

RECENT DISCOVERIES IN THE PLANET MARS.

Pending the preparation of a fuller and more detailed memoir, Prof. Schiaparelli, of Milan, has published a preliminary notice, read before the Academia dei Lincei on March 5, and accompanied by a photographed drawing of the planet's surface. The results are of a very remarkable and unexpected character; and as through the courtesy of this distinguished observer, the notice and photograph have been placed in my hands, I am induced to reproduce the latter, which, though not pretending to minute accuracy (the original, in fact, is only a provisional sketch), will give a sufficient idea of the marvelous duplication of the so-called "canals," which, between January 19 and February 24, in about twenty instances, unfolded itself progressively under the observer's eye.

The discussion which took place at the late meeting of the Astronomical Society, so far as my information extends, substantiated strongly by independent evidence the existence of these long, narrow streaks, some of them even in positions where they have not been delineated by Schiaparelli; but their duplication by similar and parallel lines does not seem to have been elsewhere noticed. Some difference of opinion may possibly be expected concerning these strange appearances; and the consequent enfeebling (to say the least of it) of the long admitted terrestrial analogy may be, to some minds, unacceptable; but the established reputation of the observer demands, at any rate, a respectful attention to his statements. It may be preferable to suspend a more detailed account till we receive a full elucidation of the subject in the memoir, of which we possess only a preliminary notice; for the present it may suffice to mention that he found the atmosphere of Mars apparently clearer than in 1877, and was thus enabled to recover the markings then detected more satisfactorily even than in 1879-80, and to confirm the general accuracy of his two earlier charts; while the concise but very clear intimations that he has given, as to the variable brightness of some great regions, the progressive enlargement on one side since 1879 of the "Kaiser Sea" (his Syrtis Magna), the brightening of certain supposed continents or islands toward the limbs, the confirmed existence of oblique white streaks, the unfolding of minute labyrinthine detail, and the continuous development already mentioned, day after day, of the collateral lines which double the so-called "canals," and extend with them ordinarily along great circles of the sphere—all these and similar announcements make us anxiously desire a more extended and detailed communication. For some of these most remarkable appearances parallels may be to a certain extent produced from the results of earlier observers; but, so far as at present appears, the duplication stands alone. The discoverer is disposed to infer a connection between these progressive developments and the seasons of the planet, and on that account hopes that, owing to the position of the axis at the ensuing opposition at the opening of 1884, notwithstanding the diminished diameter, only 12.9 seconds), confirmation of his announcements may be obtained from other observers. We sincerely trust that a report which has reached us may be verified as to the erection of a much larger telescope in the Royal Observatory at Milan, and that the extraordinary talent and diligence of the director may be richly rewarded, not only by the confirmation but the extension of results which must so materially influence our conclusions as to the physical condition of this peculiarly interesting planet.—*W. Webb, in Nature.*

The Pintsch Light on the Erie Road.

A special exhibition of the Pintsch gas lighting system, as applied to railway trains, was made to a large number of railway and postal officials and others on the evening of June 12. A train of two coaches and a postal car was taken from Jersey City to Turner's and return to exhibit the light. The lamps were supplied with gas compressed in reservoirs under each car, the tubular receiver having a capacity of 344 feet of gas, under compression of 8½ atmospheres, or 127 pounds to the square inch. From this, tubes a quarter of an inch in diameter run to the various burners. A regulator consisting of an ingeniously weighted valve, prevents the gas from flowing too rapidly, and secures an even escape-ment, despite the varying pressure. The burners are of the fish tail pattern, composed of steatite, and of about one foot capacity per hour. Of these, in the mail car, there were 13 each of 17 candle power (Bunsen's photometer), and in the other cars four groups of five burners each, of about the same power. The gas is manufactured by the decomposition of shale oil refuse and fats generally, and consists mainly of olefiant gas and other heavy hydrocarbons. This is stored under a pressure of ten atmospheres in reservoirs

