for this is, that the manner in which the cultured bird is kept, entirely differs from the natural mode of the living of the wild bird. Professor Reclam says correctly that our yellow friend is the only scrofulous room-bird. The white rice-birds, bred in immense numbers, the Japanese gulls, of small size, then the “wavy-wing,” the Zebra-finch and other ornamental finches, are, however, not much less subject to this disorder than the canary. Only the most conscientious care in every respect will ensure the well-being of the bird, and he will then repay us by the pleasure and profit derived from his

song, nesting, etc., and will remain permanently healthy. In every case it is easier to prevent diseases than to cure them.

In modern times we have progressed, not only in the general care and the breeding of birds, but also in the knowledge, and, consequently, in the treatment of diseases to which birds are subject. As a result of observations extending over a great many years and of long investigation and treatment, men of science and experience, such as Prof. Zuern of Leipsic, have been enabled to establish a rational and systematic treatment of the diseases of birds, and having bestowed particular care upon the treatment of bird-diseases, founded partly upon my own experience, and partly upon the researches of Dr. Zuern, I am enabled to offer in my book a method of healing which promises great success.

All the remedies prescribed are procured partly from the chemist's, and partly from the druggist's shop, the solutions being always made in distilled water, unless some other liquid, such as spirits of wine, etc., has been expressly indicated. As the delicate constitution of the canary, first and foremost, requires the utmost precaution, I think it necessary to reduce the proportions of the doses to a minimum.

Signs of Ill-Health.—Every bird which does not appear lively and fresh; whose movements are not brisk, or whose eyes are not clear, but, on the contrary, dull and weak-looking; whose nostrils are dirty or cleaving together; whose plumage is not smooth and spruce, but rather puffed up, or, worse still, soiled at the abdomen; who sits moping, with drooping head, or is short of breath, and utters a smacking noise or a whistling note while breathing; who is indifferent to being approached, or is sitting in an apathetic posture, must be considered as being sick, and should at once be removed from the other birds. It is also to be observed that the breast of a healthy bird must be fleshy, and

the abdomen, which should be slightly receding, is of a yellowish-white colour.

Catarrh (of the Nose, Mouth, and Jaw).—The causes are : draughts, iced drinking-water, sudden lowering of temperature, and catching cold in general. The indications of illness are : sneezing, and a yellow, slimy efflux from the nostrils, which settles in a crust ; also a tremulous movement of the head and expectoration of phlegm. *Means of cure* : Warmth and dryness, inhalation of the vapour of tar (tar 1, hot water 100, to be put into a small bottle and held under the beak of the bird), inserting good fat by means of a small brush, cleansing the beak and jaw with a solution of chloric acid (1·100), cleansing the nostrils and the beak with a feather dipped into salt water, and rinsing with oil of almonds. In popular diction every disorder of the breathing-organs of a bird is called "Pipps." The remedies prescribed by the ignorant are to scrape the heated and dry tongue of the poor bird with a pen-knife or a piece of whale-bone, or to pinch the tip of it off with one's finger-nails. This procedure is, of course, only a useless, fruitless cruelty, and should never be resorted to.

Catarrh of the Windpipe (also Inflammation of the Throat.)—The causes are the same as above, and the signs are hoarseness or complete loss of voice, cough, quickened breathing attended by a rattle in the throat. *Remedy* : Doses of sweet substances or liquids, such as honey or sugar-candy and pure liquorice juice ; further, a mixture of ammoniac ($\frac{1}{2}$ gr., honey, 3 grs., fennel water, 10 grs.) ; several drops in a teaspoon several times a day ; extract of a dulcamara (1·500), two or three drops twice a day ; also a weak fomentation of "wood-vinegar" or tar (see above), the vapour of which is to be inhaled ; tepid water ; brushing out, deep down into the throat, as well as the nostrils, with

acid of "salicyl" mixed with water (1·500). Relief is afforded when the bird is kept in warm and damp air, lukewarm water being sprinkled around him several times a day, while the room will be heated to about 18·24 deg., Réaumur or Fahrenheit. The most delicate amongst the songsters are often attacked by hoarseness, owing to their singing too loud and too assiduously. In such a case, the bird is taken into a separate room, or, where there are no other singing-birds, his cage may be simply darkened. Both methods will prevent the continuance of his song. It has also been found serviceable by some to give raw egg with sugar, pounded barley or malt sugar in water, or egg-food, or a meal-worm dipped in oil; but these methods are not backed by adequate experience, so that I can only leave it to the option of the reader to make experiments. Hoarseness and shortness of breath may also be the consequence of excessive obesity. In that case the bird should be deprived of egg-food, biscuit, and all other nourishing food, and should be kept for several weeks on rape-seed and green herbs only. Lastly, it is said that, in the case of the delicate Hartz birds, hoarseness may also be produced by feeding them with canary-seed. A continuance of the subject will be found in the part treating of Consumption.

