

N.N.W. Sunset-glow intersected by five horizontal dark cloud-streaks in the west. On the 2nd inst., at 4.20 p.m., five cumulostrati were visible in the west, separated by parallel and horizontal orange-coloured bands. Above these were numerous (probably twenty) delicate dark lines traversing—also horizontally—the upper roseate after-glow. On the 10th and 11th inst., somewhat similar phenomena were visible here. On the 15th inst., with a light southerly air, eleven cloud-bands were seen by me at 4.30 p.m. In this case only, they were not parallel to the sea-line, but followed the direction of the west-north-west horizon. I have seen the same appearances once or twice since the last date. The above phenomena are new to me, and I have not met with any detailed account of them elsewhere. I have therefore ventured to address you on the subject. Can these cloud-streaks represent stratified air-dust in the upper regions of our atmosphere?

W. AINSLIE HOLLIS

Hove, Brighton, December 26

Iridescent Clouds

THERE was a very striking display of iridescent clouds this afternoon. I noticed it first at about 3.40 p.m. The prismatic colours were pretty strongly marked, and the intense pearly brilliance of the delicate cirri was most striking. It is still visible (4.40 p.m.), though, of course, its lustre is much diminished. A gale is blowing from the west, and there has been an orange after-glow. Similar phenomena were described in your columns about this time last year. They were well seen in this part of the country.

EDWARD GREENHOW

Earsdon, Newcastle-on-Tyne, December 28

YESTERDAY, clouds very similar to those seen a year ago made their appearance, and there were a few of them again this morning. I first noticed them at 11.30 a.m., and they were extremely magnificent after sunset, showing three or four spectra of colour, and they were especially striking about 4.10 p.m., when they appeared very bright against the purple glow of the sky. Their chief difference from the clouds last December was that they were not bounded by straight lines, and that there was no special amount of blue in the colouring, as was usually the case a year ago. The chief colours were pink and green.

Sunderland, December 29

T. W. BACKHOUSE

Ventilation

IN reply to the query of J. F. Tennant, there can be no doubt that the cause of the failure of the ceiling ventilators is a deficiency of fresh-air supply to the room. An ordinary chimney with a fire will, if unchecked, draw an amount of cold air into the room which would make the temperature about the same as that of the outside air, and without enormous volumes of warmed air it is, I think, impossible to expect any service whatever from the system of ventilation from ceiling-flues, as recommended by the writer of the article referred to. Since writing my first letter I have seen a regenerator lamp attached to one of these ceiling-flues, and the down-draught was so strong and persistent as to reverse the natural current of the lamp, rendering its use impossible. The air-inlet to my own rooms consists of a channel in the wall of every room opening into ten one-inch holes at the fireplace, but this, of course, is utterly inadequate to supply one-tenth of the air required by the flue, and the ventilator and the ventilating-shaft supplement this supply by working the wrong way.

THOS. FLETCHER

Warrington

A VERY common source of trouble with respect to ventilation is the absence of any arrangement for the supply of air to fires. So long as a fire draws on the general atmosphere of the room it is supposed to warm for its supply of oxygen, there must be the "draughts" so often complained of, and people are warm on the side next the fire, and cold on the other. I should suppose this is what happens in Mr. Fletcher's case, described in his letter in NATURE (pp. 153-4). If so, there is simply a sort of "tug-of-war" between the longer chimney-flue and the shorter ventilation flue, with the additional advantage on the side of the former that the column of air ascending the chimney is neces-

sarily much warmer than that which should ascend the ventilation flue. If, however, Mr. Fletcher will have a couple of holes bored in his floor, one on each side of the fireplace, so as to supply air directly to the fire, the "pull" of the fire on the air of the room will cease, the room will be warmer, and his ventilation flue should work satisfactorily. I warm thoroughly a room with considerably over 2000 square feet of floor area by means of three small stoves. When first used the stoves were inefficient, as there was a draught all round each towards it. A common rain-water pipe "bend," inserted in the floor immediately in front of the aperture of each stove for admitting the air-supply, stopped the draughts, and at least doubled the efficiency of the stoves as warmers. With the help of Tobin tubes there is now a gentle current of warmer air from each stove. The heated and vitiated air escapes through ventilators fixed in the ridge of the roof.

W. WILKINSON

Eldon, Bishop Auckland, December 23

Friction and Molecular Structure

IN your number of December 17 (p. 154) is a letter signed by Mr. E. Geoghegan, referring to the effect of moderate friction on the molecular structure of glass lamp-chimneys. This I have very frequently observed, and it would be very interesting to have suggestions as to its cause and means of prevention. I often read under one of Sugg's Argand gas-burners, the chimney of which almost invariably breaks on first heating after cleaning. First of all, washing was tried, to remove the mottled milky stain which forms on the glass, and then rubbing with a silk cloth or cotton rubber, but there does not seem to be much difference in the result, as the glasses, the best I can obtain, generally break.