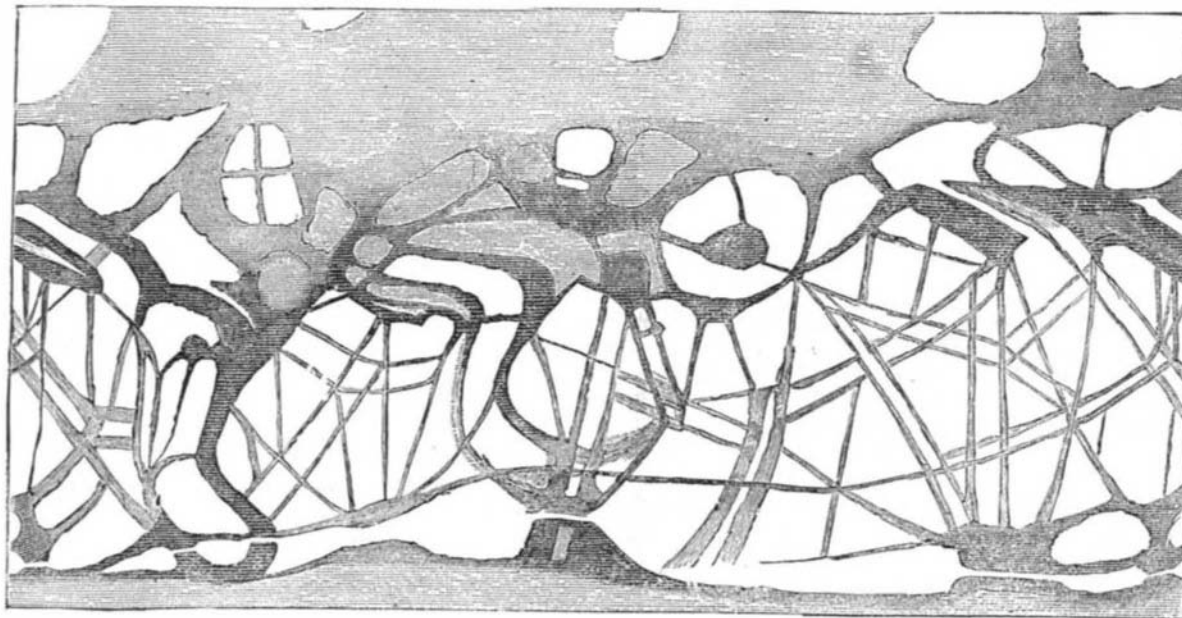
near the track, whence through stout rubber tubes, the car receivers may be charged in from one to three minutes.

On the return to Jersey City, after four hours burning, the pressure in the reservoirs was found to have been reduced only two-thirds of an atmosphere. It was said that the mail car had been run to St. Louis and back with one supply of gas.

A Wild Goose Guard.

The San Francisco *Call* says that Dr. H. J. Glenn, whose wheat farm of 75,000 acres covers most of the arable land of Colusa county, California, is obliged to keep a company of forty riflemen to guard his grain from the depredations of wild geese. The men, mounted and armed with Henry rifles, patrol the farm during the day and on all moonlight nights.

They discover with their glasses the flocks of geese, which at a distance of 300 or 400 yards look like a white blanket spread over the green wheat, and they thereupon plant a bullet right in the middle of the flock. This unexpected visitation sets the flock on the wing, and the geese herder follows them up, keeps planting bullets among them till they rise to a great height, and, disgusted, leave the vicinity. Few geese are killed, the object being to keep them on the wing, and consequently off the wheat fields. Those that are killed are carried off and shorn of their feathers, but the revenue from them amounts to little. On Dr. Glenn's ranch about 8,000 cartridges are used in a day, which represents about 20,000 geese daily put to flight. Oftentimes a thick fog blows in, and this appears to be the favorite time for the geese, and they devour the wheat with great energy. The herders then, fearful of shooting one another, are almost baffled, but when the fog rises the flocks are put to flight, and for hours thereafter the air is filled with feathers and geese, and Glenn's ranch resounds with the clatter of rifles and the



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frightened cries of the persecuted fowl. To pay his men, buy ammunition, and maintain horses, costs Dr. Glenn some \$10,000 per annum, but it saves his wheat, which yields \$100,000, as without the geese herders half would be destroyed. The herders become very expert in their business, and are generally good shots and capital horsemen.

Unhealthy Milk.

Dr. E. F. Brush, of Mount Vernon, N. Y., calls attention to the fact that the sale of diseased and poisonous milk is a matter of more serious moment than that of watered or skimmed milk. He suggests as an outline of an improved system of milk laws: First, that all city milk dealers be compelled to procure a license from the Board of Health; secondly, that all milk dealers report to the Board the quantity of milk they sell and where it is obtained; thirdly, that in the death certificates of all children under two years of age, dying from certain specified forms of disease, the name of the milkman who had supplied them be inserted. By some such plan the board would be readily enabled to detect poisonous milk. If a certain form of infantile trouble was found to exist among the customers of a certain milkman, an inspector could be sent to the source from which the milk came to ascertain if there had been an epidemic in the dairy, if any of the cattle were suffering from disease, and if the milk from a cow too soon after calving had been sent to the city. A few years of observation like this, carried on conscientiously, he thinks, would enable the Board to propose intelligent laws regulating the sale of milk. Of one fact he is thoroughly convinced—that the sale of poisonous milk in New York city produces more trouble than if the whole supply was pure, healthy, skimmed milk.