Inflammation of the Lungs. — *Symptoms*: A smacking noise, difficult or quick breathing, with a whistling sound, and the beak wide open, a hot breast, melancholy, absence of appetite, a clearly perceptible fever, painful cough, ejection of yellow phlegm, sometimes streaked with blood, and the smacking or panting sound particularly audible in the evening and during silence. *Remedies*: Warm, damp air, as explained before in catarrh, pills of carbonate of ammoniac (a 00·1 gr.), with powder of "Althea" and water. A small pill to be given at a time, twice or three times a day; or purified saltpetre (0·102-

0·103) in water to be given every three hours; also Chili-saltpetre of the size of a poppy-seed grain in water. In cases of inflammation of the lungs, the same course as with catarrh of the windpipe will be pursued.

Pulmonary Consumption (*Tubercles*). — *Cause* : Hereditary, or breeding in over-heated places. *Symptoms* : The same as with pulmonary inflammation, but in a higher degree. *Cure* : Impossible.

Breeders and dealers in the Hartz recommend particularly nourishing food, such as a mixture of hard-boiled egg, grated wheat-bread and brown candy, on which a bird may, it is true, continue to exist for some months, but its song remains weak, and the bird must never be used for breeding. Böcker suggests water from the mineral spring at Ems, for drinking, and rape-seed moistened with a few drops of cod-liver oil, as a possible cure. Even the most expert connoisseurs cannot determine, upon examining the voice of a hoarse bird, whether the latter is incurable, *i.e.*, consumptive or not. Böcker says: "In the case of a fine 'rolling' bird, a weak, thin voice is considered to be the forerunner of hoarseness, but as the latter at the commencement generally becomes apparent only in the early morning, or late in the afternoon, it frequently escapes the notice of visitors or buyers at a strange breeding-establishment whose 'examining' time is usually limited to the middle of the day."

The Windpipe Worm is one of the most destructive animal parasites, and is found in all kinds of room-birds and yard-poultry. It appears in the form of a leech, is cylindrical in shape, but pointed towards the back, and of a reddish colour. In males they are 4·5 m.m., females 12·13 m.m. long, 0·15-0·16 m.m. thick. Its eggs are cylindrical, 0·11 long, 0·1036 m.m. thick, and its mouth has a strong suction-

cap with which the creature fastens upon the membranæ of the head of the windpipe, or upon those of the pipe itself, singly or in numbers, thus producing the effect of "cupping." It causes a swelling, a reddish appearance, a thick, tough crust of phlegm, and thereby, as well as by the bulk of its body, which increases through continuous suction, it produces suffocation. The symptoms are: A peculiar cough, a tremulous movement of the head, laboured breathing, opening the beak wide, gasping for air, and throwing out of phlegm. Contagion is produced by other birds eating up the phlegm of the sick bird, in which the eggs of the parasite are found in immense numbers. *Preventative measure*: Strict isolation and minute observation of the sick bird, a dry and well ventilated dwelling, and scrupulous cleanliness, also a thorough scouring of the cages and walls, as well as the feeding and drinking utensils, with hot soap-water and carbolic acid. *Remedies*: Inspection of the head of the windpipe and extraction (with pincers) of the worm, introducing pure oil of turpentine or benzine, inhalation of steam of creosote (a red-hot iron being dipped into a solution of 1c. and 500 water), and a dose of a few drops of linseed oil.

Diphtheritis and Croup is produced by vegetable parasites called "gregarines."¹ *Symptoms*: Coughing, sneezing, difficult breathing, with open beak, shaking of the head, an excretion of sweetly-smelling phlegm, and difficulty in swallowing, gasping for air and increasing difficulty in breathing, accompanied by a snore and a rattle in the throat, increasing debility, sitting on the ground, with drooping wings and closed eyes, almost always attended by intestinal catarrh, with slimy and watery evacuations, also a trembling and

¹ Gregarines or Psorospermies are microscopic infusvriæ which lately have appeared in herds (grex), and are considered to be vegetable organisms, causing grave illnesses to men and animals.

shivering and thirst. The seat of the disease is in the *pituitous* tunic of the mouth, jaw, and head of windpipe, the pipe itself, the bronchies and the gut; also the nasal membranes and the cornea of the eye. A yellow, slimy moisture, settling in a dark yellow or brownish crust, flows from the nostrils; the eyelids become swollen and glued together. The duration of the illness is of two weeks at the most. *Preventative measures*: Inspection of each newly-acquired bird, and isolation of the same for the purpose of observation, strictest isolation of every sick bird, immediate annihilation of the carcass of the dead, and most careful cleansing of cage and utensils with carbolic acid mixed with water. *Means of cure*: The principal task will be to prevent contagion, which may be spread by the slightest contact with the excretions of the parts attacked; daily doses of 1 drop of carbolic acid in the drinking-water (1·500), and sprinkling this solution with a "spray" over the diseased parts; the crusts of sores must be softened with mild grease, but not torn off by force; also brushing with a solution of caustic. Then brushing again with a solution of common salt (1·100), for the eyes, a solution of salycilic acid (1·500), and a solution of copper-vitriol and also of tannin (1·500). For internal use, chloric acid of alkali (1·500). Two or three drops three times a day are given, and externally the parts should be brushed over with the same solution, but, in most cases, cure is impossible.

