

THE AGE OF GOLD.

From a lecture before the "Bullion Club," of New York, delivered by Prof. Benjamin Silliman, the New York *Exchange* makes the following synopsis: He began by referring to the fact that nature holds the original sources of wealth, and that labor only creates values, all effort to create them or change them permanently by human law-making being a direct violation of a great natural law. "What is money?" said Prof. Silliman. "There is a substantial agreement that money is a common medium of exchange among civilized nations. The choice of the world from the earliest time has been either silver or gold as money, because these metals demand value: (1) from the labor which it costs to obtain them; (2) they are little liable to injury or destruction by use or accident; (3) they are readily divided into coins of convenient size; (4) their transportation costs only a small portion of their value, and (5) their quantity, although limited, may always be increased by mining to replace the loss arising from consumption and to meet the wants of the growing population of the world. No other known substances possess this collective group of attributes fitting them to be used as money. Platinum was tried by the Russian government some time since without success. The preference for gold as a medium of exchange was because gold possessed the power to resist the ravages of time and the action of chemical substances which destroy silver. The value of bank notes, checks, bills of lading, notes of hand and other substitutes for coin is precisely in proportion to the credit of their maker. Coin sinks into the character of bullion when its purity or standard is tampered with. Prof. Silliman referred in severe terms to the experiment of the government of coining a debased silver dollar, and said: "Legislation is impotent to create values or make 2 and 2 equal 5. History proves that all experiments to discover and put in use any description of circulating medium, except such as has been and is immediately convertible into gold or silver, are disastrous failures."

At the time of the discovery of America the total value of the gold and silver known to exist in the world was estimated at \$170,000,000.

The total gold product of America in the 53 years from 1492 to 1845 was \$148,400,000.

In 1500 the silver mines of Potosi, Mexico, were discovered, which were destined to produce more than \$1,000,000,000 in silver between 1556 and 1803. The stock of gold and silver in commerce about the year 1600 was:

Gold (37%)	\$200,000,000
Silver (63%)	240,000,000

Total.....\$440,000,000

Between 1600 and 1800 the stock of metals was swollen by:

Gold (30%)	\$480,000,000
Silver (70%)	960,000,000

Total.....\$1,440,000,000

Add stock in 1600.....\$440,000,000

Total.....\$1,880,000,000

Add product from 1800 to 1845:

Gold.....	\$158,000,000
Silver.....	450,000,000

On the authority of Humboldt and Chevalier, continued the Professor, the silver production of Mexico and South America was as follows:

From 1545 to 1845 about—

Bolivia and Peru.....	\$2,550,000,000
Mexico.....	2,701,000,000
Chile.....	6,967,249

Total.....\$5,257,967,249

From 1845 to 1880—

Mexico.....	\$700,000,000
Bolivia and Peru.....	245,000,000

Total.....\$945,000,000

The "age of gold" was inaugurated by the discovery of gold in California in 1847. In the 300 years following the discovery of America the influx of silver and gold into commerce from America alone increased the volume of the precious metals previously existing nearly forty-

fold in nominal value. The coin in existence at the close of 1809 was \$380,000,000. Let us now see how the enormous discrepancy between this sum and the output of silver from America alone previous to 1847 can be accounted for:

American silver and gold production, say.....	\$2,000,000,000
Coin in existence in 1809.....	\$1,843,000,000
Absorbed by Asia.....	1,700,000,000
Consumed in the arts.....	1,700,000,000
Wear and tear.....	100,000,000
Lost or hoarded.....	651,000,000
	\$9,000,000,000

The Asiatic absorption of silver, Prof. Silliman said, was the most remarkable of financial problems. This phenomenon, acting with the great increase of gold during the 20 years following the discovery of California's gold, disturbed the long-established ratio between the two metals, and for a time advanced the silver to a premium in France and other European countries. Dividing the history of the precious metals into four periods, the fluctuation of ratios was as follows: First period, B. C. 1600 to A. D. 312—The ancient relation between silver and gold in the Orient was 1 to 13.33, falling as low as 1 to 8 and 8.93 about B. C. 100, consequent on the increase of gold brought by Cæsar out of Gaul. Second period, A. D. 864 to 1500—The market ratio was 1 to 12. Third period, from 1492 to the opening of the gold mines of California and Australia. Early in the 17th century the ratio rose to 1-15.40; after 1687, down to 1771, it was 1-14.80. In 1550 the production of silver was several times greater than that of gold, and the ratio was 1-11 to about 1-15, but before the close of the 17th century it had reached 1-15.5—the ratio which is still the French standard. Fourth period, 1851 to date—The prediction of many who anticipated a marked fall in the price of gold, consequent upon the enormous increase in the output from 1847 to 1853 were not sustained by the result. In 1851 the ratio was 15-46; in 1852, 15-57; in 1853-54, 15-33; and in 1855, 15-36. After 1864 it began to rise, being in that year 15-40; from 1868 to 1870, 15-60; in 1873, 15-90; and in October, 1874, 16-38. The Professor submitted the following table showing the relative production of gold and silver in the last period:

