

FIELD COLUMBIAN MUSEUM

PUB. I.

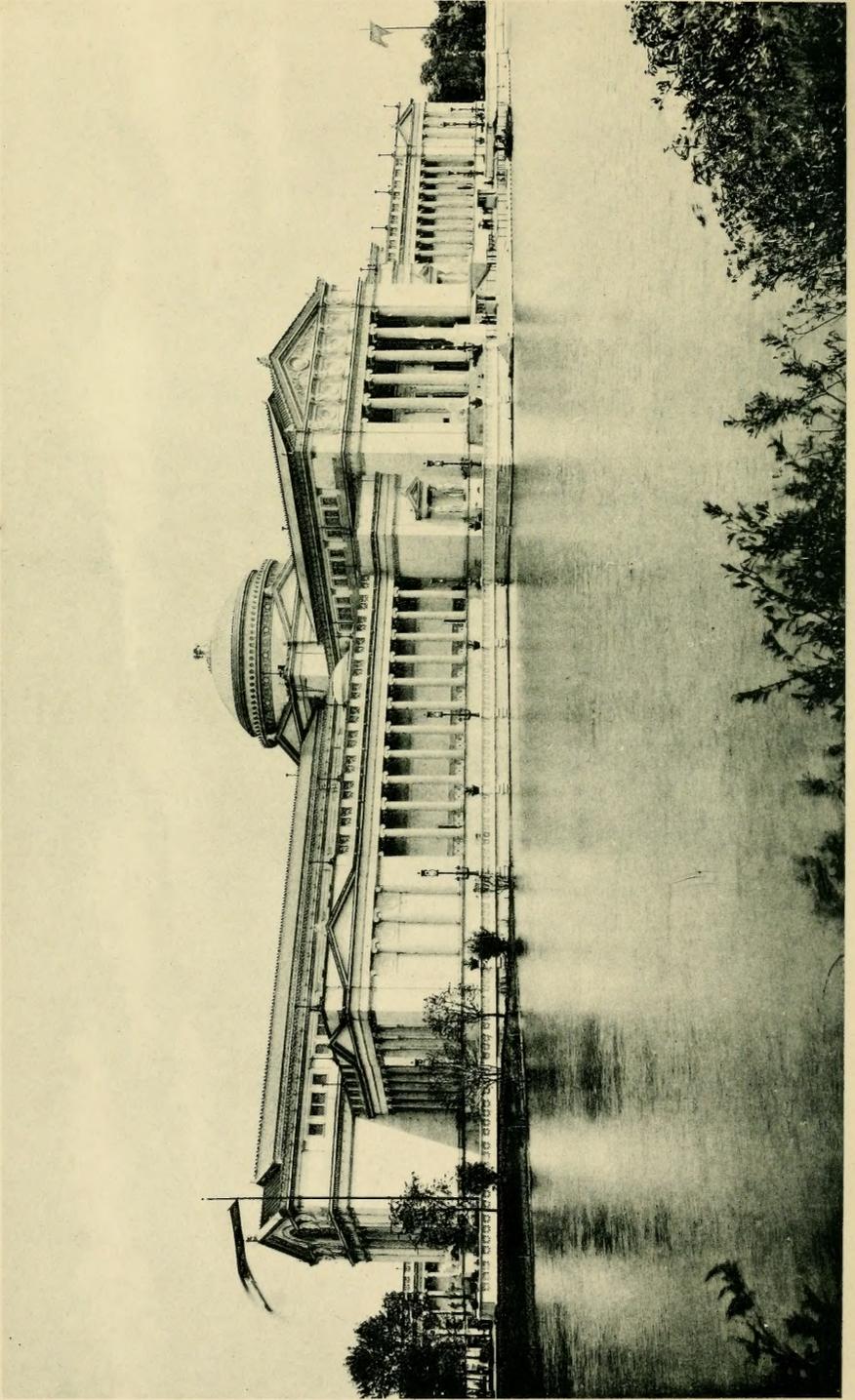
VOL. I, No. I.

AN
HISTORICAL AND DESCRIPTIVE
ACCOUNT OF THE
FIELD COLUMBIAN MUSEUM



CHICAGO, U. S. A.

December, 1894.



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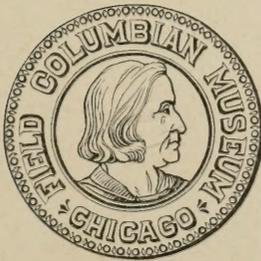
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*To Eugene Field
From J. D. Schiff March 25/90*

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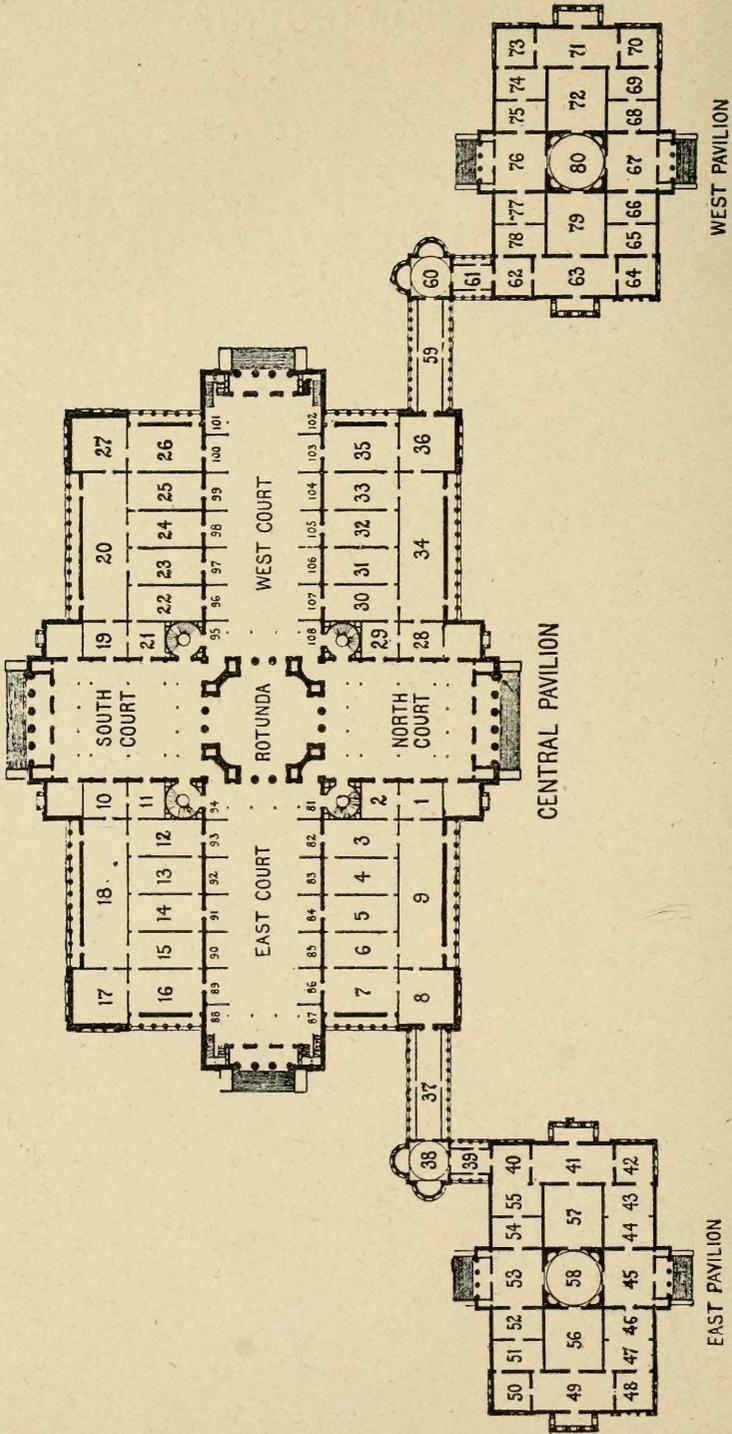
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INDEX TO CONTENTS.

	PAGE
The Board of Trustees.....	5
Staff of the Museum.....	6
Introductory.....	7
Proceedings of Opening Day.....	9
History of Collections Presented to the Museum through Ex- position Departments.	
The Latin-American Department.....	19
Agriculture and Forestry.....	23
Mines, Mining and Metallurgy.....	27
Ethnology and Archæology.....	35
Transportation Exhibits.....	39
Description of Museum Departments.	
Exposition Memorial.....	43
Columbus Memorial.....	45
Geology.....	49
Botany and Plant Economics.....	57
Zoology.....	65
Ornithology.....	68
Anthropology.....	71
Industrial Arts.....	77
Textiles.....	77
Gems and Jewels.....	79
Ceramics.....	82
Transportation.....	83
The Railway.....	85
The Library.....	89

PLANS AND ILLUSTRATIONS.

South Facade of Museum.....	Frontispiece
Ground Floor Plan.....	4
The Columbian Rotunda.....	18
Mining and Metallurgical Collections.....	30
Pennsylvania Railroad Collection.....	38
Plan of Rotunda.....	44
Plan—Department of Geology.....	48
Plan—Department of Botany.....	56
Plan—Department of Zoology.....	64
Plan—Department of Anthropology.....	74
Ayer Hall.....	70
Plan—Department of Industrial Arts.....	76
Higinbotham Hall.....	80
Plan—Divisions of Transportation and the Railway.....	84
Map showing location of Museum.....	91



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INTRODUCTORY.

The series of publications of which this number is initiatory, has been projected as a means of presenting to the world the results of the research and investigation conducted under the auspices of the Field Columbian Museum. The contributions will cover every field of knowledge comprehended within the scope of the Museum's work.

The information offered in these publications will represent studies primarily of the collections in the Museum, but not necessarily limited to these. Contributions from workers in kindred fields have the opportunity offered by these pages to bring into general circulation any body of facts of scientific or technical value. It is hoped therefore that the Museum publications will be a ready means of acquainting the general public or special classes with the results obtained by a competent body of scientists and experts, in their several lines of investigation.

The Museum is itself, in the widest sense, an educational institution and it is with this idea that the series of publications has been projected. They are offered for gratuitous distribution and the broadest possible circulation and the freest use is requested for the information, theories or suggestions they contain.

In order that a careful record of the early history of the movement that resulted in the establishment of the Museum may be preserved to the future, it has been deemed fitting to devote the first number to an account of its brief history and dedication. The exercises of the opening day are therefore presented in detail, inasmuch as the addresses upon that occasion summed up the facts of interest and of historical significance in connection with the growth of the plan for a museum to commemorate the World's Columbian Exposition, and to create an additional factor in the world's educational equipment.

Advantage is also taken of this opportunity to perpetuate in type the services so ably and unselfishly performed by the officers of the Exposition prior to and after the close of the Exposition in awakening an interest among the exhibitors and securing to the Museum what they could obtain from the contributions given them. Their devotion to the cause of culture and education and their patriotic interest have preserved in the Museum the wonderful collections of the Exposition that so easily might have been divided, dissipated or lost altogether.

The historical accounts of the collections presented to the Museum through the several Exposition Departments that fill some thirty pages of this number will, therefore, serve in some measure as an acknowledgment to those workers whose names in this connection might otherwise remain unknown. The names of contributors have already been made public in the pages of the Guide issued on the Opening Day.

