

MUSEUMS OF ART AND INDUSTRY.—THEIR INFLUENCE AND ORGANIZATION.

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GROUP XXII.

Baron Schwarz-Senborn, the conceiving as well as the directing mind of the Vienna Exhibition, announced, early in the progress of preparing for that enterprise, that one of the most important, if not the chief, feature of the undertaking, would be the illustrating of the progress of education the world over;—the various methods and appliances for teaching in use in the different countries of the civilized world. Museums of Art and Science were, of course, to find a place in this display. Their value as educational agencies has been too clearly demonstrated in states where they have been established to admit of leaving them out of the Exhibition. It was thought advisable to form a separate group of their exhibit. This action was not, perhaps, the best that could have been taken, if the object was to show the means by which the public taste is elevated, and how such institutions are enabled to bring a practical influence to bear upon industry. The Museums are only a part of a system or systems that have their root in the common schools; hence, to gather a clear idea of their work, it is necessary to go behind or below them, into the schools where drawing is taught, and other technical knowledge imparted, in order to make a thorough study from the beginning, and so on up to the Museums themselves, before a clear idea can be gained how the known results, existing to-day in industrial art-training, are reached. By this arrangement of one-half of the subject-matter in one group and the other half in another, it was made a difficult undertaking to describe exactly what was shown at Vienna. It is impossible to confine the delineation to either group without marring the usefulness of what information could be collected. To simplify the complex, however desirable, is

not always so easy that the Austrian Direction need be blamed for failing to exhaust the whole subject of the influence of Art and Industrial Museums upon public taste and industry, as their first circular relating to this subject would have led its readers to believe they intended to do, if it were possible of accomplishment. What they did achieve was certainly deserving of the highest commendation. What they will yet do, after the hurly-burly rush and hurry of the Exhibition is over, will, it is to be hoped, serve to further elucidate the value or defects of this important factor in education.

There can be but little doubt but that the gentlemen who will have the task assigned them by the Austrian government of making up the official report on Group XXII. will compile from the statistics and detailed information furnished them from many sources a most valuable and interesting document. This must be waited for with patience, as such reports do not usually appear until a lapse of six or twelve months after the close of the exhibition that has called them into being. The fact is to be regretted, for such official data would be extremely valuable in this or any other report dealing with the same subject.

One official document can be given—that referred to above, as it preceded the Exhibition and endeavored to convey, in a rapidly sketched outline, what the Austrian Direction desired might be done. This was "Special Programme, No. 12, for Group XXII."

This paper is in itself an evidence of the deeply-rooted hold Art and Industrial Museums and art-teaching, as applied to industry, have taken in Austria; and, having been written, it is thought, by Herr Jacob Falke, the acting head of the Vienna Museum, it may be taken as the utterance of one who is no mean authority on the subject whereof he writes.

This special programme runs as follows, omitting the excess of title that prefaces it:—

"Among the instructive establishments of our time which have most rapidly proved to be of great utility, the Museums of Fine Arts applied to Industry must certainly be included, and almost every city of importance possesses such an institution. This fact alone would suffice to justify the attempt we will make to show their organization and influence.

“These institutions stand, as well by the object they have in view as by the results they obtain, between real life and abstract theories; they are the mediators between the past and the future of the development of Fine Arts applied to Industry. The eminent position taken by modern industrial art for the last few years, furnishes the best proof of the justness of the remark made above.

“It may certainly satisfy and rejoice professional men to see the careful manipulation of different raw materials, and the use made of machines ingeniously constructed; but if a more elevated taste was not combined with the technical process in the execution or ornamentation of these products, one could hardly say that industry is improving.

“One of the most remarkable improvements made by industry dates back from the time when the idea first occurred to collect carefully together the rich treasures of former centuries, which had remained so long unused, to make model collections of them, to take up again and to organize the progress made by our industrious ancestors in some branches of industrial art, and in those objects produced by manual skill.

“The technical skill with which any object is manufactured is not sufficient to produce an object answering the exigencies of a connoisseur. An intelligent appreciation of the task to be fulfilled, the right feeling of the most suitable form; in short, taste in the invention and execution of each article, has become an indispensable quality for industrial production, and it alone raises the object manufactured to the rank of a work of industrial art, i. e., an object not only useful but also satisfying the requirements of good taste.

“Most of the industrial schools and institutions for promoting the study of Fine Arts applied to Industry, which under the direction of experienced connoisseurs fight every day with greater success against the old methods of proceeding and unthinking routine, owe their foundation to the acknowledgment of these truths.

“Still the creation of Museums of Fine Art applied to Industry, of those treasures of the history of art, are still more the consequence of the right feeling of the ennobling influence of art upon industry. It is from this point of view that the merits of the Museums of Fine Art applied to Industry of Paris, London, Edinburgh, Moscow, Berlin, Stuttgart, Munich, Weimar, Gotha, Limoges, Lyons, etc., just as richly endowed as they are generally useful to all, must be appreciated.

“After these come those museums, which, although not directly promoting Fine Art and Industrial Art, have indirectly the same object, by pursuing a scientific or statistical object. These institutions are also the result of modern efforts toward civilization; as, for

instance, the German Museum at Nuremberg, the Romano-German Museum at Mayence, the Museum Richartz at Cologne, the museums at Havre, Amiens, Toulouse, etc.

"It is not necessary to enter into more particulars, to prove the great utility of these creations of modern times for the wants of our generation: the great number of visitors, the extended use made of them, and the influence they exercise upon modern industry, which is easy to remark, are matters of fact which every professional man acknowledges with pleasure.

"These museums attain their purpose by different methods. Firstly, by their collections, which are arranged with precaution and discrimination, and which procure as much to the eye of the connoisseur as to the unprofessional man, a really contemplative lesson. Only instructive and most perfect objects find room in their chests and on their walls. There, one can pursue historically gradual development and progress in the production of every sort of article, and an attentive spectator is enabled to follow the laws of industrial progress in the direction mentioned. There is no room for vain pomp in those establishments, where everything has as its aim, to show how the value of every single article can gain by a tasteful transformation, which, far from prejudicing its sale, augments it.

"Secondly, those museums exercise a very beneficial influence on the schools of Fine Arts applied to Industry, which are combined with them. The living word is found on the inanimate object, and the explanation on the model. The teachers engaged here explain to their scholars all those important qualities which every production of industry, even that destined for every day's use, must possess, in order to answer the exigencies of taste. The scholars learn, therefore, to appreciate the value of a certain simplicity, to understand and make use of the laws of the style of symmetry, and thus become those men who, later on, furnish the market with artistic objects, i. e., with such objects as are remarkable for their utility and moderate ornamentation.

"All the useful methods employed by the museums of Fine Arts applied to Industry to exercise their influence, are to be exhibited and demonstrated for the first time to the public in this group, and in such a manner that every museum will be allowed to organize its own exhibition in the manner the president of the institution may think best fitted to have it worthily represented, at the Universal Exhibition. Still, in order that the whole exhibition of this group may be as complete and instructive as possible, it would be as much conformable to the purpose as desirable, that each single institution should previously communicate in which branch it more particu-

larly wishes to exhibit. Should this proposition be favorably accepted, each artist and industrial workman will find enough to inspire him in his branch; and, to mention only one thing particularly, modern ornamentation will become richer in new models of design.

“But, in order to prove to the public the practical influence of these institutions, it is indispensable that the publications of each single museum should be exhibited in samples and in single numbers; by this, we mean, more especially the reproductions—plaster casts, galvanaplastic impressions, photographs—and the artistic literary publications of the museums. Concerning the former, they must be confined, not only because of the space, to these works of art, the originals of which are in the possession of the country exhibiting. As to the latter, we cannot sufficiently express the desire to see them exhibited in collections as complete as possible.

“Finally, the museums are requested to give exact statistical statements of the number of visitors to their institutions, of the organization of their schools, etc., in order to furnish materials for the statistics of the museums of Fine Art applied to Industry.

“Signed by the President of the Imperial Commission: Arch-Duke Regnier; and the Chief Manager, Baron Schwarz-Senborn. December 10, 1871.”

It was a perfectly feasible idea, and one easy to execute, to show the official arrangement of the different institutions mentioned in the programme, and to exhibit a collection of the objects belonging to the museums of Art as applied to Industry.

Any of the museums mentioned above, that at Edinburgh, for instance, might, through its president, have sent a detailed statement of when the institution was founded and opened to the public, the amount of its endowment, its size, number of rooms or galleries, a list of their contents, estimated value of the collection, number of visitors each year, etc., and we should be but a very little nearer to a clear or precise knowledge of the effect produced by the museum upon the people of Edinburgh. It is clear that such information, so desirable to attain, must be sought for outside, and not within the museum, even if it be possible to glean it at all.

We can all fancy the immense influence the classical works of our language have had and still exert upon the English-speaking race. There is no one among us who can measure its extent; but we might imagine our loss, if we were to be

deprived of our Shakspeare, our Milton, and all the other bright stars in the galaxy of literature.

So it is with the museums of Arts as applied to Industry. They are silent instructors, with no record other than so many visitors in so many years. The schools of arts generally attached to the museums stand upon a different footing, as it is possible to keep some account of the work they perform.

The author of the special programme clearly saw the difficulty with respect to the museums. Although he forbore to enlarge upon that theme, he clearly indicated how desirable it would be if such information as to the extent and reach of the influence of museums of Arts as applied to Industry could be given. This is still unknown, except as it can be gathered from the opinions of those best entitled to speak upon the subject, and we believe no attempt was made to show its extent, by any of the states which have found their profit in establishing centres of instruction in the Fine Arts as applied to Industry.

The Austrians certainly did not attempt to show, in a direct way, how they had been and are still benefited by their beautiful museum. The endeavor will be made, ere this Report is closed, to state how they did show, indirectly, somewhat of the profits reaped by them, in payment of their enlightened encouragement extended to the Fine Arts and to Industry.

The managers of the Vienna Museum of Art and Industry would, in all probability, have made a fuller exhibit of the scope and object of their institution, if it had not been for some disagreement, or dispute, as to the proper space they should occupy in the exhibition, which occurred, it is believed, between them and the Chief Manager. Their energy was thus circumscribed and turned into other channels; as, for instance, helping to arrange the different sections of the Austrian Department to the best advantage. Thus, in the court where the Bohemian cut-glass ware was shown, Herr Loley-meyer, the chief manufacturer, was in constant communication with the museum authorities, consulting with them as to what was best to do. The results of their joint labor looked like a fairy scene, and produced one of the most interesting

displays in the Austrian section, if not in the whole Exhibition building.

It must also be borne in mind that the Museum of Fine Arts, as applied to industry, had been, and is still a power among the Bohemian glass-workers; local museums having been formed, whose contents are so arranged as to bear directly upon the industry of the place where they are established. The Viennese Museum supplied many models, while the neighboring gentry and manufacturers were solicited to give or loan such objects of interest as they had and could spare, bearing upon the business sought to be improved. Lectures are also given, and books, written to teach the principles of Art Taste, as applied to Industry, circulate in the district. The schools also form a source from whence are drawn new supplies of Art workmen. These various means and aims of the Art Museum have certainly improved the value of this special product of Bohemia, one of the most beautiful Art-industries known.

Herr Loleymeyer has helped to advance the whole district—as oftentimes one wide-minded manufacturer will do—by his early recognition of the value of Museums of Art and Science, and his hearty practical coöperation with the Museum authorities. Here, then, is one instance of the direct influence of the Gewerbe museums; and although the fact is not announced, or to be found, in the display made in Group XXII., it is none the less real.

This instance stands not alone. Any one who visited the Vienna Exhibition during the past summer or fall, will remember the large hall leading from the southern entrance to the great Rotunda, entirely occupied by one manufacturing firm—Philip Haas & Son—with specimens of the carpets, rich hangings and chamber-suites, for which the firm is rapidly becoming famous. This hall was arranged and fitted up entirely from the designs and under the direction of the professors and pupils of the School of Arts.

