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EDWARD ATKINSON'S PLANS FOR THE WORLD'S FAIR OF 1892.

THE suggestions made by Mr. Edward Atkinson, and printed in *Science*, of Aug. 30, bearing upon the scope of the exhibition to be held in this city in 1892, have attracted much attention from many business men. Voicing the sentiments of those business men and others interested in the success of the exhibition, the president of the Chamber of Commerce of this city requested Mr. Atkinson to present his views more in detail. To this request Mr. Atkinson responded with the following detailed plans for the development of an historic and economic exhibit on certain lines of industry which might be made a part of the proposed exhibition of 1892:—

We may begin with the art of spinning and weaving. The origin of these arts is prehistoric. From the earliest dawn of history woven fabrics have been in use. The linen in which the mummies of Egypt are wrapped is equal in the fineness of the thread and in the texture of the web to many of the examples of the finest work of the modern loom. The distaff is classic, but unless the railway has completed its revolution, some of the natives of northern Italy could be brought to the exhibition who would spin linen thread with the distaff after the manner of Penelope. The loom and the weaver are pictured, as I have been informed, on the walls of Babylon and on the pyramids. The hand-loom worked by the native Egyptians in the same way, and of identical type, could be

brought to the exhibition. Neither the inventor nor the date of the invention of the spinning-wheel is known. The spinning-wheel of the prehistoric type is worked to-day for clothing nine-tenths of the population of China; the wheel and the spinner, the loom and the weaver, could be brought together from there. The wheel and the loom of the same identical type are to-day in operation in the heart of the Southern mountains, working on cotton and wool, and in the western counties of Ireland, working on Irish homespun. The representatives of these prehistoric arts could be brought from there and from many other points in Asia, Africa, South America, Australia, and Polynesia, with examples of all their fabrics, ancient and modern.

Such an exhibition as the one proposed in this paragraph would undoubtedly lead to the establishment of a great and permanent textile museum and weaving school, equal or superior to that at Crefeld in Rhenish Prussia, which was formerly open to Americans, but from which they are now excluded. Such schools have only lately been established even in England, although they have existed for a long time in Germany and France. We have made a small beginning in Philadelphia and in Boston, but nothing in any measure adequate to the necessities of the case. A complete museum of textile fabrics and of looms of various kinds would be among the primary elements required for such a school. The co-operation of the Arkwright Club of Boston, of the Wool and Woollen Association, of the Silk Association, of the Manufacturers' Club of Philadelphia, and of other similar organizations, might be called for in determining the conditions both for the proposed exhibition and for the ultimate destination of the examples of machinery and fabrics which might be brought together at that time.

Within the same rail on the floor of the Atlanta Exposition were two hand carders, two spinners with their wheels, and one weaver,—five persons who could make in a day of ten hours eight yards of narrow coarse cotton osnaburg. Within the same rail was the carding and spinning machinery of the Willimantic Thread Company and the looms which were sent there from Massachusetts, on which the cotton which was growing in the field in the morning, after it had been picked, ginned, and prepared, was spun, woven, dyed, and made into a dress suit which I wore at a reception the same evening. The difference in the capacity of the operatives who worked these modern machines as compared to the homespun art on the same fabric was one hundred to one, by actual computation.

The first step in the progress from the spinning-wheel of a single spindle to the spinning-mule of twelve hundred spindles was the spinning-jenny of eight or ten spindles. Some of these spinning-jennies are still made use of, I believe, in Africa, to prepare the yarn for a hand-loom which is carried about in the hands of the natives, on which they weave the narrow strips of which their garments are made when they have been stitched together. The African spinners and weavers, with their machines, can be brought to the exhibition.

In South America, in Mexico, among the Indians of the far North-west, and in every part of the world, are people of various tribes and races who clothe themselves in homespun and hand-woven fabrics, as our grandfathers and grandmothers did in New England only a century since.

It is easy to conceive of a department in the exhibition of 1892 in which shall be built the cabin of the African, the cobble-stone dwelling of the Irish cotter, the model of the cottage of the English peasant, the dwelling of the Chinaman, the wigwam of the Indian, the log cabin of the Southern mountaineers, where each type of each race may conduct the art of spinning and weaving in their own way; while in the next compartment may be exhibited the finest examples of the most modern textile machinery: in this one section would be given the history of clothing from the fig-leaf to the type of the present day. Even the preparation of the different fibres may be brought into view. The seed of the cotton is cleaned from the fibre in China at the present time by the snapping of a bowstring, precisely as it was done in Georgia, giving the name of "bowed cotton" to the Georgia staple before Eli Whitney invented the cotton gin.

Again, while the art of weaving begins with the hand-loom in making the fabrics of the coarsest kind, the art also ends with the

hand-loom on which the finest silks of Lyons and the finest velvets of Rhenish Prussia are to-day woven; and from these points the typical weavers could be assembled with their simple looms on which they make those finest goods, which are in themselves a work of art.

In the matter of printing textile fabrics, the art began by stamping figures of a coarse and rude kind by hand upon the cloth; and that same art is still carried on in the same way in China and in Japan, and could be brought before the eye in the exhibition; while the progress in the art of printing textile fabrics could be witnessed in the next section as it is now carried on by the use of machines of the finest and highest types. But this art would end again in the bringing from France the block printers, who still print by hand the finest examples of the French cretonnes.

This conception of the method of the proposed exhibition is wholly consistent with making the exhibition itself a medium for bringing into notice the finest examples of modern machinery and the finest types of modern fabrics. The only difficulty which might be experienced in carrying out this conception might be that too many makers of machinery and venders of the fabrics of the finest types would apply for place.

