



THE GREAT EXPOSITION—LETTER FROM UNITED STATES COMMISSIONER PROFESSOR R. H. THURSTON.

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VIENNA WELT-AUSSTELLUNG, JUNE, 1873.

On arriving in Vienna, after passing the *douane*, the stranger finds himself confronted by a most important problem, namely, to determine where he shall find accommodation during his stay. Experience teaches that a week's notice may be insufficient to secure rooms at an hotel; and, although we had taken this precaution when in London, we were compelled to drive from one hotel to another until we finally found refuge in a queerly arranged old building, whose lofty and once finely decorated rooms had probably been the scene of many interesting events in earlier days. The oddly caparisoned bedstead in our sleeping room, the great and ancient porcelain stove towering up in one corner, the antique furniture, and the absence of all modern improvements, indicated that the wealth of the family which had erected this pile of buildings had long since taken to itself wings. Neither the place nor the price suited us, and we moved into one of the modern hotels (of which a dozen or more have been recently erected in Vienna) at the earliest possible moment. After becoming fairly settled in our new quarters, and recovering somewhat from the fatigue of the journey, a visit was made to

THE WELT-AUSSTELLUNG.

As we rode up the central avenue of the Prater, as the Viennese call the noble park in which the exhibition is located, we caught sight of the industrial palace, and, above it, the great dome of the rotunda. The first sentiment was one of disappointment, for its unusual size is, to some extent, concealed by the lack of surroundings with which to compare it, and its somewhat ungraceful shape and peculiar proportions do not aid the mind in the effort to realize that this is the largest dome in the world. Like all very large objects, it requires time and repeated visits to enable the spectator fully to realize its magnitude, and to appreciate it as a triumph of architectural construction.

The first visit to this wonderful exhibition of the products of all nations is bewildering and fatiguing in the highest degree. The visitor comes away confused and dissatisfied. He can hardly remember whether the splendid silks and satins he has seen are the product of the looms of France or China; whether the dazzling collections of gold and silver ornaments and of precious stones are exhibited by oriental or occidental nations; and even which continent excels in the exhibition of the products of the metal industries remains undetermined. Our first impression in regard to the display made by the United States was decidedly confirmed, however, by more systematic and leisurely subsequent examination. In quantity, we are far behind every civilized nation, and, even in some important departments, we are excelled by some uncivilized countries. Many of our most important and characteristic industries are entirely without representation, and those which are represented at all appear only partially and in disjointed divisions.

Other countries exhibit very complete and thoroughly well arranged

MINERAL AND METALLURGICAL COLLECTIONS,

illustrating their natural resources. In the United States show, excepting Professor Cox's excellent collection of Indiana minerals and productions, and two or three other similar local exhibits, there is little to indicate that we possess more extensive, more valuable, and more accessible mineral resources than any country on the globe, and that we are earnestly and intelligently working at developing them as rapidly as we can earn or borrow the capital requisite. Rock drills and mining tools are not exhibited in our section. Had they been placed here in competition with their European rivals, they would have readily carried off the premiums, and would have readily entered the foreign markets. The Burleigh drill is exhibited by Germany, and seems to be well and favorably known. Of

TEXTILE PRODUCTS

we exhibit but few samples; and, although those are excellent in quality, the stranger who may compare our department in this group with those of other nations would be led to believe that the United States is far behind other, and far less important, countries in the extent and variety of textile manufactures. We exhibit a good collection of leather, and a few manufactured leather goods. Our great India rubber industry is practically without representation, although it is one of our peculiarly Amer-

ican, and markedly successful, manufactures. Our manufacturing jewellers do not exhibit, and, of manufactured iron and steel products, many single firms, of nearly every other country, present far more extensive and far more interesting collections than appear in the whole of the space apportioned to the United States.

Similar remarks will apply to every other group in the official catalogue, except, perhaps, Group XIII, which includes machinery; and, even here, our exhibition is by no means what it should be. Our collection of

SEWING MACHINES

is exceedingly extensive; and the elegance in design, the beautiful finish and the fine work done by our best makers excite universal admiration.

