La Rose mine, which was the first to be opened and has been worked the most systematically thus far, furnishes at present the best illustration of the extent of the veins. The main shaft at this mine is down to 100 feet and drifts have been made for a distance of over 300 feet at this level. These drifts show that the vein of ore is as extensive and as rich as the portion which was first discovered. The mine was one of the series to be investigated by the mineralogists. Here the diamond drill has bored to a depth of 350 feet, ore being found at the greatest distance from the surface. The Tretheway mine contains ore of such a grade that 50 tons of it have actually yielded 190,000 ounces of silver, in addition to 12 per cent cobalt and 3½ per cent nickel. Like most of the other operations in the district, however, this mine consists of merely an open cut which at the present time is 60 feet in length and 25 feet in depth; the vein of ore averages but 8 inches in width, which will give an idea of the percentage of metal which it carries. The veins thus far located throughout the district are not noted for their size. They average from 10 to 12 inches, in one or two instances widening to 18 inches. The geologists are still in doubt as to the formation of the veins, but believe they were created by the action of highly heated water which permeated the narrow vertical fissures where they are found. These fissures cut through the rocks of the geological ages to which we have referred.

Owing to the presence of so much ore near the surface, mining operations in the Cobalt district are notable for the crude methods employed. As already stated, the majority of workings are practically on the surface, the earth and rock covering being stripped off and open trenches dug to conform to the size and direction of the vein. Some of the largest producers have not been mined to a distance of 25 feet below the surface as yet. The system usually employed in getting out the ore from these workings is to utilize explosives, sometimes the pick, to loosen the formation, when it is loaded into buckets and hoisted by means of a boom derrick to the top. The windlass operated by hand-power is one of the common methods. Sidings of tramways have been laid from some of the larger mines to the Temiskaming and Northern Ontario Railway, a line which the Canadian government has built through this district from Toronto.

At La Rose and a number of the deeper mines where shafts have been sunk, the ore extracted from the chambers on the various levels is carried to the foot of the shaft by wheelbarrows, loaded in the buckets, then hoisted by windlass and cable to the surface, a steam engine of suitable horse-power being installed for this purpose. The buildings at the larger mines consist merely of the shaft house—a frame shed covering the mouth of the shaft and hoisting machinery—and stock house where the ore is broken up into suitable sizes and sacked for shipping to the smelters. Some of the companies have not even provided storage for the ores, and it is a common sight to witness ores containing $2,000 and $3,000 per ton in silver lying in bags in the open air awaiting opportunity to be hauled to the railroad station.

Owing to the difficulty of securing the cobalt and nickel by the process employed at the New Jersey smelters it is understood that a very large proportion of these valuable substances is wasted in the effort to obtain all of the silver which is contained in the ore. A reduction works is now in course of construction at Cobalt in which the German process utilized in treating what is known as Saxon ores will be employed. It is known that by this process ores containing cobalt, arsenic, and silver are so economically treated that nearly all the cobalt and silver are saved. The mining department of the Canadian government has taken up the project and the works are being constructed under the supervision of two German metallurgists who are familiar with the treatment referred to.

Readers of the SCIENTIFIC AMERICAN, however, are aware that Thomas A. Edison has been making an elaborate series of experiments for several years with the view of producing an electric storage battery which will be more economical and durable than the types now used for commercial purposes. From time to time reference has been made to the work which Mr. Edison is doing. It is known that during the last year he has made several examinations of mineral deposits both in the United States and Canada. In a recent interview he made the statement that he had discovered a substitute for lead which would revolutionize the storage battery. The metal which he intends utilizing is cobalt, and it is evident that he has discovered a process by which it can be secured from the ore in such a form that it is available for his purposes. The cobalt contained in the various nickel ores thus far exposed in the United States, however, is insignificant compared with the extent of the ores in the new mining district. As Mr. Edison made the statement referred to after he had visited this section of Canada, it is probable that he will utilize a portion of its output in the new battery which he announces he is about to manufacture. The advantages of this battery over the majority of types in use can be appreciated when his statement is quoted. This is to the effect that for $200 a battery can be constructed and equipped which will supply motive power to propel a vehicle for two passengers a distance of 100,000 miles before another need be substituted. In other words, by the use of cobalt Mr. Edison believes he has found what might be called a permanent battery.

