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Close of Another Volume.

The next issue of the SCIENTIFIC AMERICAN closes the first volume of 1871. Subscribers who commenced with the volume, and paid for half a year, are reminded that the time for which they prepaid will expire with the next number. We hope every one of these six month subscribers will renew before the 1st of July.

The safest way to remit is by draft on New York, postal order, or check on some bank, although money is seldom lost when secured in letter and properly directed. Address MUNN & CO., Box 773, New York.

THE PROPOSED CENTENNIAL EXHIBITION IN PHILADELPHIA, IN 1876.

The Forty-first Congress, at its third session, passed an act "to provide for celebrating the one hundredth anniversary of American Independence, by holding an international exhibition of arts, manufactures, and products of the soil and mine, in the city of Philadelphia, in the year 1876." The act specifies that this exhibition shall be held under the auspices of the Government of the United States, which shall be represented by a Commission, composed of one delegate from each State and Territory, to be appointed within one year from the passage of the act, by the President of the United States, upon the nomination of the governors of the States and Territories respectively. This Commission is empowered to prescribe all necessary regulations for holding the exhibition, and these regulations the President is authorized to make public by proclamation, and to communicate to the diplomatic representatives of all nations.

The project of holding a centennial exhibition was first suggested by the American Institute of New York, and strenuous efforts were made to induce Congress to make the metropolis the site for the building, but the Philadelphians carried the majority; and as the law has now been passed, it would be better for all parties to submit to its requirements, and take hold with energy upon the work. We took occasion, when the subject was first suggested, to point out the immense labor and expense involved in the undertaking.

Such an exhibition, in order to be successful must be administered with great executive skill; it must enlist the sympathies and cooperation of the leading minds of the nation in every department of industry. The commissioners to be appointed by the President ought to be representative men, and not politicians. What we fear is that there will be the same greedy clamor for office that there always is whenever an appointment is placed within the gift of the executive, and that persons will be smuggled in who are wholly unfit for the grave responsibility that will rest upon them.

The Legislature of each State ought to make adequate appropriations to defray the expenses of a Commission, upon which shall devolve the duty of bringing forward the best illustrations of the productions of the State. The expense ought not to be great, as most exhibitors will prefer to pay their own charges, and the chief duties of the Commission would be clerical.

There ought to be an advisory committee in each State, upon whom would devolve the selection of proper articles for exhibition. This committee could be charged with the duty of collecting statistics, and the publication, if necessary, of a report upon the productions of the State they represent.

The Commissioner recommended by the Governor and appointed by the President, ought to have the power to organ-

ize advisory committees of experts upon each specialty, and to accept or reject articles intended for the Fair, upon the decision of such advisory boards. This was the course pursued by Mr. Derby in the case of the Paris Exhibition, and nothing was forwarded to Europe unless it had been referred to the highest authority in the land. Similar action must be taken here to avoid a disorganized mob of people from monopolizing all of the space that may be allotted to each State respectively. A mere collection of mouse traps is not what we wish to see in Philadelphia, but the best products of the soil, mine, mill, and every industry that can be sent forward through the agency of a competent Commission.

The State Commissioners ought to be appointed at once in order that the work of organizing committees in each county, and advisory boards in the large towns, may be started preparatory to the collection of material and statistics.

Let each State vie with each other in the generous rivalry in order to show the world what has been the progress of the Republic in the hundred years of its existence. There is no doubt that we have "built better than we knew," and there are vast stores of hidden wealth that we can know nothing about, until a competitive examination is made.

Where all the money is to come from to put up the requisite building in Philadelphia, we leave in fraternal kindness to the enterprise of the City of Brotherly Love. The cost of a structure large enough to hold all that our own people and the representatives of other nations will wish to send, will be something prodigious. The value of the building and its contents in Paris, in 1867, was estimated at one hundred million dollars. We do not wish to intimate to our neighbors that they will have this sum to raise, but the information is thrown out as an important statistical fact for the benefit of whom it may concern.

There is no time to be lost in the organization of the local board of managers, and as soon as they have decided upon a plan of operations, they ought to be met by the cordial support of citizens everywhere. The exhibition is intended to be a national one—it ought to be so regarded everywhere, and all local jealousies must be suppressed for the general good of the country.

REPAIRING ROADS.

This is an operation which is or should be performed immediately after the settling of the ground in the spring. In agricultural districts it is often deferred till later in the season. In this case the labor of putting a road in good condition is often doubled. It is as true of roads as of raiment that "a stitch in time saves nine," and if for the word stitch we substitute ditch, the old saw will be even more forcible in its meaning.

Winter makes sad havoc in the earth roads which intersect the country in all directions. His frosts upheave, and the springs wash out deep gulleys and ruts, and when at last the reign of frost is over, that which was straight is all crooked; level places are changed into alternate rises and depressions, stones are left on the top, and, in short, these roads become sloughs of despond in which loaded teams wallow in despair, and where wagons are left standing for weeks up to the hubs in mud, simply because it is beyond the power of horse flesh to extricate them.

If, when the mud has dried, the ruts were filled at once, and the ditches at the wayside opened, much would be gained, but as this is generally neglected, the June thunderstorms have things all their own way. Sluices are filled, bridges undermined and washed away, and, finally, when the "road master" summons the inhabitants to turn out and work on the road, they find plenty to do. The road is at last put into passable condition, and remains so till the fall rains and the marketing wagons again cut them all up, and the snow following hides them from view till the ensuing spring.

That this is only a fair picture of the majority of the roads in the Northern States, we know from experience; and those of the South and many parts of the West are even worse, if all accounts of their miserable condition during the winter rains are to be credited.