It is also a fact that carpet-weaving and its associated industries, at Vienna, have drawn much valuable information from the models and drawings, bearing upon this handicraft, collected within the walls of the new Museum, not to mention their influence in the improvement of the workmen.

There were many similar instances scattered through the whole Austrian Section. Indeed it would be hard to find a single handicraft, where taste is needed, that had not been benefited, directly or indirectly, by this influence. These are practical illustrations of good effected, that can be appreciated by any one who understands that an improvement in industrial art means an improvement in the community and an increase of the value of the work performed.

To give even a brief resumé of the models, etc., exhibited by the Vienna Museum in Group XXII., would be to turn this Report into something very like a catalogue.

The literary Art publications, either written by members of the faculty or under the direct encouragement of the Museum authorities, occupy the first place on the list. The writing and spreading abroad of works upon the Application of Art to Industry, upon Taste, upon Study, and kindred themes, is one among the many useful labors performed by the Museum of Arts applied to Industry. These works numbered thirty-five.

There were, also, nearly four hundred gypsum models, beside galvanaplastic impressions, photographs and specimen copies of students' work.

The Vienna Museum may be said to be one result of the influence of the idea that gave rise to the South Kensington Museum. Herr Jacob Falke, keeper of the Austrian Museum of Art and Industry, in his *History of Modern Taste* (*Geschichte des Modernen Geschmacks*), writes as follows on this point:—

“When the works of industry of all nations were brought together at the first London Exhibition, in 1851, the deplorable state of taste was made palpable to the perception of all those who would and could see. . . . There was only one nation wise enough to take to heart so important a lesson, and proceed at once to turn it to account—the English. . . . A Museum of Art Industry, that of South Kensington, was then founded.* This Museum, therefore, must be considered as a result of the experiences made at the first International Exhibition. It has now become celebrated through all countries. It was not

* This is not quite correct, as the Museum was first established in Marlborough House, now the residence of the Prince of Wales.

intended for the benefit of the artist alone, but for that of the general public as well. But matters did not rest with the creation of the South Kensington Museum. A large School of Art, comprising all branches of elementary Art instruction, was established in connection with it. *Since great artists, nowadays, do not make designs for manufacturers as they once did*, it was found necessary to educate technical designers, painters and sculptors, and to make them into accomplished artists, and to educate teachers competent to conduct schools of design in an artistic spirit. Moreover, drawing schools were established in all the manufacturing towns; circulating collections of objects for exhibition were organized, and competitive examinations and distributions of prizes established. Competent persons were sent out to give lectures on all subjects relative to Art manufacture; a whole branch of literature on this province of Art was called into existence; in short, a stir was made in every direction in which any practical result was to be hoped for. These efforts have been crowned with success, and it has been proved that something could be achieved in this new way. After the lapse of eleven years, at the second London Exhibition (1862) it became evident that England, which, till then, had been considered as taking the lowest rank in matters of taste, stood side by side with France, in an equally high position in these respects. . . . Austria was the first among the continental States to turn to profit the example, even before France had begun to make new efforts, and in May, 1864, a Museum was established at Vienna after the model of that of South Kensington—the Austrian Museum of Art and Industry.”

The italics are not in the original. Herr Jacob Falke here indicates the great want of the age—the need of men who are really artists and sculptors, to step down from the pedestals upon which they have elevated themselves, and mingle a little more amid the work of the world, as did the great men of old.

Grinley Gibbon, or Flaxman, did not injure themselves, or lessen their after fame one iota, but on the contrary they increased it, by exercising the powers God had given them, the first-named at Saint Paul's Cathedral, where he was the guide and inspiration of a crowd of carvers and artisans, the latter, working for Josiah Wedgwood designing cups and saucers, etc., for common use, in accordance with the rules of art and classic taste; not to mention the host of other great

men, long departed, who despised nothing in industry that could be made artistic.

The museums of Art and Industry will have performed a great work, if they do nothing more than cause a change in this respect, as there are signs that they have been able to do, not thoroughly as yet, but they have made a beginning. It is no longer a rarity to find men who have acquired a reputation for their art-work, designing, quietly and unobtrusively, furniture, plate, wrought-iron gates, carvings for stone and wood-workers, carpets, majolica ware, etc., both in England and on the continent of Europe.

The rank and file of labor need commanders who shall be not alone bent on conceiving great projects. Let a man come among them who can shape out great things, and he will make small things great also, if he is in earnest and loves the work; especially, as is now the case in most of the leading countries in Europe, if the rank and file have had a knowledge of art imparted to them to prepare them for their life's work.

Another fact has been demonstrated so plainly that it is now generally admitted as a truism, by the efforts put forth during the last fifty years to elevate the masses; i. e., "Those who can be taught to write can learn to draw." This fact established destroys the awe that has so long hedged in the Fine Arts, and is another contribution of the nineteenth century to the freedom of mankind. Thus kid-glove artists, who have withdrawn from the company of artisans and manufacturers, have conferred an incalculable benefit upon the world at large, in forcing upon it the conviction that all of God's gifts are universal, if not allowed to perish from neglect, or ignorance of their existence. So, if these artists have become so refined as to fear that the dust of the workshop may soil their fair, white hands, the workers will take up the task, and in the endeavor to elevate their own powers and taste will elevate the whole community. This is peculiarly in a line with the spirit of American growth. It is from the bottom that we work upward to the top. We may hope to develop a grand school of American Art when we have made the whole people familiar with its principles; precisely as we formed great men in politics, in war, and work, by making the whole nation feel profoundly. This accomplished, the cap-

tain steps forward, his lieutenants are ready to help him, and an army is at hand, almost as great as himself, and without whom he would be powerless to carry out the ideas he conceives for his country's good.

However galling it may be to our feelings, we must admit that in many things the people of Europe are ahead of us, as we surpass them in others. The Vienna Exposition showed that we are, at least, behind in the matter of education—not that imparted in our common schools and colleges, for as far as they extend they are unsurpassed in their teaching; but the education that makes fairly-rounded men and women, not one-sided individuals, who, when they really enter life have to unlearn much and learn more ere their labors are of any account.

We have a broad basis to build upon, yet it is not so broad or so comprehensive a system as that established by Austria for her subjects. Like her German neighbors, she recognizes the fact that there is no royal or easy road to learning; hence she begins low down, the school law framed in 1869 marking her "new departure."

Mr. Lytton, an attaché of the British Legation at Vienna writes of this law:—

"One of the greatest benefits conferred upon the working classes of Austria is the General School Code of the 14th May, 1869, which renders national education compulsory, and greatly elevates the standard of it. In accordance with this law, compulsory attendance at school begins with every child at the age of six, and is continued uninterruptedly to the age of fourteen. But even then (that is to say, at the end of his fourteenth year) the child is only allowed to leave school on production of certified proof that he has thoroughly acquired the full amount of information which this great law fixes as the *sine qua non* minimum of education for every Austrian citizen.

"The prescribed educational course comprises reading, writing and arithmetic; history—chiefly although not exclusively that of the native country, embracing the political constitution and general social structure of it; geography in the same sense; all the more important branches of physical science, geometry, geometrical and free-hand drawing, singing, athletic exercise.

"Children employed in large factories or prevented by special circumstances from attending the communal school, may complete or continue their education at any special school supported by their

employers, and the employers are authorized to found schools for that purpose. But it is an absolute condition that all such schools shall provide the full amount and quality of education required by law, and otherwise fulfil all the obligations prescribed by the General School Code. Every school, whether private or public, is subject to the inspection of the state. In places where a special trade-school exists, the employer is bound to send his apprentices to it.

“In addition to the subjects of instruction above enumerated, every child is simultaneously provided religious instruction in the creed in which he or she is born. The local ecclesiastical authorities or notables of the church or religious community to which each child belongs, are entitled and indeed bound by law to provide competent teachers for this purpose; but this religious instruction, which is altogether denominational, and on a footing of impartial equality for all sects, is kept by the state carefully apart from the secular education, which is in every case obligatory, and with which it is, in no case, allowed to interfere.”

These primary schools are of three grades, respectively of three, four and six classes. The course of instruction in primary schools of four classes, is extended in one direction into the Gymnasia, and in the other into the Real or Practical Schools. On the Gymnasia rests the University, and all the special schools in which language and its associated culture predominates. On the Real or Practical Schools rest the Polytechnic Institute, and all the special schools in which mathematics and the natural sciences are taught, in connection with the great industries of the nation.

But all the scholars cannot reach the Universities or the Polytechnic Institute. The majority are needed for workmen. As is indicated in the General School Code, it is possible for the young artisan to pursue a course of studies adapted to his wants, and fitted to help him on further yet, if there be the right stuff in him. The further instruction of lads after leaving school and entering into apprenticeship, is carried on with the assistance and special inspection of Chambers of Commerce and local associations of tradesmen. The instruction is given on Sundays and holidays—except high feasts—and in the morning and evening of other days. It is not confined to a review of the rudimentary studies, but is extended to higher arithmetical calculations, book-keeping,

bank dealings, business correspondence and forms, natural history, and particularly to drawing. A record of attendance is kept and delinquent parents and employers are fined, and proprietors of large establishments are subject to arrest and imprisonment for persistent neglect in respect to their apprentices and other juvenile operatives.

The special schools are open to artisans, whether apprentices or not, if they want to avail themselves of their help.

The Museum of Arts as applied to Industry, as its name implies, is part of this system of thorough education. To borrow from one of the Museum's published works:—"The object is to furnish material by which Art-knowledge shall be applied to industry, and thus produce an elevated taste, which is so much to be desired at the present day."

A brief resumé of the growth of this institution may perhaps prove interesting, as Massachusetts is treading in the same path as Austria.

The chief impetus to the formation of the Museum was given by the London Exhibition of 1862. It will be seen, further on, why this Exhibition proved so interesting to the people of Germany, Austria and France. The Exposition of 1851 had agitated the question, but in 1855 the roar of cannon from the Black Sea prevented any active result. In 1862, public attention was again aroused by Professor Rudolph Von Eitelberger, who had been sent to England to report on the comparison of Austrian industry with that of other nations.

He gave a glowing account of Art in foreign lands, and the institutions for its promotion, especially speaking of the South Kensington Museum at London. The report was laid before the Emperor, and in the fall of 1862 the professor was notified to prepare for assisting in establishing a Museum.

The want of funds in the treasury was a great hindrance to doing anything at public expense. Finally, Duke Regnier obtained from the Emperor a formal permission to found an "Aesterreichischen Museum für Kunst und Industry." His Majesty (Francis Joseph) appointed the Arch-Duke Regnier as Protector of the Museum. Professor Eitelberger was appointed Director, and Herr Jacob Falke, Custodian. The

Imperial Ball House was lent for a temporary abiding place for the Museum, and it was opened May 31, 1864. By the gifts of the Court and State the Museum was rapidly increased, and many collections were procured. The need of a special building for the Museum was more and more apparent. On February 7, 1867, a deputation of curators waited on the Emperor, and asked to be allowed to proceed with the erection of a permanent Museum. The permission was given, and in the fall of the same year the plans of Architect Heinrich Ritter von Ferstel were submitted and approved. The building was completed November, 1871, and was then opened.

It is in the Italian Renaissance style. The exterior walls are of red brick, trimmed with sandstone. Portraits of artist celebrities, executed in majolica, are placed around the building. Entering, we go through the vestibule, where are two tablets, commemorating the foundation of the Museum and the Art-School, from which a door on the right leads into a closed court; on the left are the steps leading to the school floor. Vestibule, court and stairs are adorned with appropriate ornaments. The square court, extending the entire height of the building, is surrounded by arcades, supported by pillars and monoliths. Light comes through a double glass roof. Around the court are eight exhibition halls.