Years.	Gold.	Silver.
1833-42.....	\$15,000,000	\$30,000,000
1843-52.....	86,000,000	50,000,000
1853-62.....	257,000,000	82,000,000
1863-72.....	230,000,000	106,000,000
1873.....	21,000,000	14,000,000
1874.....	18,000,000	16,000,000
1875.....	20,000,000	16,000,000

In 1600 the value of silver to gold was about as 12 to 1; in 1800, about 15½ to 1, while the stock of silver had been increased only about 5%. Prof. Silliman thought that America was destined to be the largest producer of gold and silver in the world. In conclusion, he said that both gold and silver from the earliest times have been adopted by mankind as the most convenient materials for money; that gold properly is recognized as the chief medium of value, but that the principal cause of the depreciation of silver was its demonetization by Germany; and that upon the precious metals alone is it profitable to maintain a bank-note circulation, and it made no matter whether the entire mass of the reserve gold and silver was in coin or in fine bars. "We believe that with a wise course of national legislation, the removal from the United States notes of their legal-tender quality, and the retention of ample reserves of gold and silver, will permanently maintain and renew the financial credit of the nation, and give us, in the best sense of the term, the age of gold."

PENETRATIVE POWER OF THE ELECTRIC LIGHT.

A crucial test of the great penetrating power of the electric light is furnished by the experiments of the officers of the French-Algerian Triangulation Service, who a few days ago saw the electric light at the Spanish station of Zeteca from a distance of more than 164 miles. This observation is proof, if proof were wanted, of the great value of the light for maritime purposes, when it is exhibited from sufficiently elevated positions.

FORMATION OF COAL.

The Director of the Museum of the Parisian Academie des Sciences, M. Fremy, recently read a paper under the title "Chemical Researches respecting the Formation of Coal," which is of great interest. It is known that coal is produced by the decomposition of vegetable matter, which for many ages covered the surface of the earth. The learned chemist has made a series of analyses, of which he gives an account in his paper, and which have enabled him to establish the laws of this decomposition, and to explain the transformation of the tissues of the vegetable matter into coal by the loss of their organic form.

With reference to peat, the hypothesis has been put forth generally up to the present time of a possible relation between their formation and that of coal. M. Fremy has been led by the same investigations to the conclusion that the peaty formation is, so to speak, the first stage reached by the ligneous tissues before arriving at their complete transformation into coal.

The paper gives the result of investigations on the vegetable tissues which Mr. Fremy has carried on since 1850. Our space will not permit us to give anything but the conclusions drawn from the experiments, which are as follows:

1. Coal is a substance which proceeds from the transformation of vegetable matter, but which no longer preserves its organic form.

2. The vegetable marks which the coal presents are produced by it, as in schist or other mineral substances, and do not prove its organization. This fuel is a bituminous and plastic matter, on which the external features of the vegetation are molded. When a piece of coal presents on its surface, or within its interior, marks of vegetation, it is not to be thence inferred that the adjacent parts are necessarily the result of the alteration of the tissues which were covered by the membranes whose form has been preserved.

3. The principal bodies contained in the vegetable cells, submitted to the double influence of heat and pressure, produce substances which present the properties and composition of coal.

4. The coloring, resinous and fatty matters contained in the leaves are changed, by the action of heat and pressure, into substances which approach very nearly to natural bitumen.

5. With regard to the ligneous tissues at the base of the cellulose and the vasculose, they are not transformed directly into coal. Before being so changed they pass through a process of peaty fermentation, which produces ulmic acid. It is only in the second place that this ulmic acid is transformed into coal, mingling with all the coal-forming substances produced by the contents of the cells.

FISH KILLED BY ELECTRICITY.—A correspondent

of *Land and Water* says: A curious incident of the whole of the occupants of a small fish pond being destroyed by a flash of lightning, is reported from Seck, Grand Duchy of Nassau. The *Nassauer Bote* states that during a very heavy thunder and hail storm at night time, a flash of lightning struck a small pond, well stocked with various kinds of fish, the property of the pastor of the parish. The following morning the whole of the fish were discovered dead upon the surface of the water. They had all the appearance of having been half boiled, and crumbled to pieces at the least touch, just as is the case with fish after being boiled. Neither any external nor internal injury could be observed, the scales being intact and the swimming bladder filled and well preserved. The water in the pond was still muddy and dull the morning after the storm, as if the lightning had only then struck it.