In order to furnish contemporary institutions and the world at large a more exact idea of the Museum and its contents, the officers and staff have prepared a series of articles descriptive of the several departments, and several exterior and interior views have been inserted. The descriptions are much condensed, and necessarily incomplete, but they give in general a faithful and comprehensive review of the collections and of their arrangement.

Although but seven months have elapsed since the doors of the Museum were publicly thrown open, a course of popular lectures have been inaugurated, a publication series established, and several scientific expeditions sent into the field for augmenting its collections. In these and other directions, the Field Columbian Museum is advancing along the path marked out for it and performing its part in adding to the wealth of western civilization and culture.

PROCEEDINGS OF OPENING DAY.

June 2, 1894, was the day appointed for the dedication of the Museum. At this time, and even previous to it, the extensive collections which had been donated by Exposition exhibitors, or secured by purchase, had been formed into a scientific and systematic arrangement, and their installation in the halls of the Art Gallery had been made sufficiently complete in detail. The organization was perfected and everything in readiness for a commencement of the preliminary work for which the Museum had been established.

The exercises were set for half past two o'clock in the afternoon, but before that time had arrived the trustees of the Museum and prominent invited guests, gathered in the Executive Committee room to meet Mr. Marshall Field and the officers of the Corporation.

At the hour stated, a line was formed of those who were invited to sit upon the platform, and led by President Ayer of the Board of Trustees, proceeded across the building to the north steps, where a platform had been erected. At this time the seats below the platform were occupied, as well as much of the outlying space. Probably from eight to ten thousand persons were in attendance.

The assemblage was called to order by President Ayer, and divine blessing was asked by Rev. Frank W. Gunsaulus.

President Ayer extended cordial welcome to those present congratulating them on being permitted to assemble to dedicate the Field Columbian Museum.

Mr. F. J. V. Skiff, the Director then delivered the following address:

MR. PRESIDENT AND LADIES AND GENTLEMEN:

There has been gathering head in this western land of ours during the more recent period of its history a mighty power for civilization. Neither ancient, mediæval nor modern times present a wider intellectual horizon, a period so alive to the demands of progressive humanity. The annals of centuries do not contain such evidences of a quickened higher culture and uplifting of educational forces as have been evoked within the past few years on the shores of the lake that sweeps this park.

The Exposition left its uneffaceable impress on the social, moral and intellectual development of the world. Another effort is inaugurated to carry forward this purpose, to meet the growing needs of a highly developed people, to gather up the truths of the sciences and the triumphs of the industries and preserve them as a perpetual benefit to mankind. As Columbus devoted his life to the exploration and extension of the world, so does this ceremony vitalize an analogous idea, a broader knowledge and more penetrating vision.

We are gathered here to-day to invest with the mantle of dignity and responsibility the Field Columbian Museum. The invitation is strong to look forward into the prospect that opens before this institution, or to describe in fitting terms the success already attained. But it is also an appropriate and pleasant duty to pass in hasty review the events which have filled with valuable treasures the halls and galleries of this magnificent relic of the exposition.

The illusion should be dispelled that the idea of "a museum" was suddenly born or quickly realized. As a matter of fact, the project was seriously considered in 1890, and at different times and by different persons, in public and in private, the subject has been discussed with more or less definiteness of purpose. If I have been careful in looking backward, the first publication in its behalf was a communication from Professor Putnam of Cambridge, Mass., printed in the Chicago *Tribune* in May, 1890. On two occasions in the same year the professor spoke in favor of a museum, and in November, 1891, upon invitation of Hon. William T. Baker, addressed the Commercial Club on the same subject.

In April, 1891, Director Goode, of the National Museum, visited Chicago in connection with some government function related to the Exposition, and in conversation with Mr. J. W. Ellsworth recommended the immediate appointment of a committee to foster a museum organization. Mr. Ellsworth, from the date of the interview with Professor Goode, became an active advocate of a museum as the outgrowth of the exposition. He at that time was a member of the foreign affairs committee of the exposition directory. President Baker was the chairman of the committee, and Mr. Ryerson, Mr. Lefens, Mr. Higinbotham and others enlisted in behalf of this early work of promotion. And from almost the formation of the Exposition, in asking appropriations from the directory and in outlining foreign work, this committee kept in view the museum that was to be established.

This was especially indicated by purchases made abroad and in the equipment of both the anthropological and the transportation departments. As an outgrowth of the policy of this committee of the directory, and at the suggestion of William E. Curtis to Mr. Baker and Mr. Higinbotham of the directory, the Columbian Historical Association was incorporated in Washington early in 1892. This was at a time when the Latin-American department of the Exposition commenced to receive articles collected by its commissioners in South and Central America, and much difficulty was experienced with the treasury department.

The government had no right to import articles free of duty, and they could not be entered under the general exemption law that was passed for the benefit of the exposition without being sent from the port of entry to Chicago, in bond. That was a great inconvenience because no means had been provided at that time for the receipt and storage of exhibits at Chicago, and the Columbian Historical Association was organized to take advantage of the law authorizing the free admission of goods intended for scientific societies. Of this association Professor Putnam was elected president; Professor Wilson, of the Smithsonian Institution, vice-president, and William E. Curtis, chief of the Latin-American department, secretary and treasurer. Individual members of the directory of the Exposition contributed quite a sum of money personally to provide the organization with funds, and the money thus raised

was unquestionably the first expenditure made in the interests of the museum. The general expenses of the Columbian Historical Association were paid from the government appropriation for the Department of State.

Almost in conjunction with the formation of this important auxiliary, Representative McMurdy, of the Hyde Park representative election district, introduced a bill in the Illinois state legislature providing for the establishment of museums in public parks and stipulating under what conditions and in what manner they might be conducted. The measure was a popular one and became a law early in June following. Later in the year, through the instrumentality of S. C. Eastman, Mr. McMurdy and F. A. Riddle, the question was submitted to the people in the three park districts and the vote was almost unanimously in the affirmative.

The active agitation of the museum idea in the press sprang from a letter published by S. C. Eastman in the *Tribune* in July, 1893, followed almost immediately by a series of strong editorials in the *Herald*. In fact all of the Chicago press were zealous friends of the museum, and aided the quickening of public interest in every way. As a result of this public discussion, and of numerous private consultations, J. W. Scott introduced a resolution at a meeting of the directors of the Exposition, providing for the appointment of a committee of three to form an organization of the citizens looking to the crystalization of the sentiment of the community. The committee consisted of George R. Davis, H. N. Higinbotham and J. W. Scott. This was on August 11, 1893. Three days afterward a circular was issued by this committee calling a meeting of citizens who might be interested, at the Administration Building. "to adopt measures in immediate aid of the project to establish in Chicago a great museum that shall be a fitting memorial of the World's Columbian Exposition and a permanent advantage and honor to the city."

Accordingly, on the evening of August 17, a public meeting attended by about one hundred of the prominent citizens of Chicago was held in the office of the director general in the Administration building on the exposition grounds. Director General Davis presided and Mr. S. C. Eastman acted as secretary. The first proposition was to enlarge the scope of the Columbian Historical Society. This was opposed on the ground that it was incorporated in Washington. The second suggestion was to operate under the charter of the Academy of Sciences in this city but this plan was opposed, especially by President Higinbotham, who spoke very earnestly in favor of a new and strong organization, independent of educational institutions, locality, creed or calling, strong enough to stand alone, and large enough to take in everything. This suited the temper of the meeting and prevailed, and the following committee was appointed to take the necessary steps to incorporate a museum: G. E. Adams, E. C. Hirsch, J. A. Roche, C. H. Harrison, S. C. Eastman, E. C. Bartlett, A. C. McClurg, R. McMurdy and C. Fitzsimmons. Mr. McClurg afterward withdrew and E. E. Ayer was appointed in his place. The same evening the director-general and the chiefs of the departments were requested to organize for the solicitation of contributions of exhibits.

Up to this time the museum had many names. The Museum of Antiquities Columbus Memorial Museum, World's Exposition Memorial Museum, Columbus Museum of America, Chicago Columbian Museum, etc. August 21st the citizens' committee, above referred to, in preparing their application for articles of incorporation, adopted as a name "The Columbian Museum of Chicago." At this same meeting names were selected for incorporators, of which there were about sixty-five, and fifteen trustees, of which the following is a list:

C. B. Farwell, J. C. Black, F. W. Gunsaulus, Geo. E. Adams, M. C. Bullock,
E. G. Hirsch, E. E. Ayer, D. H. Burnham, C. L. Hutchinson, O. F. Aldis,
G. R. Davis, John A. Roche, A. V. Armour, J. W. Ellsworth, Edwin Walker.

Application for a charter was forwarded to Springfield Sept. 16.

R. McMurdy of this committee prepared and sent to the Illinois delegates in Congress a joint resolution instructing the Treasury Department to admit all goods intended for museums or educational institutions free of duty. This resolution was promptly passed the following week.

Sept. 4, the director-general and chief of departments of the Exposition met to outline their work on the grounds, and appointed an executive committee to prosecute securing exhibits for the museum. Of this committee Director-General Davis was chairman, Professor F. W. Putnam vice-chairman, S. C. Eastman secretary, and F. J. V. Skiff, William E. Curtis and S. H. Peabody, the other members. At a subsequent meeting Mr. Curtis withdrew and Willard A. Smith was appointed in his place. This executive committee took up the work of actively canvassing for donations of exhibits to the museum.

In fact the zeal of the chiefs in this behalf was so great as to seriously interfere with their duties as exposition officials. However, the sentiment was so unanimous, and the interest in the museum project was so intense, that encouragement was not lacking from any source to do anything that was necessary to aid the cause. Letters were written in every direction, circulars were dispatched everywhere, portions of the grounds and sections of the buildings were made into districts, and personal appeals made by the officers and attaches of every department of the Exposition. Meetings of the executive committee were held frequently, and members of the committee were in constant communication with the new trustees of the museum corporation.

The corporation in the meantime had effected a temporary organization by the election of Edwin Walker as chairman, S. C. Eastman as secretary, and the appointment of the following committees: Finance--E. E. Ayer, George E. Adams, J. W. Ellsworth and J. C. Black; by-laws--George E. Adams, F. W. Gunsaulus and C. L. Hutchinson; exhibits--E. E. Ayer, George E. Adams and J. W. Ellsworth.

The finance committee began at once the important and delicate task of securing the funds necessary to endow the museum, or to at least in some measure guarantee that sufficient funds would eventually be forthcoming to justify the contributions of exhibits, etc., that were being solicited. As the middle of October approached, however, and nothing tangible in the shape of endowment had resulted from the efforts of the finance committee, a period of discouragement came upon many of those at work for the museum. Up to this time the funds used had been advanced by individual members of the committee. Nothing but the faith and devotion and courage of a few men prevented the disintegration of the preliminary organization and the practical abandonment of the museum enterprise, but when, on October 26, the splendid gift of Mr. Field was announced the different committees and individuals were inspired to such efforts that the loss of the lagging days was overcome and the progress of the work from that time on was resistlessly effective.

Confidence in the assured prominence and success of the museum was renewed, and a spirit among exhibitors, especially foreign and state commissions and American corporations and individual exhibitors was aroused, and their contributions were increased in proportion to the liberality of the endowment. How generous their contributions have been every evidence is presented by the museum to-day. The many valuable departmental collections that had been in danger of ruinous distribution at once became the unquestioned property of the museum, and by common agreement the different educational institutions discontinued their efforts to secure contributions in their own behalf and united in working for the museum.