The Museum comprises collections of objects in all branches of Art and Industry; gypsum figures, a library, drawings, ornamental pieces, photographs, etc. Companies and private persons, besides artists and industrial workers, can exhibit their work in a hall reserved for that purpose. Admission to the Museum is free four days in the week. Tuesdays and Wednesdays a small fee is charged, and even then artists are admitted free. The library is open weekdays from nine to two, and Sundays from nine to one. During the winter months it is also open Tuesday and Wednesday evenings. On Mondays one-half of the collection is closed for cleaning. Articles exhibited are copied for the drawing department by photographs, photo-lithographs, galvanoplastic impressions or gypsum. Protographic reproductions and the gypsum processes are wrought out in the atelier of the Museum. Copies of these can be obtained

from the authorities at cost price, for the use of similar institutions or technical schools.

For the elevation of the public taste, the Museum publishes a literary-artistic paper. This contains drawings of Art-models, articles on the theory and history of Art, reform, taste, etc., critical reviews of articles exhibited, and writings on the technology of Art. "The Monthly Mittheilungen" is devoted to special reviews of Art news, inventions, works on exhibition in the Museum, and answers to correspondents. The Museum has correspondents in all the four quarters of the globe. During the winter free public lectures are held on Thursdays, with subjects taken from Art and applied to natural philosophy, industry, etc. Beside these lectures there are courses for young artists, to instruct them in special branches, as drawing perspective, the architectural orders, photography and technical Art.

The lectures to the public are given from a different standpoint than that adopted by many of our lecturers on Art and its technics. In Vienna the lecturer aims to show the young aspirant how to make a beginning, and how to progress upward in the study of the Fine Arts; while here, lecturers who attempt to discourse upon Art and Artists, generally strive to show how impossible it is for any one to reach the height attained by the masters of old, thus chilling the awakening enthusiasm of their hearers, among whom, perhaps, may be some who would have liked to make an effort to acquire Art-skill and knowledge for themselves. But to return to the Museum.

For the benefit of the country at large, special exhibitions are given in towns outside of Vienna, on the plan adopted by South Kensington. Besides, the Museum gives advice to artists and manufacturers, and even furnishes models. It takes an interest in improving Art matters in technical schools, and is looked to for counsel by all institutions of learning.

The Museum is under the Ministry of Education. Its Government consists of Protector, Curators—whose term of office is three years—and Director, with whom lies the entire charge. Under the Director are four Custodians,

two of whom are in the Art-galleries, one in the library, and one employed as Secretary.

The following Table shows the number of persons recorded as having visited the Museum since it was opened:—

1864,	. . . . .	56,891 persons.*
1865,	. . . . .	118,438 “
1866,	. . . . .	101,733 “
1867,	. . . . .	118,802 “
1868,	. . . . .	102,460 “
1869,	. . . . .	97,680 “
1870,	. . . . .	87,892 “
1871,	. . . . .	52,927 “†
		42,746 “‡
1872,	. . . . .	129,441 “
Total,		909,010 persons.

Soon after the opening of the Museum in 1864, the Board of Trade and Industries, of Lower Austria, asked of the State's Ministry that an industrial school be started in connection with it. This request was warmly supported by the country. On the 18th of February, 1865, the Council of Education ordained that a higher school of Art-Industry should be established in connection with the Museum. A committee was appointed to draw up a code. Little was done the first year, besides familiarizing the pupils with the regulations. The artistic education of scholars was so limited, that about half the entire number admitted, or 24 out of 50, were obliged to enter the Preparatory Department.

One great trouble was the lack of funds on the part of pupils. In 1869, a number of friends of the institution formed a "Society for the Advancement of the Art-School," whose object is to aid needy students, by distribution of school money, travelling expenses, etc., without distinction in regard to nationality, religion, or anything else. The Emperor is Chief of this Society. During the first four years of its existence, about one thousand dollars were gathered for a fund, and over six thousand for yearly expenses. In 1869, the Trade Ministry set apart six thousand

* First six months.

† Temporary building.

‡ New building.

florins as two years' pay for ten students, and renewed the same in 1871. To this were added twenty thousand florins given by Baron Louis von Haber-Linsberg, for students of Lower Austria. Prince Schwarzenberg gave a capital of one thousand florins (\$500) to be used for the support of a pupil born on his domain. These are not all the donations the school has received, but they are the principal sums given to help the students. Many manufacturers and friends subscribed smaller sums.

Apropos of donations, a compliment was paid to America by one of Vienna's able professors: "Ah, we want a few men such as you have so many of, who would donate us a sum that would place us at once in a position to achieve the much larger amount of good results we could attain, had we some such generous friend. The sums given by Peter Cooper, Ezra Cornell, Mr. Peabody, Commodore Vanderbilt, and a host of other gentlemen, to help on the cause of education, amaze us, not to mention the enormous grants of land made by your Congress for the same purpose."

One can hardly doubt, after observing what they have done, with what, in this country, would be considered very limited means, that had they but half the money so freely poured out for the cause of education here, they would achieve astonishing results, working as they do, upon strictly economical and practical systems, wasting nothing, and utilizing every force and help that converge to form the real, able, skillful and tasteful worker, whether he be an architect or mason, professor of languages or teacher in an infant school; whether he be the inventor of a steam-engine or the man to run it; whether he be the designer of the patterns for rich carpets or the man to weave them; whether he be the skilled forester or the woodman who fells the tree; and so on, through every profession and every handicraft.

Perhaps, on the other hand, if they had the grand resources of this country to draw upon, instead of having to be keenly alive to the value of every cent they can earn, they would be moulded into free, pushing, go-ahead people, lavishly careless of that of which they now show themselves to be so minutely careful,—the intellect of the nation.

It is most certain that they have a very practical method

of training all within the confines of the state. No matter how successful or unsuccessful their efforts toward that end may be, the method is sound.

As, for instance: at the Art-School, where the term begins in October and ends in July, pupils who attend the lectures contend for a prize at the end of each year. Female students have the same rights as the males. The admission fee to the Art-School is one dollar; tuition fees for the preparatory school, two dollars and fifty cents; for the higher school, four dollars and fifty cents, half-yearly.

There are ten professors, who have brought to them all the work they can perform. This is a point worth noting. The method of teaching involves practical work. It is no mere copying, but the real thing itself, at which the students can work with the professors. It would also seem to indicate that the school is a success, that their labor is in such demand as it is, by the manufacturers of Vienna.

The School and Museum aim to improve and elevate public taste. Although the most recent they are not the only institutions founded in Vienna for a somewhat similar purpose, and therefore care must be taken not to ascribe to the Museum alone results only partly brought about by its agencies.

Technical, scientific education it does not attempt to touch; yet the imparting of this involves oftentimes the teaching of a right taste and feeling for the beautiful.

There is no need for the Art and Industry Museum to stir in this matter, as very ample provision has been made to meet the needs of the whole country in this respect. Technical instruction is of very long standing in Austria. At the beginning of the present century, three important schools were in operation, and others were instituted, long before the neighboring German States had moved in this direction.

The Polytechnic Institution in Vienna, as organized in 1815, was the culmination of efforts begun in 1765, to shape the instruction of schools to meet the special wants of pupils in their future mechanical or commercial occupations. It is one of the best equipped schools of its class in Europe. If it were combined with the Art Museum and School, it would stand next to the Science and Art Department at South Kensington, at present the largest centralized institution of its

kind in existence, with the tendency to still further extend its power. There has been some talk lately in England of placing the British Museum under the same direction. This proposition is not very favorably received by the English people, who are not all satisfied as to the ability of the managers of South Kensington to get all the good from what they at present control.

At the Vienna Polytechnic Institute, there is a technological museum, the contents of which comprise more than 200,000 specimens of models, machines, etc., beautifully arranged. The whole Institute numbers about sixty professors, librarians and superintendents of the museum and astronomical observatory. It has an average attendance of five hundred pupils, distributed into four special schools or divisions, besides a mathematical course. These are: 1. Civil engineering. 2. Architecture and construction. 3. Machinery and manufactures. 4. Chemical technology, including students in the evening classes and preparatory division. The attendance exceeds two thousand every year.

It is difficult to draw a distinct line, and declare, Here Science ends and Art begins. This will be acknowledged by any one who visits the Polytechnic at Vienna, or any of its fellows.

Take the study of architecture as an example. It is certainly necessary that the architect should have exact mathematical knowledge, that he may calculate the power of tension, capacity of bearing weight, etc., of the different materials he uses; but he must also be educated in art taste or his designs will be sorry, tame affairs. Indeed, there is no man in our midst who needs to be so thoroughly an artist as he who would aspire to be a real architect, and none who has more influence upon the life of the people whom he serves. A house, if it is ugly, still represents so much labor and capital, and cannot be pulled down simply on the score of its ugliness; but a beautiful building, harmonious in each part, represents more than its mere cost: it becomes a silent educator, and remains a charm to all who see it. It is, therefore, but right to look for Fine Art instruction in any institution that professes to teach architecture. This is found at Vienna, where the pupils are instructed, as were the Greeks of old, by draw-

ing and studying the best buildings in their neighborhood, the professors—men whose names alone carry commendation—pointing out and explaining every grand, broad, general effect, as well as the minutest detail that can be shown.

To the Viennese, architecture is a very important profession, as it has depended and still depends upon the able men in this department whether they shall have a beautiful city or the reverse. So far, it is in the first state, if the opinions of the many visitors drawn thither by the Exhibition can be taken as sufficient evidence.

Thus, then, though separate institutions, it will be seen that the Museum of Art as applied to Industry and the Polytechnic Institute have much in common, and fitly dovetail into each other. The Museum of Arts reaches out after other objects than its neighbor, while it does much to fill in the necessary details, of great value to the students of the Polytechnic Institute, and *vice versa*.

Take, as an illustration, the manufacture of Terra-Cotta—a business that has grown prodigiously in Austria, Germany and England of late years. The determining of the right clays, to form a fit combination; the formation of kilns to harden these clays; the calculations as to the shrinkage of the clay while passing through the firing process, with other details, rightly belong to the Polytechnical Institution; but the artistic modelling of tasteful ware and statues in Terra-Cotta comes fairly within the province of the Museum and the School attached. That this aid has not been slight, but, on the contrary, extremely beneficial, is the testimony of the manager of the largest clay-working establishment in Austria, and the second largest in the world, verified by personal observation.

It would be a vain task to attempt to describe the high perfection to which this art has been brought by the Viennese. Remembering this, it is a source of regret that our own country is so backward in this manufacture, when all the needed materials exist in abundance. Nature has here been bountiful in this as in nearly all her raw materials. It is an industry that could be promoted in this country with a fair prospect of remunerative returns; first, to the manufacturer, and more remotely, in improving the public taste by supplying

cheap and enduring statues, vases, fountains, etc., modelled to correct and artistic forms.

It is also available for architecture, being the natural sequence of brick making—the attempt of artistic power to progress from machine-pressed, square, clay bricks to hand-modelled clay, fine art objects for the million. Once modelled, these can be reproduced by pressing in moulds, *ad infinitum*—alike, yet unlike, as the artist can touch up each pressed form while the clay is yet pliable, ere it is put into the kilns. Then, too, it is made in different colors. The Italian Terra-Cotta is famous for its deep rich red color. The German and Austrian manufacturers endeavor to make theirs resemble stone, so that it may be used for ornamental work in combination with that material, thus effecting a considerable saving in outlay, and securing effective ornamentation for the façades of their buildings. In England all colors are used, although the principal architects, who favor it as a building material, desire that the English work should show the natural marks of the firing, so stamping it as no imitation of another material, but as a legitimate and old-time medium for forming buildings and articles of utility and art.

Several buildings lately erected in London are particularly striking. The combination of terra-cotta with pressed brick-work is charming in the highest degree. It is safe to request—in these latter days when almost every one travels—that if any of the readers of this Report, in the future, find themselves in London, they should seek the merchants' offices, built directly opposite the Ludgate Hill Railroad depot; and if the London soot and smoke have not blackened the building, there is no fear but that this suggestion will be pardoned on account of the pleasure experienced. While in this locality, round by the home of the "Thunderer," near Printing-house Square, is a neat store, the elaborate front and interior of which will bear inspection and pay for the time bestowed upon them. The inside walls are lined with Minton's encaustic tiles, evidently designed and made for this building. The pictures on the tiles are beautiful paintings of pastoral scenes. This tile work is another artistic production which should be carried on in this country, but which is entirely neglected, on the reasoning that we can buy all

we want from England, while we devote ourselves to rougher and better-paying labor.

