

and German territory — of the officials of which countries she speaks very highly — possess a strong interest both for geographer and statesman. Like the true patriot she is, Miss Kingsley not only sees the possibilities of the usefulness of these West African colonies to Great Britain, but is desirous that they should be utilized to their fullest extent. Since the force of circumstances, duty, and profit all seem to tend to our occupation and administration of these extensive districts, it is the duty of all patriotic persons to know as much as they can of them. To acquire this knowledge it would be almost impossible to go to a more instructive, informative, and withal eminently enjoyable work than that in which Miss Kingsley describes her travels in West Africa.

For our engraving and the foregoing review we are indebted to St. James's Budget.

Science Notes.

Professor Von Voit, of Munich, Germany, has investigated the nutritive value of extracts of meat, and now announces as the result of his researches that such extracts have very little nutritive value, if any, and that their action is almost entirely a stimulating one, being due to their contents of alkaloids, such as creatine and creatinine.—Prometheus.

A very interesting account of some simple experiments on central attraction is contributed by Mr. R. W. Wood to the Physical Review. Mr. Wood employs a circular glass plate having a hole in the center through which the "somewhat conical" pole of a powerful electro-magnet projects. This glass plate is worked and set quite level, and then a bicycle ball is blown across it in the direction of—but not exactly to—the pole of the magnet. Parabolas, hyperbolas, and ellipses can thus be described on the plate by giving varying initial velocity to the ball.

The great objective of the Yerkes telescope at the Yerkes Observatory, Williams Bay, Wis., has been successfully placed in position, and on May 21, President Harper, of the Chicago University, and a party of representative Chicagoans were present. The visitors were shown the two motions of the telescope, the clock was started, the lifting floor came up with a motion almost imperceptible, the great dome revolved, and the telescope was turned on Jupiter. Director Hale then adjusted the instrument and President Harper was the first of the visitors to look through the greatest telescope in the world. Professor Barnard declares that it is not possible to estimate what the telescope may do for science. It may take several weeks, and possibly months, for the operators to successfully solve the problems which the atmosphere may present.

The property acquired by gases, after being traversed by electric sparks, of cooling heated bodies as if the gases had become better conductors of heat, forms the subject of a short note by Prof. E. Villari (Rendicenti della R. Accademia di Napoli), says Nature. The phenomenon was observed by studying the action of different gases on a platinum spiral heated to redness by the electric current, the sparks being produced by a powerful coil reinforced by large Leyden jars. In some cases the apparent cooling produced a fall of resistance of 10 per cent. Under similar conditions, the effect was nearly the same for oxygen, nitrogen, and air, but was much less marked in the case of hydrogen. It increases with the energy of the sparks, and also, at first, with the temperature of the spiral; but after this exceeds a certain limit, the refrigerating power decreases. Experiments made with a similar apparatus, with a view of testing whether Roentgen rays modify the thermal conductivity of the gases they traverse, have as yet given negative results.

Those who have studied rocks from the point of view of their magnetic properties, observes a writer in Nature, have long been aware of the existence of certain isolated portions, or zones, endowed with intense magnetization, the distribution of which, in general, bears no fixed relation to the direction of the earth's magnetic field. The theory has been frequently advanced that these singular points owe their magnetization to discharges of lightning, and this theory is said to have received a remarkable confirmation at the hands of Dr. G. Folgheraiter, who finds, as the result of numerous observations of the remains of walls and ancient buildings in the Roman Campagna, that these structures frequently exhibit singular points and zones in every respect identical with those observed in rocks. It is suggested that the presence of singular points in walls might be accounted for by supposing that they had existed in the stone before it was used for building; but this explanation is incapable of accounting for the singular zones in which a number of adjacent stones, as well as the mortar connecting them, were found to be so powerfully magnetized that even a small detached portion of the mortar was capable of deflecting a compass needle through 180°. These zones could only have derived their magnetization after the wall had been built, and the presence, in some cases, of cracks down the wall in the neighborhood of the singularities, such as would be caused by lightning, tends to confirm the present theory of their origin.

The Truth and the Trusts.

Perhaps the most discussed subject in this republic to-day is the question of capitalistic combination for carrying on business operations. The agitators, taking advantage of the general interest in this question, have been quick to take up the cry that the liberties of our people, the resources of our land and the land itself, are being acquired by the few and so utilized as to defraud the many out of their just and inalienable rights and privileges. Without taking the trouble to acquaint themselves with the truth, many citizens of the republic give credence to the assertions of the agitators, and out of the falsifications by malicious propagandists and the ignorant credulity of their followers have arisen confusion, perplexity, discord and conflict. The only way to fight erroneous public opinion is to meet it with the weapons of fact and figure, and this is what conservative men are doing. The propagandists of hatred of capital, of hostility to wealth in general, and of discord and conflict have laid down the general propositions that a rich man is a criminal, that a corporation is a conspiracy, and that, wherever a large combination of capital is employed in business, it is employed to rob the many for the benefit of the few.

