March, 1903. The present condition of the volcano is shown by the following extract from a letter to the author written July 13, 1904, by Rev. Thomas Huckerby of Château Belair, St. Vincent:

The general condition of things is far different from what it was twelve months ago. At the present time there is very little emission of steam from the fissures which formed themselves in the ejecta left inside the crater after the last eruption. The surface of the lake is gradually widening, which result is brought about by the falling down of the ashy sides of the immense bowl. Large quantities of material from the top of the perpendicular windward side are falling in, which cause will ultimately bring back the gradual declivity of former years. I should say that the crater, from east to west, is considerably over a mile in diameter. There is still a very strong smell of sulphuretted hydrogen, which at times is perceptible at Château Belair. It is surprising to find that much of the vegetation especially near the base of the mountain has survived through all the adverse circumstances of the past two years; even the maroon tree is throwing out shoots from its battered and charred roots. The mongoose has found his way back to a point above the Half-Way Tree. I think that we may with safety conclude that the god Vulcan has quietened down to another period of rest as far as St. Vincent is concerned.

Mr. Huckerby also forwards a photograph of the interior of the crater which indicates not only a widening of the lake due to the falling in of the walls, but also a rise due to the accumulation of water. It is evident that the mountain is rapidly resuming its former condition and appearance under the influence of the agencies which tend towards the rapid decomposition of rock material in the tropics.

Edmund Otis Hovey.

American Museum of Natural History,
August 4, 1904.

SPECIAL ARTICLES.

THE INHERITANCE OF SONG IN PASSERINE BIRDS.

Further Observation on the Development of Song and Nest-building in Hand-reared Rose-breasted Grosbeaks, Zamelodia Ludoviciana (Linnæus).

In a paper published in Science, June 24, 1904,* I have recorded some observations in regard to the growth, plumage and song of hand-reared rose-breasted grosbeaks. It is the purpose of the present paper to carry these observations a step further and to describe what occurred to the birds after they were mated, as recorded in the foregoing paper.

About the third week in May, 1904, the song of the two male birds, each of which now had a mate, became crystallized and assumed a definite character, which was almost alike in both, but was absolutely and entirely different from the song of the rose-breasted grosbeak as it is heard when wild out of doors. I have had for some years in a cage one of the green bulbuls of India, known as Hardwick's bulbul, *Chloropsis hardwickii,* Jardine & Selby. This bird is singularly persistent in singing for about nine months in the year. It is a male. My two pairs of rose-breasted grosbeaks were in a cage adjacent to that of the bulbul, and by the middle of May of the present year the songs of the two male grosbeaks were so closely an imitation of the insistent song of the bulbul that it was difficult, when not looking at the birds, to tell which species was singing. I may say that the song of the green bulbul is emphatic, clear, high-pitched, rather melodious and delivered so that the whole does not occupy more time than does the song of the song sparrow, which, in a certain way, this song resembles. The song of the rose-breasted grosbeak as heard in wild birds I should describe as being like that of the robin, but more melodious and richer, and uttered with much greater deliberation. It will be perceived that the contrast between this kind of song and that of the bulbul is great. This song was constant and of daily occurrence throughout the last ten days of May and the whole of June, but ceased and was given up entirely by July 4.

During the whole of May (the pairs having mated and being in different cages), the process of mating, and later the matters of nest-building and laying were carried on as I shall now set forth. After much preliminary courting on the part of the males, which was accompanied by some severe quarrels between the mating birds, they finally became paired. These quarrels were at times so severe that it was essential to separate the birds for periods

* Science, N. S., Vol. XIX., No. 495, pp. 957–959, June 24, 1904.

of greater or less time. The strange female which I introduced to one of the males had to remain for several weeks in a small cage inside of the larger cage in which the male was confined in order to prevent the sanguinary quarrels in which the birds engaged. At times one would be the victor and again the other; but generally it was the male bird that was triumphant. The victor in every case so bullied and annoyed the vanquished that the life of the conquered birds was, for the time, rendered miserable. However, all this was remedied by time and the birds came ultimately to a satisfactory understanding.

About the middle of May it was evident that they wished to build nests; any straw or stray feather in the bottom of the cage was eagerly taken and attempts were made to place such material in some secure position. I now put branches in both of the cages, with what I considered suitable forks in which the birds might build the characteristic nests of wild grosbeaks. I also placed in the cage rootlets, straw, small sticks and twigs, in short, as nearly as I could, the same material that I found in the nests of wild rose-breasted grosbeaks. These the birds eagerly availed themselves of and for ten days or more engaged themselves most busily in abortive attempts at nest-building. They seemed unable to arrange a suitable foundation of rootlets and twigs in any of the crotches or branches I had given them, and after this thing had gone on for two weeks and no progress had been made, I determined to give them artificial nests. These were the kind of nests supplied to canary birds, being wire baskets of fine mesh into which a felting of cowhair was securely sewed.

In both cases the grosbeaks availed themselves of these nests at once and proceeded to utilize feathers and some extra cowhair that I had given them to complete the lining of the structure. In four days after receiving these nests both females began to lay; but, though each female laid a full complement of eggs, these were generally broken by the birds. The first three or four eggs laid had hard shells and after that each of the females laid several eggs with soft shells. The way that I account for the eggs being broken is that both birds of each pair, after an egg had been laid in the nest, continued their efforts to build a structure more to their liking, and that it was their claws as they trampled about that perforated the shell of the eggs already laid.

After the first laying which I have described as abortive, an interval of perhaps a week intervened, when laying began again with almost precisely the same results. All this time the males were constantly singing, courting the females, feeding them, caressing them, and the operation of treading was frequently witnessed throughout the day.

While I am not prepared to conclude that the grosbeaks would not have built a nest, if furnished with more commodious quarters and nearer like the condition of affairs that exist out of doors, I conclude that so far as nest-building in cages is concerned they are unable to accomplish anything. So far as the song is concerned I believe that they inherit the call-notes of both pleasure and fear, but that the song of the males was an imitation of the song of a bird that strongly impressed them during the period when they were cultivating this secondary sexual characteristic.

WILLIAM E. D. SCOTT.

PRINCETON UNIVERSITY,
August 8, 1904.

CURRENT NOTES ON METEOROLOGY.

UTILIZATION OF FOG.

IN the *Monthly Weather Review*, XXXII., No. 4, 1904, the suggestion is made by a writer in San Diego, Cal., that an instrument consisting of a wire frame-work be contrived, which shall collect fog particles, conduct the drops into a rain-gauge, and thus make the measurement of fog possible. The object of this measurement would be to show that in such a region as southern California, where the rainfall is small and where there is a good deal of fog, the fog deposit is a considerable one, and is of noteworthy importance to vegetation. In his comments on this suggestion, Professor Abbe rightly points out that it would be difficult, if not impossible, to argue from the catch of a fog screen to the catch of an orchard of trees; that the 'fog depositor'