Two days after the announcement of Mr. Field's munificent benefaction

George M. Pullman subscribed \$100,000, followed in a few days by Harlow N. Higinbotham with another \$100,000. Other conditional donations for various amounts were made.

November 1st a circular was issued to the stockholders of the Exposition and signed by Edward E. Ayer, George E. Adams, J. W. Ellsworth and John C. Black as a finance committee, soliciting donations of the stock in the exposition to the museum.

I may note in passing that the *Evening Post* of Sept. 14th contained a communication from A. W. Manning suggesting the donation of exposition stock to the museum on the theory that there would be a dividend, which in this way would add a considerable sum to the museum resources, and may also state, if I am correctly informed, the first stockholder to donate his stock in the exposition to the museum was L. C. Stebbins, fifty shares. The present total exposition stock donations approximate \$1,500,000 par value from over 1,100 stockholders.

The day after the issuance of this circular Mrs. Mary D. Sturgis, of Lake Geneva, made a donation of \$50,000.

During the month of November the museum corporation appointed Ralph Metcalf as its representative on the exposition grounds, and this gentleman opened offices in the then partly deserted Administration Building and co-operated actively with the executive committee of chiefs.

The museum committee on exhibits, consisting of Messrs. Adams, Ayer and Ellsworth, made quite extensive purchases during November, including the collections from Paraguay, Peru, Java, Samoa and the Hagenbeck collection. The first large purchase of material was made at this time--the Ward collection of natural history--for which \$95,000 was paid. The first great donation of material was at that time made to the museum, the Ayer anthropological collection being presented by the now president of the museum. The collection is valued at \$100,000.

November 18th it was formally determined to mass the donations of exhibits in Fine Arts Hall. And with this end in view all of the committees interested in articles, collections or exhibits, either donated or purchased, concentrated their efforts in preparing for a general removal. On the 7th of December a number of gentlemen, including E. E. Ayer, J. W. Ellsworth, Professor T. C. Chamberlain, of the Chicago University, Professor Putnam and Mr. Skiff met in Fine Arts Hall and determined in a rough way the preliminary installation plan of the museum. On that day the present director accepted temporary charge of affairs, and about 4 o'clock on the afternoon of that day the first load of material for the museum was placed under the roof of this building

From this very general resume of what transpired up to the beginning of the real work of the installation it will be seen that while no great public acts nor unified labor were apparent, many men each in his own field, largely by his own volition, were sincerely enlisted; that there was a generous and energetic co-operation in gathering material, making purchases and in securing funds. Further that the growth of the museum was contemporaneous with the progress of the Exposition.

And now began the tremendous task of gathering the vast amount of material from every part and corner, and stretch and recess of these vast grounds; from all of the buildings, large and small; from the Midway Plaisance and from Wooded Island; from the Forestry Building to the Fisheries Building. Hundreds and hundreds of tons of exhibits, collections and objects of every describable character were transported to this building at which we are assembled. Then the selection, alteration, arrangement and rearrangement and elaboration began. Gradually hall by hall was emptied and as the objects of art left the building, a mass of material poured in, heterogeneous and appalling in extent. And the beautiful products of

the artist's brush and the sculptor's chisel—ours for only a summer—were supplanted by what we see in these halls to-day, a sequential and systematic exposition of the wonderful and instructive things of the world we live in, began to grow. Through the same door streamed boxes and bales from the Transportation, Mining, Forestry, Electricity, Manufactures and Liberal Arts, and state buildings, from government buildings and from the Plaisance; objects from the remotest lands and the most diversified climes!

A temporary allotment of space permitted rough classification. A winter's work was consumed in dividing, determining and listing the material that had been received. By March the assortment and selection of the material had advanced to such a state as to allow positive installation. A hall here and a hall there began to take on the semblance of a museum. Finished cases and cabinets displayed in orderly array and attractive manner the valuable material, and brought out its excellences by systematic arrangement.

The many collections and exhibits that had been so carefully and judiciously purchased at the close of the exposition by the trustees and department chiefs furnished the broad foundation upon which could be built correct series of collections. Great gaps in the continuity of separate subjects were thus in a large degree obviated, until to-day from one end of the museum to the other can be traced, almost without a break, the living and instructive story of nature and of man and his works. Let us not, however, underrate the labor still necessary to place this institution on proper comparative footing with other great museums. These collections around us, although large and carefully arranged with reference to some central idea or scientific principle, indicate that only one step in the process of completion has been taken. They present, to be sure, many features that may be found nowhere else in the world, but that they require addition, rearrangement and re-establishment from the scientific or technical standpoint, goes without saying.

In the meantime, on January 22, 1894, the board of trustees was reorganized with the following new membership:

H. N. Higinbotham,	E. E. Ayer,	N. B. Ream,
Norman Williams,	Geo. E. Adams,	Edwin Walker.
Owen F. Aldis,	M. A. Ryerson,	H. W. Jackson,
C. H. McCormick,	Watson Blair,	Geo. Manierre,
W. J. Chalmers,	Geo. R. Davis,	A. B. Jones.

E. E. Ayer was elected president, Martin A. Ryerson, vice-president; Norman B. Ream, second vice-president; Ralph Metcalf, secretary (afterward resigned and succeeded by Geo. Manierre), and Byron L. Smith, treasurer. H. N. Higinbotham was elected chairman of the executive committee

At this meeting the incumbent was made director-in-chief.

I must take this opportunity to publicly acknowledge the faithful, intelligent, helpful service performed by my associates in the work of building up this museum to its present stage of comparative completeness and working efficiency. They have labored with the inspiration of the true lover of art and science, undismayed by countless difficulties, working almost without seeing the end, and with an enthusiasm that the deepest and most unselfish interest alone could inspire. As in the building up of the Exposition and so many great human enterprises, here, too, must be recorded the prominence of the young man, the composite age of the museum staff being thirty-three years.

The generous and helpful advice and assistance extended by the faculty of the educational and scientific institutions of this city are gratefully acknowledged by the museum. No discordant note on their part has been heard. They have appreciated

the importance to Chicago and to educational interests at large of the museum institution and have shown by their sympathy, as well as by their active co-operation, their desire that it shall be an unbounded success.

We have builded in a few short months a great structure on the broad highway of progress. Science and industry have entered its portals hand in hand. Knowledge, that moral force which both commands and obeys, awaits within. In this temple may be swung the incense of reminiscent love and veneration as sentiment and popular enthusiasm unite the name of this great institution in indissoluble bonds with the glory and culture of the year past. May the influence be forever felt.

The museum was practically installed on May 1. On May 21 the trustees by a unanimous vote, decided to name this institution the "Field Columbian Museum."

I have the honor, Mr. President, to hand you a report of the expenditures from the first disbursement until the present time; a report showing the value of the collections contained in the building and a report of the inventory of the furniture and fixtures. I have the further honor and the very great pleasure of presenting you with the first copy of a complete guide to the museum.

Mr. Edward G. Mason, President of the Chicago Historical Society, then delivered the following oration on The Message of the Museum to Chicago and the World:

MR. PRESIDENT, LADIES AND GENTLEMEN:—We are assembled to commemorate the public opening of the Field Columbian Museum, an event of deep significance to our city and to our time. The superb collection which bears this name has found an appropriate home in one of the noble buildings of the World's Columbian Exposition. And gathered as we are at the portals of that building, we cannot fail to remember the scenes of which it was a part less than a year ago. Here flowed that living tide of rejoicing humanity which was perhaps the most marvelous exhibit of all these grounds contained. In this structure and those related to it were displayed the progress, the skill and the genius of our race. And enshrining this and all the rest, and greater than all else, glorious as the seer's vision of the New Jerusalem, was the world's fair city itself, "robed in white, mystic, wonderful." Its memories naturally throng about this place, but to-day there is a special reason for their recall. Of that grand Exposition, which is in all our minds just now, this museum is both the outcome and the monument.

It is the outcome, for it became part of the plan of the men who made that Exposition. The proper commemoration of that great undertaking was in their minds almost from the beginning, and there is something very fine in the feeling which this reveals. Undaunted by the tremendous task of preparation and serenely confident of the result while the Fair was still in embryo, they assumed its complete success many months before its gates were opened, and said the one to the other: What shall its fitting memorial be? This was heroic. Of this noble purpose the Field Columbian Museum is the fruition. In its inception, therefore, it illustrates the spirit which carried the Exposition to its triumphant goal, and of that spirit it was born. It is the monument of the Exposition, holding many of its best exhibits, housed in the most beautiful of all its beautiful edifices and perpetuating its central idea. It is the lasting flower of that glorious summer to which we look back as to an enchanted dream.

These are the abiding associations with which it auspiciously commences its career. Although so young it already has a splendid past. How worthy of its origin it is, the opening of these doors will make known. Other great museums have slowly grown out of national expositions. This in an instant takes its place by their side. The stately halls which but the other day contained simply the productions of the chisel, the brush and the pencil are now filled with the long array of ordered series

which tell the story of "the great globe itself, yea," of "all which it inherit." By such a collection even the most careless observer must profit to some degree. Infinitely more is its meaning to those who read its object lessons aright. These bring to light the processes which have formed the world in which we dwell, the materials of which it is composed, the treasures of the rocks, the ancient and the modern life of earth and air and sea. These disclose the beginnings of our race in that antiquity too remote to conceive of, and its incredibly slow and toilsome movement through savage æons to the dawn of a better day. And thence onward they unfold to us the highest meaning of this museum, which is the development of the mind of man. The annals of humanity begin with the birth of the inventive faculty. It is only when man makes something that history takes note of him. The ages before are as nothing. To the thoughtful student pouring over these shewles, the ill-shaped tools of the early people, the first rude drawings on rock or bone, are of unique import. In them lay the potentiality of all the rest. From them dates that majestic succession of triumphs over the forces of nature, that magnificent progress in science, in art, and in all knowledge, ever changing the surprise of yesterday into the commonplace of to-day, which this museum is designed to teach and to illustrate. Its opening rounds an epoch. It is the high water mark of the advance of mankind.

But it denotes as well the continuance of this advance. That this forward movement cannot cease, our knowledge of the past, our hope for the future, unite to assure us. Each great exposition has been the commencement of a new era. Each one's record of achievement has been in turn surpassed by that of its successor. The law producing these results is in operation to-day, nor would we have it otherwise. And in that greater progress which we believe to be before us we feel that this museum must be a factor. Here men will come to learn what man has accomplished, and to prepare to take the next step beyond. In this armory of science will be found the weapons for new conquests over the material world. From this storehouse of the arts will be drawn the suggestions and the devices for real improvement in the surroundings of our daily life. And what a scope for the imagination and its works will it afford! How its revelations will awaken every instinct to accomplish something better, something higher than what has gone before! How it will arouse the mind to new flights into the regions of the unknown to bring back treasure trove! As an inspiration, therefore, in its own sphere; the value of this museum is priceless. It means much at the present. It means more for the future. It is not simply a collection of wood and metal, clay and stone. It is a potent entity instinct with life and growth, to which all things are possible.