Debility of Digestion.—*Symptoms*: Want of appetite, little evacuation, excrements brown and hard, lassitude. *Causes*: Unsuitable or spoiled food, producing an abnormal state of the gall and of the gastric juices. *Remedies*: Light food, little green food, some salt, and tepid drinking-water. Much benefit is derived from lukewarm claret, about two or three drops in the water. In England a shell of cayenne pepper, or an infusion of it, is given.

Flatulency manifests itself by a flat, white swelling, and declares itself mostly in the case of young birds, often before fledging. It is caused by impaired digestion, and is also produced by abundant, spoiled, or unsuitable food. When in a mild form it is curable by a cautious pricking of the pimply swelling. This causes the air to escape, and the spot is then tipped with warm oil. Nestlings should also be wrapped in soft, loose wadding. A further remedy is to feed the sick, resp. the old birds, sparingly and frugally.

Abdominal Inflammation, Inflammation of the Bowels, Mortification, and Gastric Inflammation.—*Causes*: Catching cold, iced drinking-water, spoiled, or too abundant food, also the consumption of seeds which are too fresh, or of wet green-herb. *Symptoms*: A downward bending of the abdomen at a whipping movement of the tail during evacuation; inflated and reddened abdomen (in the Hartz, this disease is therefore called the red sickness), and a perceptible projection of the breast-bone, excrements of an evenly blackish-green colour, (instead of being calcinous in part, and in part blackish) and sour or ill-smelling; ceasing of the desire for food, a full crop, and great thirst.

This illness is extremely contagious, and therefore transferable. If the watery excrements should, somehow, come in contact with the food, in such cases the illness becomes epidemic. *Cure*: Isolation of every sick bird, location of the same in an evenly heated room (18-20 degrees of Réaumur or Fahrenheit); stopping of all soft food, of soaked seeds, green herbs, and fruit, etc. The diarrhoea must not be stopped, but a drop of simple opium tincture should be given, or some red wine in water. *Food*: Some poppy-seed, rice water, burned magnesia to be mixed with water and given as a thin pap, and finally a solution of nitrate of silver (1·800). In most cases, however, the birds are lost.

Diarrhœa (Intestinal Catarrh).—*Causes*: With old birds it usually results from sour or spoiled food, but, in the case of young ones, it is often caused by catching cold. *Symptoms*: Whitish or yellow, slimy excretions, cleaving together of the feathers at the lower body, or even an inflammation of the posterior aperture. *Remedies*: Withdrawal of green herb, warmth, spreading some warm oil or balm of nutmeg over the abdomen, feeding with poppy-seed; and for each bird one drop of tincture of opium, given daily in the drinking-water. In cases of dysentery, which latter shows itself by a strong pressure and by a wagging movement of the lower part of the body, and slimy or bloody excretions, two or three drops of ricinus-oil with a thin oatmeal gruel, also well diluted tincture of rhubarb (one to three drops to a medicine glassful of water, daily), and an oil-clyster are given. The feathers at the abdomen, which are cleaving together, must be washed with warm water, whereupon the inflamed parts are anointed with almond-oil.

Calcinous Diarrhœa.—*Causes*: Bacteria and other microscopic vegetable parasites, which are easily transferable. *Symptoms*: Strong diarrhœa, with excretions of a thin, whitish-yellow phlegm, which, later, turn to a greenish colour and strongly soil the abdomen, want of appetite, a dejected attitude, drooping wings, debility, and sometimes vomiting of a thin, greenish pulp, strong thirst, trembling, strongly ruffled plumage, dizziness, and death amidst convulsions. *Preventative measures*: Strict isolation of every sick bird; a most careful disinfection by means of chloric water and extreme cleanliness. When the disease has broken out, the birds which still remain healthy should be given a solution of sulphuric oxid of iron (one to three drops in water), during a fortnight. *Cure*: The same solution as above, three or four times a day. At Andreasberg they give

powdered rhubarb with sugar mixed among the food, but it is hardly possible to save the birds.

Obstruction of the Bowels may arise from various causes, but it is chiefly engendered by an impaired digestion. *Symptoms*: Pressure to excretion, a jerking movement of the back part of the body, ruffled feathers, dejection, want of appetite. *Cure*: First of all the attempt to produce mechanical excretion by means of the insertion of the eye of a needle steeped in oil (ricinus and olive-oil in equal parts) into the aperture for excrements; also a simple water-injection given by means of a fine india-rubber syringe ending in a thin point of blown glass. Doses of castor oil with gruel (one to two drops once or twice a day), scraped, sweet carrots and green food are also suggested as aperients.

