[FOR THE SCIENTIFIC AMERICAN.]

### Future Inventions and Improvements.

Judging the future from the past sixty years, we may reasonably expect wondrous developments in genius and science. Railroading, telegraphing, ocean navigation, were then engaging a few advancing minds, with predictions of failure, and yet success has attended each of these wondrous enterprises; and probably no one then anticipated crossing the Atlantic inside of six days, or sixty miles an hour by rail, or of telegraphing around the globe, yet these have long since been successfully accomplished. But little was then known of electricity or of its power of transmitting messages, and not until many years after messages were transmitted did anyone anticipate the running of cars through our cities by its wondrous power. At our 1876 centennial at Philadelphia, an electric light was exhibited as a curiosity, and now nearly all of our cities are so lighted, and Mr. Edison has given the world the incandescent light for the interior of our dwellings and buildings. The storage battery is now being so perfected that we may reasonably look for its being employed to convey passenger cars over our common railroad tracks, and even to be used in place of the steam engine for freight trains. The public are more credulous now than sixty years ago. Aerial navigation is no doubt an accomplishment of the future, and when some supposed crank says that he is going across the Atlantic in an air ship, don't discourage him nor predict a failure, as they did poor Fulton with his first American steamer.

Electric light and heat is no doubt an accomplishment for not only lighting but warming our homes, and to be produced by a small windmill on our roofs, which may run a dynamo and produce these elements and store them in our attics, to be used at pleasure and at a nominal cost of production. All of the so-called lost arts are to be restored, Damascus steel being among the most useful of them all. Then comes tempered copper; but from what I saw of tempered copper tools in England, in 1869, I think that its usefulness has been greatly overrated, and I have been of opinion that steel tools in place of tempered copper were used in chiseling ancient obelisks and granite, but that rust has destroyed them, while the copper have remained as they were used.

Certain colored glass is very desirable for ornamentation, but not so very useful as steel for choice implements.

And now our sculpturing is approaching the Grecians. We have had our Powers in the Greek Slave, and in sculptured heads are nearing the ancients. In painting, we appear to be behind Raphael and Michael Angelo and many others of the old masters.

In architecture we are as yet mere imitators in structure, except in bridge architecture. Ancient architecture never spanned Niagara nor built a Brooklyn bridge. Our scientific architects and inventors are becoming not only grand imitators but great originators. And this is not only due to natural genius and America's liberal protection to the original inventor and designer, but also to the discovery of the so-called lost arts. And whenever any important principle for usefulness, whether mechanical or ornamental, is discovered or invented, it opens a vast field for thousands to improve, as each one of the improvers is entitled under our protective laws to an exclusive interest in his rights. Our present patent laws should be greatly improved to still encourage inventive genius, and our Congress should look more to the encouragement of inventions than to many of our useless laws. And to-day our Patent Office bureau is more neglected than any other one of our departments, and is the only department that pays, and now I believe has over $3,000.000 to its credit in the United States Treasury. We have abundant skill for examiners, and why keep a poor inventor often four to six months even to have an examination of his case.

Inventors have combined and held important meetings and petitioned Congress for reforms in this terribly neglected matter, and still nothing is done for relief. But, as we truly live in a great age for advancement, we can but still hope and work to win.

J. E. EMERSON.

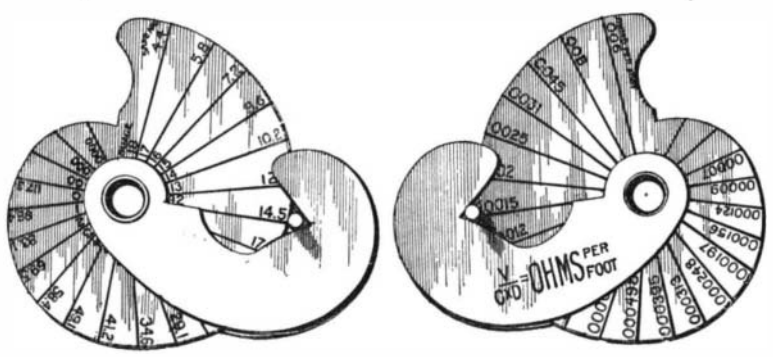
### The Measles Bacillus.