Some great discovery associated with it may hereafter make our most sanguine forecast of to-day seem poor and mean beside the reality. That its collections must increase is the law of its being. To it are coming, and will continue to come, things rich and rare from the four quarters of the globe. No limit can be set to its expansion along the lines already so wisely laid down, nor to the results which may flow from it. This is the century of wonders, and its closing years are like to be the climax of all which have preceded them. Men of science tell us that the problem of ærial navigation is on the eve of solution, mainly through atmospheric observations and the study of the motion and structure of birds, carried on in part in collections like this. It is said that the mighty power of electricity has not even shaken off its swaddling clothes, and is yet to tower before us like genie of the Arabian tale from the unsealed vase. If these things be true, and if other revelations of which we do not even dream are to re-make the world in these or some of these, it may well be that this institution will have an honored part,

As an example to be followed it must also have an enduring influence. The spectacle of a great work unselfishly performed incites to like undertakings. The knowl-

edge of what men have done for the community in which they live impels others to do as well in other directions. That civic pride, that belief in its future which characterizes Chicago and should be treasured among its most precious possessions, are represented and will be inculcated by this notable instance of both. Not only in our time but in the long hereafter will men tell the story of the origin and the purpose of this institution with that quickening of the soul which is fruitful of great results. While it shall endure it will be the well-spring of other noble enterprises for the benefit of mankind. The poet says;

Our slender life runs rippling by, and glides
Into the silent hollow of the past;
What is there that abides
To make the next age better for the last?

And he tells us in reply to his question that there is—

Something that leaps life's narrow bars
To claim its birthright with the hosts of Heaven;
A seed of sunshine that doth leaven
Our earthly dullness with the beams of stars.

Such a seed of sunshine has been planted here and has already risen and grown into that which shall abide to make better the days which are to come.

With such associations, and characteristics, and possibilities the Field Columbian Museum is opened to the people. They are its beneficiaries. For them and their children and their children's children it is to fulfill its destiny. The first museum, from which the name has been handed down through the centuries, established by the old Egyptian king in the once proud city of Alexandria, was set apart for the use of one privileged class alone. But this museum knows no distinction of class or condition of men. It holds for all its wealth of opportunities for instruction and for research, and its treasures are to be had for the asking. No man can measure the amount of pure and elevated pleasure, of real and lasting benefit which will be derived from it by the multitudes who will throng its halls from this time henceforth. Nor can we lightly estimate the continuing tribute of thankfulness which they will gladly pay to its benefactors, and especially to those whom we honor as its founders. To them it is not easy to render a fitting meed of praise. But they already have a reward in that consciousness of a grand deed grandly done of which nothing can deprive them. This great creation is due to a munificence far more than princely, A prince can only give his people's money. These donors have given of their very own freely, lavishly, for the good of their city and of their race. As we enter into their labors there enter with us the rejoicing shades of the philanthropists of all time to welcome this latest exemplification of the spirit of those who love their fellowmen, and in their shining list will forevermore appear the names of the founders of the Field Columbian Museum.

President Ayer then arose, and with a raised gavel said: "I now declare the Field Columbian Museum open," which concluded the ceremonies.

The doors were opened and the invited guests spent the remainder of the afternoon among the collections.



THE COLUMBIAN ROTUNDA.

HISTORY OF THE COLLECTIONS PRESENTED TO THE MUSEUM
THROUGH THE LATIN AMERICAN DEPARTMENT OF THE
EXPOSITION.—WILLIAM E. CURTIS, IN CHARGE.

The origin of the collections in the Columbus Memorial Halls may be traced back to August 1890, when Mr. William E. Curtis, then director of the Bureau of American Republics, at Washington, appeared before the Committee of Plan and Scope of the World's Columbian Exposition, and submitted his plan for an historical Columbus exhibit. Prof. Putnam at the same time laid before the committee his plan for the reproduction of an Aztec temple and a collection of articles to show the civilization of the aboriginal races that occupied the continent before Columbus came.

The scheme of Mr. Curtis comprehended a series of object lessons that should illustrate the history and development of America from the birth of Columbus to the present day. Both plans were heartily approved, and recommended for adoption, and after more or less difficulty and delay were carried into effect with such accuracy and success as all who visited the exposition may testify.

In the spring of 1891 the President of the United States, at the request of the Director General of the Exposition, ordered the detail of a number of army and navy officers to assist Mr. Curtis in carrying out the scheme he had submitted to the committee. Lieut. William McCarty Little, of the Navy, was sent to Spain to superintend the construction of the fleet of caravels, and to obtain the necessary plans and specifications for the reproduction of the Monastery that furnished Columbus an asylum when he had no other home, and is more closely connected with his career than any other building. Lieut. Asher C. Baker, of the Navy, was sent to Mexico, Captain Gilbert P. Cotton, of the Army, to Honduras, and Capt. George P. Scriven, of the Army, to the other Central American States, Lieut. Henry R. Lemly, to Columbia, and Lieut. Roger Welles, Jr., of the Navy, to Venezuela and the Guiana Colonies, who made a memorable journey up the Orinoco River to its sources in Colombia—farther than any

white man had ever been before—and brought back with him a splendid collection of curiosities that have their place in the ethnological section to-day. Capt. Alexander Rodgers, of the Army, and Lieut. F. E. Sawyer, of the Navy, were sent on a similar errand to Brazil, Surgeon D. B. Bertolette, of the Navy, to Uruguay, Paraguay and the Argentine Republic, Lieut. Charles H. Harlow of the Navy to Chili, Lieut W. E. Safford to Bolivia and Peru, and the collection of ethnological samples he brought home is unrivalled in many respects. Mr. Willard P. Tisdell, who was a general assistant to Mr. Curtis, visited Equador on a similar mission.

The most important historical work in the field was done by Mr. Frederick A. Ober, the well-known author and scientist, who spent two years following the trail of Columbus in American waters, and visiting all the places on this side of the ocean that are associated with his name. He explored Watlings Island, which those best qualified to know believe to be the first landfall of Columbus, and the island called Guanahani; then visited the other places that the discoverer mentions in his journal, in turn, carrying photographic materials and making the curious collection of pictures that were exhibited in La Rabida and afterward transferred intact to the Museum. At Navidad, where the Santa Maria was wrecked and a stockade built of her timbers; at Isabella, the site of the first civilized settlement in the new world; at Conception de la Vega, the second town; at Santiago de los Caballeros, the third; at Santo Cerro, where Columbus won his first victory over the indians and erected the first fort, and at other ruined cities of the Island of Santo Domingo, which were the scene of the first chapter of American history, Mr. Ober spent two years of hard work, under the direction of Mr. Curtis, making a series of important discoveries and adding a great many important facts to the knowledge of the world. Since these cities fell during the earthquakes of the early years of the sixteenth century they had remained unnoticed and Mr. Ober was the first man to retrace and uncover them.

Mr. Curtis himself went to Europe to carry an invitation to the Queen of Spain and the family of Columbus, to visit the Exposition as the guests of the United States, which had been authorized by a resolution of Congress, and to search the museums and archives of the old world for relics of the great discoverer. He also went to Rome as the bearer of a letter from the President of the United States to His Holiness, the Pope, asking the loan of such historical papers from the records of the church as threw light upon the alleged pre-Columbian voyages to the new world and its early settlement.

He also borrowed from the library of Queen Victoria, at Windsor Castle, the original of the first map that was ever made of the American continent, which curiously enough was drawn by Leonardo di Vinci, who painted "The Last Supper."

From Spain he brought the most interesting and precious collection of historical papers that exist, including the original commission granted to Columbus by King Ferdinand and Queen Isabella the original of the royal order to the inhabitants of Palos to furnish him vessels for his voyage, the royal decree granting amnesty to all inmates of prison who would consent to accompany the adventuresome sailor, a number of autograph letters from Isabella to Columbus, including his instructions for the voyage, and twelve priceless manuscripts in the handwriting of Columbus himself addressed to his wayward son, Diego.

When these documents arrived in Washington, Mr. Curtis took them at once to two photograph galleries, where, under a military guard negatives were taken of each manuscript. First, as a precaution in case anything should happen to them, for they had never been photographed before; and, second, in order that the shadows if not the substance of these precious relics might remain in the United States. Those negatives have since been deposited in the Field Columbian Museum, and prints from them are now lying in the cases that the originals occupied at the Exposition.

The Columbian Historical Association was organized at Washington in the fall of 1891 for the purpose of facilitating the entry through the Custom Houses of articles shipped from South and Central America by the Commissioners of the Latin American Department of the Exposition. The Government of the United States under the laws of Congress has no authority to import foreign articles for its own use, but there is a statute that permits all societies of a scientific nature to do so. Thus, the Columbian Historical Association, for the purpose of promoting the study of American history, brought in without the slightest difficulty all the collections that were shipped from abroad by the agents of the Exposition. The President was Prof. Putnam; the Vice President, Prof. Thomas Wilson of the Smithsonian Institute; the Secretary and Treasurer, Mr. William E. Curtis. All of the exhibits secured by Mr. Curtis and Prof. Putnam outside the limits of the United States were nominally the property of this association, but at the close of the Exposition were transferred by it to the Field Columbian Museum.

Before the foreign commissioners who were sent out by the Latin American Department of the Exposition started on their missions it became apparent that they would require funds for the purchase of articles that could not otherwise be procured, and Mr. Curtis

laid the matter before the Committee of Foreign Exhibits of the World's Columbian Exposition which had supervision of his work. They decided that the appropriations placed at their disposal by the Board of Directors could not be used for that purpose, but at the same time individually subscribed to a fund that was sufficient and paid for many of the articles that were brought home by Mr. Ober and other commissioners. Thus to Mr. W. T. Baker, Mr. H. N. Higinbotham, Mr. Martin A. Ryerson and their generous associates the Museum is indebted for many valuable and interesting collections.

The Congress of the United States appropriated fifty thousand dollars for a historical collection to be made by Mr. Curtis under the direction of the Government Board of Management and Control and a large part of the collection of Columbian relics was paid for from this fund. Those still belong to the Government, but there is pending before Congress a bill, that has already passed the Senate, authorizing the Secretary of State to transfer the title to the Field Columbian Museum.

The Caravels, which also belong to the Government, are in a similar situation. The Senate has passed a bill transferring them to the Museum and it is hoped that the House of Representatives will concur in the measure.

To Frank M. Mason, United States Consul General at Frankfort, Germany, the Exposition and the Museum are indebted for the interesting collection that illustrates the manner in which the Continent of America was named. He spent much time at the old town of Saint Eie, Germany, investigating the subject, searching musty records, and the results of his work made clear for the first time the means by which a little geography, published in that quaint old town in 1507, deprived Columbus of the honor of having the new world called by his name.

The late William Hayden Edwards, Consul General at Berlin, Henry Vigneaud, Secretary of Legation at Paris, James Fletcher, United States Consul at Genoa, Robert W. Turner, Consul at Cadiz, John F. Healey Consul at Funchal, and Colonel A. Loudon Snowden, United States Minister to Spain, all contributed much to the success of the efforts of Mr. Curtis to secure a complete collection of the existing relics of Columbus and the results of their zeal are in the Museum to-day.

These collections which were on exhibition at the La Rabida Convent during the Exposition were, at its close, transferred to the Museum and are now installed in Halls 8, and 9, as shown on the plan to be found on page 74. The collection made under the Exposition management form a part of the extensive contributions which were by vote of the Exposition Board of Directors presented entire to the Museum for permanent preservation.

A description of the arrangement of the material in the halls of the Museum is given under a succeeding caption.

HISTORY OF THE COLLECTIONS PRESENTED TO THE MUSEUM
THROUGH THE EXPOSITION DEPARTMENTS OF AGRICULTURE AND FORESTRY.—W. I. BUCHANAN, CHIEF.

