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

NUMBER I.

At sea, latitude 53°3′ N., longitude 36°17′ W.: That is to say, at very nearly the half way point in the great circle course which has been taken by our "skipper" in running from New York to Glasgow, after clearing the Newfoundland coast.

June 1, 1873.

We are *en route* to Vienna in great haste, and yet in a somewhat roundabout course. The object to be attained is to learn as much as possible of the industries of the world, as illustrated at the great *Welt-Ausstellung*. This route has been chosen with the intention of obtaining a glimpse at some of the principal establishments which have produced the marvels of the exposition, and to learn something of the methods adopted and facilities possessed by British and continental manufacturers, and thus to learn how to imitate as well as what to copy from them. We shall find much to learn, undoubtedly, and as certainly shall be able to find many points in which our Yankee practice excels that of our friendly rivals across the Atlantic. Our time is limited, yet we hope to be able to acquire a valuable stock of interesting and valuable information before the equinoctial gales shall meet us on our return.

These great international exhibitions are becoming, as they should be, most powerful agents in the work of advancing civilization. Bringing together all nations in generous emulation, they lay before them the fruits of the labor of man in every part of the globe, presenting to each the *chefs d'œuvre* in art, of every country, the national productions of every clime, and every variety of manufactures from the whole civilized world.

The Vienna exhibition is the last of a series, of which the British exhibition of 1851 was the first.

In 1851, the whole world was at peace; even the threatenings of the storm, which so soon after burst upon the Crimea, had not attracted attention. There had been, for some time previous, exhibitions of British products, at more or less regular intervals, which had gradually increased in magnitude and importance, until their managers finally concluded to attempt the experiment of a "World's Fair." The experiment was quite successful, and it was, for several years, referred to as a display, marvelous in extent and wonderful for its varied attractions. America competed successfully with Europe, although her distance and the novelty of the scheme, as well as the comparatively short time allowed for preparation after its announcement, prevented as full contributions as would otherwise have been made.

Other "World's Fairs," including that in the Crystal Palace at New York, were attempted during succeeding years; but the next really important and truly international exhibition was also held at London. This was in 1862.

The area occupied was something more than half a million square feet, and the exhibition was a very successful one. The United States were quite well represented and our exhibitors had little cause to complain in the distribution of awards.

Five years later came the Paris exposition, in some sense the greatest triumph ever achieved by the late Emperor of the French. It can never be known how far Napoleon III. was influenced, in proposing this great plan, by a desire to acquire "victories of peace" for himself and for the French people, and how far by the necessity which he undoubtedly felt, even then, of taking every possible method of distracting the attention of his people from the schemes of domestic enemies, and from the work in which they were evidently actively engaged—that of fomenting internal dissensions. Bismark, the shrewdest and most skillful statesman and diplomat living, was quietly but not unsuspectedly perfecting his plans for the humiliation of France and the "unification" of Germany, and for the creation of a new empire; and the French Emperor could not but be fully aware that France would require perfect unity and all her strength to command success in what he must have known to be an irrepressible conflict.

Thus the Paris exposition preceded the French and German war of 1870, as the World's Fair, at London, in 1851, preceded the war of the Crimea of 1854.

It was a wonderful display of the manufactures and productions of the world. It covered an area of a million and a half square feet, and every civilized country on the face of the globe was well represented, while even the most distant islands of the Pacific and the most barbarous tribes visited by either missionary or trader, in the "uttermost parts of the earth," contributed rude weapons or yet ruder domestic utensils and industrial implements.

America distinguished herself at Paris as she had never done before. The American section was not remarkable for its extent, but our most important manufactures and productions were well represented, and our exhibition of labor-saving machinery, of machine tools, and of those apparently minor yet really important "notions," which so largely constitute the details of our material civilization, was far more remarkable in variety and in excellence than could have been expected, even by ourselves. The juries acknowledged the preëminence of Yankee ingenuity by the large proportion of awards made to American exhibitors. This exhibition was attended by an officially delegated commission, appointed by the United States Government to report upon the progress of foreign and domestic industry as there presented. The result of the labors of that commission was the production of a valuable series of papers, which were afterward published by the State Department, and which embody a vast amount of precisely such information as the American people most needed and most desired. The report of Dr. F. A. P. Barnard, upon the machinery and processes which it was his province to examine, is, of itself, a large volume, and contains matter of great value and material which can nowhere else be obtained. The reports of Commissioners Hewitt, Beckwith and others were also of great value, and embodied new and important information relating to their several departments.