The exhibition of mowing and reaping and similar agricultural implements from the United States also stands unrivalled in extent and in quality, but Great Britain is far ahead of all nations in the heavier classes of portable engines, steam plows, and road locomotives. We have sent none of these. Our wood and metal working tools are, at least, well represented, and Whitney's pail making machinery and the small collection of shoe manufacturing machines, from New England, with several single machines, represent, in an interesting manner, the peculiar talent possessed by our mechanics in designing machines for special purposes.

We have in our section no representative of our standard drop cut-off engines, with regulation by the adjustment by the governor of the point of cut-off; although the fact that nearly every other manufacturing country exhibits engines of the Corliss pattern may enable us to claim the credit which is due to our inventors in this field. Of the smaller and less complex classes of engines, we exhibit several superior examples. We find but one or two exhibits of cotton or woolen machinery in our section, although here, and in woodworking machinery, our mechanics are represented by creditable copies from almost every other country.

Not a locomotive appears from the United States, but close imitations of the standard American types appear elsewhere. Copies of our sleeping cars and other railroad stock are shown by several European builders.

Indeed, American mechanics are universally copied, and their genius finds its illustration in every section of the machinery hall. They are more fully represented, in many departments, by the exhibits of foreign countries than in that of their own. So patent is this latter fact that it is a subject of general remark among those visitors, of whatever nationality, who are familiar with our position as a nation of mechanics. Every product of American inventive genius, from the sewing machine to the steam engine, is imitated, and the copy appears here, while the original frequently, indeed generally, remains at home. Some of these imitations and copies are exceedingly creditable, and, in some cases in the British section, they even excel the original in some respects. In many cases, the imitation is declared in the circulars of the foreign manufacturer, and they are usually perfectly willing to acknowledge their indebtedness to us. They seem to look upon the fact as one of the strongest recommendations of their work. Jury work will soon bring these instances more fully under observation, and in succeeding communications they will be noted as they appear.

Excursions are proposed into the neighboring country, which promise to be enjoyable, as well as instructive. One of these excursions was made a few days ago to

KOLIN,

in Bohemia, where the party spent the day with the venerable Ritter von Horsky von Horskysfeld, who has had the boldness and the enterprise necessary to break down the conservatism which impedes progress in this country so seriously; and who, by the introduction of agricultural machinery, some of it imported and some of it his own invention, has increased threefold the income from his great estate, 6,000 acres in extent. A special train left Vienna, late on Friday evening, carrying the party, among whom a half dozen of us were "*aus Amerika*." After riding all night, we breakfasted at Kolin, at 8.30 next morning. Our meal, which consisted of a glass of *bier* and the beautiful bread for which this country is justly celebrated, was quickly despatched; we re-entered the train, and were soon at Karolinenhof, entering the place through a beautiful deer park, evidently greatly to the consternation of the beautiful animals whose home it was. They had never before seen a railroad train, for the rails were laid expressly for our accommodation; and we caught occasional glimpses of the does scampering off as rapidly as the less fleet motion of their pretty fawns would allow. The masculine members of their family, being unimpeded, were all out of sight long before our train could bring us near their resting places.

The party were received and entertained with characteristic hospitality by the host, and, after an inspection of the farm buildings, which were remarkably well built and well arranged, and after examining his singularly heterogeneous collection of old and new, rude and creditable, farming tools, the cattle were presented for criticism. Many were of Hungarian stock, long horned, large framed and muscular, excellent for draft but of little value for other purposes. The remainder were of Swiss and other breeds, smaller and better filled out, sleek and well kept.

A *gabel fruhstueck* followed: a more pretentious meal than the preceding, but at which the absence of meats and of plain bread was not compensated by the abundance of native wines and of beer, excellent although they were, nor by the variety of cake presented. Before breakfast was over, the carriages, which had been collected from neighboring domains for miles around, had been brought up, and the party was soon comfortably seated in ninety-six of them, and those remaining unoccupied were sent home again.

THE FIELDS,

through which the long procession passed, were in fine condition. The principal crops seemed to be wheat, rye, and beets. The latter were the sugar beet, and a large proportion of the cultivated land was devoted to its production.