C. K. BUSHE

Bramhope, Old Charlton, Kent, December 25

The Longevity of Insects

WITH reference to the longevity of insects, it is worth while to record that we kept a ladybird from the September of one year to the September of the following. She was a handsome specimen of the seven-spotted ladybird, and her eggs, which were laid in the winter, after passing through the miniature crocodile stage, produced perfect insects in February. It is curious to watch the imago emerging from its dusky case; at first no spots are visible on its buttercup-yellow "shards," which contrast strongly with the jet-black legs and underneath; but in a very few hours the first brilliancy has gone, the spots appear faintly, and in a few days the final red with the black spots is established.

E.

December 28

SOUTH AMERICAN BIRD-MUSIC

MR. BURROUGHS, an American naturalist, in his "Impressions of some British Song Birds," has said:—"Many of the American songsters are shy wood-birds, seldom seen or heard near the habitations of men, while nearly all the British birds are semi-domesticated, and sing in the garden and orchard." This fact, I had said, in connection with their more soft and plaintive voices, made our song-birds seem less to a foreign traveller than his own. These words apply with much greater force to the birds of South America, the species being much more numerous and less well known than in the northern portion of the continent; while the true songsters are relatively fewer, owing to the presence of several large songless families, such as the tyrants, humming-birds, and others.

The South American songsters certainly do not, like those of Europe, mass themselves about the habitations of men, to sing there as if sweet voices were given to them solely for the delectation of human listeners; they are pre-eminently birds of the wild forest, the marsh, and the savannah; and the ornithologist or collector from Europe, whose principal object is to make a large collection, has

little time to make himself acquainted with the accomplishments of the species he desires above all things to shoot. Nor is this all. Doubtless there remains in the minds of most people something of that ancient notion that brilliant-plumaged birds utter only harsh, disagreeable sounds; while the sober-toned songsters of temperate regions—especially those of Europe—have the gift of melody; that sweet songs are heard in England, and screams and grating notes within the tropics. Only we know now that the obscure species there are greatly in excess of the brilliant ones. It is quite possible, however, that the tropics, so rich in other respects, though by no means the realms “where birds forget to sing,” do not excel, or even equal, the temperate regions in the amount and quality of their bird melody. Mr. im Thurn only echoes the words of many English travellers in the tropics, when he says, in his recent work on British Guiana:—“The almost entire absence of sweet bird-notes at once strikes the traveller who comes from thrush and warbler-haunted temperate lands.” Mr. Bates, on this subject, says:—“The few sounds of birds are of that pensive and mysterious character which intensifies the feeling of solitude rather than imparts a sense of life and cheerfulness.”

On the question of tropical bird-music much remains to be said by future travellers; but South America is not all tropical, and travellers visiting the southern temperate portion of that continent might have looked to find there melodists equal to those of Europe and North America; for even assuming that to utter agreeable sounds a bird, wherever found, must be fashioned after the pattern of some European form, we find that the typical songsters of the north—the thrushes, wrens, warblers, finches, &c.—are well represented in the Plata, Chilian, and Patagonian regions. As a fact, the best songsters there belong to the wide-ranging American genus *Mimus*, while in the more tropical Icterine family there is great variety of language, and some exceedingly sweet voices.

Of the great naturalists of recent times who have depreciated South American bird-music, I will mention Darwin only, as very great importance must always be attached to his words, even when he fails to show his usual discrimination. He says of the common *Mimus calandria*:—“It is remarkable from possessing a song far superior to that of any other bird in the country; indeed, it is nearly the only bird in South America which I have observed to take its stand for the purpose of singing.” He then adds that the song is like that of the sedge warbler.

There are many better singers than the *M. calandria*; and as to its being nearly the only bird that takes its stand for the purpose of singing, there are, in the Plata district alone, a greater number of birds with that habit than in England; though, taking the number of species in the two countries, the Plata singers are relatively fewer. It is equally beside the mark to compare the sedge warbler with the Calandria, the performance of the former bird resembling that of the other only as a slight sketch may be said to resemble a finished painting.

Darwin does not say much about the singing of birds, and appears to have taken but little interest in the subject, possibly because this species of natural melody gave him little or no pleasure; otherwise he could scarcely have written of the Diuca Finch that “the male during incubation has two or three pleasant notes, which Molina, in an exaggerated description, has called a fine song.” The fact is, the old Chilian naturalist scarcely does justice to the song of the Diuca, which is mellow in sound than any other finch-melody I am acquainted with. Of his account of the singing of the Thenca mocking-bird, the Thili, the black-headed finch, Loyca, and various other species, Darwin says nothing.