Dr. Canon and Dr. Pielicke, of the Moabit Hospital, the former of whom was one of the first to demonstrate the presence of the influenza bacillus in the blood, have now turned their attention to measles, and it is reported that they have been so far successful that they have been enabled to demonstrate the presence of a specific bacillus in connection with this disease.

This discovery has naturally attracted considerable attention; for although *a priori* we should expect measles to be the result of the action of such a germ, we have hitherto been unable to associate it directly with any such causal agent. In fourteen patients they have succeeded in finding what they assume to be a specific bacillus in the blood, in the expectorations, and in other secretions. This bacillus is stained with methylene blue in the same way as the influenza bacillus, the coloration being specially intense at the ends. The different individuals differ considerably in length, being from one three-thousandth to one one-thousandth of an inch. Its characteristics are said to be different from those of any other bacillus known, and artificial cultures have already been obtained. If once we are enabled to study the life history of this organism, there seems to be a possibility that we shall be able to take some efficient steps in the protection of children against this disease. The further observations on this organism and on its power of producing the disease will be awaited with additional interest from the fact that it appears to be so like the influenza bacillus in its distribution, and also to a certain extent in the effect it produces, in spite of the fact that it is very different in structure and appearance from the influenza organism. —*Lancet.*

### AN IMPROVED POCKET WIRE GAUGE.

The little implement shown at full size in the illustration is finely finished in German silver and is designed to be a great convenience to electricians, linemen, and all having occasion to use wire for any electrical purpose. By placing the wire in the V-shaped opening between the movable arm and the edge of the gauge, and moving the arm around until the wire is closely held, the shoulder of the arm and its radial line will indicate: 1. The American or Brown & Sharpe gauge of the wire, (2) the safe current it will carry in amperes, and (3) the ohms resistance per foot of copper wire. Then, by formula as stamped on the arm, may be readily determined the size of wire required to carry any number of lamps, any distance. The figures on the front of the gauge, near the center, indicate the Brown & Sharpe wire gauge, and those on the outer edge show the amperes the wire will safely carry before raising its temperature thirty degrees. On the back of the gauge is given the ohms resistance of a foot of copper wire of any size, as shown by the gauge. This resistance is multiplied by seven to find that of a foot of iron wire, or by thirteen to find the resistance of a foot of German silver wire. This very useful implement is manufactured and sold by the Novelty Electric Company, whose factory and warerooms are at 50, 52, and 54 North Fourth Street, Philadelphia, Pa. For price see advertisement on page 349, this issue.




THE "NOVELTY" ELECTRIC WIRE GAUGE.

### Long Distance Fast Trains.

The fastest train from Denver to Chicago is now the 9 A. M. on the Burlington, reaching Chicago at 2:15 P. M. the next day. It is also the fastest long run in the West. The distance is 1,028 miles, and the time, allowing for the difference in longitude, is 28¼ hours. Hence the speed from terminal to terminal is 36·4 miles an hour. This is not far behind the speed of the limited trains between New York and Chicago, and is a pretty fast schedule for a run of over 1,000 miles. The fastest New York-Chicago trains are as follows:

New York to Chicago—North Shore Limited via New York Central and Michigan Central, 976 miles in 25 hours. Average speed between terminals, 39 miles an hour.

Buffalo to Chicago—North Shore Limited via Michigan Central, 536½ miles in 14⅙ hours. Average speed between terminals, 37·8 miles an hour.

New York to Chicago—South Shore Limited via New York Central and Lake Shore & Michigan Southern, 964 miles in 24¾ hours. Average speed between terminals, 39 miles an hour.

New York to Chicago—Pennsylvania Limited via Pennsylvania Railroad, 911 miles in 24½ hours (allowing for the ferry). Average speed between terminals, 37·2 miles an hour.

New York to Chicago—Columbian Express via Pennsylvania Railroad, 912 miles in 26¼ hours. Average speed between terminals, 34·7 miles an hour.

The Southwestern Limited from New York to St. Louis by the New York Central, etc., runs 1,168 miles in 30¾ hours, or 38 miles an hour between terminals.

