A Grand Observatory on the Mediterranean.

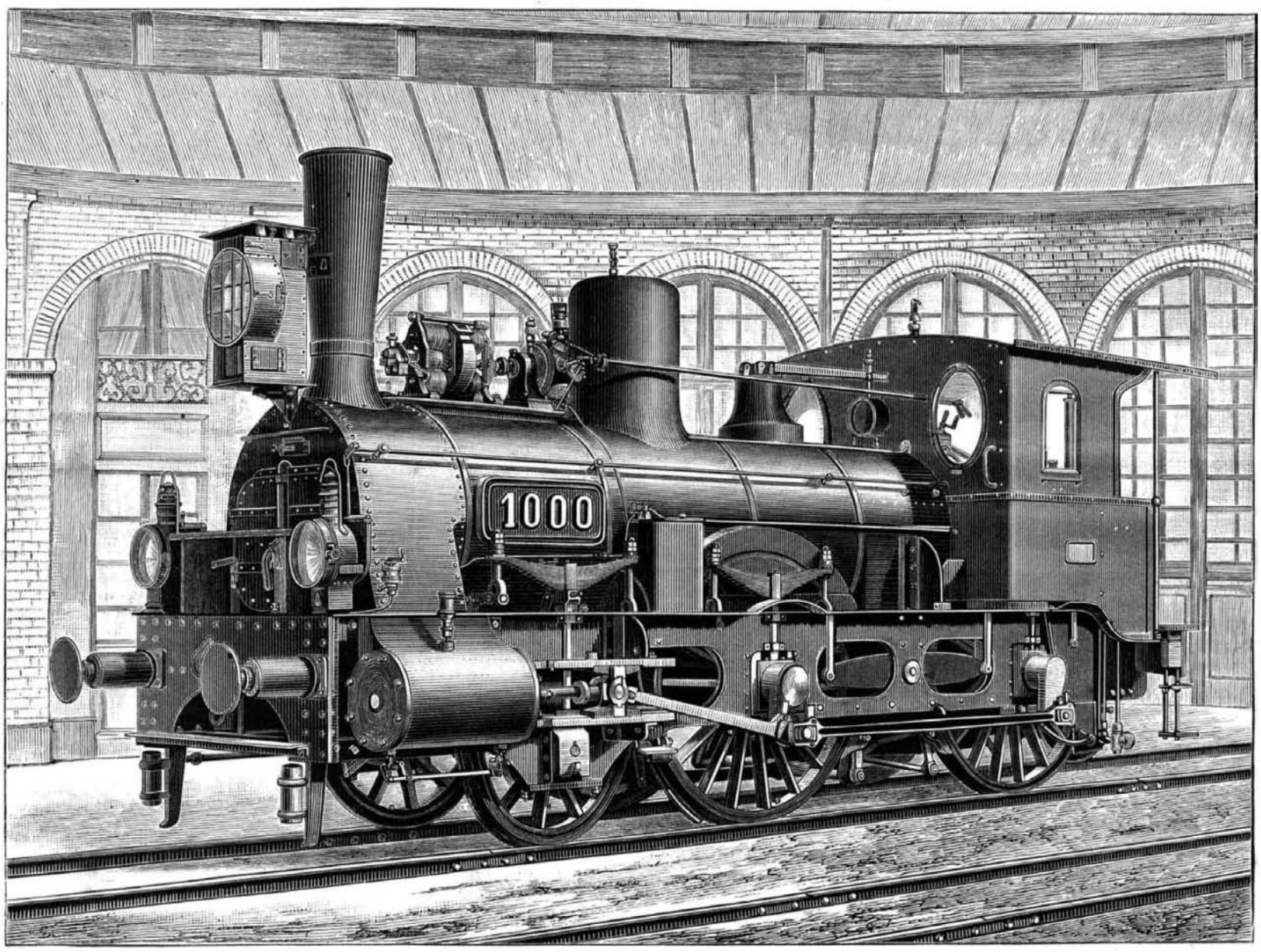
The readers of the SCIENTIFIC AMERICAN SUPPLEMENT will remember that some time ago (No. 327) appeared an illustration and description of a new observatory that was in process of construction at Nice, France, by a wealthy Continental banker. The London *Times* has recently published a more detailed account of this observatory, from which we extract as follows: One of the finest observatories in Europe is now almost completed at Nice, and the work of observation has already commenced, under the able direction of M. Perrotin, the French astronomer who conducted the expedition to Patagonia for the observation of the Transit of Venus. The importance of this new undertaking may be judged of from the fact that more than £80,000 has already been spent upon it, and the total cost, when all is complete, will not fall far short of £120,000. This great enterprise is due entirely to the munificence of M. Bischoffsheim, of Paris. France, it is well known, has fallen somewhat behind the age in the matter of astronomical observatories, whether public or private.

In England, America, Russia, and other countries they are far more numerous than in France; and the establishment of the observatory at Nice is consequently considered a patriotic work which will help to redeem the reputation of France in the world of science. The site is admirably selected on the crest of a hill to the east of Nice, dominating the Valley of St. Roch, and commanding a magnificent panoramic view of the entire town, the basin of the Paillon, and the innumerable mountains that rise on either side to shelter the flower gardens and the orange and olive groves that lie at their feet. The central building is the library, a capacious and luxuriously furnished hall, with sweet scented pine wood shelves, bearing the literature in all languages devoted to the one subject of study; while the walls outside are decorated with handsome mosaics, inscribed with the names of Laplace, Arago, and Leverrier.