Not all the European writers whose words carry weight, however, have turned a deaf, or, at any rate, a very unappreciative ear to the bird-music of the great bird-

continent. Azara is a notable exception. He was not a mere collector, nor was he even a naturalist in the strictest sense of the word; but, made fit for his task by a keen faculty of observation, and an insatiable craving for knowledge of all kinds, he went into the forest to watch the birds and write the history of their lives. In Spain he had been familiar from childhood with the best songsters of Europe, and in Paraguay he paid great attention to the language of the species he noticed. He makes mistakes sometimes, when speaking of the nesting or other habits, but when describing their songs, he records his own impressions only. With the works of his contemporary, Buffon, he only became acquainted after having completed his own observations; and the voluminous strictures on the French naturalist, which burden, and to some extent spoil, the otherwise delightful “Apuntamientos,” were only inserted after his own descriptions had been written.

In his introductory pages, entitled “De los Paxaros en General,” he refers to Buffon’s well-known opinion concerning the inferiority of American songsters, and says:—“But if a choir of singers were selected in the Old World, and compared with one of an equal number gathered in Paraguay, I am not sure which would win the victory.” In another place, in allusion to the same subject, he says:—“They are mistaken who think there are not as many and as good singers here as in Europe.”

To return for a moment to Mr. Bates’s words, already quoted, bird-music of that “pensive and mysterious” character he mentions is to many minds more pleasing than the loud, cheerful, persistent singing of many highly-esteemed British singers, like the chaffinch and song-thrush.

Mr. Bates also heard in the Amazonian forest, “another bird that had a most sweet and melancholy song, uttered in a plaintive key, commencing high, and descending by harmonic intervals.”

Of the common house-wren of the Plata, Azara says that its song is “in style comparable to that of the nightingale, though its phrases are not so delicate and expressive; nevertheless, I count it amongst the first songsters.” He speaks even more highly of the voice of the Todo Voz (*Cistothorus platensis*), which greatly delighted him with its sweet, varied, and expressive melody. The members of this melodious genus, and of the allied genera, are found throughout South America, from Panama to Patagonia, and we know from others besides Azara that their music does not dissolve away in the tropics, or turn to harsh sounds. Mr. Wallace heard a *Cistothorus* singing very sweetly on the shores of the Amazon, and D’Orbigny, in the “Voyage dans l’Amérique Méridionale,” thus describes the singing of the *Thryothorus modulator*, which he heard in Yungas, in Bolivia:—“Perched on a bough overhanging the torrent, its rich melodious voice seemed in strange contrast to the melancholy aspect of its surroundings. Its voice, which is not comparable with anything we have in Europe, exceeds that of the nightingale in volume and expression, if not in flexibility. Frequently it sounds like a melody rendered by a flute at a great distance; at other times its sweet and varied cadences are mingled with clear piercing tones or deep throat-notes,—in one word, a grave music composed of the purest sounds. We have really no words adequate to express the effect of this song, heard in the midst of a nature so redundant, and of mountain scenery so wild and savage.”

It might be thought that in this description allowance must be made for the enthusiasm natural to a Frenchman, but Mr. Bates, certainly the most sober-minded naturalist that ever penetrated the Brazilian forests, gives a scarcely less fascinating account of a melodist closely allied to D’Orbigny’s bird, if not identical with it. “I frequently heard,” he says, “in the neighbourhood of these huts the realejo or organ-bird (*Cyphorhinus*

cantans), the most remarkable songster by far of the Amazonian forest. When its singular notes strike the ear for the first time the impression cannot be resisted that they are produced by a human voice. Some musical boy must be gathering fruits in the thickets, and is singing a few notes to cheer himself. The tones become more fluty and plaintive; they are now those of a flageolet, and, notwithstanding the utter impossibility of the thing, one is for the moment convinced that some one is playing that instrument. . . . It is the only songster which makes an impression on the natives, who sometimes rest their paddles whilst travelling in their small canoes, along the shady by-paths, as if struck by the mysterious sound."

Outside of these pre-eminently tuneful groups—thrushes, warblers, finches, &c.—there are many species belonging to groups considered songless which nevertheless do sing, or have, at any rate, some highly musical notes. Dendrocolapine birds are not, strictly speaking, songsters; but they are loquacious, and fill the woods with sound, often pleasant and laughter-like in character; and in many species the male and female combine their voices in a pretty kind of chorus. In the well-known oven-bird this is very striking, the male and female singing a ringing joyous duet in different tones, producing an harmonious effect. D'Orbigny notices this harmonious singing of the *Furnarius*. The hirundines in many cases have voices utterly unlike those of Europe, which as a rule only emit a squeaking twitter. They have, on the contrary, rather thick tones, in many cases resembling the throat-notes of the skylark, and some have a very pleasing set song. The human-like tones of some of the pigeons, the plaintive fluting of the Tinamous, even the notes of some kingfishers and cuckoos, contribute not a little to the bird-music of South America. Waterton's words about the "songless" bell-bird are well known, and, allowing that he goes too far when he says that Orpheus himself would drop his lyre to listen to this romantic sound, it is still certain that there are hundreds of species, which, like the bell-bird of the Orinoco forests, utter a few delightful notes, or produce a pleasing effect by joining their voices in a chorus. Thus, Mr. Bates speaks of the *Monasa nigrofrons*—a barbet:—"This flock of Tamburi-para were the reverse of dull: they were gamboling and chasing each other amongst the branches. As they sported about they emitted a few short tuneful notes, which altogether produced a ringing musical chorus that greatly surprised me."