In Europe they have the advantage over us, in the long artistic training that has been afforded the people; but we can avail ourselves of their previous experience, and progress more rapidly from the knowledge so gained, as is evident from the work already accomplished in Massachusetts. But, as has been indicated in the instances cited above, without exhausting the list, there are so many kinds of artistic work of which we know nothing, except as we purchase specimens ready-made from foreign markets, that much hard and continuous labor is entailed upon us, if we desire to be an artistic as well as an industrial people.

It is worth while to note the fact that terra-cotta, like brick-work, is a fire-proof material, hence deserving of notice in America where the fire-king has wrought such terrible havoc. Specimens of terra-cotta that have passed through a fierce and destructive fire are shown at Vienna, to prove its power of resisting heat. The facts, as related, certainly demonstrate that it will stand fire without being very seriously damaged, if it is not injured by the falling masses that generally cave in, at any really calamitous conflagration. That it will endure for ages is proven by the specimens of ancient workmanship exhibited in almost every European museum. There are articles made of terra-cotta in the British Museum, at least three thousand years old. The mark of the artificers' tools show as plainly as when first burnt in.

While writing of terra-cotta specimens in the museums of Europe, it may be said that they contain specimens of everything, many articles and subjects exhibited being to-day priceless, on account of their antiquity, rarity, and intrinsic value as exemplars of ancient art and industry. Vienna is abundantly supplied with these collections. The imperial palace* is a rich treasury of works of art and collections of scientific objects easily accessible to the public. The Swiss Court has the private library of the Emperor; also some sixty

* The principal royal palaces of Europe are becoming more and more every year show-places or art-galleries for the occasional use of the crowned monarchs, who nominally own them, and for the general use of the public, who really own them.

thousand maps. The jewel office is open three days in the week, during the summer months, to the public. There is also a collection in this court known as the Physico-Astronomical Cabinet. This is likewise open to the public, but visitors must make application to the custodian. The Royal Library is situated near the Winter Riding School and contains over three hundred thousand volumes, twelve thousand parchments, twenty thousand manuscripts, and upwards of eight hundred volumes of wood and copper engraving, etc. In the palace, there is also a Cabinet of Zoölogy and Natural History—one of the richest collections to be found anywhere. The public are admitted one day in the week. A Mineralogical Cabinet is attached, beside the Numismatical Cabinet and collections of antiquities. Its collection of specimens of cut-gems stands unrivalled, and the bronzes, vases, gold and silver-work accumulated represent an enormous value.

The Belvidere Gallery is one of the world-renowned art-buildings. Any good guide-book will tell of the works of the old masters collected within its walls, a single one of which would be considered a grand acquisition to any of our modern formed galleries; but they cannot be bought; they are not for sale. At the Belvidere, there is a collection of antique works of art, which forms the complement of the Cabinet of Coins and Antiquities in the Palace (Hoffburg); and, lastly, there is a Museum of Egyptian Antiquities.

The Royal Armory is in the building called Stallburg. This collection includes a fine assortment of all kinds of weapons, and other appurtenances of war, which may be seen daily, free.

There is also a Museum of the Academy of Art, containing a number of valuable engravings, ancient paintings, marbles, and a great assortment of plaster of Paris casts, of considerable merit. This is open, free, once a week.

There are Medical, Botanical, Polytechnic, University, and many private galleries, to which the public can gain admittance.

Prince Liechtenstien's Picture-gallery contains some twenty-four thousand free-hand drawings,—many by Albert Dürer, and two hundred thousand engravings on copper. This is open twice a week.

In front of the Imperial Palace, the Museums of Science and Art are in course of erection, and will be immense structures, if the foundations are any guide to an idea of their proposed size. The fact that these buildings have been commenced indicates that the judgment of the leading men and of the Parliament of the Austrian Empire is still favorably inclined toward this method of fostering and cultivating public taste. They ought to be able to judge well of its effect, having had so long an experience with the galleries already in operation.

The following is a concise summary, from the official catalogue, of the facilities for technical education provided by the Austrian Government for its people. It does not include the Art and Industrial Museum or School, or the galleries and collections above enumerated.

“In Austria proper there are 45 Superior Schools and Academies for scientific instruction in agriculture, horticulture, forestry, the cultivation of the vine and the silk-worm, and veterinary surgery, also of mining, navigation and commerce; with seven Polytechnic Schools, in all having 6,000 pupils and 426 professors and teachers. These schools are in part sustained by the Imperial Government, and are under the general direction of the minister charged with educational matters.

“Hungary has 13 similar schools, with 116 teachers and 1,311 pupils.

Bohemia has an extended system of industrial instruction, more diffuse than in other parts of the empire.

“What are termed ‘burgher schools,’ answering to our secondary or grammar schools, have special courses, designed for mechanical and commercial training.

“Besides, there are, throughout the Austrian provinces, many workman and apprentice schools, usually teaching some special trade. In Vienna and Prague there are a number of these. In the latter city, there is one whose course includes the technical sciences, practical weaving, linear and free-hand, machine and constructive drawing, lectures on machinery, practical chemistry and modelling. These are classes for machinists, building trades, weavers, dyers, industrial artisans—as goldsmiths, jewellers, porcelain makers, etc.”

It must be confessed that Austria presents a splendid arrangement of practical and artistic educational agencies, and it is already evidenced that in the future they will increase rather than decrease. The principal trouble there is the extreme difficulty of obtaining a sufficient number of competent teachers. This will be remedied in the future, now that it is so generally recognized that the teacher's post is a most honorable one.

It is safe to say that it is educated labor that prevented Vienna from sinking into a torpid state after the terrible blow Austria received at the hands of Prussia in 1866, so soon after her defeat in Italy, by the combined Italian and French forces. Her rulers were compelled to see, through the sober light of misfortune, that their true interest consisted in fostering industrial progress, and developing the resources of the empire. This had been done to a very considerable extent previous to the events referred to above; and because such was the case, the city of Vienna could not lose her prestige; but by continuing to work in the same path of educating labor and fostering taste, she has attained a greater degree of prosperity than she ever before possessed—fortunate in having men at the head of affairs who see the importance of encouraging industrial enterprise and progress in the widest and broadest sense; fortunate in having a splendid system of instruction by which the citizen is helped in his life's work; and in having men who were already first in the trades and business for which Vienna is, and is becoming, famous.

A slight glance at the work done in the Austrian capital and its natural advantages will show the correctness of the assumption that the strength of this empire lies, not in her drilled legions of soldiers, but in the armies of busy, skilful, hardy, trained workers. The industrial progress so apparent in Austria may really be said to have commenced in 1860, when the old walls that encircled the city were thrown down, and new boulevards built on their site; and confirmed when her rulers, in 1866, were taught that a stronger military power existed than their own.

It must be remembered that, with all her educational facilities, Vienna could not have attained her present degree of importance in the world if there were not unusual natural

advantages to help to form a great city. The position of Vienna is unique, and had not the evil influence of a repressive governmental system checked private home or foreign enterprise, preventing everything like thorough development, Vienna must have been, at the present hour, second in importance to no continental city. It stands upon the confines of civilization and semi-barbarism, on the bank of a stream which receives into its waters no less than thirty-four navigable rivers, and which, connected as it is with the Rhine and the Maine by the Ludwig's Canal, directly unites the German Ocean with the Black Sea. Of all European capitals it is nearest to those points where the Elbe, Weichsel, Oder and Dniester rivers become navigable; the nearest to the Adriatic (Trieste), the Grecian Archipelago (Piræus), the Ægean Sea (Solonica), and the Black Sea (Constantinople, Varna, Kurtange and Odessa). From Moscow or Petersburg to Italy; from Moscow to Spain, France and England; from London, Edinburgh and Dublin to Constantinople; from Paris to Odessa; from North Germany to Stamboul or Athens,—the road to be taken must run through Vienna; and that road must be the Austro-Hungarian Railroad, long in contemplation, and which will be built, if the Austrian executives pursue with vigor the path upon which they seem to have set out. Vienna is the greatest and most advanced outpost of manufacturing industry on the banks of the Danube; it is the natural depot of the raw produce furnished by the vast tract of country known as the Lands of the Danube, from which it may be distributed to its proper destination for consumption; the central mart for the corn, woollen, hide and leather trades, for wine and other agricultural produce of these territories by the Danube, is in Vienna. The numerous railroads radiating from the city are obvious proofs of the magnitude of the existing and expected commercial traffic.

The above is but a brief summary of the city's natural and acquired advantages.

The real struggle between the great powers of Europe to-day, lies in the endeavor to gain control of rivers and territories where commerce and industry can find the best paying return for their work.

Special products and industries are necessary conditions, appertaining to the commercial importance of a city. Even seaports, in which traffic and the forwarding trade predominate, require the support of productive territories, which, in at least one or more branches of industry, give it a particular excellence in the department especially cultivated by it. The Viennese cultivate so many that it is hard to select the few principal ones.

All the various trades are reached, in a greater or lesser degree, by the Museum of Arts as applied to Industry and the numerous Fine Art Museums and Industrial Schools existing in the city.

The workmen take the raw material brought to them, and, as an English artisan once said of the Parisian *ouvriers*, in comparing them with his own countrymen, they put a hundred dollars' worth of work into it where we put one, before they permit it to pass from their hands.

Every one knows or has heard that Vienna is famous for its meerschaum trade. The raw material is brought thither, where the taste and skill to manipulate it is to be found. The cutting and carving of this "foam of the sea" is here raised to a fine art, and the workmen produce the most marvellous results. The fine, soft nature of the material gives the carvers opportunity to produce elegant and tasteful effects, and this the artisans in meerschaum ware at Vienna fully improve; hence they supply all the known world, where smokers exist, with their goods, and everywhere, because they are Viennese, they command a higher price.

The bronze trade is another business carried on there, and bears quite a Viennese character—just as the French bronze work is Parisian. Austria used to purchase the bronze goods she needed from the French houses, until this trade was developed in Vienna, where, in the first place, bronze-work is applied to useful ornaments, such as lustres, candlesticks, chimney ornaments, etc.

The strict observance of the truest rules of Art is particularly remarkable, and is chiefly due to the Museum of Art and Industry, where considerable pains is taken to collect and exhibit the best, most chaste and most useful models applicable to this special trade.

The leading architects of Vienna—most of whom are connected with the Art and Industry Museum—furnish many of the manufacturers engaged in the bronze trade with designs, so that the articles made after them harmonize with the buildings into which they are to be fitted. This course enables the Viennese to compete with the best French houses, as was shown at the Exposition. It was there evident to all who attempted the comparison that Austria had made rapid strides toward reaching the artistic plane long ago attained by the French, and beyond which the latter do not seem to advance.

The many little nick-nacks made of bronze, and known as "Articles of Vienna," have very often combined in them fine woods, leather, paper, mother of pearl and *papier maché*.

This development of the bronze and leather trade has not taken place without exerting an influence upon the higher branches of artistic book-binding, which has likewise been peculiarly improved.

It is noticeable that the development of one artistic idea, applied to industry, is sure to beget others in rapid succession, if the ground be but favorable for their growth. The manufacture of portrait albums, ornamental covers for diplomas, books, etc., calls for, besides the leather material, gilding, bronze, jewels, enamels and ivory. Workers in all these different materials are found in Vienna, as competent, if not more so, than those elsewhere, working cheerfully, "day in, day out," for wages which would here be deemed miserably small. Indeed, it does seem strange that they should continue there, when this country would be glad of their help, and willing to pay treble what they now get for their labor.