Dropsy.—*Cause*: Catching cold, inflammation of the abdomen, also caused by other disorders such as tubercles in the entrails. *Symptoms*: Difficult breathing at the commencement; and later, swelling of the body; and when at its height, a clearly perceptible moisture in the affected parts. It is rarely curable.

Fattiness, Obesity.—*Cause*: Bad feeding and tending. *Symptoms*: Difficult breathing, panting, ponderous movements; hard, or, at least, thickish excretion; and, on closer inspection, a very full body cushioned with fat, a slack, wrinkled, inactive skin, also bald spots. *Cure*: Reduce food, much green-herb, in case of costiveness, ricinus-oil will be given once or twice a day, in doses of from one to three drops, and lastly, a spacious cage, and frequent bathing.

Emaciation is not, in itself, an illness, but only a morbid symptom in various phases. Sometimes it is merely the consequence of an impeded digestion, but in most cases it originates in various disorders of the organs of digestion,

or inhalation, or of some other parts of the body ; it may also result from a suppuration of the gland of the croup, and can therefore be cured only after the various causes have been ascertained and removed.

Disorder of the Gland of the Croup commonly called "Pipps"—(Fatty gland)—this latter yields the fat necessary for the preservation of the plumage, and, in the case of all caged birds, it easily gets out of order. Most frequently the gland becomes too replete with masses of fat which get hard and then suppurate so that the gland resembles an ulcer, erroneously called "pipps," and which is, irrationally enough, cut off, or squeezed out, with a view to healing it ; this process often endangering the life of the bird. *Cure* : Careful inspection as to whether the gland really contains pus, or only hardened fat. In the former case, warm olive-oil should be spread over it twice or three times a day, much green food should also be given. Exercise must be promoted, and the effected part cautiously bathed in tepid water ; but if there really be pus in the gland, then a careful cut should be made, the gland gently squeezed out, and, according to Zuern, brushed out with a solution of acid of "Bor" (1·100). In case of an inflammation of the croup-gland (mostly attended by diarrhœa), the nearest feathers should be removed, a poultice of goulard water or lead-water put on, a solution of carbolic acid will be spread over the part (1·100) (Zuren). Then grease will be laid on, or an ointment of glycerine or of zinc. Those who are charged with the selection of birds, will sometimes find on the belly a small wart of a fatty appearance, which is only found upon males, and is perfectly harmless.

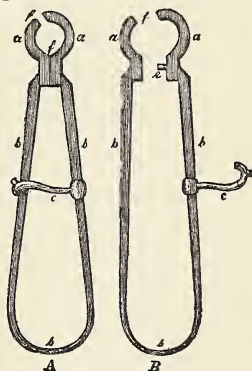
The Sickening of Females While Laying.—*Causes* : Females who are yet too young or which are weakly, faint, or sickly, or, on the other hand, females affected with

fattiness, a lack of calcinous substances required for the formation of the egg-shell, being disturbed immediately before laying, during which latter a stoppage of the eggs may also occur. *Preventative measures*: Nourishing and abundant food for the lean females before they are brought into the hatch (not before the middle or the end of April). In the case of very fat females, the egg-food should be withdrawn during six weeks; and they should be fed with rape-seed only. Eight days before installing them one should begin to feed them copiously, and they should, if possible, be coupled with the males in February. All breeding birds should be provided, all the year round, with lime and with good dry sand. In order to avoid the laying-sickness, Böcker gives to every female a morsel of fresh lard daily. This method has been attended with the best results, and is beneficial also to sound females and to males. *Cure*: A steam-bath. The bird is placed on a cloth, folded several times, over a pot full of hot water, but so that, although thoroughly heated, it does not get scalded; it is then quickly wrapped in loose cotton which has previously been warmed, and covered with another cloth, so that only the head remains exposed, and in that state it is laid down in a warm spot, on lukewarm sand, if possible, until it is thoroughly dry. It must then be located in a very warm room, near the stove, and must be kept as quiet as possible. Later on, some warmed oil is inserted into the laying-tube, in the same manner as has been indicated for the clyster, but in this case it should be done with the head of a good-sized pin. The tube should be carefully widened until the egg is reached, which must be sought for, if necessary, and must, when found, be gently squeezed out. A projection of the gut or of the intestinal canal occurs sometimes. The projected gut of the respective tube must be washed with lukewarm lead-water by means of a small piece of soft linen

rag or a piece of lint, and then softly and tenderly pressed back. At the same time a drop of a mixture, half castor-oil, half Provence-oil, must be given daily for about five or six days. The mixture might be given on a small piece of soft bread. Should the excretion get thin and watery, the oil-mixture must be stopped, and one to three drops of claret given if diarrhoea continues.