But even leaving out all these irregular melodists; also omitting the tanagers, the tyrants, and their nearest allies; the Dendrocolaptidæ and Formicariidæ, and the humming-birds—these few families I have mentioned comprising about 1800 species—there would still be a far greater number of regular songsters than Europe can show, so great is the bird-wealth of South America; and concerning the merits of their music I can only say that Azara and D'Orbigny did not hear the best singer—the *Mimus triurus*. It would have been strange indeed if in that portion of the globe, so inconceivably rich in species, and where bird-life has had its greatest development, the faculty of melody had not been as highly perfected as in other regions.

A very long time has passed since Azara made that remark about a choir of song-birds selected in Paraguay, and our knowledge on this subject—possibly because it has been thought unimportant—has scarcely been added to since his day; but it seems to me that when the best singers of two regions have been compared, and a verdict arrived at, something more remains to be said. The species which "formally take their stand for the purpose of singing" sometimes delight us less than others which have no set song, but yet utter notes of exquisite purity. Nor is this all. To most minds the dulcet strains of a few favoured songsters contribute only a part, and not always the largest part, of the pleasurable

sensations received from the bird-voices of any district. All natural sounds produce, in some measure, agreeable sensations: the pattering of rain on the leaves, the lowing of cattle, the dash of waves on the beach, the "springs and dying gales" of a breeze in the pines; and so, coming to birds, the clear piercing tones of the sand-piper, the cry, etherealised by distance, of a passing migrant, the cawing of rooks on the tree-tops, afford as much pleasure as the whistle of the blackbird. There is a charm in the infinite variety of bird-language heard in a sub-tropical forest, where birds are most abundant, exceeding that of many monotonously melodious voices; the listener would not willingly lose any of the many indescribable sounds emitted by the smaller species, or the screams and human-like calls, or solemn, deep booming or drumming of the larger kinds, or even the piercing shrieks which may be heard miles away. The bird-language of an English wood or orchard, made up in most part of melodious tones, may be compared to a band composed entirely of small wind-instruments with a very limited range of sound, and which produces no storms of noise, eccentric flights, or violent contrasts, or anything to startle the listener—a sweet but somewhat tame performance. The sub-tropical forest is more like an orchestra in which a countless number of varied instruments take part in a performance in which there are many noisy discords, while the tender, spiritual tones heard at intervals seem, by contrast, infinitely sweet and precious.

W. H. HUDSON

FORESTRY

THE report of the proceedings of the Select Committee on Forestry which sat during the past summer does not, perhaps, throw any more light on the condition of forestry in this country than was possessed before the appointment of the Committee, for the substance of the evidence given is for the most part to be found in the various works and reports on forestry that have appeared from time to time during the past few years; nevertheless the evidence of such men so well versed in forest conservancy, especially with regard to India, as Dr. Cleghorn, Col. Michael, Col. Pearson, and Mr. W. G. Pedder is of much value, as it brings together in a collected form information that has hitherto been much scattered.

The subject of forest produce is one that is but little understood or even thought of by people in general. It is supposed by most people to relate only to the supply of timber, which indeed of itself is of very great importance; but when we consider the other products—such as gums, resins, oils, fibres, and such like—the enormous money value becomes more apparent, as well as the great importance of the forests as sources of many absolute necessities of life. The evidence of Col. Michael fully illustrates this and is especially valuable from this point of view. Taking the subject of Indian timbers alone, the value of teak was fully set forth when it was shown to be unequalled for the backing of ironclads and for ship-building generally, as offering the greatest resistance of any known woods. Questioned as to whether teak was capable of being brought into this country as a commercial article at a remunerative profit, Col. Michael replied that, judging from the price realised for some logs sold at the Forestry Exhibition at Edinburgh and from other information obtained, no doubt existed that the trade in teak might become a very remunerative one. It was shown further that in 1883 647,000*l.* worth of teak was imported into England; but Col. Michael also touched upon what, if put upon a proper footing, might equally, or perhaps more so, become a source of revenue to India and a boon to this country—namely, the introduction of the more ornamental woods for cabinet purposes. There is, of course, always a steady demand for British-grown