England has, in the past, given us a useful hint on this point. When she could secure a good workman, with special artistic skill, from the Continental countries of Europe, by paying extra for his services, she did so; the result produced was counted and sold as English work, and this practice insensibly educated the native artificer and designer by the new blood infused into the veins of their industry.

It is to be expected that the Jewellers' Art would be fostered in Vienna, as it is in every Catholic country in a

greater or less degree. Such is the case. The aristocracy of this part of Europe have for ages been noted for their love for fine jewellery; hence here are found wonderfully cunning workmen in gold, silver and precious stones. Influenced on one side by the ruling church, with its highly developed Italian goldsmiths' art, and on the other side by the nearer Orientals and Hungarians—who have to this day the most gorgeously dressed nobles and gentry in the world when they don the national costume—public taste chiefly governed by the rich, who dazzle with their profuse magnificence, thus has the Vienna jewellery attained a distinctively marked character, combining the richness of the East with the taste of the West. The Museum and School of Arts strive to keep this distinction prominent, as being a trait well worth the perpetuation.

Without further attempting to enumerate the thousand and one trades carried on in Vienna and the surrounding country, many of which are of recent date but now firmly seated, we may notice that the great number of new buildings erected since the Ringstrasse was made, has called into being a new race of cabinet-workers. All the trades which find their occupation in furnishing houses have had an impetus given them by the efforts of the distinguished architects who have designed so much of New Vienna, to improve the interior decorations and furnishings of the new buildings. Cabinet-making, carpet-weaving, bronze-work, modelling and frescoing for walls and ceilings, marble-working, etc.—with all these trades the Museum has had direct contact, and has met with the greatest measure of success that has rewarded any of the efforts of the authorities to improve and elevate work and the workers.

The influence of these attempts of the leading minds and teachers of Austria to elevate the taste and improve the skill of all her workers, professional and artisan, bids fair to be crowned with the happiest results. By enlarging the scope of the people's mental vision, they insensibly polish their manners and aspirations, rendering them more content, cheerful and industrious. By giving them an interest in their daily work other than that which comes from it as being the means of earning a livelihood, an ambition is fos-

tered to excel in what each produces. It is of vital importance to the world at large that this should be done.

The introduction of steam machinery into industry has, without doubt, added greatly to the power and comfort of mankind; but in its onward progress it has left behind, or destroyed, some things that it would have been well to retain; and, among others, the artisan, thoroughly master of his craft in all its parts. One-branch hands are in the majority to-day—quick at a single thing only, as making the head of a pin or the handle of an iron shovel.

It is not at all surprising that there are so many empty-headed and shallow-pated men in each community, who are so conceited as to think they have nothing to learn. This dwarfing of mental powers engenders a whole train of evils. Open the closed mines of the workman's brains, and he becomes at once a thinker for himself, his work a pleasure to himself, and his life a blessing to all with whom he comes in contact. Thus, if Austria should apparently lose money in her immediate efforts to elevate the taste and aspiration of her people, ere long it will return to her with compound interest.

The Exposition itself will have a great effect upon the nation. The native artificers, manufacturers and designers, have been able to compare the work of all the world with their own. In making this comparison they will have learned many lessons, and the varied literature the Exposition has called forth carries to their homes the ideas of men trained to observe and to report upon their observations. They must have noticed the general average ability of nearly all the European countries, in the staple manufactured articles in every day use, such as calicoes, boots, woollen cloth, etc. This is owing to the general acceptance of the same kind of machinery to perform the work. No sooner is a labor-saving machine invented in one country than it is copied entire, or in its essential parts, and used in every country where it is needed.

America and England have supplied the rest of the world with more practical help in this way than all the other nations put together; yet with all this start, the other nations are creeping up to these in industrial progress.

The Technical and Polytechnic Schools have greatly helped to effect this result; while, upon the other hand, Austria, Germany and England, have, by diligent attention, greater or less in degree, paid to the subject of Art-industry, gradually neared the two nations so long famous for fine work, industrial and artistic—France and Italy. The United States is not in the race, if we may judge her by what was exhibited in the American section of the Vienna Exposition. Not that it was worthy in any respect of the position we occupy among the nations of the earth, though we secured more prizes in proportion to the number of exhibitors than any other country. Those prizes were all awarded upon the basis of industrial merit. The artistic element was *nil*, if we except Prang's chromos and the photographs exhibited. The first germs of a change in this respect were shown in the School Group; viz., samples of drawings executed by the pupils of our common schools and by students of the evening classes, established in several of our large cities. It was but a grain in that vast granary, but any one who took the trouble to compare these drawings with those exhibited as the work of the pupils of a similar grade in the Austrian, Swiss or German section, found that their merit was as great as that of the others, notwithstanding the much shorter period this kind of instruction has been imparted to the young scholars here. This is a small but very encouraging fact. Those countries that have not paid the same attention to Art-industrial education as have the principal nations of Europe, were poor in proportion in their exhibition. Spain and Portugal are illustrations of decay in these matters. Russia, Sweden and Denmark illustrate the results of a one-sided education, i. e., technical; the bulk of their exhibit consisting of articles of utility, industry and defence. Austria, as we have seen, showed an even balance. Germany is not so strong in her Art as in her Industry, but is still very respectable, and evinces a strong tendency to improve in the future in this respect. Much that she has done is of the first order; still, the professional men engaged in the endeavor to elevate the standard of taste in their country's work are not satisfied. They regard their own progress as too slow, and continually fret under the influence of French

inspiration. Honest Germans are not wanting to tell their countrymen of their faults, and to point out what they deem to be the remedy for them. One of these, writing in a publication issued for the special purpose of improving the taste of the people, says :—

“The German States have still a great work before them, ere they can emancipate themselves from the influence of French art. They have made considerable progress since the Paris Exposition of 1867, but it is still evident that very much of the German art-industry is altogether bound by French taste. No matter how well one race may think they are copying the works and art of another, in so much as it is copying, the result will be void of originality, expression, and freshness, and becomes fainter and weaker at each repetition.”

The German critic assails French taste at some length, and claims that it is based on entirely wrong principles :—

“An all-prevailing fashion, and the decline of all art during the last centuries are the causes through which it has acquired and retained its powerful sway. The superiority of the French art-workmanship lies in the possession of a great number of artists who extend and practice an hereditary skill and dexterity. The fascinating charm of their creations consists in mere outward finery and show, or, in an accomplished superficial treatment, a manual facility or genius for arrangement, and an originality of invention instead of truthfulness of expression and faultless beauty in structure and form. These accomplishments and charm, certainly of great value, when combined with true art, are necessarily lost in copies and imitations, because they are the exclusive specialty of the French artist; hence the miserable failure of our own artists and designers, who imitate French teachings and turn out mongrel conceptions, neither native or French.”

Some part of the above will apply to ourselves if we will but be candid in our confessions. Admitting this, we must look to it that the aims of our slowly increasing number of museums and art schools, shall mainly be directed to correct this servile defect. We are strong enough now to walk alone in this path, as we have in so many others.

The critic quoted above points out a remedy for the evils of which he complains, and as his words help to show the

influence and drift of modern art-industrial education, a further quotation will be pardoned :—

“There is no difficulty in finding the path we must follow. England has already chosen it with great success, and it lies open to us also. It was fortunate for the reforming endeavor in England, and is beneficial for us, that French taste and French art-industry are, in themselves, hollow, insipid and perverted. It is here that the English apply the lever with a keen understanding. Had they continued following the French, they would have naturally always kept in the back ground; they would not have been able to overtake the amazing start their rivals possessed. They were obliged first, to oppose a new and true taste to the old acknowledged bad one, and then to convert the world—perhaps the hardest part of the task. To the arbitrary caprice of the French, they opposed conventional strictness of style; to frivolity, principles; to outward show and puppet-like attire, the dignity innate to art. In order not to be led astray or to permit the ascendancy of what ought to be secondary, they kept constantly before their eyes the goal they aim to reach.

“The recent international exhibitions showed that wherever the object was taken up and pursued with strict consistency, as in paper hangings, carpets, porcelain, terra-cotta and upholstery, but above all in works of crystal, the English either surpassed, or, after traversing the wide distance which had separated them, equalled the French. Where, however, they allowed themselves to remain subjected to French fashion, especially in works of gold, silver and jewellery, there they remained far behind. * * *

“We are aware, indeed, that the efforts which the patrons of art in England, supported by the government, have made to act upon the public mind, are of the most manifold kinds; that museums and other institutions, general instruction in drawing, public lectures, popular literature, are constantly extending their influence. We know, too, that this influence is gradually gaining ground every day, and that its ultimate result cannot be doubtful. The present state of the case, and the path we have to follow, are thus clearly marked out for us. In the first place we must, and that immediately, emancipate ourselves from French taste. We must no longer allow ourselves to look with slavish admiration on Paris. We must not, as hitherto, regard whatever comes from thence as faultless in beauty and unexceptional in taste, without exercising our own reflection and judgment, but rather look upon it with the persuasion that much that comes from there is faulty. We allow that French works of art-industry are very much better than our own, but still they are not absolutely good, only relatively so.”

The writer's words, addressed specially to his own countrymen, have certainly a meaning for us, if we ponder them over well, now that real, earnest efforts are being put forth to found a genuine American system of Education in Art-Industry. But it must be remembered, that if we want quick and valuable results, our outlay and exertions must be in proportion to our desires. To give a lukewarm support to the movement, and then, ten years hence, grumble because we have not effected as great changes as other countries in a like period of time have done, would be but a sorry way to bring about a beneficial result, though it is what is likely to happen unless a very strong interest is aroused in the public mind in behalf of the idea.

In England, it is the fashion to grumble and growl at the amount of work performed by the South Kensington Museum and Schools, and their method of doing it, even for those who are ignorant of what is really accomplished. The work has been something marvellous in extent and rapidity of execution, as is fully shown by the opinions of the critics and observers who are not English.

That Austria believes in following the example set by the English is plain from her actions, as is also the case with most of the German States, who, if they have not already established Museums and Schools on the South Kensington plan, propose to do so in the near future, to supplement their already existing systems of technical and artistic instruction. Even Italy moves into line, notwithstanding that her name is almost synonymous with the *Beaux Arts*. France early acknowledged the value of the movement, and her recorded statements are curious but clear proofs of how soon it is possible to inaugurate a new reign of taste, and create the skill to meet it. Bearing in mind the fact that the International Exhibition of 1851 showed the unrivalled supremacy of France in nearly all matters of Art-Industry, the reports of the French Commissioners and Jurors of the Exhibition of 1862 will show that swift work had been performed in the decade between these dates, and will establish the fact that this Art-education as applied to industry is no natural demand, but one entirely artificial in character, shaped by the demands of our complex system of civilization, yet capable of an early and rapid

development in the hands of vigorous and well supported leaders.

The following extracts are interesting, as showing the influence and value of the institutions comprised in Group XXII., illustrated by a single example—that at South Kensington:—

FRENCH JURORS' REPORT—1862.

[Extract from Report by M. Natalis Rondot.]

“On the closing day of the Exhibition of 1851, Prince Albert pointed out to England the new object which she ought henceforth to pursue. His words found an echo in all workshops, and the mayor of one of the chief manufacturing towns then said that ‘the greatest benefit which could be conferred upon industry would be to give, by the development and improvement of Art-education, a purer and more practised taste to the producer as well as to the consumer.’ The Department of Science and Art has been created under the sway of these ideas. * * * * In almost every direction, the influence of a larger number of teachers of drawing, and of working draughtsmen is making itself felt. The manufacturers of Nottingham, Manchester, Sheffield, Worcester, and Staffordshire recognize the fact that their best designers come from the Schools of Art, and that, thanks to them, the general character of designs and of forms has undergone the most happy modification.

“Before the next ten years have passed, English industry will have more than one million workmen, who will have acquired, by several years of schooling, sound notions of Art and Science, and an intelligent practice of drawing; circulating museums and collections will have familiarized many millions of manufacturers and workmen with the styles of all countries, and of all great epochs, with the most beautiful types of ornament, and the most esteemed models of every kind.”