Sweating Sickness.—This disease sometimes assails females while nesting. A finger placed underneath the firmly-sitting bird will feel quite wet; the eggs get spoiled, the young perish, and, frequently, the old female dies also. In the first instance the latter must be driven from the nest, and if that is of no avail, then the male is caught and taken out, so that the hen is compelled to come down and seek her own food. In some cases a cure has been effected by the cooling occasioned by this procedure; a similar result is obtained by taking the hatching hen and her nest away, and placing both in a separate cage. This will be done in cases where, as in the bird-room, for instance, the respective male cannot be caught. Of late, good effects have been produced by occasionally bathing the body of the hatching bird with salt water. Much more frequently, however, young birds alone are subject to the sweating sickness, and this is evidently owing to an impaired digestion. *Prevention:* Best and most suitable food. Mr. Götschke of Berlin uses the following remedy: When the young are three to four days old, and the illness is noticed, one after the other should, by means of a small pair of pincers, be placed into a warm bath of 30 degrees. The bird is immersed as far as the head (which latter will be washed by means of a soft painting-brush), and it is then taken out, wrapped in soft tissue or blotting-paper, and allowed to dry in some very warm place. All the young birds will be treated in this manner, and when the nest has been carefully cleaned and

has been lined with a clean linen rag, they will be replaced, and the nest located in its former place. The female immediately returns to her young, dries them by the warmth of her body, and, after a few hours, they are as woolly as before, and greedily open their beaks. This process must, in the most unfavourable cases, be continued on every alternate day, up to the tenth; and by that time both the old and the young birds will be completely restored to health and cheerfulness.



BATH PINCERS.

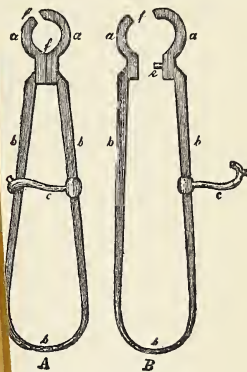
Liver-Complaints.—*Causes*: Bad, spoiled food, and overcrowding of the nesting-places. *Symptoms*: The so-called “liver-spots,” want of appetite, fading of the plumage. If the spots are small, the abdomen not puffed up, and the bird is still continuing to sing, then it does not matter much. Dry food should be given in such cases, and the bird should not be used for breeding, for it will have diseased young. But if large spots of a violet-brown colour are noticeable, extending broadly across the body, especially over the right side of it, then the liver is inflamed and swollen, and the bird can hardly be saved. In the Hartz, birds suffering from that disease are kept very warm, and are fed with poppy-seed, linseed, and a little rape-seed. The young which come from such birds are generally diseased even in the egg, and rarely attain maturity. The liver-disease easily develops, both in young and old birds, into the contagious abdominal inflammation, spoken of previously.

Jaundice.—*Cause*: Unsuitable, or too abundant feeding; and owing to intestinal catarrh, the passage by which

rag or a piece of lint, and then softly and tenderly pressed back. At the same time a drop of a mixture, half castor-oil, half Provence-oil, must be given daily for about five or six days. The mixture might be given on a small piece of soft bread. Should the excretion get thin and watery, the oil-mixture must be stopped, and one to three drops of claret given if diarrhoea continues.

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HERBERT, FRASER & CO., RODNEY-PLACE, NEW KENT-ROAD, LONDON, S.E.

[15,319.]—GOLDFINCHES AND LINNETS.—

For a dozen or two hard boil an egg each morning and rub through a sieve with an equal weight of plain biscuit (I use Middlemass' Digestive). I also provide grated boiled carrot, and crushed hemp, linseed, and canary. Hardheads, thistle seed, and properly harvested plantain are useful additions. Give shell gravel, which with all foods must be fresh daily, water also, and use a large cage covered over for say ten days.—A. J. L. JONES, 6, Fitzroy-street, W.

[15,320.]—ACCUMULATORS.—A 4-volt lamp

will require a two cell accumulator, and a 6-volt lamp three cells, the cells being connected in series, and if charged for eight hours at full strength (i.e., change the bichromate solution every three hours) by a battery having one cell more than the number of cells in the accumulator would probably light lamp for six hours if the accumulator is carefully made. Each cell should be constructed as follows:—Interior of cell about 6in. by 4in. by 1in.; take two plates of clean lead $\frac{1}{8}$ in. thick having tags of lead left on upper edge for connecting up, score them horizontally with a knife so that when in the cell they are like files with the teeth pointing upwards, make a stiff paste of red lead and diluted sulphuric acid (one acid, ten water) spread this on the plates about 1-16 in. thick and wrap round with flannel, two plates should then be fixed side by side in the cell with rubber bands and small blocks of rubber or glass between to prevent touching one another. If desired the cell may now be sealed at the top leaving a gas vent end opening to pour in solution (dilute sulphuric acid 1 to 10) which should just cover the top edge of the plates, the cells may now be connected in series, and "formed" by a long charge of about twenty-four hours, the direction of the current being reversed every four hours. After this they are ready for the ordinary charging and use as above described. If all this is too much trouble (as no doubt it would be unless experience is sought) all parts, cells, plates and finished accumulators and re-charging can be had at most electrical shops at moderate prices.—P. W. J.

the gall is conducted into the gut is closed, and produces a stoppage, absorption of the gall into the blood, and, consequently, jaundice. *Remedies*: bitter-salts (0·02 gr.) in water, once or twice a day, to produce relaxation of the bowels, also an infusion of "calmus"-root (1·100), a few drops twice or three times a day, besides this, light and frugal food; green herbs should be also given.

