NEW NOTES ON STRIDULATION.

According to the Science Summary, in the *Independent*, some fresh observations on the buzzing of insects have been made by J. Perez. He believes that the cause of buzzing certainly resides in the wings. In the Hymenopters and Dipters the buzzing is due to two distinct causes—one the vibration of which the articulation of the wing is the seat, and which constitutes true buzzing; the other the friction of the wing, an effect which more or less modifies the former. In moths of strong flight, such as the sphinges, the soft and full buzzing which these insects produce is only due to the friction of the air by the wings. This sound, which is always grave, is alone produced. It is not accompanied by the basal beatings, owing to a peculiar organization, and especially to the presence of the scales. In the dragon-flies, also, in which the base of the wing is furnished with soft fleshy parts, no true buzzing occurs; but a simple rustling, due to the friction of the organs of flight. M. Perez believes that the passage of air through the respiratory orifices has nothing to do with the production of sound, as when injured or closed the buzzing goes on. When the stigmats or air-holes are stopped hermetically, as was done by Barmeister, the buzzing is only weakened, as the insect itself is partially asphyxiated by the loss of fresh air. When, as Chabrier did, Perez stuck together the wings of a fly, the sound was still produced, as the base of the wing continued to vibrate and the buzzing sound to be produced. But all buzzing was stopped if, by holding the wings pressed together, over as large an extent as possible, so as to exert a certain traction upon their bases, all movements of these organs is rendered impossible. In whatever way the wings are confined, provided their immobility be incomplete, the buzzing absolutely ceases; contrary to Hunter's statement. M. Perez's observations can be readily repeated, if nice methods of procedure are followed, by observers in this country, and this vexed question be set at rest.

SHIPPING A STEAMBOAT TO SOUTH AMERICA.—A complete steamboat was shipped from Pittsburg, Pennsylvania, on the 19th of October last, by way of New York, to be delivered to the United States of Colombia, South America. It was shipped in sections, and will be put together when it reaches its destination by men who will be sent from Pittsburg for that purpose. The hull is 150 feet long, 29 feet 9 inches beam, 4 feet depth, 28 inches sheer, and made of homogeneous and tensile strength of 70,000. The machinery consists of 15-inch cylinders, five feet stroke, two patent cut-off boilers, 45 inches in diameter, 16 feet long, with 41 3½ inch tubes each, which were tested before leaving to 245 pounds. The boilers are also of homogeneous steel. The cabin was made somewhat after the style of our Western river boats. The hull is all steel except the bulkheads and angle-irons; the cylinder "timbers" also being steel. The wheel is of iron. The cabin-stanchions are fastened to the hull and stern-bulkhead. The name of the steamboat is the *Francisco Montagu*, and she is designed to run on the Magdalena river.

AN ENGINEERING PLUM.—A Washington dispatch states that Colonel W. Milnor Roberts, late engineer of the Northern Pacific railroad, has been appointed by Dom Pedro, Emperor of Brazil, the superintending engineer of efforts about to be made for the improvement of the water-ways of that empire, and that he is to receive a salary of $20,000 per annum for three years, or a compensation at the rate of $25,000 per annum if his services should be required for a less term than three years.

A MARBLE-BORING SPONGE.—The New York Academy of Sciences has had an interesting specimen of marble which came from a ship wrecked in 1871, off the south coast of Long Island. The marble was perfectly honeycombed by some marine-boring animal. The *Scientific American* says that Dr. Newberry believes that it was due to the ravages of a species of sponge of the genus *Cliona*, and this view has been recently indorsed in a note on the subject published by Prof. A. E. Verrill, who has had an opportunity of examining some specimens sent to the Peabody Museum of Yale College. Prof. Verrill states that the exposed portions of the slabs examined by him are thoroughly penetrated to the depth of one or two inches by the crooked and irregular borings or galleries of the sponge, *Cliona sulphurea*, so as to reduce them to a complete honeycomb, readily crumbling in the fingers. The marble is perfectly sound and unaltered beyond the borings. He says that the rapid destruction of the shells of oysters, etc., by the borings of this sponge has long been familiar to him, but he has never before seen examples of its effects on marble or limestone; for calcareous rocks do not occur along those portions of our coast inhabited by the animal. He suggests that its ability to rapidly destroy such rocks might have a practical bearing in case of submarine structures of limestone or other similar materials.

SPONTANEOUS COMBUSTION.—Dr. Hoffman has called attention to some curious cases of spontaneous ignition of hydrogen in air. The phenomenon has been noticed in factories where large quantities of zinc were being dissolved in hydrochloric acid for the preparation of zinc chloride. Violent explosions took place when no flame was near; and it was eventually ascertained that the gas took fire spontaneously. It appears to be caused by fragments of very porous zinc, which, when lifted above the surface of the liquid during the violent evolution of the gas, and so brought in contact with hydrogen and air, act just as spongy platinum would do under the circumstances. The author recommends the performance of such operations in the open air. The ignition can be shown by treating a few kilogrammes of finely divided zinc with acid. The "zinc dust" may even ignite by contact with water.