Correspondence.

Esperanto Grammars.

To the Editor of the SCIENTIFIC AMERICAN:

Doubtless you have long ago formed your opinion as to the merits of Esperanto, the international language. I hope that it is favorable; but as there is much irresponsible criticism of Esperanto, I want to offer an opportunity for every thinker to judge for himself. I have had prepared 100,000 brief grammars of the language in pamphlet form, and will send one free to any person who is sufficiently interested to ask for it, inclosing stamp for reply. I think it really due to this great movement for an international auxiliary language, which now embraces thirty nations in its scope, that you publish this letter, so that your readers may have the opportunity of judging for themselves.

ARTHUR BAKER,
Editor L'Amerika Esperantisto
(The American Esperantist).

Oklahoma City, January 15, 1907.

Perhydrase Milk.

To the Editor of the SCIENTIFIC AMERICAN:

In your current issue we find an item relating to perhydrase milk, in which you state that the cost of this milk is about four or five cents higher per liter than that of ordinary milk. However, this is erroneous, since there is an increase of four to five pfennige, or 1 to 1¼ cent, only per liter.

You state further that "perhydrase milk must be kept in a dark place. Exposure to light will give it a bitter taste." This refers not only to perhydrase milk, but to milk in general, as Drs. Römer and Much have ascertained by numerous tests. If *any milk* is exposed to light, even for a short period, it acquires a bitter taste and becomes injurious to health, while if kept in a dark room, it remains sweet. They therefore recommend the use of colored, preferably dark red or dark green, glass bottles for the keeping of milk; while if kept in the ordinary white bottles, or in bottles of blue glass, milk will "turn" after a short time if exposed to light.

These remarks may prove of interest to your readers.

New York, January 17, 1907. C. BISCHOFF & Co.

Supplementary Railroad Signals.

To the Editor of the SCIENTIFIC AMERICAN:

Considering the recent railroad collision accidents in this locality, it has occurred to me the following plan of signaling might be used advantageously.

Place two electric lights, one red, the other white, on each telegraph pole on the line of the railroad between all stations, to be connected at the stations with any electrical plant sufficient to light the signals from one station to the other (when found that it was needed). Should the signal agent find that he had made a mistake, or for any other reason wish to stop the train, touching the button in his office will light all red signals instantly ahead of the train that has passed him. The engineer seeing this will know that he must be cautious, and go slow or stop for further orders. Then, when all things are righted, turn on the white light and permit the train to continue.

I suggest this as an additional safety signal, where there is now in use the block system, and also where there is no block system at all. If there could be electricity used between stations by the engineer, he could connect to these same wires and give signals himself to other trains "fore and aft." This would be essential in cases of wrecks or other delays. I believe, if this plan had been put in use, President Samuel Spencer and party would be alive to-day.

R. MAYS CLEVELAND.

Marietta, Greenville County, S. C.

The Current Supplement.

The opening article of the current SUPPLEMENT, No. 1622, describes a German coal-tipping device. The second installment of the article on the new incandescent metallic filament electric lamps is published. A. Frederick Collins gives full details of the location and erection of a 100-mile wireless telegraph station. This article should be read in connection with that by the same author published in SCIENTIFIC AMERICAN SUPPLEMENT No. 1605, describing in detail the design and construction of a 100-mile telegraph set. F. E. Junge gives some considerations affecting the application of waste gases for power purposes. Jacques Boyer writes on mushroom culture in France. Just as the living organisms of man and animals and plants suffer various changes as the result of disease, so also many of our manufactured products are subject to undesirable changes in their character. Bread is among these. The diseases of bread are accordingly made the subject of a very clear and instructive article. A very good article is published on hard solders, and some excellent formulas are given. Mr. V. E. McCourt writes exhaustively on the origin, occurrence, and chemical composition of peat.

The Automobile Races on the Ormond-Daytona Beach.