Formation of Tubercles in the Liver.—*Postules* (small-pox). Böcker says: "Whenever this disease appears in a hatch the birds are usually lost, one and all. It commences by the formation of small postules on the head, on both sides of the breast, and at the abdomen. Every bird attacked by this illness will perish within a few days, a cure being out of the question; and every effort should be made to arrest the spreading of this extremely contagious malady."

Apoplexy.—*Causes*: Great excitement, fright, fear. Further, strong heat, too much hemp-seed in hot weather, and a sudden and excessive rush of blood, also fatty degeneration. *Symptoms*: A peculiar slanting position of the head, rolling of the eyes, tottering, or a backward movement, giddiness, and a rapid death amid convulsions. *Preventatives*: Avoidance of the influences mentioned above, muriatic acid in water, every day (one drop to a glassful), frugal food, and much green-herb. *Cure*: Cold water on the head, applied with a sponge, and ricinus-oil as an aperient.

Convulsions, Epileptic Fits.—The bird suddenly drops down, amid violent convulsions, flapping of the wings, and giddiness, or it begins to tremble, totters, rolls its eyes, twists its head round, falls down, and kicks convulsively. *Causes*: The same as above, but, additionally, the being kept in too narrow a cage; too much heat, whether produced by a stove or by the sun; unsatisfied sensual desire,

etc. *Remedies* : Much green herb and fruit, cool fresh air, change of locality ; and when the fit seizes the bird, he should be held in the hand so as to prevent his knocking himself about, and thus sustaining an injury, and also in order to afford him some relief ; I cannot advise the having recourse to the usual barbarous remedies, such as, cutting off a toe, or otherwise bleeding the bird. Canaries which are subject to epileptic seizures are extremely timorous, and emit a peculiar sound while feeding. If the seizure happens once only, it is of no consequence, and only when it is repeated, that the remedies should be applied, and, above all, the cause should be ascertained. Giddiness is produced either by a continuous gyration in the narrow, round cage, or by knocking against a sharp angle, whereby the skull is injured, or by animal parasites in the brain. *Symptoms* : The head is held in a slanting position, the body is bent backwards, gyrations around himself, reeling, falling backwards amid convulsions. In the first of these instances only, a cure may be effected by using a square and spacious cage, in the other cases, a cure is scarcely possible.

Eye - diseases.—Swelling and inflammation of the ligatures are produced by cold. *Symptoms* : Watering of the eyes, swelling of the lids (aversion to light). *Remedies* : Moistening with lukewarm solution of “chlor.” (1:600) ; the tunics and the cornea of the eye may also become inflamed by knocks or bites. Also cooling with rose water, moistening with a solution of vitriol of zinc or of a mixture of potash and opium (p. 1 : 200, o. 1.)

Gout.—Gouty and festering inflammation of the joints. *Causes* : Cold or a hurt ; also sitting upon poles which are too narrow or too angular. *Symptoms* : Diminishing appetite, fever, swelling of the joints of the feet and wings. These swellings are, at first, firm, very red, warm and pain-

ful, later they become soft, and contain a moisture composed of blood and pus. After that, they grow hard again, and contain a bilious and cheesy substance. Sometimes, after some weeks, they heal of themselves, but usually a permanent thickness of the joints remains, or a slow emaciation, wanness, strong diarrhœa and death from exhaustion, may, in some cases, be the consequence. *Remedies* : Dryness and warmth ; if the swelling is inflammable and hot, cooling with lead or vinegar-water is advisable, friction with spirits of camphor. Also wrapping-up in warm woollen stuffs. If the swelling is festering, it should be cut, but not too soon ; brushing out with carbolic acid and water (1·200), also squeezing out ; but in both cases a dose of salycil-acid and water (1·500) will be given internally ; the unsuitable sitting-poles must be removed at an early stage and must be replaced by proper ones.

Rheumatic Complaints which appear as a painful paralysis without any swelling of the joints, and which are likewise produced by cold, principally by draughts, I have, as a rule, cured by means of friction with warm oil, and by wrapping up the affected limb with a warmed woollen cloth. It need not be said that the patient must be kept in a well-warmed room.