Against these vicious propositions, in the abstract, it may be fruitless to argue, for opinions are not easy to change, but there is a concrete side of the question which must appeal to even the opinionated ignoramus who have been deluded by the empty assertions of the propagandists. Neglecting the slanderous proposition that a rich man is necessarily a criminal, and the equally absurd proposition that a corporation is a conspiracy, the student of current affairs may meet the concrete position, that capital in business is always employed to rob the many for the benefit of the few, with substantial proof of the falsity of that theory. The record of market movement and prices is the weapon with which the student may successfully assail this pet theory of the crank legislators and of the falsificationists in general. What does that record show? Does it prove that large combinations of capital have controlled standard articles of consumption and increased the cost of those articles to consumers? Take the most notable of these combinations. The Standard Oil Company was formed in 1872, and it found the markets supplied with dear and dangerous illuminating oils. This company employed scientists, inventors, mechanics and business men, laid pipe lines, reduced the cost of package and transportation, and made illuminating oil safe. In 1872 dangerous oil sold at 25 cents a gallon, and in 1897 it sells for 6 to 8 cents a gallon. So much may be said for the one great "trust." The example of the one great "corporation," the American Sugar Refining Company, is similar. This corporation was formed in 1887. It found sugar selling at 7 cents a pound, and in 1897 it sells the same grade of sugar for 4 cents a pound. The Cottonseed Oil Trust, formed in 1884, has reduced the price of standard summer yellow oil from 48 cents a gallon in 1884 to 24 cents a gallon in 1897.

Among other capitalistic combinations are many that have similarly cheapened the products which they manipulate. The United States Rubber Company, formed in 1892, advanced prices far enough to insure a profit, but outsiders have compelled a reduction. The United States Leather Company has controlled since 1892 the sole leather output of the country, but prices have gone down until leather is selling at 17½ cents a pound, while the raw hides sell at 18½ cents a pound. The National Cordage Company smashed itself in its attempt to smash others, and its successors are now selling for 6 cents a pound the same product that sold for 10 cents a pound before the original trust was organized. The Whisky Trust, formed in 1890, found alcohol selling at \$1.44 per gallon, including the revenue tax of 90 cents, and to-day it is selling at \$1.16 per proof gallon, including the revenue tax of \$1.10. The bituminous coal producers combined in 1896, and sold coal at \$2 to \$2.10 per ton, and to-day it is quoted at \$1.70 per ton. The anthracite coal producers put stove coal up from \$3 to \$4.10, and after one year, of combination they dissolved, and coal again fell in price. The telegraph companies have been denounced as "gigantic conspiracies." They formed a combination in 1866. In that year it cost \$2.20 to send a 10 word message by wire from New York City to Chicago, and to-day it costs 40 cents. They have reduced the cost of such a message during thirty years proportionately to all parts of the republic. The business man in New York finds his 10 word message to St. Louis reduced from \$2.25 to 40 cents, to New Orleans from \$3.25 to 60 cents, to St. Paul from \$2.25 to 40 cents, to Galveston from \$5.50 to 75 cents, to San Francisco from \$7.45 to \$1, to Oregon from \$10.20 to \$1, and to the State of Washington from \$12 to \$1. The railroads of the country have likewise reduced the charge of moving a ton of freight a mile from 2.21 cents in 1873 to 0.84 cent in 1897.

Even these achievements, which are beyond dispute, do not tell the whole story. While these trusts, firms and corporations have so enormously reduced costs to the consumers of the country, they have, on the whole, increased the average of the wages which they pay to

their laborers. According to the theories of the agitators, all these combinations have robbed the people of their money and their liberty, but the record shows that the combinations, like business men in general, fail in some lines and succeed in others, that they have, by making use of scientific economics, reduced the cost of all standard products to consumers, and that, instead of having robbed the people of any privileges or liberties, they themselves have been subjected to restrictive legislation in the different States and in the national council. Thus do the plain truths and facts tell against the main indictment in the charge of the demagogues against the capitalists of the land. An illustration of the trust question was furnished in the recent collapses of several conspicuous and much-maligned combinations in the metal industries. The moment these concerns dissolved, the prices of their products were cut, and they were forced either to close their establishments or to cut down the wages of their laborers enough to cover the drop in prices. This, again, was contrary to the teachings of the demagogues, who have all along insisted that in "securing to labor its just reward or remuneration," the "first and necessary step is the squelching of the capitalist." Indeed, wherever and whenever the demagogic theories collide with the commercial and industrial facts, there is a wreck, and it is never the fact that is wrecked.

