

compressed air, on the contrary, suffers no such diminution of pressure on being carried over long distances, as does steam; and its escape serves to ventilate the tunnel.

The Rand drill is in use in a large number of mines, etc., throughout the country, notably those in Port Henry, N. Y. the Comstock mine in Nevada, the Lehigh and Wilkesbarre Coal and Iron Company's mines in Nevada and elsewhere. For further information relative to both drills and compressors, address

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NEW YORK, SATURDAY, NOVEMBER 24, 1877.

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\$80,000 REWARD FOR A CURE FOR CHOLERA.

By a will dated August 28, 1849, a French gentleman named Bréant left to the Paris Academy of Sciences the sum of \$80,000, to be awarded as a prize to any person who should either discover a cure for Asiatic cholera, or the cause of the disease. He further directed that the interest of this fund, until the principal was finally awarded, should be donated as premiums to investigators who should contribute important information tending to advance knowledge relative to the malady. The rules of the French Academy, under which the prize will be awarded, are as follows. The competitor is required:

- (1). To point out a system of medicine that cures cholera in the immense majority of cases; or
(2). To indicate, in an incontestable manner, the causes of Asiatic cholera, so that, by suppressing these causes, the epidemic will cease; or
(3). To discover some certain prophylactic as evident for cholera, as, for instance, vaccine is for small-pox.
(4). To become entitled to the annual prize (derived from the interest on the \$80,000), the competitor will have to demonstrate, by rigorous processes, the existence in the atmosphere of substances that may play a part in the production or propagation of epidemic diseases; and
(5). In case none of the above conditions have been fulfilled, a competitor may take the annual prize by finding a radical cure for tetter, or enlightening the world upon the etiology of that disease.

The existence of this reward has been the cause of an immense amount of medical research, and hundreds of papers have been submitted to the Academy. The great prize has never been awarded, and probably it never will be, for before the cause or the cure of Asiatic cholera can be discovered, the malady itself, owing to our constant progress in knowledge of preventive sanitary precaution, will probably, like the plague, have disappeared altogether.

During the present year, we learn from the English Magazine of Pharmacy, nine papers have been sent in. None have been adjudged worthy of the \$80,000, but as the interest may be bestowed annually upon any person "who shall have caused science to progress, as regards cholera or any other epidemic disease, either by giving better analyses of the air, and showing therein some morbid element, or by discovering some process enabling us to become acquainted with, or investigate, the animalculæ which, up to the present time, have escaped the eyes of the learned, and which may be the cause, or one of the causes, of the disease."

Portions of the revenue have been awarded—on two of the nine papers. The first of the successful pair is by Dr. Duboué, of Pau, and he endeavors to demonstrate that the primitive lesions consist in a disquamation of the endothelium of the small vessels, and of the epithelium of the various membranes, particularly that of the intestine, and he attributes this disquamation to the influence which the morbid agent of cholera, after it has penetrated into the system by the capillaries of the lungs, exerts upon the epithelial cells and the intercellular substance. For explanation of the various phenomena of cholera, according to this theory, Dr. Duboué was awarded a prize of \$400. The other fortunate competitor was Dr. Stanski, of Paris, who forwarded a large number of pamphlets, wherein he endeavored to demonstrate that contagion at a distance by miasma, or, in other terms, infection by means of a volatile principle, has no existence in any disease whatever. For this contribution a prize of \$200 was given.

We believe that the existence of this prize is little known in this country, and as cases of cholera have been of frequent occurrence in some localities South, and also have been closely and intelligently studied by the physicians of that section, we have no doubt but the American medical profession, if it does not possess some member who may secure the prize, at least numbers many who can contribute materially to general knowledge concerning the disease.

SUN SPOTS STUDIED BY SOLAR PHOTOGRAPHY.

M. Janssen has obtained magnificent photographs of the sun, measuring some 12 inches in diameter, on which the granular solar surface can be as clearly distinguished as by regarding the sun through the largest instruments. He obtains these by diminishing the time of exposure to less than 1/100th of a second and employing special means for the development of the image.

On April 14th last, M. Janssen states that a photograph of the sun showed no spots, and it was therefore reasonable to presume that none existed, as spots as small as one second in diameter were always registered. On the next day, at about 8 A. M., another photograph showed, near the center of the sun, a considerable group of spots, the largest of which measured some 20 seconds in diameter. M. Janssen points out that, as the earth when seen from the sun is but 18 seconds in apparent diameter, our globe could easily have been contained within the area of the largest spot. The suddenness of the apparition and the grandeur of the phenomenon led the observer to predict the prompt disappearance of the spots and frequent changes in their configuration. He further concluded that the idea that, when the sun (as at present) exhibits few spots, that it is undergoing a period of repose is inexact, but that the truth is rather the reverse, as spots then form and vanish with a rapidity much greater than at any other epoch.

