be one of her greatest natural attractions stamped out in a few months under her very eyes, — a work, that, when fully known, as it will surely be, will pass down as one of the blackest pages in her history? A quarter of a century ago the writer was at Charlotte Harbor himself, and well do I remember my unbounded enthusiasm as my eyes first feasted upon the sight of a Floridian heronry: many, many, species, represented by thousands upon thousands of individuals, were ranged along the beaches, or covered the cypress tops, where their nests were in hundreds. Never shall I forget their lovely uniforms as they glistened in the soft atmosphere of that sub-tropical land: some were snowy white, others a charming blue, or warm chestnut, while, more beautiful than all, the wondrous rosy tints of the spoonbills fairly shone in the bright sunlight.

Really I am sad as I see, only too vividly in my mind, the disgusting slaughter that is now being perpetrated in their very midst. Entire rookeries have been exterminated, and others reduced to a few, very few, pairs of birds, now so wild and suspicious that it requires the skill of the rifleman to capture them.

R. W. SHUFELDT.

Fort Wingate, N.Mex., July 14.

Tornado 'Power.'

REFERRING to a communication by H. Allen Hazen, in *Science* of July 8, entitled 'Theoretical Meteorology,' in which he states that "theoretical meteorology most signally fails in its attempts to explain our most violent storms and tornadoes," and, "that the theory that the sun's heat could start a vertical current, which, with the condensation of moisture in the upper atmosphere would give rise to winds of 200 to 300 miles per hour seems incredible," and "that the attempt to meet the difficulties by suggesting 'great contrasts in temperature,' 'meeting of warm southerly and cold northerly winds,' etc., does not seem at all satisfactory," I would say that there appears to be a disposition on the part of writers on scientific subjects, more particularly as relates to meteorology, to sacrifice common-sense reasoning and probable facts to profound but improbable theories, which, while they do, and are probably intended to, fill the common mind with wonder at such amazing displays of learning, are unsatisfactory and worthless from a practical scientific standpoint.

The attempt to prove that wind-velocity constitutes the 'power' of tornadoes always did and always will signally fail; nor will it be possible to convince any one who possesses a knowledge of meteorology, that air-currents can be made to attain the several-thousand-mile per hour velocity which would be required to effect the results of tornado action. It is evident to the practical mind that the suggestions referred to by Professor Hazen do not meet the difficulties involved in explaining the violent character of these phenomena, and it is equally evident that more satisfactory suggestions concerning them have not been brought to, or received, his intelligent attention.

It has been claimed and shown that the 'power' of tornadoes is electrical, and it has been demonstrated that trees and twigs which had been subjected to their action bore conclusive proof of this fact. It is not known, however, that theories have been advanced in explanation of the processes whereby the electric fluid is so largely collected within the tornado-funnel, and herein is embodied the object of this communication.

The meeting of warm southerly and cold northerly winds, in the southern quadrants of low-barometer areas, occasions great contrasts in humidity and temperature in a limited area, and it is well known that these conditions are essential to a storm's development and existence. Tornadoes and local storms are, in all instances, subsidiary to extensive storm-systems, and invariably occur at the point where, in accord with the laws governing the circulation of wind in low-barometer areas, the warm and cold currents are brought into opposition. A natural result of the meeting of warm and cold masses of air would be the elevating of the former to higher altitudes, if for no other reason than on account of their relative specific gravity: the ascending currents would, on attaining a proper elevation, precipitate their moisture, and the continual and large inpouring of these opposing currents, in any given locality, would intensify the elements of disturbance. It is conceded that the angle of contact of air-currents, to the south-eastward of the centres of general storms, contributes to impart a rotary movement, and ascending warm-air currents would naturally assume that motion; and, in the case of tornadoes and local storms, this whirl is most marked at a distance from the earth's surface, or at the point where the moisture in the ascending air is precipitated. That this mass of revolving air is well charged with electricity is shown by the heavy electrical discharges which are commonly observed within its body and in its immediate vicinity. When, through its whirling motion, or the electrical attraction offered by the earth, the extremity of this generally low-lying cloud descends to the earth's surface, there is formed a column of very moist air extending from earth to cloud; and, as moist air is one of the best known conductors of electricity, and the earth is the great reservoir for the electric fluid, the tornado-funnel furnishes the medium of communication by means of which the fluid may leave the earth, and the collecting of vast quantities of both positive and negative electricity within such confined limits would naturally give rise to tremendous exhibitions of its power.

Every observable feature of tornadoes shows them to be electrical storms developed under unusually well-marked conditions. Their action and results are essentially electric, but until the true nature and composition of their mysterious element is known, the exact formula of its action as the destructive agent of local storms cannot be presented. We only know that under certain conditions it will produce certain results. Its presence in tornadoes, in enormous quantities, is shown, and its accountability for the destructiveness of these energetic phenomena is claimed, to the almost total exclusion of the wind-velocity theory, which is not only an improbable, but, it is perfectly safe to say, an impossible one. This is a fundamental proposition established by actual results on the spot where the 'power' of these storms has manifested itself, and is deserving of more consideration than has heretofore been accorded it.

E. B. GARRIATT.

Signal Office, Washington, July 15.

Theoretical Meteorology.

THERE is no contradiction whatever between page 51 and page 328 of 'Recent Advances in Meteorology.' My mind, also, remains entirely unchanged with regard to the other matters in the book referred to, by Mr. Hazen, in *Science* of July 8. There are, however, some other parts of the work, which, after a lapse of nearly three years since the first writing, I would be disposed to amend, and even in some cases correct, in a second writing. This it is proposed to do in a forthcoming more popular work, so far as it shall cover the same ground.

W. FERREL.

Kansas City, July 13.

Queries.

10. ROBIN'S NEST. — Is there any thing unusual in a robin's nest built inside of a last year's nest, which in turn was built inside of a nest now two years old, and that one inside of one three years old, and so on, like the house that Jack built, until you have a pile of nests fitting into one another and numbering ten? Such a ten-storied affair was found in Potsdam, N.Y., lately, the top story being in use, while beside it on the same window-cap was another pile of three nests.

C. H. LEETE.

11. LAKE ITASCA. — There is one point in the controversy about the name of Lake Itasca, of which I have often thought, but to which I have not seen public attention directed. The priest who is said to have suggested the name is represented to have been a Latin scholar, and to have proposed a name which is intended to signify the 'true source,' *ver(itas ca)put*. Now, I have never been able to see how the words correspond to the idea. *Caput* will do for 'source;' but *veritas* is a noun and nothing else. The two nouns cannot, therefore, mean what they are represented to mean, or the Latin is not that of a classical scholar. *Verum caput* might mean the 'true source,' not, however, *veritas caput*. If there is any other explanation of the case than that the good priest was caught napping in his Latin, I should like to see it in print.

C. W. SUPER.

Athens, O., July 11.