We were given an opportunity to witness the operation of all the agricultural implements used by our host, and also of the Fowler steam plow. Some of the latter are in use in our own country, and the time cannot be far distant when the steam plow will supersede the ordinary apparatus on all the large farms of our Western prairie districts. The manufacturers of the Fowler apparatus in England are building up a splendid business. At one point, we were shown the

ROPE TRAMWAY

in operation, transporting clay a long distance across the farm to the compost heaps, where it was used to correct the sandy character of the soil under cultivation. The wire rope was about five eighths of an inch in diameter, running over pulleys of thirty inches diameter and a hundred feet apart, at the rate of about four miles per hour. In such situations, this method of transportation affords many advantages over any other, from its cheapness of construction, its adaptation to every variation in the character of the country over which it is led, and its low cost of operation. Roebing & Sons, of Trenton, N. J., have been the pioneers in the introduction of wire rope transmission in the United States.

An inspection of a well arranged

SUGAR MANUFACTORY,

where the sugar beets raised on the farm are worked up, a visit to the American elevator, as it was called, where the grain is all cleaned, dried, and winnowed, and finally an excellent dinner, with speeches and congratulations in all languages, were the closing events of this most interesting excursion.

R. H. T.

The Hartford Steam Boiler Inspection and Insurance Company.

The Hartford Steam Boiler Inspection and Insurance Company makes the following report of its inspections in the month of May, 1873:

During the month, 1,237 visits of inspection were made, and 2,386 boilers examined, 2,017 externally and 754 internally; 168 were tested by hydraulic pressure. The defects in all discovered were 1,062, of which 218 were regarded as dangerous. These defects were in detail as follows:

Furnaces out of shape 29—8 dangerous; fractures, 59—23 dangerous; burned plates, 34—18 dangerous; blistered plates, 133—32 dangerous; deposit of sediment, 173—25 dangerous; incrustation and scale, 197—16 dangerous; external corrosion, 62—10 dangerous; internal corrosion, 18—9 dangerous; internal grooving, 12—4 dangerous; water gages defective, 58—7 dangerous; blow-out defective, 17—1 dangerous; safety valves overloaded, 14—2 dangerous; pressure gages defective, 180—24 dangerous; without gages, 135—8 dangerous; deficiency of water, 9—3 dangerous; braces and stays broken, 29—12 cases placed the boilers in dangerous condition; boilers condemned as unsafe to run, 8. The defects enumerated in the above report are sufficient to show the importance of good care in the use of boilers. The tendency is to run boilers too long, and inspectors are often asked if they cannot "fix things up for another year, six months, or even one month." We are sorry to say that, in some instances, those who have used boilers for years do not (or will not) understand that an overworked, worn out boiler is unsafe, even when the evidences of weakness and insecurity are most shockingly visible. There is a disposition to "patch up and run along" a little longer, and so the matter often goes until accident and disaster put an end to such recklessness. If any persons pursuing such a course read this article, we desire to say to them that the kind of economy they practice is not infrequently attended with great loss of life and property.

A Preventive against Hot Journals

We have received a sample of a new elastic waste, which, from its appearance and the statements made as to its merits, seems superior to cotton or wool for the packing of journal boxes. It is composed of cow hair, sponge, and asbestos, and is quite elastic, a quality, we are informed, which effectually prevents its caking in the receptacle. The agents, Messrs. W. E. Allen & Co., of No. 4 Great Jones street, in this city, submit many testimonials as to the value of the compound from railroad officials by whom the article has been in use.

The advantages claimed are that the material is composed of incombustible and lubricating substances, wears longer than cotton or woolen waste, does not grind into mud, requires less oil, saves several brasses per annum in each journal, reduces friction and hence economizes traction power, and, lastly, effectually prevents the heating of journals. The invention, which has recently been patented, is known as Devlan's Patent Elastic Waste.

Meteoric Iron from California.

The analysis made by Mr. F. A. Cairns, assistant in the School of Mines, Columbia College, of this city, is as follows:

Iron.....	81.480	Calcium.....	0.163
Nickel.....	17.173	Carbon.....	0.071
Cobalt.....	0.604	Silicon.....	0.032
Aluminum..	0.088	Phosphorus.....	0.308
Chromium..	0.020	Sulphur.....	0.012
Magnesium..	0.010	Potassium.....	0.026
Total..	99.987		

Of the twelve elements quantitatively determined by this analysis, aluminum, calcium, and potassium have been rarely observed in meteoric iron—meteoric free from silicates—while the absence of copper, tin, manganese and sodium will be noticed.—*American Journal*.