Of course these views of M. Janssen have led to many observations and much discussion by and among astronomers. M. Denza cites a small spot which appeared on

March 6th and disappeared before the 12th; the same observer notes the fact that the spot of April 15th formed on the afternoon of the 14th. M. Ventosa at Madrid also saw the spots form at 5 P. M., on the 14th, and mentions seeing other smaller spots appear and vanish rapidly during previous months.

M. Gazan dissents from M. Janssen's views, and regards sun spots as the result of eruptions in the solar mass. Before the spot, however, there are faculae which should have been seen. In the photograph of April 14th, however, faculae are altogether absent, but this M. Gazan explains by assuming that the faculae were too near the center to be visible. According to him the spot in question will not disappear any more rapidly than spots during the maximum epochs, and he thinks that it will return. M. Janssen, however, replies that fifteen days afterward, when the sun had more than completed his semi-rotation, the spot should, according to M. Gazan, have reappeared, whereas it did not.

M. Tacchini does not coincide with M. Janssen in the idea of the present activity of the sun, but on the contrary considers that an actual period of repose exists. He points out that there were 290 spots observed within five months in 1871, while but 24 were noted in the same period in 1876.

M. Janssen states that the first mentioned total is exaggerated, for several spots which appeared three or four times were counted as frequently, and that numerous small spots could not appear and disappear rapidly, as is the case now, without producing excessively violent movements in the solar mass. This very great activity would militate against the formation of spots and be favorable to the disappearance of those already produced.

CEREBRAL THERMOMETRY.

At a recent meeting of the French Medical Association at Havre, M. Broca laid before it the results of a prolonged investigation into the temperature of the surface of the head in health and disease. He employed an instrument of which the bulb was maintained in contact with the cranium, whilst its opposite surface was thoroughly insulated from external air. As a rule, he placed three of these thermometers on each side of the head, and thus obtained readings at six different points. A normal standard was obtained by experiment from healthy individuals. Twelve persons were taken. The maximum temperature was 94.73° F., the minimum 91.04°, giving a mean temperature of 92.87°. The thermometers on the left side registered two degrees higher than those of the right, when the brain was passive; when active an equilibrium was at once established. From this, Mr. Broca inferred that the blood supply is more abundant to the left than the right hemisphere; but when the brain is called into activity, the right hemisphere, being, as it were handicapped, calls for a greater supply of blood than the left. The reading of a book raised the temperature one degree.

LESSONS IN MECHANICAL DRAWING.

The very admirable series of Lessons in Mechanical Drawing which have been serially published in the SCIENTIFIC AMERICAN SUPPLEMENT is now approaching its termination. The first of these lessons appeared in No. 1 of the SUPPLEMENT and in it the author, Professor C. W. MacCord of the Stevens Institute (himself perhaps the ablest mechanical draughtsman in the country) entered upon his subject in a manner not only entirely novel but in a way which could not but prove to the student that the subject was to be treated with a comprehensiveness and thoroughness never before attempted in any work, and certainly never essayed in any periodical journal. Professor MacCord began by teaching the beginner how to make his own instruments, starting out with a couple of triangles to be cut out of paste-board, and showing how much might be done with these simple aids. Then followed instructions how to make lines and angles and to combine them into various geometrical patterns. In lesson 7, he reached the employment of the compasses and the first introduction of circular forms, and thus he proceeded, taking up the various instruments and clearly elucidating their uses. The first thirty-two lessons completed the elementary portion; and whoever had mastered the principles and faithfully practiced the exercises presented in the large number of drawings, which were accurately prepared by the author himself, was then in a position to place the knowledge acquired of mechanical drawing to the test of practical application in its legitimate sphere, namely the actual draughting of machinery. The new series began with the draughtsman's scale and its uses, and the learner was at once inducted into the drawing of simple forms, such as bolts, nuts, links, and all the various parts of machines and so onward until in the most recent lessons the construction of the screw propeller has been elucidated.

That the lessons have proved of practical value we have the direct evidence of a number of correspondents who have written to us telling us of their progress, and also by their questions showing how intelligent an interest they feel in the same. Some have sent us capitally executed drawings as proof of their attainments. One writer informs us that he has practiced but for two months on the lessons extending to No. 5 in the second series, and that, although he had no previous knowledge of draughting, he has acquired sufficient skill to enable him to prepare patent office drawings, so that he now is making money out of the valuable education he has obtained from the SUPPLEMENT's pages.