GEOLOGICAL.—The *Polytechnic Review* learns through a private letter from Dr. T. Sterry Hunt, that the Geological Congress at Paris was a great success. There were 260 members present; and various committees were formed, the work of which will prove highly important and useful. Arrangements were made for a Congress, to be held in 1881, at Bologna. From another source we learn that Dr. Hunt has returned from England, and will spend the winter in Montreal, Canada, where, as scientific men will be interested to hear, he expects to devote himself to important scientific investigations. Before leaving England, he accepted an invitation to deliver two lectures at Cambridge—a graceful and merited recognition of the ability and reputation of an American *savant*.

THE SIZES OF BALES.—The following practical notes may be found useful by those whose business is in the way of raw produce. Cotton bales vary from 4 to 5 feet long, and from 1 foot to 2 feet 6 inches in width and depth. Their weight varies from 300 to 550 lbs. The dimensions are different at different shipping ports: thus, Indian bales weigh from 350 to 400 lbs.; American bales 400 lbs. to 500 lbs.; Egyptian bales about the same; Calcutta bales of hemp measure 4 feet 8 by 2 feet by 2 feet; Calcutta bales of jute measure 3 feet 6 by 2 feet by 1 foot; Bombay bales of hides measure 7 feet by 3 feet by 2 feet, and weigh 17 cwts. Bales of cocoa-nut fiber measure 3 feet by 2 feet by 2 feet, and weigh 400 lbs.

WASHING OUT BOILERS WITH HOT WATER.—A letter from John E. Martin to the *Railroad Gazette* contains the following: I notice in the discussion on boilers at the last convention of master mechanics, that Mr. Hudson recommends washing out locomotive boilers with hot water. I have used the injector for that purpose lately and with great success. We connect the boilers to be washed out with the injector of another locomotive by means of wrought-iron piping and a flexible hose pipe that will stand a good pressure. A nozzle of five-sixteenths of an inch is used on the hose. With such a nozzle and with a boiler pressure of about 130 pounds we throw a stream of hot water of 140° Fahr. temperature into the boiler to be washed out. A gauge on the hose pipe showed a pressure of 110 pounds, equal to a vertical weight of nearly 250 feet. The hot water loosens the scale more effectually than cold water, and the force of the stream is all that can be desired. A stream of water can be thrown a distance of 60 feet and could be used as a fire extinguisher.

POPULATION OF SOME OF THE GREAT CITIES OF THE WORLD.—The Registrar General of London, in one of his weekly reports, gives the population of the cities of the world having over a quarter of a million of inhabitants, as follows: First comes London, with its 3,577,304 people; next is Paris, with its 1,988,806; New York, with its 1,084,528, and its close neighbor or partner, Brooklyn, with 549,438; and then Berlin, with 1,019,620 inhabitants. Philadelphia has its 876,118; Vienna, 727,271; St. Petersburg, 669,741; Bombay, 644,405; Glasgow, 566,940; Liverpool, 532,581; Manchester, with Salford, 530,765 people. All these are above the half million. Then comes Naples, with its 457,407; Calcutta, with 429,535; Madras, 397,552; Hamburg (the State), 405,104; Birmingham, 383,117; Baltimore, 355,000; Buda-Pesth, 319,350; Dublin, 314,666; Leeds, 304,948; Amsterdam, 302,266; Sheffield, 289,537; Rome, 282,214, and Breslau, with 267,000 population. He seems to omit the great Chinese and Japanese cities.

THOUGHTS FOR WINTER.—A writer in the New York *Independent* says: Typhus, typhoid fever, and diphtheria are more abundant in winter than in summer; while, if the specific infective diseases get any foothold in the fall, they are apt to linger with continuous pertinacity until the late spring. It is quite apparent too that our population suffers from the winter confinement amid impure air, even where no special distemper is produced. One reason why it seems so necessary for our urban population to spend the summer on the seashore or in the mountains is just because there has been a reduction of vital force by surroundings, which must be thus repaired. These heated chambers beneath the basement do not send into these household lungs enough of the pure air of heaven. Nature struggles on, with her compensations and adjustments, until she institutes a longing for a change, and so restores the balance, at a disadvantage.

PRIZE CATTLE CARS.—The Royal Society for the Prevention of Cruelty to Animals (England), having offered £400 in prizes for improved cattle trucks, the judges, in June last, inspected 55 competing models, and selected four, which they requested the inventors to build of full size, in order that if necessary a practical trial of their capabilities might be made. Three of these trucks have now been completed, and one inventor has been allowed further time. The traffic managers of the railways companies expressed their readiness to facilitate the proposed trials, and to adopt a simple, light, cheap, safe and workable method of watering animals in transit, if only the objectionable features hitherto found existing in most proposals of the kind can be really removed.