The races this year on the Florida beach were by no means as interesting as heretofore. The only cars to compete were a few stock machines and the rebuilt, cigar-shaped, Stanley steam racer that last year covered a mile in 28 1-5 seconds—at the rate of 127.6 miles an hour. A special light-weight racer fitted with an air-cooled, 8-cylinder, V motor, and a Curtiss motor bicycle with the same type of engine, did not succeed in breaking any records.

First of the races to be held on Tuesday, January 22—the first day—was a 5-mile race from a standing start. This was won in 4 minutes and 25 seconds, or at a rate of speed of 67.9 miles an hour, by E. B. Blakely, a young Harvard student, driving a 70-horse-power American Mercedes. A 20-horse-power English Rolls-Royce was second, and a 30-horse-power Stanley steamer third. The 5-mile open championship with flying start was won by F. H. Marriott, driving the special Stanley racer, in 4 minutes and 44¾ seconds—a speed of 80 miles an hour. Capt. C. E. Hutton, on his 20-horse-power Rolls-Royce, was second in 4:52 4-5, while a 30-horse-power Stanley again took third place. A one-mile race with flying start was won by W. Durbin with a Stanley racer in 53 2-5 seconds. The 30-horse-power Rolls-Royce was second and a 30-horse-power Stoddard-Dayton third in this event. The second best time of the day—3 minutes and 51 4-5 seconds—was made by Marriott with the Stanley racer in a 5-mile match race. He beat Blakely, on his 70-horse-power American Mercedes, by but 5 seconds, however. A mile race for stock touring cars was won by Ralph Owen driving the same Oldsmobile touring car with which he recently completed the strenuous journey from New York city to Ormond Beach. His time for the mile was 1:12. Thirty-horse-power Winton and Wayne cars were second and third respectively.

The chief event of the second day was a 10-mile race in which the Stanley freak racer blew out a cylinder head after the first half mile, breaking the rear part of the chassis and damaging the engine beyond repair. Three other Stanleys in this race broke down and had to be towed to the garage. The race was won by the 70-horse-power American Mercedes by less than 10 seconds from F. E. Stanley, who drove one of his own 30-horse-power cars, notwithstanding that the steam machine broke its pump rocker arm just before it finished. A 50-horse-power Welch touring car was third. The time of the winner was 7:42 1-5, which means a speed of 77.8 miles an hour. A 20-mile race with one turn for American touring cars was won by the 50-horse-power Welch in 22:32 4-5, or at a speed of 61½ miles an hour. This is a new record for stock touring cars of but 50 horse-power. An international touring car race (distance, 20 miles) was won by Hutton on his Rolls-Royce in 23:5 2-5. Curtiss, on his 2-cylinder motor bicycle, made a mile in 46 2-5 seconds, and went ahead of W. Ray, who drove a 2-cylinder Simplex, by about 50 feet. On Friday, however, Ray made a new record of 44 2-5 seconds for the mile, which corresponds to a speed of 81 miles an hour.

On the third day of the races, Thursday, the 70-horse-power American Mercedes, driven by Blakely, won the 100-mile race, including seven turns, in 1 hour, 26 minutes, and 10 seconds, at an average speed of nearly 69½ miles an hour. The Rolls-Royce car was second in 2:02:35, and the New York-Florida Oldsmobile third in 2:57:40. The 10-mile open handicap was also won by Blakely in 13:59. The Stanley racer did a mile in 31 4-5 seconds, and F. E. Stanley drove his 30-horse-power machine a mile in 45 2-5 seconds, thus making a new record for steam touring cars. On Friday, January 25, the last day of the races, a special 6-mile match between two 30-horse-power runabouts was won in 7:35 3-5, and the English Rolls-Royce stripped touring car defeated a 30 H. P. Franklin touring car in like condition by running 12 miles in 13:12 2-5. With the repaired Stanley racer, Marriott came within two-fifths of a second of equaling his record of last year. In a second attempt later in the day his machine struck a bump while running very fast. This threw it high in the air, and caused it to overturn and roll over and over when it again struck the ground. Marriott was thrown free of the remains of the racer. He was severely, though not fatally, injured. This accident will no doubt put an end to attempts at attaining tremendous speed with freak machines. One of the other Stanley racers made a mile in 35 seconds, or at a rate of 102.8 miles an hour.