There is, perhaps, some excuse in the pressing work of spring for the delay in road repairing. We believe, however, that the custom is maintained more through habit than necessity.

An old farmer once remarked to us that there is no other work done by farmers that pays so well as road making; but there are few of them that are far sighted enough to see that the saving effected by good roads in the current expenses of repairs in wagons and harnesses, and the increase of loads which can be carried, pay liberally for the work, which they do grudgingly, when at last it is performed.

GUESS WORK AND REAL WORK.

"I guess that will work," says A. "I will try it and see." "This will work," says B, "provided that in my reasoning I have not omitted any element essential as one of the premises upon which I build my reasoning and calculations. I will try it and see whether I have omitted any essential."

A represents a large class, and B a smaller class, of men, which together make up the entire group of humanity. Individuals of the first class sometimes blunder upon successful inventions, sometimes, by lucky hits, make fortunes, sometimes entertain correct views. But in all that they do there is an element of uncertainty, a feeling of insecurity that is never allayed except by final results. In blundering along, they expend money and time, which frequently are more valuable than what they can hope to obtain by any success they can achieve. They wander off into by paths, and finding they are wrong, guess another is right, and so keep on guessing through life, sometimes guessing right,

sometimes wrong, sometimes reaching that which they sought, but oftener fain to content themselves with something they did not contemplate in the outset of their career.

There are the men who expend all their capital in erecting factories, without knowing where the money will come from for stock and machinery. They are the men who, when an invention is only half completed, stake their all upon its success, regardless of future contingencies for which they can foresee no provision. They are the men who give credit without good security; in short they are the men who strew the shores of life's great sea with wrecks, broken up and helpless; to be pitied, but never repaired.

It is a pleasure to turn from this sad picture to another and brighter phase of human character, to the class, B, the members of which never count chickens in the shell; to the men who never guess but reason, step by step, to their conclusions, the men who have invented the machines and processes that have revolutionized the world's industry, the men who have developed science and art. Wherever they are found, whether in schools, pulpits, counting houses, or work shops, they are doing the real solid brainwork of the world.

They live in no fool's paradise. No false haloes cluster around the realities of life to blind them. No superstition is accepted by them as a substitute for a belief founded upon facts and reason. By them every proposition is scrutinized with rigor, and nothing bearing the semblance of truth, but false under the surface, is allowed to pass unchallenged.

They are men who, knowing truth may exist in human life and character, are not suspicious without reason, but who nevertheless are seldom deceived. Their faith in truth is not destroyed by their own falseness. They seek truth for its own sake, and search for it eagerly and long, early and late, but never guess at it. Their search is thorough, systematic, and organized. They are slow to assent to anything laid down as a general principle, but once assenting, are steadfast in their adherence, for their belief is founded upon knowledge, not guesswork.

The age is at present prolific of this class of men, and their labors are preparing the way for the final emancipation of the race from giant superstitions, and the strong chains of ignorance. The generality of mankind think the world very far advanced in civilization. Indeed, a popular but superficial writer has recently asserted that the world is suffering from over-civilization; but the class of men we have described, guessing at nothing, see that only the twilight has dawned upon the civilization of the ages to come. Knowing that their eyes shall never behold that brilliant epoch in the history of mankind, they still labor for the generations to come, blessing the present generation as well.

Well will it be when all men are no longer content with guessing, but strive to know, not in the sense of passive acceptance of creeds and formulae, framed or thought out by others, but thought out by each individual. For when all men really think for themselves, and act upon their conclusions, there will be an end to the poverty, drunkenness, crime and most of the diseases which now curse the human race.

THE ELECTRIC LIGHT.

The light produced from a powerful current of electricity, under favorable circumstances, is the most brilliant ever yet discovered by man. By actual experiment it has been shown to possess an intensity equal to one third of that of sunlight. The light emanating from an incandescent piece of lime under the action of the oxy-hydrogen jet, well known as the Drummond light, cannot compare with it in brilliancy, nor compete with it in point of economy. Though the first cost in the preparation of an electric light may exceed that of the Drummond light, the subsequent outlay is much less.

The light is produced by passing an electrical current between two pieces of charcoal a small distance apart, one connected with the positive pole and the other with the negative pole of a galvanic battery. In order to keep these burning charcoal points always at such a distance from each other as to produce the most brilliant light, ingenious machines called "regulators" are used. The principle involved in the construction of these machines is, that the nearer the charcoal points are to each other, so much greater is the flow of electricity. Now, increase in the flow of electricity in the conducting wire will produce corresponding increase of magnetism in an iron bar which it encompasses; therefore, one of the charcoal points is inserted in an iron cylinder, which plays freely up and down in the center of an electro-magnetic coil. As this coil exerts an attractive influence upon the iron, a weight passing over a pulley is attached to it, which, acting as a counterpoise, keeps it in equilibrium. The other point remains fixed. The result of this arrangement is that an increase of distance between the charcoal points gives a decrease in the flow, and consequently a decrease in the attractive power of the coil. The weight, for this reason, overbalances the attraction of the coil, and the charcoal point is drawn up until the increasing flow of electricity, caused by the decreasing distance between the charcoal points, shall have sufficiently augmented the attractive power of the coil as to restore the equilibrium.

The regulators employed in general use are much more complicated, but their principle is the same.

A machine has been invented in France by means of which this light may be derived from electro-magnetism. It consists of eight rows of powerful horseshoe magnets arranged around a hollow cylinder and having their poles towards the axis of the cylinder. The magnets are 7 in each row, 56 in all, and are attached to a stationary frame. The hollow cylinder has affixed a set of double coils or bobbins, 112 in all, so placed that, on revolving the cylinder, the ends of the bars, which are the cores of the bobbins, are in rapid succes-