Very much the greater part of the Burlington line is single track, and on much of it the freight business is heavy. A schedule of 36·4 miles an hour for 1,028 miles therefore requires skillful operating besides robust motive power. This fast train is hauled by the class "H" mogul designed at Aurora.—*Railroad Gazette.*

### Eating Before Sleeping.

It used to be considered prejudicial to good health to partake of food just before going to bed. But many physicians now recommend to their patients a light meal before retiring. On this subject Dr. W. T. Cathell, in *Md. Med. Jour.*, says:

Many persons, though not actually sick, keep below par in strength and general tone, and I am of the opinion that fasting during the long interval between supper and breakfast, and especially the complete emptiness of the stomach during sleep, adds greatly to the amount of emaciation, sleeplessness, and general weakness we so often meet.

Physiology teaches that in the body there is a perpetual disintegration of tissue, sleeping or waking; it is therefore logical to believe that the supply of nourishment should be somewhat continuous, especially in those who are below par, if we would counteract their emaciation and lowered degree of vitality; and as bodily exercise is suspended during sleep, with wear and tear correspondingly diminished, while digestion, assimilation, and nutritive activity continue as usual, the food furnished during this period adds more than is destroyed, and increased weight and improved general vigor is the result.

All beings except man are governed by natural instinct, and every being with a stomach, except man, eats before sleep; and even the human infant, guided by the same instinct, sucks frequently day and night, and if its stomach is empty for any prolonged period, it cries long and loud.

Digestion requires no interval of rest, and if the amount of food during the twenty-four hours is, in quantity and quality, not beyond the physiological limit, it makes no hurtful difference to the stomach how few or how short are the intervals between eating; but it does make a vast difference in the weak and emaciated one's welfare to have a modicum of food in the stomach during the time of sleep, that, instead of being consumed by bodily action, it may during the interval improve the lowered system. I am fully satisfied that were the weakly, the emaciated, and the sleepless to nightly take a light lunch or meal of simple, nutritious food before going to bed for a prolonged period, nine in ten of them would be thereby lifted into a better standard of health.

In my specialty (nose and throat) I encounter cases that, in addition to local and constitutional treatment, need an increase of nutritious food; and I find that by directing a bowl of bread and milk, or a mug of beer and a few biscuits, or a saucer of oatmeal and cream before going to bed, for a few months, a surprising increase in weight, strength, and general tone results. On the contrary, persons who are too stout or plethoric should follow an opposite course.

### Steam Launches.

The steam launches or cutters for the United States naval vessels are built strong enough to be raised and lowered with bunkers and tanks full and steam up. They are 30 feet long, 7 feet 9 inches beam, 4 feet deep, 2 feet 5 inches and 2 feet 10 inches draught forward and aft. They have a speed of 7½ to 8 knots. They are fitted with compound vertical inverted engines, intended to run at 300 revolutions per minute with a boiler pressure of 160 pounds. The cylinders are 3½ inches by 5 inches and 7 inches by 5 inches. The valves are of the three-port slide valve type, with 1⅝ inches travel, and driven by the ordinary link motion. The crank shafts are of wrought steel, with two thrust rings forged on. The screws are true helices, 27 inches diameter and 48 inches pitch, or 36 inches pitch for 28 feet cutters; the helicoidal area is 3·19 square feet, and the projected area 2·23 square feet. The boilers are of the Towne pattern, having a rectangular grate, surrounded by a water box with water tubes running diagonally from side to side above the grate, with a top steam drum connected to the water box by tubes. These boilers have been in service for some years, and are found to steam freely with natural draught, to be economical in coal consumption, and to have a low center of gravity. Their working pressure is 160 pounds per square inch. The condenser consists of a copper pipe along the keel. The boats carry 35 gallons of water on each side of the engine space, and 300 pounds of coal on each side of the boiler, or 70 gallons—640 pounds—of water and 600 pounds of coal. The weight of machinery is 850 pounds; boiler, with water and attachments, 2,295 pounds; bunkers, tanks, etc., 570 pounds; total weight, fully equipped for service, 4,955 pounds.

THE rate of progression of a storm is often 50 miles an hour, and a series has been traced in a direct line from north to south, a distance of 400 miles. Mr. Marriott thinks that the average altitude of a thunderstorm does not extend beyond about 5,000 feet above the earth's surface.