Wounds of birds generally heal of themselves, after having been cooled by washing them out with a sponge saturated with water. In the worst case, they are cleansed with arnica-water (1·25-50), and then brushed out with oil of carbolic acid (1·200 Provence-oil). Likewise, if a bird is entirely left to itself, the healing usually takes place in a very short time. Every wound of a bird, if not very large, closes itself in this manner that the nearest feathers and other light stuff over it stick to the blood, and thereby a bandage is formed by nature of itself.

Fractures, too, heal with a surprising facility in the case of birds. The simple fracture above the ankle wants nothing but rest in order to heal again completely. It will, of course, be better to pull the two ends of the bone into their proper position—they will then be inserted between two smooth pieces of wood (according to Zuern, slips of pasteboard, or, better still, thin Norwegian splints should be used). These will be tied with a firm but soft thread and some pulp of gypsum, or some thick, moderately warm joiner's glue (or, if you have not this in the house, gum) will be spread over the whole; the bird should be held fast until it is dry, and then be put into a narrow cage. In about a month the bandage may be carefully removed by softening it with water. If the fracture be at the wing, the feathers must, of course, be cut off, but in no case should they be plucked out. Zuern advises to tie a woollen bandage over the injured part, to cover this with a linen band steeped in the solution, and to spread some powdered chalk over the latter. This kind of bandage is said to offer the advantage of being adhesive, and yet easily cut off.

Ulcers.—Hard ulcers are softened by placing upon them a warm poultice with some grease. A very much inflamed, hot and reddened swelling, will be cooled by an application of lead water, and, subsequently, a warm poultice. A mature, suppurating ulcer may usually be emptied by means of an incision, without incurring any danger. After squeezing it out, it should be covered with salad oil, mixed with carbolic acid (1·200 Prov. oil).

Cutaneous Ulcers.—Principally forming at the head, near the beak or the eyes. Such an ulcer is neither hard nor soft, and is filled with a skinny compound. It either spreads out very much, or it grows deeper, and, in either case, it causes great inconvenience and pain to the bird.

While it is small, and sits loosely in the skin, it may be removed by cauterising it with caustic stone, or, better still, by severing it by means of a thin, but firm thread or hair. Most frequently, however, such ulcers result from internal corruption of the juices, and the local removal of one of them can be of but little use, because new ones will continually be forming. In such a case the bird can only be saved by strictly depriving it of all unsuitable food. Doses of salicylic-acid with water (0,01 : 300) for about two to three weeks may be of service.

Deformities of the Beak.—If the upper part of the beak grows over the lower to such an extent as to inconvenience the bird while feeding, it should be repeatedly rubbed over with warmed salad oil, after which it must be reduced to its natural length, by skilfully cutting it with a very sharp knife. It would be easier to do this with pincers, but it is more dangerous, as the quick, fleshy kernel of the beak may be injured thereby. In every case one must beware of breaking or tearing it in such a manner, for if not, splits in the horn of the beak, reaching as far as the kernel, is the consequence, and these are difficult to heal—if they can be healed at all—and will always burst again, causing much pain to the bird and hindering him from feeding, so that he is likely to succumb. A split in the horn of the beak will have to be cleansed once a day with a painting-brush, and then brushed out with a warm oil-mixture. An injured beak, and sometimes even a healthy one, may suddenly begin to “overgrow” by unduly increasing at the point, and developing a filmy split at the same time. *Cause*: Deficient or unsuitable nourishment of the horn, and a peculiar irritation of the same. Such a beak can be, without much trouble, cut again to its former size, and yet the bird will frequently perish through it, because

the horn will then continue to grow to an increasing length, and will, at the same time, become soft, brittle or flexible, and, therefore, unfit for cracking hard grains. The only remedies are: suitable nourishment, small doses of lime and sand, and avoidance of soft food.

Diseases of the Feet.—If a bird's foot is neglected, inflammation, suppuration, smaller and larger ulcers, will easily form beneath the layer of dirt, and these may lead to inflammation of the joints, to the decay of a toe, or even to the loss of the whole foot. Timely bathing in warm water, cooling the inflamed foot with lead water, brushing the affected part daily with diluted glycerine, and afterwards thickly powdering it with the finest starch meal or baby powder, will produce a speedy recovery. In very obstinate cases, the parts should be rubbed over with white-lead ointment, the foot will then be placed into a small leather bag, which will have to be firmly tied, because the salve is poisonous for the bird. More serious are :

Indurations, which produce either ulcers in the joints (knots), or corns ; in the first case, the treatment will be as above, but in every case the original cause is that the sitting-poles are too thin, too hard, or otherwise inconvenient, and must be removed ; and enlarged corns must be softened by a vinegar poultice or by rubbing them with warm Provence oil, then washed with warm water and soap, and carefully peeled away with a small, sharp knife. If a sharp, tough film has wound itself round the joint of the foot, and, by cutting into the flesh, has produced inflammation and suppuration, the film must be removed by means of sharp pointed scissors (first cleansing as above), and the foot, having been anointed with glycerine-salve, will heal of itself.