[Extract from Report by M. Rapet.]

“The study of drawing in the primary schools in England dates only from ten years back. Until then it had remained a privileged study, reserved exclusively for the richer classes. But the Exhibition of 1851, which rendered distinctly visible the superiority of France, in those products which demand taste, and the value of which is based upon a knowledge of design, revealed to England the cause of her inferiority. With that ardor which she displays in the pursuit of an object, as soon as she thinks it useful to attain it, she undertook, almost immediately after the close of the Exhibition,

to establish Schools of Design over the whole of the United Kingdom. Since then, she has pursued her work with characteristic perseverance, and without shrinking from the sacrifices demanded by an enterprise in which everything had to be created. A new branch of the council on education has been established, under the title of Department of Art. Its special mission is to urge forward the creation of Schools of Design, the professors of which receive a direct payment from the government, and further remuneration, proportioned to the number of pupils to whom they give instruction. At the same time a Normal School was established for the training of masters, and a system of awards and prizes organized to encourage the study of drawing on the part of the pupils who attend the schools. A Museum of objects of Art was likewise formed to help this teaching, and the Department of Art itself caused to be prepared from the commencement, models to serve for instruction in the schools. Its example has since been followed by publishers, who have already begun to publish important collections of models of design.

“It would be out of place to expect from a system of education which is still in its infancy, the progress which such a system may have made in countries where it has been long established; nevertheless, in examining the English Exhibition, we must at once admit that England has turned to good account the experience of other nations. In particular, she has borrowed largely from France, whose published models may be found frequently employed in the English schools.

“In observing the results of these efforts, and taking notes of deficiencies, it is impossible to ignore the fact that a serious struggle awaits France from this quarter, and that by slumbering in treacherous security, our country would risk the loss of that superiority to which numerous branches of her industry owe their importance and their glory.

“It may not be useless to add here that England is in another respect our competitor by carrying off our designers. For many years her manufactories have attracted them, by the high wages with which their services are remunerated. But it is a very remarkable fact that these artists have often lost, after sojourning some time on the other side of the channel, the superiority of taste by which they were previously distinguished.”

[Extract from Report by M. C. Robert.]

“Since the Universal Exhibition of 1855, immense progress has been made throughout the whole of Europe, and although we have not remained stationary, we cannot conceal from ourselves that the

advance which we have made has diminished, and even has a tendency to disappear.

“In the midst of the successes obtained by our workmen, it is our duty to remind them that defeat is possible; that it may be even foreseen at no distant date, unless they exert at once all their efforts to maintain a superiority, which can be kept only on the condition of incessant self-improvement.

“English industry in particular, which, from the artistic point of view seemed greatly in arrear at the Exhibition of 1851, has, during the last ten years, made amazing progress, and should it continue to advance at the same rate, we might soon be left behind. This state of things appears to us to merit the most serious attention of the French government and manufacturers. * * *

“It is particularly in that which concerns the application of art to industry, that England manifests the happiest and most notable improvement. A new school has been founded, on a plan admirably devised for the advantage of industry, and neither care nor money has been spared to render it worthy of its mission.

“With regard to the influence exercised within so short a period by this great institution, we fully admit the testimony of our colleagues, the English members of the jury. When questioned by us as to the causes to which they ascribed the progress so obvious, this year, in the products of their manufactures, all have assigned a chief place to the new resources which are opened to industry by the schools of South Kensington.

“Such are the rivals whom our workmen have encountered in the Exhibition of 1862. It is impossible to hide from ourselves that the impulse given to English industry has not yet acquired its complete development, and we must look forward to see it make new efforts, and yet more brilliant advances.

“By the side of this increasing energy among the English, we regret to discover among our countrymen a little too much confidence, a sort of indifference and relaxation, which are not uncommon results of long-continued success. The position is, however, serious; nay, even threatening; it calls for prompt remedies.”

Quotations might be made from the same sources until space was exhausted, and prove, as Herr Jacob Falke has expressed it, that “The reputation of the South Kensington Museum, or at least the acknowledgment of its merits, is greater in foreign countries where people look on with impartial eyes, than in England herself.” (See “Die Kunst-

industrie der Gegenwart: Studien auf der Pariser Welt-Anstellung in Jahre, 1867.")

It is strange that so little has been written by the English, to give a clear view of what has been and is being done. Apart from the government reports, it is difficult to find the least particle of information relating to the progress of the work among them. Perhaps this is due to the fact that they are too much engaged in extending the progress to stop to add up the results. Even in that very interesting work by J. M. Ludlow and Lloyd Jones: "The Progress of the [English] Working Class, from 1832-1867," we find very little upon this point, while on other subjects the information is extremely full and exhaustive. These authors, however, place the original motive which prompted the manufacturers and governing classes of England to put extended facilities for improvement in art and taste within the reach of the working people, upon the right ground:—

"The progress of the working class in science and art belongs, we consider, rather to the education of the man than to that of the child. The rudiments of both may and should be acquired in childhood, but it requires the matured powers, the developed taste of the adult, to make either study a reality.

"The public recognition of the claims of the workingman to prosecute both, belongs entirely to the period under review [1832-1867].

"It was in the field of design that such recognition first took place—not, indeed, from any appreciation of the workingman's right, as a man, to enjoy all means of manly culture, but simply with a view to making him a more useful instrument in the battle of competition with foreign countries."

The authors then proceed to give an account of the rise and progress of the South Kensington Schools, etc., and state that within ten years (1855-1866) the number of art pupils was all but trebled. And further:—

"No higher testimony to the success of England's efforts to spread the knowledge of art and design amongst her working classes can be offered than that of the French workingmen dele-

gates—keen, critical, jealous observers—who were sent to the great Exhibition of 1862. Nothing seems to have struck them more than the development of our system of art-education and the progress in design of our workers.* Thus the sculptors in ornament say: ‘The progress made by sculpture in England is immense since the Exhibitions of 1851 and 1855.’ The cabinet-makers: ‘Comparing the products of England in 1862 with those of 1855 one sees that she has made a gigantic advance.’ The shawl-designers speak of England’s great progress, and envy her her schools of design. The jewellers, who admit, on several points, England’s superiority to France, regret that all competent men, in the jewellery, carving, engraving, enamelling and goldsmith’s trades should not have been able to go to London to see Kensington Museum. The painters on porcelain dwell on the vast progress of the English workmen within ten years, and attribute it mainly to the ‘immense extension given to the study of drawing,’ etc.

“Quite apart, however, from the commercial effects of our public efforts for Art-Education, is the growth, amongst workingmen, of a real sense of the visibly beautiful. Those who have had the opportunity—as students in Mr. Ruskin’s Drawing-Class at the London Workingmen’s College—of seeing the fascination exercised over many a workingman by the gradual discovery of the hidden charms of form and color in the works of God and of man, know that the artisan is as capable of appreciating Art, for its own sake, and pursuing it with disinterested love, as the most refined aristocrat.”

The opinions quoted above, all relate to the progress the people of England have made in improved powers of design, art taste and skill as applied to industry.

It needed the great Exposition, held at Paris in 1867, to show the English another want in their systems of education. It was during the period that this Exposition was open, and since, that a profound and wide-spread interest was awakened in Great Britain in the cause of special scientific or technical education. Endeavors had been made to establish something of the kind in England for a series of years previous, but with little success,—with how little, the Paris Exposition demonstrated conclusively.

The London Society of Arts did a great service, in connec-

* See the interesting volume, entitled “Rapports des Délégués des Ouvriers Parisiens à l’Exposition de Londres, 1862,” Paris, 1862-1864.

tion with this subject, in selecting and sending to Paris a body of as intelligent practical artisans as they could find. The observations and ideas these men gathered while there, were afterward printed and published in what made a notable book, calling forth a wide-spread utterance on the subject of Technical Education from every one interested in the advancement of the nation.

The artisans paid but little attention to the subject of Design and art taste, except to notice the rapid and more facile methods in vogue on the continent for teaching the art of Free-Hand Drawing; but they at once saw and felt the disadvantages under which the British artisan labored in competing with the workmen of Germany, France, Belgium and other countries where there are so many schools of different grades and kinds for the instruction of the workman, foreman and directors in technics of the several crafts that they followed.

The press took up the theme with ardor; meetings were held in almost every town or industrial centre to consider the question; much was written and spoken explanatory of the systems of education established in France, Germany, etc.

Quite a flood of literature, purporting to deal with the interesting subject, appeared, some of which is of value; as, for instance, "Cassell's Technical Education."

At last, a Royal Commission of eminent men was constituted, with powers to examine into what existed, to hear testimony, opinions, etc., of those who could throw light upon the matter, and finally recommend such alteration in the existing system as they should deem necessary.

The result of the Commissioners' labors appeared in 1872, in the form of a voluminous Blue-Book, containing much that is interesting, and much more that is not. From this report a few facts are selected that help to throw light on the history of the attempts to popularize science among the English people.

Mr. Cole, late head of the South Kensington Museum, but who resigned that post upon accepting a similar position over the Annual International Exhibition, held in London, was the first witness called, and his testimony is the main basis of the facts collected.

It is said of him, or by him, "that he had witnessed the conversion, since 1852, of twenty limp Schools of Design into one hundred and twenty flourishing Schools of Art in the kingdom, and other schools like them had been established on the continent, in the colonies and the United States. For artisans, five hundred night-classes for drawing had been established; one hundred and eighty thousand boys and girls were now [1873] learning elementary drawing, and one thousand two hundred and fifty schools and classes for Science had spontaneously sprung into existence. The South Kensington Museum had been recently founded, as a national centre for consulting the best works of Science and Art, and as a store-house for circulating objects of Science and Art throughout the kingdom. While this Museum had been visited by more 12,000,000 visitors, it had circulated objects to one hundred and ninety-five localities, holding exhibitions, to which more than 4,000,000 local visitors had contributed above 93,000 pounds sterling."

The happy result of the labor of Mr. Cole is spread over England, Ireland, Scotland, and Wales. It is proposed to present him with a national testimonial. The idea was mooted in London last summer, and is a happy one; for, without doubt, his has been a life-long and ardent work in this special department of progress. That he still believes in it, the earnest words uttered by him at a provincial School of Art quite recently, bear witness.

Mr. Cole said people were still apt to look at Museums as mere collections of "things rare and curious—things for learned people only, for rich people only, for diletanti only.

"The late Prince Consort and his followers looked at them from a different point of view—the point of view of Science and Art applied to Productive Industry.

"What did the architect do who wanted to learn his profession? He looked at buildings. What did Flaxman do when he applied himself to pottery? He studied Greek pottery. What did Herbert Minton do to enable his manufactory to compete successfully with Sevres? He collected and studied the master-pieces of Sevres. Why was Mr. Phillips, the jeweller, trusted to set jewels with good taste?

Because he studied the ancient and mediæval models. What gave Pugin his reputation for Gothic metal-work but his study of mediæval models? What had created a trade in majolica, in England, but the Soularge collection? What had given the Craces, and Jackson and Graham, and Gillows, and Holland, their reputation for furniture, but their knowledge of ancient examples. It was simply savage ignorance and priggish pedantry not to recognize the absolute necessity for examples of art, easily consultable by the public who were consumers, by the manufacturers who were producers, and by artists and artisans who were students. Where were they to consult them if not in public Museums? Why was the Frenchman more apt at Industrial Art than the Englishman? Because, for a century, he had had his free Museum in Paris and every other large town.

"And public Museums were necessary for Science as well as Art. Collections of diagrams, of educational apparatus, and of specimens of natural history, were indispensable to the managers of schools and teachers. The fact was, if Museums were not educational they were of very limited value."

Without doubt it is greatly due to Mr. Cole that the South Kensington Museum and Schools have attained their present proficiency and value—sufficient to secure for it the Medal of Honor given to it as the best of this class of institutions at the Vienna World's Fair.

To return to the Commissioner's Report and the subject of Science-teaching.