The "Grand Exposition of 1867" was Napoleon's last success. The well laid plans of the Prussians were aided by the increasing discontent of the French people, and, in a desperate endeavor to save his shaking throne, the Emperor, while still unprepared, declared war with Prussia. Then the world saw what had seldom, if ever, been seen before. The country from which came the declaration of war was invaded by a better prepared enemy. The war was as short, sharp and decisive as the Austro-Prussian war, which had so lately preceded it, and the victories of the first Napoleon were again avenged, in the misfortunes which accompanied the downfall of the second empire. It has been remarked, and probably with truth, that the weakness of the French and the strength of the Germans were well exhibited in their respective sections in the exhibition of 1867, and that the result of the inevitable war could have been, indeed was, predicted by the careful observer who made even a cursory comparison of their relative exhibits in the arts of both war and peace. As has been well shown by the events of our own late civil war, supremacy in pure science and in the arts of peace gives as great advantage in the contest as superiority in purely military sciences and arts.

The Paris exposition of 1867 revealed, also, to their British, as well as to their French competitors, the fact that the thorough system of technical training which had, for so many years, been kept in operation by the far sighted Teutons was, at last, yielding a splendid return. Even Great Britain was evidently threatened with the loss of her leadership as a manufacturing nation; and the lesson was promptly read, for immediately there arose a powerful movement, in which the great engineer J. Scott Russell took a prominent part, for the establishment, in Great Britain, of technical schools, and for a change of the existing standard curriculum that should enable the student to readily and effectively apply the principles which he had been taught to the useful and telling work of every day life. The Germans have, however, a quarter of a century the lead, and whether British supremacy in manufactures is to be maintained on the Eastern continent remains a doubtful question.

Our own people, while teaching others, were also themselves taught many useful lessons at Paris, the most important being that which the British were so ready to learn. We had already taken some steps in the right direction, and since that time technical, that is to say, in the best sense, practical education has become a subject of paramount interest in the United States. Our venerable institutions of learning are modifying their courses of instruction, in deference to the general demand, and are founding chairs of mechanical and civil engineering, and of applied sciences, while wealthy citizens, in almost every State, are exhibiting a noble patriotism and a real benevolence in applying some portion of their superabundant treasure in the foundation of new technical schools. We owe much, both directly and indirectly, to the Paris exposition of 1867.

Now another international exposition, on a still larger scale, is just taking shape, and the *Welt-Ausstellung* at Vienna, in 1873, promises, in spite of the delays and unfortunate accidents which have attended its opening, to be a far more extensive and complete exhibition of the *matériel* of civilization, from all parts of the world, than was even that of Paris in 1867.

The area assigned for the purposes of the exhibition is over eight millions of square feet, five times that covered by that of the Exposition of 1867. The immense buildings, which have been so well described in earlier issues of the SCIENTIFIC AMERICAN, were designed by John Scott Russell, the projector and designer, with Brunel, of that marine monster the Great Eastern. They are not specially remarkable, excepting, always, the colossal dome which rises above the *Industrie-Pallast*, to the hight of 250 feet and with a diameter of 118 yards. Of the exhibition itself we shall have much to say when we reach Vienna. Its opening has been attended with unfortunate accidents and delays, and our own department has been particularly unfortunate; but it is to be hoped that all difficulties have arisen at the beginning, and that all will now work smoothly and pleasantly to the end; and that, unlike the great exhibitions which have preceded it, this *Ausstellung* may not be followed by a less peaceful strife among nations.

We have taken passage for Glasgow for our little party, on a steamer which, only a half dozen years ago, was admired as the latest and best on the line. A ship 390 feet long, 33 feet wide, and of 20 feet draft of water, displacing over 3,000 tuns and driven by engines of the power of more than 800 horses, was considered then a wonder only excelled by the Great Eastern. Her speed, 10 knots an hour in smooth water, was thought very satisfactory; and accomplishing this with 35 or 40 tuns of coal per day was thought an equally successful attempt at economy of fuel. Other steamers, larger and faster, were, even then, afloat, but their success was generally deemed somewhat problematical.

To-day the "crack ship" of the line stands before the public much as did the one just described a few years ago, but how great the change! Her length is over 360 feet, her breadth of beam more than 40 feet, and ship and cargo together, ready for sea, weigh over 6,000 tuns. She is driven by compound engines of 1,000 or 1,500 horse power, at a speed of 14 knots, about 16½ statute miles, per hour, and yet consumes but 50 or 55 tuns of coal per day. The ship first described cost about $350,000, the last is worth something over a half million. Larger vessels than even the last are already building and some are afloat in the transatlantic trade, and it seems not at all improbable that the Great Eastern, whose dimensions, if memory serves, are 680 feet long, 80 feet beam, and nearly 30,000 tuns displacement, will, before many years, be looked upon as a ship of not at all remarkable size. Even now we think her a slow craft, for she only steams 12 knots at best.