On both sides of the library are the houses of the astronomers, distinguished by elegance and comfort. In the Director's office telephonic communications connect every part of the establishment. The two largest instruments are the great and the small equatorial, each, of course, placed in a building of its own, with a revolving cupola roof. The smaller of these telescopes is now in working order. It measures 7 meters in length, and the objective 18·38 centimeters in diameter. Both the body and the lenses were made in Paris. The cupola of wood and copper opens and shuts and revolves with the greatest ease, one man alone sufficing to set the whole of this large dome in motion, and this without any fatiguing effort. The larger equatorial telescope will cost for the instrument alone £14,000. This monster, which can only be compared to a 100 ton gun, is 18 meters in length, and the diameter of the object glass is 76 centimeters; yet it can be moved with the slightest touch of the hand and follows with ease every movement of the planets. When in working order it will be one of the sights of Europe. Until the telescope now projected for the Observatory of Pultawa at St. Petersburg is completed, it may be considered, we are assured, the finest instrument of its kind. The building destined to hold this giant is a formidable quadrangle of Turbiæ stone, and though the heights of Turbiæ are within sight of the observatory, and but a few miles away, the mere stones required for the wall around this telescope cost £6,000. Altogether, this one telescope, the cupola through which it can command the sky, and the building it occupies will cost about £40,000. The town of Nice can now boast of an institution that will render its name as familiar among astronomers as it is to those who study the climatic treatment of disease.

LOCOMOTIVE ELECTRIC LIGHTS.

In our paper for November 10, we gave illustrations of a traction engine carrying an electric machine for generating light and a tower for the use of the light. We herewith illustrate another special application of the electric light in its use upon railroad trains for brightly lighting up the road ahead of the locomotive. Upon certain lines, on which the track may become easily obstructed, such a light is of great importance, and is capable of rendering great services.



LOCOMOTIVE WITH ELECTRIC HEAD LIGHTS AND ELECTRIC MACHINE.

In order to permit of the adaptation of the electric light to a locomotive it has been found necessary to have recourse to a regulator of special construction, and one capable of operating well while submitted to the jarring that attends such an engine.

The regulator of Messrs. Sedlaczek & Wilkulill is of this nature. It has been derived from an apparatus, now old, constructed in 1856 by Messrs. Lacassagne & Thiers.

In this lamp, which we have heretofore illustrated, the upper carbon being fixed, the lower one was pushed into a tube by a column of mercury that rose slightly every time the arc became too large.

The entrance of mercury into the tube that carried the lower carbon was regulated by the current itself in the following way: The slightly elevated reservoir that contained the mercury communicated with the carbon holder tube through a rubber tube that was held between the core of an electro-magnet and its armature. This electro was traversed by the current from the lamp, and, as long as the intensity was normal, its attraction upon its armature kept the rubber tube closed and prevented the mercury from flowing. But when the arc elongated the armature fell, and the mercury pushed the carbon up until the former intensity was established again.

Our illustration, which is from *La Lumière Electrique*, shows a locomotive with the dynamo machine arranged just back of the smokestack. By a lever extending to the cab the engineer starts or stops the electric machine, and so lets on or shuts off the head lights.

A Curious Electric Phenomenon.

On his ground at Espeluy, Count De Las has a locomotive that runs a thrashing machine. While standing near the belt and holding over him an umbrella to shield himself from the sun, the Count chanced to touch one of the iron braces that supported the ribs of the umbrella, and suddenly felt a very perceptible spark upon his hand. On the following day, he says, I repeated the experiment, and obtained at two centimeters' distance very frequent sparks that formed an almost continuous current, whose intensity increased with the rapidity of the motion.

When the rapidity of the engine was great there was heard a crackling of strong sparks which were leaping from the belt to the boiler, although we could not see them on account of the strong sunlight in the middle of the field. How is this phenomenon to be explained? Could it be attributed to the development of electricity obtained by evaporation, which was the basis of the Armstrong electric machine? No, because the boiler of this machine must be mounted upon large insulated columns. Here, on the contrary, the locomotive, through its iron wheels, communicated directly with the earth, and the latter, which was certainly quite moist, increased its conductivity. The explanation that appears probable to me is the following: The belt was not sufficiently taut, and, in order to increase its adherence to the rim of the fly wheel, it was thickly besprinkled with resin. But, despite all this, the adherence was not perfect; there was friction between it and the fly wheel, and, in this rotary friction, just as happens in the electrophorus, the two fluids separated. The metallic frame work of the umbrella operated as a condenser, and, since the belt was 10 meters in length and 20 centimeters in width, it presented a superficies of 2 square meters, upon which a large quantity of free fluid was capable of accumulating. I had not, upon the spot, a means of verifying the kind of electricity, but I think that I can assert that it was resinous.—*J. M. Folache, in La Nature.*

[The "phenomenon" would seem *curious* only to those who do not know about the electricity of machine belts; belt electricity is within the experience of most mechanics, and nothing beyond the ordinary appears to have occurred in the Count De Las' case. Also the allusion to Armstrong's machine and the electrophorus indicates that J. M. F. is not a very competent witness on electrical matters.—EDS. SCIENTIFIC AMERICAN.]

THE Treasurer of the immense colony of South Australia says that the population is only 300,000.