From the first conception of the idea of equipping a great Museum in the City of Chicago from material that might be gained through the benevolence of home and foreign exhibitors and commissioners, Mr. W. I. Buchanan, Chief of the Department of Agriculture at the World's Columbian Exposition began to plan for the accomplishment of collections even before he accepted a place upon the soliciting committee composed of the heads of departments. Before the close of the Exposition he had already gained the interest of many of the Foreign Commissioners and secured their promises of complete or representative exhibits of their country. He personally conducted the work in the Agricultural Building, thus gaining by his prominence and courteous manners, far more than could have been procured by any one outside. At his solicitation the following munificent gifts were secured.

Russia, through the Imperial Commission, presented her entire exhibit in the agricultural section, consisting of natural food-stuffs, fibers, tobaccos, etc. The labeling and transfer of the material was supervised by Count Rostovtsov of the Commission.

Japan, through the Imperial Japanese Commission, carefully selected a complete line of specimens from her fibers, teas, rices, and grains. Mr. Komada of the Japanese Tea House also presented the Museum with samples of tea, and a living tea-plant.

Mexico, through her Commissioners, selected a full line of specimens representative of their oils, grains, waxes, gums, fibers, etc., for donation.

The Brazilian Commissioners gave from their exhibits a large quota as may be seen in the chapter devoted to the installation of the Botanical Department.

The Commissioner from British Guiana donated a carefully selected set of the specimens exhibited by his country, including the woods, many of which were of superior quality and great interest.

The Korean representative donated agricultural products and the woods of the peninsula. Ceylon through her commissioners also donated specimens of her field and forest products, while Johore gave a full collection of woods, medicinal plants and rattans.

The Spanish Commissioners donated a complete set of olive oils and fibers; and the Siamese Commissioner, a duplicate set of their very fine exhibit of natural drugs.

The Representatives of Liberia and of Curacao kindly contributed from their products many interesting specimens, including a fine collection of their native woods.

The Paraguayan Commissioners generously contributed their entire exhibit in the Agricultural Building. The commissioners of the Argentine Republic divided carefully and equally their collection between this institution and others, Dr. Niederlein, one of the commissioners, spending the winter following the close of the Fair in the distribution. This donation included the wools and leathers with the other agricultural products.

The representatives of Uruguay and Costa Rica contributed freely sets of their products, and the Jamaican commissioners in the Manufacturers Building donated a full line of their agricultural products, including a complete set of their natural timbers.

The commissioners of Guatemala, United States of Columbia, Ecuador and Venezuela donated freely from their agricultural collections, and each added a full set of their native woods.

Finally, the United States Department of Agriculture loaned from the United States Government Building a complete collection of tobaccos, cottons, fiber plants, Alaskan woods, and series of forest trees, including the cases for each exhibit. A complete list of these donations collected by Mr. Buchanan will be found in a subsequent chapter relating to the installation of the Department of Botany.

In the Forestry Building, Mr. Buchanan appointed Dr. C. F. Millsbaugh whose acquaintance with the exhibitors and commissioners had become extended and personal during his superintendance of the West Virginia collections, and service upon the Jury of Awards, to solicit donations from the representative treasures there exhibited. At the outset, the difficulty arose that many of the commissioners, while they particularly desired to leave the Museum a complete collection of their woods, had already promised several others portions, at least, of the collections; this was especially true in regard to the Murphy Varnish Co., who had done so much to bring out the beau-

ties of the woods of all the countries exhibiting. In order to overcome this obstacle, Dr. Millspaugh, at the instigation of George E. Adams, Esq., now one of the trustees of the Museum, and the assistance of the Murphy Varnish Co., set up an electric motor and power band saw in the building, and supervised the divisions of the collections through the months of October to February, thus procuring many valuable exhibits that would otherwise have been unattainable.

The Imperial Japanese Commission offered to donate their entire forestry collection provided the Museum would distribute a set of thirty of their commercial timbers among the seventeen different institutions to which promises had been made. With the saw in operation this was done, and the most complete collection of Japanese forestry products in the country was thus obtained.

The British Commission made a similar request concerning their fine exhibit of the forest products of British India, which was complied with, and their exhibit, almost entire, was thus acquired. The Museum was thus able to secure a complete set of the excellent exhibit of timber of Trinidad, that was to go to the Imperial Institute, London.

The commissioners of both Brazil and Mexico had also promised several institutions collections of their woods. These great collections were however turned over complete, with the stipulation that the Museum should divide the collections according to their original plans. This was done, thus compassing these two rich displays.

A division of products was also made for commissions of Colombia, Siam, Turkey and Venezuela, fine collections of woods being thus secured, that would otherwise have been lost.

The Paraguayan Commissioners donated their complete collection of woods to the Museum without division, while the very complete collection of the Argentine Republic was left in the hands of their commissioner, Dr. Gustave Niederlein to be divided between the Museum and one other institution.

The Imperial Russian Commission freely donated from their exhibit collections not belonging to the Imperial Institute.

The complete forestry exhibit of the State of Illinois was turned over to the Museum by the State Commissioners, while California, Washington, Oregon, Virginia, Kentucky and Michigan, Quebec and British Columbia added many examples of their timbers to the collections from their forestry displays.

Messrs. Armstrong Bros., of Pittsburg, Pa., donated a full set of the products of the cork oaks; Redlich M'fg Co. added numerous specimens of cork to this collection, which was still further increased

by a magnificent specimen of a full decortication presented by Messrs. Gudewill and Bucknall of New York.

The Indurated Fiberware company of Chicago contributed a complete set of material and forms to illustrate the process of manufacture of utensils from wood fiber; while the Waldhof Zellstoffabrik Company of Germany, the Japanese Commissioners, and the Commission of Sweden contributed many specimens toward a collection to illustrate the manufacture of paper from wood pulp. The Commissioners of Sweden also contributed a full set of products of the destructive distillation of wood.

Prof. Nawa of Japan, donated entire his fine collection of insects injurious and beneficial to cultivated plants in Japan; of this collection amassed in the forestry division a full account is given in a succeeding chapter on the installation of the Department of Botany.

As will be seen from the foregoing account the Department of Agriculture at the World's Columbian Exposition, contributed its full quota toward the success of the Museum, giving the Department of Botany its initial equipment and forming the nucleus of one of the finest forestry displays in the country.

HISTORY OF THE COLLECTIONS PRESENTED TO THE MUSEUM
THROUGH THE EXPOSITION DEPARTMENT OF MINES,
MINING AND METALLURGY.—FREDERICK J. V. SKIFF,
CHIEF.

In narrating the history of these collections, they may for convenience be divided into, first, the special collections prepared and exhibited by the Department of Mines, Mining and Metallurgy, and second, the collections exhibited by various individuals, corporations or countries in the Mining Building, and which were solicited and obtained for the Field Columbian Museum by the same department.

I.

THE DEPARTMENTAL COLLECTIONS.

The Department of Mines, Mining and Metallurgy found at an early stage in the promotion of its exhibits, that while an unexcelled showing from various localities or of isolated mining and metallurgical industries would be made at the Exposition, no comprehensive survey of the resources of great areas or complete presentation of a particular art from beginning to end would be made unless under the immediate direction and supervision of the department. The field was therefore carefully examined with a view to discovering where deficiencies or omissions might occur, and immediate steps were taken to have these deficiencies adequately represented. As a result, five national and technological special collections were projected. All of these collections having been exploited by the use of Exposition funds, were at the close of the Exposition, by vote of the board of directors, transferred to the Field Columbian Museum.

These were:

A. A collection of the mineral combustibles of the United States.

B. A collection of the building and ornamental stones of the United States.

C. A graded collection illustrating the metallurgy of the precious and base metals.

D. A collection of transparencies.

E. A collection of the literature pertaining to the subjects of mining and metallurgy.

A. The technical collection of the coals of the United States.

The idea of this exhibit, and the form in which it was executed by the Chief of the department, was substantially as follows:

First, the preparation of a large map of the United States on plate glass, and to scale of ten miles to an inch showing plainly the outlines of the states and lines of transportation, and designed especially to display, by areas painted black, the extent and distribution of the great anthracite and bituminous coal fields.

Second, obtaining actual specimens of coals, cokes and lignites as mined in every coal producing county of the country.

Third, exhibiting the coal samples, trimmed to a uniform size, in wall cases surrounding the plate glass coal map, making cross references from coal map to coal sample by means of figures in red upon the map corresponding to similar figures upon the sample and presenting upon the base of each sample accurate statistics as to quality of coal, width of seam, output of mine, etc.

This scheme was executed with satisfactory results, and probably no exhibit in the Mining Building conveyed so easily an intelligent comprehension of the geographic distribution and characteristics of this economic mineral. The map illustrated many interesting facts concerning the relations of coal areas to each other, their relation to lines of transportation and distribution, their relation to the great centers of industry, and their bearing on the future development of new manufacturing or industrial regions. The samples and their accompanying data were only obtained at the cost of much labor and constant application. Correspondence was entered into with the mine owners of the country. Specially prepared blanks were sent and the information provided by the responses underwent compiling and editing. The samples were sent in all sizes and grades and were trimmed to cubes of uniform dimensions, and the data obtained lettered upon the base supporting the sample.

The specimens were classified by states, so that the coals of any particular locality may be easily found. The collection is installed in an identical manner in Hall 69 of the Museum.

B. The collection of building and ornamental stones of the United States. A special circular prepared in the office of the department calling attention of quarrymen to the undertaking of the department to make a qualitative exhibit of the building and ornamental stones of the United States was distributed discriminately in the leading stone producing districts of each state. This circular also described the manner in which specimens should be prepared. It instructed contributors to trim the cube samples four inches each way and to dress the sides of the cube in different fashions—ribbed, tooled, polished, planed, etc.

The specimens as they came in from the quarries were labeled and arranged in glass cases and installed under Group 44 of the central west gallery of the Mining Building. The samples in the majority of cases were sent as contributions and in some cases were loaned.

Special blanks calling for statistical data relative to the location of the quarry, character of the stone, position of the strata—bedded or vertical, chemical analysis of the stone, physical tests, etc., were sent out with the original request, and the information obtained in this manner was carefully collated for the report of the Department to the Director-General.

A series of transparencies illustrating on a large scale the microscopic structure of typical stone specimens was especially prepared for this exhibit by Mr. Geo. P. Merrill, Curator of the Section of Building and Ornamental Stones of the United States National Museum, and author of the well-known work "The Building and Ornamental Stone of the United States." These transparencies were hung before the large window over the main east entrance to the building, and in close proximity to the stone collection.

The collection was transferred to the Field Columbian Museum and is now installed in Hall 68.

C. Technical Collection Illustrating Metallurgical Science.

A pamphlet setting forth the aims of the Department to fittingly and instructively present an exhibit of the metallurgy of the precious and base metals was prepared during the period of promotion in the office of the Department, and was distributed among the principal metal producers and manufacturers. The scheme as outlined in this pamphlet comprised separate monographic exhibits of each of the principal metals of economic importance. It included actual samples that illustrated the progress of the metal from the ore



THE MINING AND METALLURGICAL COLLECTIONS.
West Annex.

as it left the mine's mouth, to the specimens of alloys and various manufactured articles.

The steps represented, therefore, were:

First:—Concentration samples, or mine metallurgy, showing the ores after various processes of milling, separating, etc.

Second:—Reduction samples showing the product of ore treatment by fire, by chemical and other processes.

Third:—Application samples, which show the manner in which metals are alloyed or otherwise combined to make them more useful in the arts.

