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A CENTENNIAL NUMBER.

In commemoration of the opening of the Centennial Exposition on the 10th of May, the next number of the SCIENTIFIC AMERICAN will appear in a new dress, and its pages will be devoted to illustrations of some of the various buildings, national, state, and those devoted to special industries, which together constitute the miniature city now almost completed in Fairmount Park. In the succeeding number we shall present a full account of the opening ceremonies, together with illustrations thereof, and interesting descriptions of matters and things connected with the event.

At the present time, beyond the brief report of progress which will be found in another column, it is an impossibility to afford any idea of the contents of the Exposition. Two sets of workmen, numbering many thousands, are working continuously, night and day, evolving order out of a chaos which appears to be continually augmented by fresh contributions pouring in at the rate of hundreds of car loads daily. As soon as affairs run smoothly, and the entries are in such condition as to admit of proper examination, our readers may look for complete accounts of all matters likely to prove of utility or interest.

SILVER AND GOLD MONEY.

On February 12, 1873, Congress passed an act by which the gold dollar was made the unit of value, the trade dollar of silver, weighing 420 grains, established, and silver money rendered no longer a legal tender for sums exceeding five dollars. The effect of this measure is, it is claimed, practically to demonetize silver, and a bill to amend it, by making silver a legal tender up to sums of \$20, is now before the Senate. The chief supporter of the amendment is Senator Jones, of Nevada, who represents one of the greatest silver-producing districts in the world, and who has recently made an able speech in behalf of a silver currency. From a review of the mutations and quantities of the precious metals, from the earliest times to the present, it appears that any diminution of the stock of specie, whether resulting from failure of mines or from arbitrary legislation, is fraught with the greatest disasters that can befall society. England, said the Senator, by making gold the only standard of value, in 1816 was brought to serious financial straits, only relieved by the discovery of gold in California, and this, despite the fact that gold was a peculiarly British product. By existing laws, the United States is committed to resumption in specie, combined with a demonetization of silver, and Senator Jones believes this to be an impossibility, and that one or the other course must be abandoned. As no one, save those committed to the inflation heresy, will dispute the necessity of early resumption of specie payments, it follows that silver must be brought to the level of gold; and it is in support of this view that the Senator addresses a valuable array of facts and figures, some of the more striking of which we quote below:

From the discovery of America up to 1873, it is a remarkable fact that the relative values of gold and silver, 15½ lbs. of silver being equivalent to 1 lb. of gold, have scarcely varied, and it is probable that similar stability will be maintained in the future. The reason is that the nature and qualities of the two metals are so nearly alike that any improvement applicable to the extraction or recovery of the one must be applicable to the other; and further, their geological distribution is such that in many of the largest deposits they lie in the same matrix. At the present time, the world's store of specie is one half silver; the estimated figures in 1872 were: Gold, to the value of \$5,800,000,000, and silver, \$5,600,000,000. As a matter of curiosity, we have calculated, roughly, the volume of each metal, supposing each could be melted into a solid mass. The gold would form a cube only 27 feet in each dimension, and the silver, one of 177 feet. A medium-sized room, therefore, would hold all the gold in the world. The gold supply is, however, diminishing; the river beds of California and Australia, the Senator says, "have been washed, the surface gold has been secured, the water line has been worked, and below it are only those sulphurets which as yet have not been successfully treated." The annual production in gold in 1801 aggregated \$13,000,000 a year, in 1829 \$5,000,000, in 1852 \$182,000,000, in 1875 \$97,500,000. This shows, not only a falling off, but great fluctuation in production; and, moreover, in 1875 British possessions contributed \$60,000,000 against \$26,000,000 for the United States, so that gold is now a British product. The present gold product is insufficient to meet the demands of the world for that metal in use in the arts, and to keep good the loss and wear of coin. On the other hand, in marked contrast to the above, the annual supplies of silver, essentially an American product, have always been steady and are now but little above the average. In 1805 the average of coin *per capita*, throughout the world, was \$2 83; in 1862 it was \$4.75. Between these periods both the production and the *per capita* rate of coin have doubled; and this swelling of the measure of value lies in the increase of gold and not of silver. The production of the latter metal at the beginning of the century was \$35,000,000; in 1875 it had reached but \$72,000,000.

Senator Jones points out that it is the stock of precious metals in the possession of the world that measures prices; and as nearly one half of this stock is silver, to demonetize the latter would be to reduce all prices one half, and convulse every country in the world except those which may refuse to take part in such demonetization. Further more, he insists that we never can resume specie payments by gold alone. By continuing to exclude silver from equal participation with gold in the United States currency, and attempting to resume specie payments, we occasion a demand, say of 350,000,000, to pay off the greenbacks and furnish bank reserves and \$50,000,000 of silver in lieu of fractional notes. The quantity of precious metal needed to maintain prices at their present level in the occidental world is \$4,000,000,000; and of this, if the United States succeeds in resuming specie payments, it must hold \$350,000,000 in gold. It is impossible for the country to obtain this by 1879, with the present production of gold only at \$97,500,000; more than half of this yearly yield is needed in the arts, and 1½ per cent of the occidental stock of gold, \$2,600,000,000, is needed for the maintenance of money, to pay for the abrasion and loss. Deduct these sums, and there is a surplus of \$10,000,000 a year, whence to obtain our \$350,000,000, so that at least thirty-five years will be needed to amass the amount. But the increase of population will make an increased demand for gold exchanges and use in the arts, equal to at least \$6,000,000 annually; and the annual gold product is, besides, diminishing. When these elements of the circulation are all moderately provided for, there will remain perhaps \$500,000 a year surplus, and we shall be 700 years getting our \$350,000,000.