Yellow Ulcerous Knots will, in consequence of internal maladies, be formed at the legs, especially between

the toes, and these must be treated the same as other ulcerations, but, generally, they will disappear only when the causes of the illness from which they originate, have been removed.

Diseases of the Plumage are caused, partly by tiny parasites which settle in the skin or in the feathers, and partly, also, by an internally diseased condition. The former exist in numerous varieties, and produce either eruptions resembling the itch, or the destruction of the feathers. *Symptoms* : The bird frequently scratches himself with his beak, and often tears himself sore ; the feathers, in some parts of the body, become brittle. *Remedies* : If the parasites prove to be bird-lice, the advice given previously on this subject should be followed. Feather-insects, etc., which settle in the plumage only, damaging it, are also combated by brushing the parts with tincture of insect-powder or Peruvian balm, and by gently greasing them with Provence-oil, after having bathed them with soap and water.

Moulting is also, in a certain sense, to be counted among the diseases to which birds are subject.

There is not a period more trying to the fancier and the breeder of Hartz-birds than the annual moulting season. It may be that the first and second hatch were not quite satisfactory, and the third brood is expected to offer compensation for the loss, when there appear the first traces of the injurious consequences of the moulting. The most zealous hatchers among the females leave their nests. In other cases, empty "layings" are found in the nests, a proof that the moulting males could no longer productively "pair" with the female ; the song of the cocks grows weaker and weaker, and, at last, becomes hoarse. The birds, usually so lively and cheerful, sit moping with ruffled plumage, and the

anxious question arises, whether this or that excellent songster will get over the moulting. The young birds, too, give less satisfaction, for, although they suffer less from the first moulting, yet, while their song was being rapidly perfected as long as the old birds were singing, they now perceptibly recede, and many a young bird sings less well than he did some weeks previously. The more delicate the canary, the more care does he require during the moulting-time. The songster should, as is done at the Hartz, at this time be then taken into a well-warmed room—even when he has already been weaned of the higher temperature. He must, moreover, now get nourishing and abundant food, including egg-food, also lime and sepia. He must be kept scrupulously clean, and should, altogether, be carefully tended. All injurious influences, such as draughts, strong and rapid variations in the temperature, damp and cold, etc., handling, sudden fright, or a state of fear, should be carefully avoided. The females, too, should have more nourishing food during the moulting season. Old Bechstein recommends a repeated application of lukewarm water in case of a heavy and morbid moulting, as also when the young are not in good condition. If the old, dry skin remains on the legs, when the new has already appeared, the legs should be rubbed over with Provence oil, and, after five or ten minutes, the old skin should be carefully removed. This must be done because the latter causes much pain to the bird, and may even produce inflammation, through cutting into the delicate new skin, and consequently into the flesh, while the bird is moving about.

Egg-Bound.—Messrs. Potts and Homer write: “This complaint proceeds from cold, and especially the coldness of the spring weather, which is so very uncertain in England; therefore, you will find it best not to put your birds up too early, but let the weather be settled a little; the last week

of the March month is generally early enough to put them into the breeding cage. Cold weather likewise causes your birds to have soft eggs, that is, no hard shell when laid. Therefore, begin not too early, especially as we recommend a room without any fire; remember to give the bird a little moist sugar with the bread and egg, which will cause a slipperiness and openness for the egg. Should you find the hen very bad, and scarcely able to move, or down in a bunch at the bottom of the cage, take her gently out with a warm hand, and anoint the abdominal part with two or three drops of warm salad oil, or the oil of almonds; this will relieve her, and you will find her lay or drop the egg about the cage in two or three hours after, or by the next morning. This happens frequently with a maiden hen; and the last resource, if the above means are unavailing, is to gently introduce one drop of castor oil down her throat by means of a quill or pen."

A P P E N D I X .

THE following concluding hints may be found of service:—

It is very necessary that the canary breeder should take an interest in his fancy, and be prepared to give up to it a certain amount of time and thought.

In pairing, the peculiarities of each individual bird should be consulted.

Cleanliness is of the utmost importance. In the matter of purchase, it is as well to learn as much as possible concerning the breed and habits of the purchased bird.

Keep a diary of laying, breeding, hatching, &c. Mule breeding is done better in the country than in a town.

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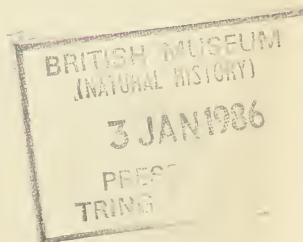
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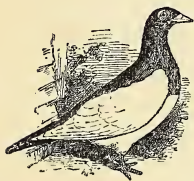
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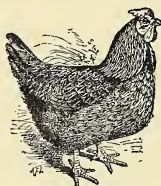
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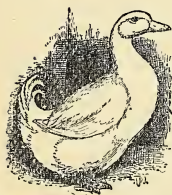
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