Fourth:—Samples illustrating test treatments. Under this head were exhibited specimens bringing out the interesting results of testing for tensile strength, torsion, malleability and various other tests necessary to meet the severe requirements of modern engineering.

The scheme also provided for a display of diagrams of metallurgical process as well as pictures and models of the appliances in practical use. This scheme resulted in an assemblage of excellent museum material arranged on strictly scientific lines. The collections were both contributed and loaned, and most of the owners of private exhibits, after learning of the project of transferring the exhibit to the Museum, cheerfully gave their assent and donated the material outright. The collections are now installed in Halls 72 and 79.

D. A collection of Transparencies.

In order to illustrate the development of the mining and metallurgical arts and to show their crude beginnings, a series of enlargements of drawings from the earliest work on the subject, that of Agricola, were specially prepared. These were enlarged usually from two to three times, and were reproduced photographically on glass with ground glass backing. They hung in frames along the entire length of the west gallery of the Mining Building and fittingly accompanied the technical collections installed there. The subjects represented in this manner are:

Divining Rod; Underground Mine Working; Mine Exploring Level; Timbering; Barrows and Cars; Drum for Hoist; Power House; Drainage Chain and Work; Mine Drainage Apparatus; Pumping Apparatus; Pumping; Ore Bucket Hoist; Ventilation, Hand Power; Form of Shaft; Pottery; Stamp Mill; Overshot Wheel and Stamp Mill; Assorting of Ores; Crusher; Crusher-Man and Animal Form; Rotary Crushers and Washers; Trough Washers and Separators; Compound Stamps; Sieving and Sizing Appliances; Cradle; Riffles; Various Methods of Hand Washing; River Mining; Mine Dump, etc.; Furnace; Blowers for Furnace; Weighing and Mining of Ores for the Furnace; Method of Charging Furnace; Metallurgy of Lead; Manufacture of Blooms and Plates; Charging Furnace; Manufacture of Hard Steel; Reduction of Silver; Sublimation Chambers; Separation of Copper from Lead; Separation of Gold from Silver; Assaying of Gold and Silver; Foundry with Crane; Dome Fur-

nace; Remelting of Lead and Refining; Preparation of Silver to separate Copper; Apparatus employed in the preparation of Silver to separate Copper; Preparation of Tin; Furnace; Heating Ingots; Cooling Bath; Ancient Salt Garden, Evaporation of Salt; Distillation of Sulphur; Pottery Kiln; River Mining; Ventilation, Hand and Horse Power.

E. Collection of literature pertaining to mining and metallurgy.

A separate reading and library room was set aside in the south west gallery of the Mining Building where was exhibited a comprehensive collection of the principal works bearing upon mining and metallurgy. The list includes extensive sets of publications of the United States and State Geological Surveys, etc. These books were contributed to the Library by publishers at the solicitation of the department. At the close of the Exposition they were conveyed to the Library of the Museum. Chief Skiff of the Mining Department also donated a collection of 500 books on mining to the Museum.

II.

EXHIBITS OTHER THAN DEPARTMENTAL.

When steps had been taken for establishing the Museum, an active organized effort was made by the department to solicit and secure the contribution of material from among the exhibitors in the Mining Building. Circulars and donation blanks were liberally distributed by representatives of the department, and all of the exhibitors were canvassed personally by the Chief and his assistants. Letters were also issued to the various state and foreign commissioners making collective exhibits in the building. In this manner nothing was allowed to escape by lack of urgent request. The department was materially assisted in this by the friendly advice and active co-operation of Prof. T. C. Chamberlin, Prof. R. D. Salisbury, and Prof. R. A. F. Penrose of the Chicago University, Dr. Herman Haupt, Jr., of Armour Institute, Prof. Geo. Collie of Beloit College. These gentlemen performed a large amount of valuable labor in selecting the specially choice specimens of geologic and mineralogic value, and material possessing unusual excellence from a museum standpoint.

The transfer of this material to the Museum occupied a large portion of the winter months. On account of its bulkiness and great weight it could be moved only with much labor, and its final installation was attended with equal if not greater difficulties.

Among the larger displays placed in the hands of the Chief of the department for disposition may be mentioned the iron and steel exhibit from the German Section, that of Messrs. Stumm Bros., the entire exhibit of the Standard Oil Co., etc.

These exhibits much worked over, re-labeled and arranged according to scientific classification, will be found in the thirteen halls of the west annex. The entire ore, mineral, metallurgical and engineering collections and the cases in which they are installed, in these thirteen halls are the exclusive donation of the Exposition through the Department of Mines, Mining and Metallurgy to the Field Columbian Museum.

EXHIBITORS CONTRIBUTING FROM THE MINING BUILDING.

Acme Cement Plaster Co.	French General Asphalt Co.
Aitchison Metal Co.	Fullers' Earth Mining Co.
Alan Wood Co.	Galitzki, L.
Albion Clay Co.	Goyard, M.
American Cement Co.	Greek Commission, W. C. E.
American Tripoli Co.	Gibbs & Co., Lt'd.
Anker, Chr.	Hardtmuth, L. & C.
Bergen Port Sulphur Works.	Houston, Sam H.
Best Bros. & Co.	Illinois Brick & Tile Ass'n.
Black Rock Mining Co.	Illinois Fluor-Spar & Lead Co.
Boyden, Obadiah S.	Indiana Commission, W. C. E.
British Columbia Commission, W.C.E.	Indiana Stone Co.
Buckeye Portland Cement Co.	Jessup, W. & Son.
California Commission, W. C. E.	Johns, H. W. M'fg. Co.
Compagnie Francaise des Mines de Laurium France.	Kentucky Commission, W. C. E.
Canada Iron Furnace Co. (Ltd).	Kunz, Geo. F.
Cape Colony Commission, W. C. E.	Lathrobe Steel Co.
Chisholm, Boyd & White.	Leffel, James & Co.
Colorado Commission, W. C. E.	Lipe, Chas. E.
Connecticut Commission, W. C. E.	Louisiana Commission, W. C. E.
Coplay Cement Co.	MacKay, Henry S.
Corydon Stone Co.	McCune, W. A., & Co.
Crown Preserved Coal Co.	Mexican Exhibitors:
Drake Co., The.	Compania Minera de los Placeres.
East Anglian Cement Co.	Compania Minera y Fundidora de Santa Rosa.
East Tennessee Land Co.	Compania Minera la Fronteriza.
Empire Portland Cement Co.	Compania Minera la Parrena.
Fort Madison & Appanoose Stone Co.	Compania Minera la Fortuna.

Cia Minera de Jesus Maria.
Cia Metalurgica Mexicana.
Cia Minera Constancia y Perrena.
Galindo Modesto.
Kopez, Lucio B
Vega Miguel.
Pul Miguel.
Puente Telipe.
Cia Minera el Carmen.
Cia Fundidora y Ofnadora de Monterey.
Cia Minera la Union.
Gran Fundicion Nacional Mexicana.
Maiz Joaquin.
Gobierno de Oaxaca.
Hegociacion La Castellana.
Hegociacion Huitccicila.
Hegociacion Montage.
Hegociacion La Randanera.
Mexican International Railroad
Prospero de la Fuente.
Carlos Gonzalez.
Hacienda de la Concha.
Gobierno de Colima.
Cortez Salazar y Cia.
Aurelio Lurtique.
Municipio de Monterey.
Salazar Francisco.
Gobierno de Sonoro.
Tepic, Political Authority of.
Marcelo Salinas.
Ewique, Freeman.
Gonzalez Lic, Jose G.
Praxidis Guerrero.
Ramon, C. Ortoz.
Juan N. Torres.
Gobierno de Michoacan
J. A. Hartman & Co.
Compania Minera la Barranca.
Compania Concentradora La Dura.
Miguel Guzman.
G. Micho.

Anthracita Sonora.
Cia Minera La Luz.
Mines & Mining Department. W. C. E.
Minnesota Commission, W. C. E.
Moulton, Francis D. & Co.
Morning Star Mining Co.
Musselburg Wire Co.
New Mexico Commission,
New South Wales Commission, W.C.E.
New York Commission, W. C. E.
Ontario Commission, W. C. E.
Ohio Commission, W. C. E.
Oregon Commission, W C. E.
Philadelphia Engineering Works.
Pittsburgh Coal Exchange.
Quebec Commission, W. C. E.
Roessler & Hasslacher Chemical Co
Russian Cement Co.
Salisbury Mining Co.
San Juan del Rey Mining Co.
Sandusky Portland Cement Co.
Sioux Valley Stone Co.
South Dakota Commission W. C. E.
Standard Oil Co.
Standard Asphalt Co.
Stanley Mining Co.
Stumm Bros.
Suydam, John.
Trenton Iron Co.
Truax Mfg. Co.
Turner, W. G.
United Alkali Co., Ltd.
United Coal Co.
Waldhof Sulphite Co.
Warren Chemical Works.
Warren Scharf Asphalt Paving Co.
Weimer Machine Works.
Western Mineral Wool Co.
White, T. & S. C.
White Cap Mining Co,
Zimmerman, John.

HISTORY OF THE COLLECTIONS PRESENTED TO THE MUSEUM
THROUGH THE EXPOSITION DEPARTMENT OF ARCH-
ÆOLOGY AND ETHNOLOGY.—F. W. PUTNAM, CHIEF.

The extensive exhibits illustrating the archæology and ethnology of America displayed in the Anthropological Building of the Exposition were brought together by its Chief, Prof. F. W. Putnam as the result of two or three years of energetic work on the part of himself and a large corps of assistants. The exhibit was originally planned by Prof. Putnam with the distinct idea of using the opportunity offered by the Exposition to assemble a vast number of anthropological objects representing the American peoples—a field of exceptional richness. He kept in mind the value such collections would have for permanent exhibition and this, no doubt, furnished the inspiration which led him to express the hope that a great anthropological museum might be ultimately established in Chicago.

The collections transferred by vote of the directors to the custody of the Museum at the close of the Exposition were obtained through special expeditions sent out under the direction of Prof. Putnam or by collectors resident in the field who were commissioned by the Department of Ethnology to undertake the work. The principal expedition to South America was under George A. Dorsey who in 1891 was sent to Peru, Ecuador, Chili and Bolivia. Other collections from South America were gathered through United States naval officers, commissioned by the department to go to widely remote localities; the result of their work is to be seen in the Scriven collection from Costa Rica, the Welles collection from the Orinoco River and the Safford collection from Peru; also the Bertolette collection from Paraguay.

The Central American field was covered by Mr. Edward H. Thompson, United States Consul to Yucatan, under whose direction a series of casts of Central American ruins were procured, as well as by the research work carried on by Messrs. Seville and Owens. The

archæological collection from Southern California was secured through the services of Stephen Bowers, of Ventura, California.

A series of archæological investigations among the remains of North American aboriginal peoples was also initiated by Prof. Putnam and resulted in collections from the Little Miami Valley and the Hopewell group of mounds of Ross County, Ohio, collected by Warren K. Moorehead; the archæological collection from New Jersey, by Ernest Volk, the Michigan collections by Harlan I. Smith, and the archæological collection from Ohio by Dr. C. L. Metz; also the models of Ohio earthworks prepared by Prof. Putnam himself.