Demagogic agitation will continue so long as the agitator can find men to accept their falsehoods as truths and their baseless claims as facts, but it seems probable that, with the spread of a more general knowledge of what has been accomplished by the great capitalistic concerns, agitation must become a less harmful and a less dangerous evil than it has been.—By A. B. Salom, in the American Wood-Worker.

Oscillations of a Tower.

Prof. W. Ritter gives in the Schweizerische Bauzeitung of February 13 the results of his experiments on the oscillations of a tower in Zurich produced by the ringing of bells, says the Railway Gazette. The tower, which is 39½ meters high, contains five bells, ranging in weight from 425 to 3,430 kilogrammes, and it is remarkable that the light bells produced greater oscillations of the tower than the heavy ones. The horizontal oscillations were elliptical in shape and variable in size, those produced by a bell of 705 kilogrammes, which was swung fifty-three times per minute, being at a maximum 3.6 mm. long and 2.4 mm. wide, the longest axis being in the direction of the movement of the bell. When the five bells were rung at once the ellipse had a maximum major axis of 5.8 and a minor axis of 4.4 mm. The bells were swung from forty-three to fifty-seven times per minute, while the tower oscillated quite uniformly 160 times per minute. It was shown that the oscillations were felt at any point in the tower below the bells and that the amount of movement was proportional to the height above the ground. According to the principle of the conservation of center of gravity the tower tends to move in the opposite direction to that of the bell, and this movement increases until the resistance of the masonry produces equilibrium with the impulsive forces.

THE WASHINGTON MONUMENT, PHILADELPHIA.

The new Washington monument, erected at the Green Street entrance of Fairmount Park, Philadelphia, which was presented to the city by the State Society of the Cincinnati, was unveiled on May 15 by President McKinley in the presence of thousands of spectators. The statue is one of the most important and imposing monuments ever erected in the United States. In 1783 the officers of the revolutionary war, wishing to perpetuate their friendship and raise a fund for relieving the widows and orphans, organized the Society of the Cincinnati. In 1810 they began to raise a fund of \$150,000 to build a monument to George Washington, but owing to the troublous times following the war of 1812 this movement was stopped temporarily. When Lafayette visited Philadelphia in 1824, the absence of any monument caused some adverse criticism, and a new fund was started which was soon forgotten, but was revived in 1832 on the one hundredth anniversary of Washington's birth. The fund of 1810 had in 1880 grown to \$137,000, and the funds of 1824 and 1832 had grown into \$50,000. The union of these funds, together with their further increase by investment and donation, was sufficient to pay for the splendid memorial which has just been unveiled, which cost in all \$250,000. The design was made by the German sculptor, Rudolph Siemering, and represents an equestrian statue of George Washington on an immense pedestal of bronze placed on a granite platform or base. The figures and ornaments are all in bronze, and the monument as it now stands is forty-four feet high. The base of the monument is oblong in shape, 61 x 74 feet, and is built of pink Swedish granite, having thirteen steps, symbolical of the thirteen original States. At the corners are fountains representing four great American rivers, the Delaware, Hudson, Potomac and Mississippi, with allegorical figures of Indians. These fountains are guarded on either side by native animals, all in bronze. From the platform rises a

granite and bronze pedestal some seventeen feet high, while, as a crown, is a bronze equestrian statue of General Washington in the uniform of the revolutionary army. A large military cloak is thrown over his shoulders, falling well over the horse. At the front of the pedestal is an allegorical group representing America, seated, holding a trident and cornucopia. On either side is a figure, one holding a scroll, the other offering a wreath; below is an American eagle supporting the arms of the United States.

The group at the back is America showing her sons their condition of slavery, at the same time urging them to go forth and seek freedom and independence. Beneath this group are the arms of Pennsylvania.

Bronze bass-reliefs are on either side of the pedestals, one representing the march of an army and the other that of a west bound emigrant train. Immediately under the statue and running around the pedestal are the words, "Erected by the State Society of the Cincinnati of Pennsylvania."

The unveiling ceremonies were most imposing. The first event of the day was firing the salute at sunrise by the batteries of the United States regulars camping in Fairmount Park. A committee of the Military Order of Foreign Wars called on the President and presented to him the insignia of the society. After a drive through the park and city the President returned to the Hotel Walton for luncheon. In the mean-

time the parade was forming. The parade passed through the principal streets, the President being escorted to the scene of the unveiling ceremonies by the City Troop.

The ceremonies at the monument began at two o'clock with prayer by Bishop Whittaker, of Pennsylvania. An address by Major Wayne, President of the State and General Societies of the Cincinnati, followed. The President then unveiled the figure of Washington. This was the signal for the firing of the national salute by the war vessels in the Delaware. President McKinley then made a short but excellent speech.

Our engraving is reproduced from an excellent photograph by W. H. Rau, of Philadelphia.



THE WASHINGTON MONUMENT, PHILADELPHIA.

Copyrighted, 1897, by W. H. Rau.