RELIEF FOR THE ARCTIC COLONIES.—The schooner *Leo*, with supplies for the meteorological station at Point Barrow, Northern Alaska, will leave San Francisco, about June 20, hoping to reach the Point by the middle of August. Lieutenant Greeley's party at Lady Franklin Bay, Greenland, will be relieved by the steamer *Neptune*, which will leave Sydney, N. B., about July 1.

The Desert Sea.

The report on this subject, presented by M. de Freycinet, French Minister of Foreign Affairs to the President, has been published. He reports so far favorably that he considers the project worth the appointment of a special commission, for which purpose he has prepared a bill. The scheme under consideration is that of M. Roudaire, by which a canal nearly 150 miles long, 32½ feet below the sea level, and 328 feet wide, is to lead the waters of the Mediterranean from the Gulf of Gabes into the empty lake beds known as the *chotts* of Rbarsa and Mebrir. Although the expense is variously calculated, M. de Freycinet does not consider that it will be prohibitory, if the formation of the lake is desirable on other grounds. In its favor it is urged that the climate of the regions lying round its shores will be improved, and their soil fertilized, that it will form an impassable barrier against the incursions of the nomad tribes from the Sahara and Tripoli, that it will greatly increase the commerce of Algeria and Tunis by furnishing them with internal water communication, and form a perfectly safe harbor of refuge for the French mercantile marine in time of war. The objections raised are that the great evaporation will leave the lake so salt that fish will be unable to live in it, and that the water will stagnate and become a source of pestilential miasma. M. Roudaire, however, is of opinion that a return current to the Mediterranean will be established in the bottom of the canal.

Welding by Pressure.

At a recent meeting of the Physical Society, London, Professor W. Chandler Roberts communicated the results he had obtained in repeating the experiments of M. W. Spring, Professor at the University of Liège, on the union of finely divided particles of metal by pressure. M. Spring had shown that at a pressure varying from 5,000 to 7,500 atmospheres, metallic filings may be united into coherent disks. Thus at a pressure of 6,000 atmospheres bismuth filings may be united into a disk, which has a crystalline fracture and a density which is identical with that of the metal cooled from the molten state. Zinc, again, also a very crystalline metal, will weld into a disk at a pressure of 7,000 atmospheres, 105,000 pounds to the square inch, and the metal will even "flow" into cracks between the die and the collar surrounding it, just as in the experiments of M. Tresca, lead "flowed" under similar circumstances. Professor Roberts had repeated and confirmed many of the experiments of M. Spring,

whose more recent results are of special interest, as he has shown that if filings of bismuth, lead, and cadmium be mixed in suitable proportions—such, for instance, as in Wood's alloy—and if the mixture be submitted to a pressure of 7,500 atmospheres, 112,500 pounds to the square inch, an alloy is obtained which will actually fuse at 70° C., the true fusing point of Wood's alloy being 68° C. Professor Roberts showed to the Society an alloy he had prepared which melted below 100° C., although of the constituent metals the lowest melting point is 230° C., and he pointed out the great interest, both to the physicist and metallurgist, of M. Spring's results.

Defective Brick Piers.

The committee of architects appointed by Kraft, Holmes & Co., to investigate the fall of the building lately occupied by them, in St. Louis, have made their report. It is made on calculations based on standard authorities. No defects were found except in the basement piers.

The brick piers in the basement will have to carry the load of all the floors and roof added. This will be 74,100x5, equal to 370,500, to which add 7,410 and will have 377,910 pounds, which is 189 tons.

The dimension of the brick piers being one foot ten inches by two feet five inches, will give four and one-half square feet as the area of each pier. The average crushing load of first class hard brick work laid in cement mortar is about sixty tons per square foot, and again taking one-sixth as a factor of safety, we will have ten tons per square foot, as the safe load, and if each pier has four and one-half square feet, it will give forty-five tons as the safe load to be imposed upon piers of this size.

It will be seen from this that the load of 189 tons was four and one-quarter times as great as the pier was reasonably able to carry. It is therefore evident that the brick piers, being the weakest part of the structure, had to give way first, and they caused the disaster.

While the above calculations are based upon brick piers of the very best quality of workmanship and materials, the piers in this building were not a fair average of work.