To begin at the beginning, it is necessary to cite the speech of the queen, in 1853. She then, by the advice of her Government, declared that the time had come when the nation should systematize scientific instruction having a bearing upon industry.

That was at the opening of the sessions of Parliament. After her majesty's speech Lord Aberdeen's government took the subject into consideration, and, after a correspondence with the Board of Trade, they enlarged the department called the Department of Practical Art into the Department of Science and Art. The object was to extend the system

of encouragement already commenced in the Department of Practical Art to local institutions for Practical Science.

The minutes further say, that "the Treasury agree that that object will be best attained by the creation, in the metropolis, of a school of the highest class, capable of affording the best instruction and the most perfect training, which can alone be hoped for from an institution which has the command of the most eminent and distinguished talent, the advantages of which will be experienced by minor institutions throughout the kingdom, not only as furnishing a central source of information, but as a means of furnishing competent and well qualified teachers for local institutions, and of completing the education of pupils who desire higher accomplishments than can reasonably be expected from minor schools."

That creation of a central Science School exists at present only in words. There is no Science School, but it looks as if this minute would be carried out ere long.

It is even proposed in England to create a National Institution of Science, or college of the highest class, at which shall be assembled all the great authorities in this domain who can be got to act as professors, and such students as desire the highest training that can be received. It is only a proposal as yet, but serves to indicate which way the tide is running.

Various attempts were made, after the passing of this minute, to create what were then called Trade Schools. For a few years they did not succeed very well, and when the late Lord Salisbury became Lord President of the Council, he firmly determined either to abolish the word Science out of the title of the department, or to cause some Science to be given to the country. Accordingly, about the year 1859, certain principles were laid down which enabled the department to encourage the teaching of certain sciences assumed to have a direct bearing upon industry throughout the country.

The principles then established have been carried much further. The Science-classes were, in 1860, nine in number, and have increased since to twelve hundred and fifty. They

are conducted by certified and uncertified day-school teachers, and are commonly held in day-school rooms. The subjects taught are as follows :—

1. Practical Plane and Solid Geometry.
2. Machine Construction and Drawing.
3. Building Construction.
4. Naval Architecture and Drawing.
5. Pure Mathematics.
6. Theoretical Mechanics.
7. Applied Mechanics.
8. Acoustics, Light and Heat.
9. Magnetism and Electricity.
10. Inorganic Chemistry.
11. Organic Chemistry.
12. Geology.
13. Mineralogy.
14. Animal Physiology.
15. Zoölogy.
16. Vegetable Anatomy and Physiology.
17. Systematic and Economic Botany.
18. Principles of Mining.
19. Metallurgy.
20. Navigation.
21. Nautical Astronomy.
22. Steam.
23. Physical Geography.

-In the Government Tables, every institution in which scientific instruction is given is counted as a school, though the subjects taught and the number of classes in them vary much. In some instances a school consists of but one class, in which only one subject is taught, while in others there are ten or more classes in different subjects.

The progress of the Science Schools since the passing of the general Science minute, June, 1859 is shown in the following Table :—

	No. of Schools.	No. under In-struction.
1860,	9	500
1862,	70	2,543
1864,	91	4,666
1866,	153	6,835
1867,	212	10,230
1868,	300	15,010
1869,	516	21,500
1870,	810	27,956

At present, as before stated, there are 1,250 Science classes in Great Britain in direct connection with the South Kensington centre. It is stated that 212 schools, in 1867 had 560 classes in different subjects; of these 10,230 scholars, 4,520 went up for examination, besides 400 persons not taught in classes aided by the Department.

It was stated by Mr. N. McLeod, one of the South Kensington masters, "That whilst the pupils who attended the Drawing classes belong *almost entirely* to the working class, the proportion of ladies and gentlemen being very small, on the other hand, those who attended the Science classes belong *entirely* to the laboring class."

Mr. Cole said, in the course of his statement before the Royal Commission, in reply to a question concerning the earlier pupils who had been educated at these schools:—

"The best of them come to the surface and get scholarships, and I should hazard the prediction that they turn into Science teachers, who make teaching the business of their life. (In some instances within my recollection are young people whose ability has first been manifested at those examinations, who, taking several high positions in different examinations, became qualified to obtain scholarships, and studied afterwards, either in the London School of Mines, or at the College of Science in Dublin, and now earn their living wholly by teaching.) Manufacturers also employ them, on account of their scientific attainments."

It has not been the policy of the State in England to aid or interfere with the education of the middle classes, except to some slight extent, and that indirectly, by State endowments in colleges.

The general opinion of the country, working through the School's Enquiry Commission, and such agencies, can alone be looked to, to make any important change in the way of introducing the study of Science. Nothing, however, can have much effect on the Grammar Schools and Middle-Class Schools of that country, until the Universities, which give the key of education in the country, allow a fair proportion of their endowments to the reward of scientific studies. The instruction in the primary schools is, of course, only of an elementary character. That in the adult night classes, though in some cases carried a little further, for want of time, means and apparatus cannot go to any depth. Such instruction, generally diffused, is of great use; but it only goes far enough to warn people of the mistake they may fall into from their ignorance; to teach them not to be satisfied with mere empiricism; to show them how Science may be applied to their work, and to induce them to follow up their education. The application of Science to the Arts can only be made by those who have a thorough knowledge of special branches. The masters, mechanics, foremen and others, who have learned what they know of Science by the aid of the South Kensington Museum are but a small percentage of those engaged in industry. Any of the poorer people, who show a special ability and aptitude for Science can only follow it out if supported while pursuing their study. The richer classes can always get what they may desire by paying for it.

The efficient head of the Science Department of South Kensington, I. F. D. Donnelly, makes the following statement:—

“Much is said about the necessity for technical instruction, and efforts are being made to induce the State to supply it. It becomes, therefore, necessary to consider how far, if at all, the State can take this up advantageously, as distinct from the general scientific instruction.

“This idea is proposed from two rather different points of view. The one proposed is to have a Technical School adapted to the staple industry of a place; the other, apparently, to teach trades which do not exist there, with the idea of their introduction.

“Real, technical instruction, the teaching of a trade or art, itself, on scientific principles, necessarily entails workshops for practice.

It would be scarcely possible to devise a more effectual blow to the manufacturers of a place, than for the State to establish a really Technical School for their trade, with its workshops under no constraint to pay its expenses, underselling them, and interfering with their market. A State Pottery School and Messrs. Mintons' could not exist side by side.

"On the other hand, for the State to teach trades where they do not exist, with the view of introducing them, and thereby most probably tempting them away from where they have established themselves, could, at the most, only be innocuous so long as it was ineffectual.

"With regard to general industry, it may be taken that the action of the State cannot safely go further than by aiding and encouraging instruction in general Science—or such applied Science as Mining and Metallurgy.

"The Commission for the College of Sciences for Ireland laid down that its aim should be to impart a sound and thorough knowledge of those branches of Science which may be applied to industry, leaving it to the student, subsequently, to specialize his knowledge, and turn his attention in the direction he may find most suitable."

The Captain points out a method of aiding pure technical instruction "in the very best way," by means of the existing system of payment on results. That is to say, the teachers will receive a fixed sum from the Department of Science for every pupil of theirs that passes the necessary examination, in addition to the fees paid by the pupils, or the help that manufacturers might extend, either separately or in combination, to establish schools for the instruction of their employes.

"The state, by paying on the results of elementary and scientific instruction, would assist in the instruction of the students just up to the point of their learning the absolute trade.

"There is nothing to prevent manufacturers, with energy and public spirit, from establishing as good schools as those of M. Schneider at Creuzot, and obtaining as much government aid toward them."

It will be seen from the foregoing account that the South Kensington Department of Science and Art has commenced the work, in a broad sense, of diffusing scientific instruction, generally, throughout the length and breadth of the nation. It will be also seen that its action is preparatory as yet, but

indicating, as the result aimed at, a much higher and wider system of training in the future.

As the Commissioners whom we have quoted write in their Report :—

“The ground thus prepared may hereafter be occupied, step by step, with Elementary Science Schools in well constructed buildings, supplied with proper apparatus and a sufficient staff of trained teachers. These schools may train assistant teachers, may group around them humbler classes, and aid them with apparatus and superintendence or instruction.

“The first steps have been taken with such vigor, and the result has been to such an extent successful, that we confidently expect that, with needful guidance and encouragement, a thoroughly efficient system of elementary scientific instruction for the working classes, may, ere long, be founded on this basis.”

The “working classes” themselves begin to move in this matter. Last summer was very prolific of meetings among them, called for the purpose of considering this subject, besides a deputation of members of their body, who waited upon the head of the Board of Education, Mr. Forster, M. P. for Bradford, and the authorities of South Kensington, to urge various questions they wanted noticed, upon the powers that be.

The facilities already afforded them for special instruction, the museums, the independent institutions existing having a like object in view, the flood of literature prepared for their enlightenment during the last four years, and the utterances of the trained leaders among them, gradually bring to the front this need of the present time.

In considering what can be done to help the present generation of grown-up artisans, as well as the rising generation, they themselves see that it is not possible for them to go back to the primary or elementary schools, but that something should be done for them, or by them, to supply what is lacking.

It is generally admitted all along the line, that Museums of Art and Science are of the first importance, as places of instruction and reference. The fault found by the artisans is that there are not enough of them; that those existing are

either too far away from their homes, or closed when they have leisure to visit them,—in the evening or on Sundays,—or that they are so crowded by mere loungers as to drive earnest students away. Then, it is complained, that the present facilities for education are not quite what are needed, or what the workmen understand by the term Technical Education. It is felt that something practical must ere long be accomplished if the English artisans are to maintain their high reputation as cunning and skilful workers, especially in view of the fact that the apprenticeship system, as with us, is almost obsolete. It is thought by many that the mediæval system of Trade Guilds, if they could be revived, would meet the needs of to-day. The discussion upon this point, if related fully, would prove extremely interesting to workmen; but it can only be briefly noticed here, in preference to the European, Continental, Government Trade-Schools, for the reason that the English are trying to bring about an improved system of training, more in accordance with the free, American government; namely, by individual or combined effort in preference to clamoring for state help; the feeling being one of watchful jealousy lest the government crush out all the springs of healthy, free individual action, dwarfing the people into mere automatic beings, with everything marked out for them and limited.

It is well known that the technical and practical knowledge how to work at any trade in the best way, is a valuable possession. It can only be acquired at the cost of time, money, mental and bodily labor. It is a species of capital, only to be parted with for a fair return. Formerly, each employer of labor, for the most part, had learned his own trade as an apprentice, had worked at it for a time as a journeyman, or as his own employer, and taught apprentices to help him in his business. Hence, he had a direct interest in making his assistants the best possible workmen, and imparted freely to them all the ordinary knowledge and all the more hidden secrets of his trade. But with the modern system, of great capital, of large workshops and factories, which has been inaugurated during the last century, the duty of teaching apprentices devolves on journeymen, who—except in the case of a father and son—have not only very little interest in teaching the youth, but who,

in many cases, feel that they are training pupils to become their rivals. When an employer finds that a young man of twenty can do his work as efficiently and more rapidly than an old workman employed at double the wages, there is great danger that the older hand will be discharged, the younger one being put in his place. This, though true of England, is only partly applicable to us, owing to the fact that the demand for skilled labor exceeds the supply, though this is lessening every day, as the population increases; so that, like the British people, this nation will have to consider the question of apprenticeships and Trade Guilds, or some other system that will give a constant supply of able workmen.

The working of the two systems is well described in the following passage from an able and interesting paper on "Guilds," read by Dr. Yeates at a meeting of the London Society of Arts, January 29th, 1873.