The personal factor and the element of individual profit may therefore be brought to bear in connection with this plan, as well as in any other way. The plan only gives a definite point or purpose to the undertaking, and would make the whole exhibition an example of progress and a means of comparing the mechanism by which the people of different countries and races have clothed themselves or otherwise provided for material wants in the past and do now-clothe and serve themselves in the present.

If it were too great an undertaking to bring together typical examples of the garments of the past as well as of the present, nevertheless, pictures may be gathered to hang upon the walls of this exhibition, artistic in their conception, typical of the art in the different countries in their execution, and yet object lessons in the history of the textile arts.

I have in my possession six pictures painted in China on silk, giving the whole story of cotton, from the field to the fabric, which were sent to me by Messrs. Russell and Co. to exhibit at Atlanta, accompanied by a complete set of garments worn by the common people of China. They were sent to me without cost, but were evidently expensive. I have already mentioned the little artistic clay figures which can be purchased in India, showing every type of costume, at a mere trifling cost.

If we pass on from the textile out to the treatment of metal, taking iron as an example, we find that iron is still treated in Spain as it was when the Toledo blade became famous. It is treated in Africa in the crudest manner. In the heart of the southern mountains, iron and steel are still made directly from the ore in wayside furnaces heated with charcoal on what I believe are called "Catalan forges." How various or how widespread over the world are the different methods of treating the ore of iron, I am not informed, but all these primary methods could be brought, with those who practise them, into one section of the exhibition; and since the introduction of the most modern type of furnace worked by gas has been adopted, it has also become possible to set up small examples of the most modern form of producing iron and steel and working these metals into manifold shades. The whole history of metallurgy as applied to iron can be brought before the eye; and here again the element of personal interest may be brought to bear on the part of those who desire to exhibit the most modern types of stoves, smelting furnaces, and the like.

Perhaps the most interesting and the most varied of the many arts which can be brought together into view would be the types of the tools and machines used by various races and nations in the conduct of agriculture. Herein again, the plough, as pictured upon the walls of the Pyramids, could be brought from the fields of Egypt, with the fellahin, who still make use of that prehistoric implement; and alongside could be placed the modern polished steel plough, of which I have a record among my insurance papers that when accidentally placed outside a barn it concentrated the rays of the sun, and reflected them in such a way as to set the barn on fire. Herein, again, there would be a rush of competitors to exhibit the best types of the most modern agricultural tools and machines.

Again, the one art which is of all others prehistoric is that of the potter. Would it not be possible to bring the potters from many lands into a single section with their primitive implements, placed alongside the most modern type of apparatus with their artists as well as their ovens?

Lastly, there is nothing like leather. How easy it would be to bring into the same section the worker in leather from different parts of the world; the cobbler from that part of this country which has not yet been penetrated by the railway, alongside the modern machines by which each visitor, having been measured on entering the section, may have a last prepared to fit his or her foot, and a pair of finished boots made to measure ready to put on, within the time that would be necessary to get even a superficial idea of the mechanism by which the work had been accomplished.

When all these and many other arts had thus been brought together, to be conducted under one great roof by representatives of many races and many nations, each according to his kind dwelling in his accustomed way and conducting all the household arts as they are conducted at home, the Arab in his tent, the African in his hut, the Mexican Indian in his adobe house, the mountaineer of the South in his log cabin, the native of Japan in his dwelling of wood and paper, the Chinaman, the Aleut, the Alaskan, and all the rest — what could be more attractive or instructive? And lastly, what would pay better in a mere commercial sense?

I therefore submit that my conception of an exhibition which shall give the history of industrial progress, by means of object lessons drawn from the past, but yet existing in the present, is wholly consistent with the necessary element of personal interest and personal profit on the part of those who contribute the modern examples of existing machinery.

In addition to these object lessons, the art of the painter, and even of the sculptor, may be invoked to decorate the walls; the art of the engineer and of the mill constructor may be called in to build the structures; while the services of the statistician, the economist and the ready writer, and the engraver would be required to prepare the catalogue and to write the descriptions, so as to tell the whole story of what the eye could see in part.

This would be the main conception to be carried out, either in the main building or in the main series of buildings. Auxiliary buildings may be added by States, in the manner previously indicated, in which examples of every crude material, together with maps and descriptions showing the resources of any section of the country, might be brought together. If, in addition to this, it was thought expedient to make preparation for a great fair or bazaar where goods could be exhibited and sold according to the will of the contributor, that purpose might also be provided for in the exact measure of the demand which would ensue for space or place. The conditions precedent to carry out this conception consist, first, in finding the money which will be required to make the preparation, and, second, the men (especially the man) capable of laying out, executing, guiding, and directing the whole work.

AN UNKNOWN ORGAN OF SENSE.

IN the frequent dwelling upon questions of development, which one cannot avoid in these days, one sometimes wonders whether the future is destined to endow man with any senses which he is not now in possession of. However that may be, it is probably unknown to a great many of the laity that within a few years past a new organ of sense has been discovered, the existence of which had not before been so much as suspected. It was always known that the internal ear was a curiously complicated structure, and there was little hope of being able to make out the separate functions, in hearing, played by all its different parts. But it was not suspected, even when Flourens had made his celebrated experiments in 1824, that one part of it — the three narrow semicircular tubes which spread out in three planes at right-angles to each other — might be the organ of a totally different sense. It is only now that the question has been definitely set at rest by the admirable experiments of Brener. There can no longer be any doubt that the semicircular canals are the organ for sensations, whether conscious or not, which enable us to determine both the direction and the amount of all rotations performed either by the

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