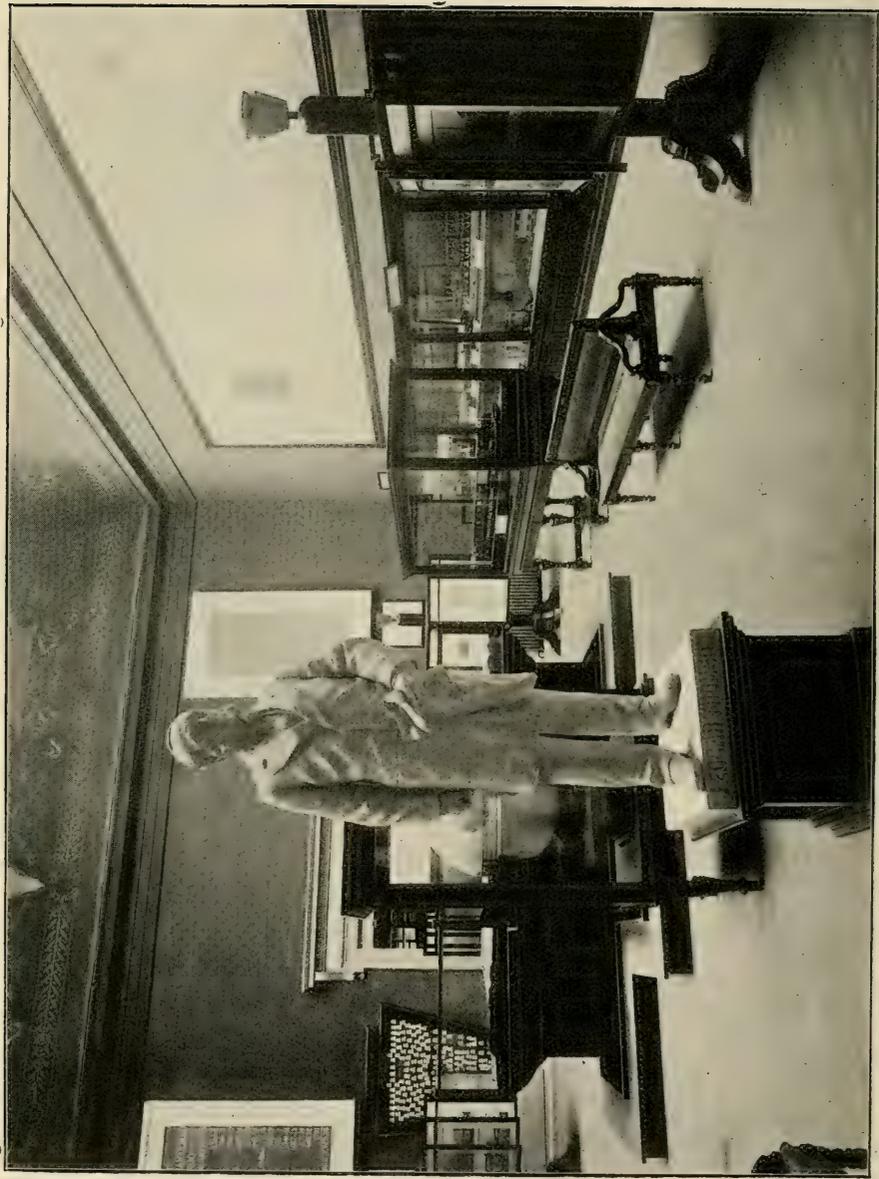
Expeditions were sent out in 1891 to Alaska and to various Indian tribes of Canada and the United States, principally for the purpose of gathering anthropometric material. The collectors in this work were for the most part men of the Harvard Medical School or residents in the territory covered.

In 1892 the work was again taken up and some fifty men were in the field covering the territory from Mexico to Alaska and from the Atlantic to the Pacific. The collections then gathered and afterwards transferred to the Museum are as follows:

Dean	Collection from	North Pacific Coast.
Wilson	“	Assiniboin Indians.
Hall	“	Ojibway Indians.
Bolton	“	Shoalwater Indians.
Holgate	“	Ottawa Indians.
Cowie	“	Saskatchewan Indians.
Brown	“	Ottawa Indians—Queen Sound.
Tisdale	“	Montagnaise Indians.
Tisdale	“	Amalcite Indians.
Tisdale	“	Micmac Indians.
McDonald	“	Micmac Indians.
Kaven	“	Sisseton Agency, B. C.
Wilson	“	Salteaux Indians.
Boas	“	North Pacific Coast.
Jacobsen	“	Bella Coola.
Shurtléff	“	Muskogee Indians of Indian Ter
Riddle	“	Menominee Indians, Minn.
McLean	“	Blackfeet Indians.
Ruoff	“	Chippewa Indians.
Montague	“	Minnesota Indians.
Fairbank	“	Buford, N. D.
Eells	“	Puget Sound.
Swan	“	Cape Flattery.
Peary	“	Eskimo of Smith Sound, Alaska.
Cherry	“	Yukon Valley.

Collections from the European museums of Berlin, Vienna, etc., as well as the Finsch collection were obtained by Dr. Franz Boas who, at an early stage of the promotion of the work of the Department of Ethnology, was sent abroad to secure exhibit material.

The Anthropological Library was brought together from various parts of the world in response to a printed circular, sent out by Prof. Putnam in February, 1893. A special library of over 1,200 books and pamphlets was thus secured to the Museum.



THE PENNSYLVANIA RAILROAD COLLECTION.
East Annex.

HISTORY OF THE COLLECTIONS PRESENTED TO THE MUSEUM
THROUGH THE EXPOSITION DEPARTMENT OF TRANSPORTATION EXHIBITS.—WILLARD A. SMITH, CHIEF.

The Department of Transportation Exhibits of the World's Columbian Exposition was planned with a view to showing as graphically as might be, not only the most improved transportation methods and appliances of the present time, but also the gradual steps by which the present high degree of perfection has been reached. The conveyance of men and things from place to place was one of the first wants of the race to develop itself after the birth of industrial activity. Civilization has been so dependent upon physical means of intercommunication in all ages, and physical, intellectual, and moral improvement have clung so closely to the world's highways that the one may be fairly said to be the index to the other. If modern civilization is to prove permanent and is not to suffer the fate of the ancient, it will be largely because the world is becoming so closely bound together by the bands of iron—the highways of commerce and of intelligence on land and sea—that the fact of solidarity may lead mankind into the realization of that brotherhood which is still only a sentiment.

To illustrate the beginnings of transportation is not difficult because among the ruder and less informed nations of the world of today these still exist in their original simplicity and in identical forms. The perfection attained by the ancients in wheeled vehicles, saddlery, and water-craft, are more difficult to show, because there are almost no remains of the articles themselves. A light two-wheeled vehicle believed to be a Scythian racing chariot was exhumed from an Egyptian mummy pit and is now in the Archeological Museum at Florence, Italy. The perfection of its workmanship is remarkable and certainly indicates that the historical accounts of ancient vehicles are not overdrawn. In the museum of the New York Historical Society there is also an ancient Egyptian wheel. With these exceptions

there are no known relics in existence. An exact replica of the former was made in Florence for the Exposition and is now in the Field Columbian Museum. From the same place also came a copy of a child's toy boat, found in an Etruscan tomb. These are, we believe, the only remains known of ancient vehicles. The museums of the world, however, contain numerous ancient and mediæval bits, spurs, etc., exhumed from tombs or found on battle fields, a fair representation of which were loaned to the Exposition, but could not be retained for the Museum.

On the various monuments of antiquity, in manuscripts, in inscriptions on mummy cases, etc., there are found various representations of vehicles, saddlery, and boats, from which fairly accurate pictures have been made. Many of the illustrations to be found in historical works are imaginary, based to be sure upon authentic descriptions but dependent in details upon the fancy of the artist. From the most important and accurate of these, numerous pictures were prepared for the Exposition which are now to be found upon the walls of the Museum.

European museums contain many interesting vehicles of the tenth century. Of the many centuries before that, there are no relics, except an occasional fragment of saddlery. There are in existence many interesting vehicles of the early portion of the present century, but their bulk and the difficulty of transporting them long distances rendered it impossible to secure them for exhibition—except by means of pictures. A very interesting example was however shown in the Brazilian exhibit at the Exposition in the shape of a royal carriage formerly belonging to the Emperor Dom Pedro, evidently made in Europe, and corresponding very closely with the royal carriages of the eighteenth century.

Among the most interesting of existing rude forms of transportation are those of the American Continent. From Alaska were secured various canoes, dog-sleds, etc., through the Alaska Commercial Co., and Lieutenant G. V. Emmons of the U. S. N.; South American canoes, donkeys, llamas, sedans and pack outfits for men and beasts were obtained through the agency of the Latin American Department of the Exposition, Dr. Luna of Peru, and Lieutenant H. R. Lemley, U. S. A. Mexican ox-carts of rude construction were purchased direct by the Exposition; and the Mexican government exhibit included mule-litters, saddlery, etc. The Brazilian government also contributed aboriginal canoes, rafts and jangadas. The Indians of the Pueblo of Acoma, New Mexico, contributed a rude ox-cart of their own construction.

The collection of the various interesting water-craft, sedans, palan-

quins, and models of every kind illustrating transportation in Africa, Australia, India, Burmah, China, Malta, Madeira, Sicily, Straits Settlements, Syria and the West Indies were made through the agency of the consuls and consular agents of the United States. These gentlemen were not only courteous in furnishing information, but indefatigable in pursuing pointers sent to them and purchasing and shipping the desired articles. As no similar work of collection had ever been undertaken before, the result accomplished in such a short time and at very small expense was certainly remarkable.

Interesting contributions to the historical feature of the Transportation Exhibits Department of the Exposition were made by the governments of Argentine, Brazil, British Guiana, Cape Colony, Ceylon, Italy and Siam; portions of which came subsequently into the possession of the Field Columbian Museum. The German engineering exhibit was especially rich in this regard, as was also that of Spain. The historical articles in these exhibits, as well as those of Great Britain, France, Japan, Mexico, New South Wales, Netherlands, Norway and Russia, were the property of museums or other institutions, and could not be retained for the Field Columbian Museum. The interesting Turkish exhibit was purchased by the Exposition through Mr. Robert Levy of the firm of Elia Souhami Saddulah & Co., of Constantinople.

The great collection of relics, models, photographs, drawings and reproductions, forming the unrivalled railway division of the Department of Industrial Arts of the Field Columbian Museum, was collected and prepared by the Baltimore & Ohio Railroad Company, through its agent, Maj. J. G. Pangborn, and the Pennsylvania Railroad Company through its agent, Mr. J. Elfreth Watkins. The Chicago & Northwestern Ry. Co., contributed the locomotive "Pioneer," and the Illinois Central Railroad Co., the locomotive "Mississippi." The Exposition contributed the locomotive "Samson" and the car accompanying it, and the locomotive "Albion," purchased in Nova Scotia. A. S. Hallidie of San Francisco, Cal., contributed the first dummy used on a cable railway, a section of the road, grip, etc., and various other manufacturers also made important contributions. Many interesting tickets, passes, time-tables, way-bills, etc., were presented by individual donors—these having been portions of an admirable loan collection made for the Exposition by Geo. De Haven, Esq., General Passenger Agent, C. & W.M. and D. L. & M. Railroads. The Museum purchased from the Plymouth Works of Merthyr Tydfil, Wales, two of the first wagons or trucks ever drawn on rails by steam; together with rails and stone stringers from the road on which these cars were drawn by Trevithick's locomotive in 1804. These consti-

tute perhaps the most interesting railway relics in the world; unless exception be made in favor of Stephenson's "Rocket" in the South Kensington Museum, London.