With these difficulties, the Senator contrasts the ease with which specie payments could be resumed on the basis of the double standard of gold and silver. The total coin in the world is \$5,700,000,000, and the annual supply of both metals

to draw upon is \$170,000,000. Instead of having to draw upon the accident alone, we should draw upon the whole world. Three hundred and fifty millions in gold forms one seventh of the entire stock of that metal; the same sum in both metals is less than one sixteenth. If a draft of one seventh would occasion a fall in prices of 15 per cent, a draft of less than one sixteenth would occasion a decline of less than 6 per cent; and while 15 per cent during two and a half years—equal to 6 per cent per annum—would sweep away all and more than all the profits of industry, which on the whole do not net more than 3 or 4 per cent, 6 per cent in two and a half years—equal to 2½ per cent per annum—would enable us to get back to a sound measure of values without the loss of more than a very small portion of our industrial profits.

LA GRANDE CHARTREUSE.

Although modern society has generally concluded that the usefulness of the monastic life has long since passed away, there are many precious legacies in art and literature, which, born and nurtured in the cloisters of the middle ages, have descended to these times. When the outer world was given over to rapine, and the favorite amusement of men of wealth and high birth was highway robbery, it was surely a good thing that men desirous of cultivating the arts and sciences, and of keeping alight the sacred flame of literature, should find retreats which the wildest marauder respected, and which, moreover, were centers whence many streams of charity and benevolence took their course.

The ancient order of Carthusian monks was celebrated through many centuries. St. Bruno and six of his disciples repaired, about the year 1080, to the beautiful country watered by the Rhône and the Isère, in the southeast of France, and there founded the monastery called La Grande Chartreuse which is to this day the headquarters of the order. Another important organization occupied the site of the Charterhouse schools and asylum in London, the name of which is obviously derived from the monastery. The worthy ecclesiastics are now, however, appearing by their attorneys in our courts to defend their right to a trademark affixed to the bottles of a cordial of great delicacy called "chartreuse," for the manufacture of which the monks are justly celebrated. Some base imitators in this city, it appears, have adopted the trademark, and, by foisting a home-made article on the market, have brought discredit upon the old Carthusians. But Judge Shipman, after hearing argument in the case, at once directed an injunction to issue, and the bogus traffic will now be stopped.

It seems singular that so ancient and venerable a body should appear in the forefront of our modern civilization, claiming its rights like any manufacturer or inventor of our day. Much of the art, learning, and literature, so carefully nursed by the monks of bygone days, has passed away, and their science has long since gone, no one knows whither. Their houses and lands are, even in Italy itself, given over to secular purposes, their numbers are reduced, and there is little left of many of their orders but the names; but there still remains in all its force, protected by theegis of the United States Patent Office, their capability of producing potent liquids of exquisite flavor.

WORRY AND ITS PHYSICAL EFFECTS.

To so every-day and common a state of mind as worry, ranging, as it may, from a passing "fit of the blues" up to the most poignant mental anxiety regarding life itself, little importance is popularly attached; and especially among so exceptionally nervous and rapid people as the Americans, the fact of a person succumbing under mental strain is of too ordinary occurrence to give rise to extended comment. To the list of the insane immured in asylums and brought thither through heredity or by their own excesses, thousands are added, suffering with broken minds induced by anxiety; but the great majority of people thus affected continue in their places in society, by no means lunatics, nor maniacs, nor idiots, but nevertheless of brain unsound in parts. The world sometimes dubs them "eccentric;" and, if they be distinguished, their odd habits, absence of mind, and like traits furnish rich material for the biographer; in other cases the eccentricities become crimes, and indiscriminating justice may declare the life forfeited because of the workings of hidden faculties, uncontrollable, because disorganized.

Worry, then, is dangerous, more so than the alcohol which kills the drunkard, for the latter involves a taste and a habit which may be put aside; the former is the creature of necessity, and creeps insidiously into every man's life. Its physiological effects, therefore, should be clearly and adequately realized. And the knowledge of the ills may, in some instance, prevent the existence of the cause.

During the early stages of dementia induced by mental anxiety, Dr. Richardson tells us in his "Diseases of Modern Life," there is nothing more than an increased tension of the minute vessels which supply the brain. In later stages, the substance of the nervous tissue itself undergoes a modification by which its activity is permanently lost. These are the physiological consequences, most briefly summed up. The first symptom is a want of full bodily vigor; then follows craving for more work, disturbed sleep, acute sensitiveness to external impressions, and, finally, strange figures and sounds are seen and heard. This condition may continue for years, and the sufferer in time may begin to accept abnormal creations as natural. Dr. Richardson cites a case of a merchant, who for weeks retained in his vision the spectra of three lights, oval in shape, of the size of an egg, and so clearly defined to the observer that he would watch them half consciously as they floated before him on the wall, the ceiling, or in space. In this stage of the disease lies the