Contrasting these leviathans with John Fitch's steamboat, which was the first to make regular trips, 80 years ago, on the Delaware, a little craft of sixty tuns, which paddled along in smooth water between Philadelphia and Trenton at the rate of six miles an hour, and with John Stevens' or with Robert Fulton's boats of a little later date, we can hardly conceive what will be the size, shape, or structure that shall be conjured up when, a century hence, some later Vanderbilt shall paraphrase Longfellow:

> "Build me swift, O worthy master,
> Staunch and strong, a goodly vessel,
> That shall laugh at all disaster,
> And with wave and whirlwind wrestle."

R. H. T.

Street Nomenclature.

One of our correspondents, writing from London, says: New Yorkers have substantial reason for exercising their powers of brag over their less fortunate neighbors in the English metropolis in some respects. A stranger in London is continually put to his wits' end not only by the different names given to what is substantially a single street, but by the very obscure manner in which the name of the street is indicated. Starting for a walk in "Leadenhall street," he will not have proceeded far ere a dingy sign on a dingy wall says "Cornhill;" and almost before he comprehends how that can be, another sign tells him that he is in "Poultry," and, without his knowing how, he gets out of Poultry into "Cheapside," and presently the dingy sign says "Newgate street," and next it says "Skinner street." After Skinner street comes "Holborn Hill," and "Holborn," and "High Holborn," and then "Oxford street"—most respectable in length—and after that "Uxbridge Road" and "New Road." And these twelve different names are applied to one long though not very straight street. And so "Marylebone" and "Euston" and "Pentonville" and "City" and "Grand Junction" roads are the several names of another single street. Nor are these exceptions. Go where you will in London, you will find streets that are long enough and bustling enough, but you might grow gray before you could master a knowledge of their names, and then find your lesson but half learned. Woe to him who seeks to thread the mazes of London by night! He cannot, by any device other than dependence upon such chance information, determine the name of the street in which he walks. The street names, dingy by daylight, are now utterly invisible. Could our New Yorkers appreciate the advantage which they enjoy of street names so placed as to be distinctly visible by night as by day, they might derive from it—as a Londoner would say—"no end" of satisfaction.

The Sun Cholera Mixture.

"More than forty years ago," says the New York *Journal of Commerce*, "when it was found that prevention for the Asiatic cholera was easier than cure, the learned doctors of both hemispheres drew up a prescription, which was published (for working people) in the New York *Sun*, and took the name of "The *Sun* Cholera Mixture." Our contemporary never lent its name to a better article. We have seen it in constant use for nearly two score years, and found it to be the best remedy for looseness of the bowels ever yet devised. It is to be commended for several reasons. It is not to be mixed with liquor, and therefore will not be used as an alcoholic beverage. Its ingredients are well known among all the common people, and it will have no prejudice to combat; each of the materials is in equal proportion to the others, and it may therefore be compounded without professional skill; and as the dose is so very small, it may be carried in a tiny phial in the waistcoat pocket, and be always at hand. It is: Tinct. opii, capsici, rhei co., menth. pip., campho.

Mix the above in equal parts; dose, ten to thirty drops. In plain terms, take equal parts tincture of opium, red pepper, rhubarb, peppermint, and camphor. and mix them for use. In case of diarrhœa, take a dose of ten or twenty drops in three or four teaspoonfuls of water. No one who has this by him and takes it in time will ever have the cholera. We commend it to our Western friends, and hope that the receipt will be widely published. Even when no cholera is anticipated, it is an excellent remedy for ordinary summer complaint."

We can fully endorse the remarks of the editor of the *Journal of Commerce* in reference to the excellence of the above remedy. Many years ago, when the office of the SCIENTIFIC AMERICAN was in the *Sun* newspaper building, Fulton street, the cholera prevailed to an alarming extent; this remedy was then employed at the *Sun* office for treatment of compositors, pressmen, carriers, newsboys, or whoever happened to be attacked with the disease in the neighborhood, and the number of cases was quite large. The remedy was always used with success if administered in time, and we then formed a high opinion of its value. It is now well known among the druggists here and, by most of them, kept on sale.

A NEW acid, termed acid of alorcine, has been extracted from aloes by M. Weselsky.