He had been showing how the old "Guilds" of the different trades, formed by our ancestors, in which employers and workmen were alike enrolled, provided for technical education:—

"As we have already seen, the Craft-Guild did, aforesaid, largely take charge of industrial education. This was, indeed, its first care. Apprentices were regularly enrolled, and provision was made for their instruction. Journeymen, likewise, were constrained to improve themselves in the mysteries of their craft. What would be called examinations in our day were periodically held in different parts of the country; and frequently, too, comparisons were instituted between the work of native artisans and of foreigners, not always to the advantage of the former. Many of our Grammar Schools owe their existence to the 'Guilds,' and higher institutions profited by their liberality."

And again:—

"One point of contrast between the old Craft-Guild and its modern analogue—the Trade-Union—should be noticed. Trade Unions are societies of workmen, while the Craft-Guilds included master and workmen alike. It is necessary, however, to distinguish between the master of modern times, the wealthy capitalist at the head of a great concern, employing workmen by the hundred, or even by the thousand, and the masters of mediæval England. To be a master it was

necessary to have been, first, an apprentice and then a journeyman, and it can easily be seen that such masters would rarely be large capitalists. While this state of things lasted, workmen who would, in all probability, become masters, and masters who had been workmen, were actuated by similar motives, and therefore worked together harmoniously. As the masters became capitalists this community-interest died out, and from the time of Elizabeth the Guild declined; and now its modern lineal descendant, the Livery Company, has too often preserved little of the character of the parent institution but its conviviality and the distribution of some anti-quoted charities."

The agitation now proceeding in connection with this revival of the question of the utility of the old Craft Guilds, points out to the modern Unions that it would be for the interest of the Trade Societies of the United States and the United Kingdom that they should see that the required practical instruction in their respective trades is supplied to their members. It is of the greatest importance to them to keep up a high standard of workmanship, and all the more so as they aim at keeping up a fair standard of wages.

It is proposed that classes for technical instruction—as distinguished from the higher and scientific education—and for Art-workmanship in trades requiring it, should be established, supported and managed by each Trade Society in its respective locality; in fact, that they assume more of the functions of the old Craft Guilds.

In connection with this movement it is stated that the University of Cambridge wishes to help workingmen to obtain higher education, by sending some of its ablest men to give instruction on subjects of interest or importance to workingmen, provided that in each locality there shall be a proper organization for making the requisite arrangements, and a sufficient number of students to benefit by the proposed teaching. "As the nation cannot go to the Universities, let the Universities—through their ablest representatives—come to the nation."

The South Kensington Institution has so far achieved one of its objects for the good of the people as "to teach them not to be satisfied with mere empiricism; to show them how

Science may be applied to their work, and to induce them to follow it up."

The exhibit made by it at Vienna, though not at all equal to the high position it occupies in the world, showed that it had also been enabled to help to bring about a solution of another important problem; i. e., the enlargement of the confines of woman's work. Many of the students at South Kensington are ladies, who have, through its agencies and teachings, been enabled to earn a fair competence for their work; this, in some instances, being entirely new to the industries of England. Examples of woman's work were shown in the hall occupied by the South Kensington Museum at the Exposition, consisting of designs for Lace, Fans, Etchings—an old art revived—Decorative Wall-paper, and other Art-industries.

The remainder of the objects exhibited do not call for any special notice, consisting as they did of the usual collection of articles that go to make up a Museum, similar in character to those shown by the Vienna Museum, differing in detail but not in the general tone.

Instances were not lacking among the seven hundred and fifty British exhibitors, serving to illustrate with more potency than the official display of student's work, the beneficial influence of the South Kensington School of Art.

Here is an illustration: Messrs. Doulton, of London, amid their multifarious display of sanitary earthenware, drain-pipes, plumbago crucibles, terra-cotta, and domestic utensils, such as water-pitchers, drinking-mugs and jars, showed a set of this latter kind of ware that consisted of real objects of Art, both as to form, coloring, and the designs upon them. These have all been made within the last two years. The material used is the same as that from which the old brown "Tobies" are made, so common in the English country ale-houses, and with which nearly every one is familiar, in the form of the earthenware teapots, sold by all dealers in like commodities.

One of the firm (Mr. James Doulton) illustrated in a most forcible and direct way the value of Art-taste in works of industry, by a simple method. Selecting two pitchers from his collection he said: "This is an old-fashioned jug

worth tenpence; this other one, made from precisely similar materials, both in quality and quantity, is an example of our new style, and is worth ten shillings." The difference consisted in the improved form and simple quaintness of the designs burnt on the sides of the new examples of the potter's art. No two are made alike.

"The artist workman who has shown an aptitude for this work is the son," says Mr. Doulton, "of a journeyman wheelwright, and would in all likelihood have continued a wheelwright, like his father, if there had not been a local branch of the South Kensington School near his home to which he went, out of curiosity in the first instance, and afterward continued to attend because of the new and absorbing interest awakened within him. At this school the manufactory found him, and drew him to a field of usefulness where he could turn his developed talent to account, not only to the profit of himself and his employer, but to that of the nation. Some other less apt and artistic man could fill the wheelwright's position which he vacated."

Mr. Doulton laughingly said that his old brown pitcher was one of the objects collected by Mr. Cole to form what he termed his Cabinet of Horrors; i. e., objects in every day use, devoid of taste, art, or beauty in any shape. It is devoutly to be hoped that no one will act on his idea and make a similar collection on this side of the Atlantic. The bare thought of such a contingency is fearful to contemplate, and we must be held blameless if it should arise.

So much space is already used that it becomes impossible to give as full an account of the many exhibits made by the German States illustrating the subject as could be wished, remembering their great value. Brief allusion may be made to some of them, or rather to the result.

An instance has been cited, of the influence of the German system of Technical Education upon the English nation, which, awake to its deficiencies in this particular, noted what its Teutonic and Swiss neighbors had achieved. This is a good recommendation as to their value. In this country no other proof is needed of the efficiency of German home-training than the quality of the citizens sent thence to our shores.

No expense was spared in fitting up the different halls and separate buildings, wherein the various states of the German Empire exhibited what they had sent to Vienna, for the purpose of illustrating their educational systems. Here were really Museums of objects used in Technical or Art Schools. It would have been a splendid thing if one of our rich men had gone over, and bought up some one of them and sent it home for the benefit of his countrymen. A perfectly feasible idea, if the rich man had only existed.

It was most surprising and interesting to note the reach of the educational facilities afforded to the people of some of the smaller states by their respective state, communal and social agencies. It was to be expected that the larger and wealthier states would have admirable arrangements. The prosperity of these small states can be noted by almost any one, which fact may be taken as a proof, if proof be needed, of the efficacy of the judicious course pursued in the past and continued in the present.

Selecting examples at random, one may find that in the Grand Duchy of Hesse all that can be done is done for the people. The workingman has every opportunity for improvement. Education is provided for his children free of charge, and for apprentices and workmen desirous of improving themselves, there are winter schools, where book-keeping, mental arithmetic, etc., are taught, and similar schools are open in summer for women and girls.

Of the men called out to fill up vacancies in the ranks of the Hessian Division in 1870-71, out of the total of 4,542, only 14 were without a school education.

There are also the so-called "Handwerks Schulen," or Schools of Design for Artisans. These were first started with a surplus of \$250, which remained from the receipts of the first International Exhibition in 1837; and two schools were started as an experiment, one with fifty pupils and another with twenty-eight. These were found to answer so well, that now, there are fifty-two such schools, with 3,000 pupils attending them. As a result, coöperative societies,—benefit clubs, managed by the workmen themselves,—exist in considerable numbers; also savings banks, of which the artisans avail themselves more and more every year.

The schools commenced with \$250! The statement seems almost incredible, but it is easier to believe it after what was seen at Nuremberg, where a museum on the plan of that of South Kensington has recently been formed. It was evident that the Nurembergers were more bent on making a start than on building a grand edifice for their museum. Having decided that such an institution was needed, they went to work at once, without being too particular as to where they worked, so that a commencement was made.

The exclamation was natural, when first seeing what was pointed out as the Museum: "This cannot be the Museum of Art and Industry!" for it was over a meat market, in what had once been a prison. Yet this was, or rather had been, the Museum, which changed its quarters but a few days before the writer visited the city for more commodious though still not palatial shelter.

Thus it is that the German museums and educational systems grow bit by bit, until, some day, it is discovered with astonishment, what splendid results they have achieved.

Bavaria presents a capital example of the good results flowing from a wise encouragement of the Fine Arts in other places beside Nuremberg, one of its cities.

Munich, its capital, under liberal and systematic expenditures by the central government, has become, within the last half century, eminent among the capitals of Europe for its public buildings, its historic monuments and memorials, its art treasures, its libraries, laboratories, and facilities for high literary, scientific and art culture.

The following is an extract from a Report on Education in Germany, issued by the National Bureau at Washington:—

"In a mere economical view, in their relation to the industrial development of the capital, the large expenditures required to build and equip the *Pinakotheks*, with their 1,800 pictures, 300,000 engravings and 9,000 drawings; the *Glyptothek*, with its twelve galleries of ancient sculpture, and its large collection of the works of Canova, Thowaldsen, Schadow, and other modern sculptors; the *Royal Library*, and its 800,000 volumes,—four times the number in the Library of Congress; the *University*, with its five faculties, 100 professors, and the Conservatorism of Sciences, with their laboratories, museums of natural history, botanic garden and arbore-

tum; the *Royal Foundries*, to which this government is obliged to resort, for casts of its bronze doors and memorial figures, even when designed by its own artists; and the *Public Parks*,—all these expenditures, not extravagant in any one year, but liberal and systematic from year to year, after fifty years have made Munich the home of artists, and professors foremost in every department of Science, and have been felt in their beneficence throughout all the mechanic industries, and by every class in the kingdom.”

The instance cited above, of our Government being compelled to get work done at the royal foundries at Munich that ought to be done at home, if the right conditions existed, as they should exist, is not a solitary case. A long list might be compiled, of cities and individuals, who have been compelled to send thither for similar work, needed for fountains, memorials, etc. So much is this the practice that it has come to be thought the right course to pursue. Thus, for want of a knowledge of some technical and artistic details in manipulation and finish, purchases are made to a vast extent from Europe, which, if our workmen and designers had but some of the facilities afforded them which there exist, would be made at home.

Happily, Massachusetts has commenced this needed work.

Nuremberg, a city of less than 80,000 inhabitants, four thousand miles away from these shores, can compel us, under our present system to send it, in exchange for their manufactured goods,—take as an example the years 1870–71, and 1871–72,—in dollars :

Amount for 1871–72,	\$2,511,419 65
“ “ 1870–71,	2,107,663 18

and this for articles we claim to make, in the main, for ourselves, as will be seen by the citation of the following articles, from the list before us; viz., cotton and linen goods, leather, boots and shoes, gas-burners, stockings, baskets and basket ware, combs, hardware, colors, etc.

The fact is, no doubt, partly due to the cheaper rates at which the goods can be manufactured in Germany, and all over Europe, owing to the low wages paid the work-people; but it is also due to the superior skill and taste displayed by

the workers, taught in the schools and museums existing in their midst.

In conclusion, the fact must be admitted that in this Report it has been impossible to present anything like a complete statement of the facts brought out and noted down in the course of the investigations made before writing it; but probably enough has been written to prove the great value of the institutions that the Austrian authorities sought to illustrate at their recent grand World's Fair, and to show the beneficial effects produced wherever they exist, upon the industries of the country, and in the general education and improvement in art and taste of the whole people.

One fact is proven, standing firm as a rock, by the united testimony of all the European savants, who claim to speak with authority on this subject; that is, that if any improvement is to take place in the Art-Industry of the country, it must come from the better education of the people in Art, and this must commence with popular instruction in free-hand drawing. It is also shown that such knowledge as is imbibed at the Drawing School, the Technical Educational Class, Art-Gallery, and the Art-Industry Museum, educates men to feel more interest in their work; that new methods of doing old-time work suggest themselves to the man who has been taught in the principles upon which the success of his work depends; and finally that a vast improvement can rapidly be brought about by earnest work, even though it be true that—

“ So slow is
The growth of what is excellent—so hard
To attain perfection in this nether world.”

LOUIS J. HINTON.