The amount of work and expense represented in this section of the Museum is very great. It was undertaken in time to save many valuable relics which would soon have disappeared. The Museum will welcome additions to this division from authentic sources and will be obliged for information tending to further its accuracy and completeness. It is believed that there is here the nucleus at least of a collection which will be not only unique among the museums of the world, but of the highest practical value to the people.

The abundant success that attended the execution of the elaborate and sweeping plans of the Department of Transportation Exhibits, gave to the Chief of that Department deserved prominence among the executive officers of the Exposition. That the Museum to-day possesses the marvellous collection of vehicles, crafts and other means of transportation upon land and water, representing the methods of all nations and all climes, is because from the inception of the project to establish an institution of this character as a memorial to the Exposition and the men who made it, and until the work was done, Mr. Willard A. Smith assumed his part of the labor with the high inspiration and devotion that characterized his labors for the department over which he presided.

EXPOSITION MEMORIAL STATUARY.

The Rotunda of the main building of the Museum is devoted to an artistic memorial of Columbus and of the Columbian Exposition. The center-piece—the statue of the great discoverer consecrating the New World—at once attracts attention both as an historical study and as a work of art. The original models of the figures and groups of figures ornamenting the main exposition buildings, and donated by the Exposition to the Museum, occupy the entire space around the statue. These models are invaluable as works of modern art, representing the genius of the most talented sculptors of the present day.

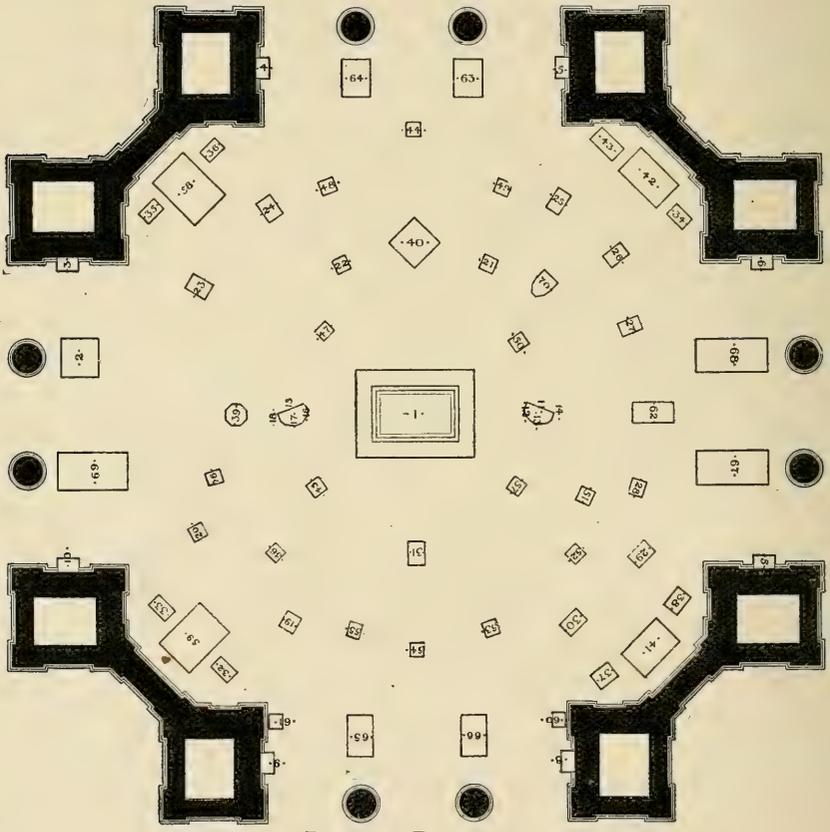
In the contracts entered into with the various prominent sculptors they were called upon to furnish what are called “Sketches” of the sculptural decorations, i. e., the models were to be about one-sixth of the full size; from these models the Exposition’s force of sculptors prepared full size work enlarging the “Sketches” six times. All the models were first submitted to the architects of the buildings for approval, in order to harmonize the sculptural decorations with the architecture. The models shown in the Museum are the original “Sketches.”

The heroic-sized statue of Columbus, with uplifted sword in one hand and grasping in the other hand the standard of Castile and Leon, is the imposing center-piece of this collection of historic statuary. This statue overlooked the Court of Honor from its position during the Exposition at the main portal of the administration building.

The next in point of size is the model of the Republic Statue by Edwin C. French. This, like the other statuary, is one-sixth the size of the completed figure, but its height is about equal to the full size Columbus.

Reference to the plan below, of the Rotunda will give the exact position as installed of these sculptural pieces. The Statue of the Republic is marked No. 2.

Thirty-six of the allegorical figures that ornamented the Administration Building, by Karl Bitter, are shown in models (Nos. 3 to 38 of Plan). The other pieces are the sculpture work on the Agricultural Building, by Philip Martiny, (Nos. 39 to 45); figures of invention on Machinery Hall by Robert Kraus (Nos. 46 to 51); six figures



PLAN OF ROTUNDA.

on Machinery Hall by M. A. Waagen (Nos. 52 to 57); sculpture on Colonnade, by M. A. Waagen (Nos. 58 and 59); sculpture work on the Electricity Building by I. A. Blankinship and N. A. McNeill (Nos. 60 and 61); sculpture work on lagoons by M. A. Waagen (No. 62); sculpture work on boat landings by D. C. French and E. C. Potter (Nos. 63 to 66); sculpture work on bridges of lagoons by Edward Kemeys (Nos. 67 to 69); and Glorification of Discovery, by Cratt (No. 70).

THE COLUMBUS MEMORIAL COLLECTIONS.

The most representative of the pictures and historical objects exhibited in La Rabida have been placed on exhibition in Halls 1, 8, and 9 of the Museum. Owing to lack of sufficient wall space, not all of the pictures could be displayed, but as far as possible every one of the divisions of the subjects as treated in the Exposition catalogue of the relics and of the portraits of Columbus are represented.

The later career of Columbus is given in pictorial form upon the walls and screens of Hall 9. The pictures, maps, and charts exhibit the primitive state of geographical knowledge at the time when the great explorer needed the best results of the hydrographic art. Here are portraits of great contemporary travelers, such as Marco Polo and Martin Beheim, also data upon the supposed earlier discoverers of the New World, including charts showing the course of their voyages.

The Court of Ferdinand and Isabella is vividly brought before the eye by the portraits of the king and queen, by pictures of castles, cathedrals and notable buildings that figured prominently in the history of this great period.

Views of the city of Genoa and its antiquated but picturesque surroundings take one for a temporary sojourn into the midst of the scenes of Columbus' birth and early boyhood. His career in Spain is illustrated by paintings of the Monastery of La Rabida and of its generous hearted prior, Father Perez. In one case is to be seen an original door and jamb of the Monastery. There are, also, a number of more or less imaginative pictures, such as Columbus explaining his theories at the Monastery; Columbus appearing before the gates; views of the city of Salamanca, where Columbus appeared before the Council, and of the roads through which he traveled in Spain.

Of the scenes associated with his several voyages, there is profuse illustration. The departure, the caravels, and the landing, receive, of course, sympathetic and varied treatment. The lands he

visited are represented in the collection from Watling's Island where he first touched, to San Domingo and Honduras, where he first set foot on the American Continent proper. Maps show the zigzag course of his voyages, and the modern towns are indicated in order to identify the new names with old historic sites. Various relics, such as spears, handcuffs, bells and other ancient articles form a most curious collection of antiquities. Among these should be mentioned the sixteenth century anchor which laid in the mud on the east bank of the Amazon river for centuries, and according to tradition was the property of Don Diego Colon. The key is preserved which belonged to the house at Porto Santo, Madeira Islands, where Columbus lived after his marriage. A pile of stone, brick and tiles represents all that remains of the town of Isabella, the first civilized settlement of the New World, founded by Columbus on his second voyage in 1493.

The personal history of Columbus' latter days consist of pictures of the death of Columbus, of the house in which he died at Valladolid, and of the various resting places of his remains. They were once interred at Cartuga and also in the cathedral of Santo Domingo. A fac-simile of the box in which his remains were found in this cathedral as well as a reproduction of the casket in which his dust is now contained are in the collections.

The descendants of Columbus, his son Diego and his son Fernando in portrait and likenesses of his later descendants, the Duke of Veragua, Don Luis Columbus, and Don Pedro Colon, hang upon the walls of Hall 8.

The personal relics of Columbus consist of a reproduction of his autograph letters, his commission as Viceroy and Governor-General of the Indies of which the original is in the possession of the Duke of Veragua, the grant of a coat of arms to Columbus by the Catholic kings, original grant of 10,000 Maravedis per year made to Columbus by the Catholic kings, etc. Eight cases in Hall 9 are filled with photographs, papers and documents relating to Columbus, owned by the Duke of Veragua and others. The manner in which the discovery of the New World was published is told by the rare books, maps pictures and charts found upon the screens and in the cases of Hall 9. Here is a reprint of the Guiliano Dati poem which recounts in metrical form the story of Columbus and his voyage. Here are the curious and crude pictures first printed of the scenes in the New World and of its inhabitants; manuscript copies of Ptolemy's *Cosmographiae*, fac-similes of the first charts of the West Indies, both of which greatly improved upon the earlier attempts at charting the new western region.

Several sections of the collection are devoted to maps and charts showing the progress of the growth of geographic knowledge; to the history of the conquest and colonization of the South and Central American countries; and to Spanish remains in North America.

The south wall of Hall 8 is entirely devoted to portraits of Columbus which are grouped into four classes as follows:

1. Those of the Giovio type—either copies of the portrait which hung in the gallery of the Archbishop of Como, or drawn from verbal descriptions given the Admiral by his contemporaries.
2. The De Bry type, representing Columbus as a Dutchman.
3. The portraits with beards and costumes of the century subsequent to his death.
4. The fanciful pictures without pretense to authenticity.

Upon the north wall are displayed pictures of the many monuments erected in honor of Columbus.

In this same hall the nucleus has been made of a collection of articles used in the administrative work of the World's Columbian Exposition, such as bonds, tickets of admission, etc. In connection with this collection is exhibited the original march of the Columbus ode and hymn, sung at the dedication of the Exposition, Nov. 22 1892.

THE DEPARTMENT OF GEOLOGY.

Geology may be defined as the science which treats of the history of the earth's development and the materials which form its crust. It is this subject which by means of actual rock specimens the Department of Geology seeks to illustrate and the facts of which it aims to present in a form as vivid and as available for direct study as does Nature herself. In the place of printed descriptions of what others have seen and from which their conclusions have been drawn, each may here see for himself natural objects and construct if he desires his own science. While therefore each specimen is not without its individual interest, it is as parts of a systematically arranged whole that they possess greatest value.

The history of the earth's development is illustrated by specimens of the fossils of successive eras, by models of the forms of relief which now mark its surface, by specimens of those bodies which, coming to us from beyond the earth, are believed to indicate much in regard to its constitution, and by specimens which show the effects of physical and chemical forces in shaping and modifying its crust. The materials of the earth's crust are illustrated by collections showing its mineral species, its rock varieties, and the ores and products which it yields of use to man.

Since the latter class of substances has an interest and application quite apart from that which pertains to geology as a theoretical science, a primary division of the collections is made in order to set forth these two phases of the subject separately. The collections illustrating geology as a theoretical science are grouped in the Division of Systematic Geology; those setting forth its practical bearings, in the Division of Economic Geology. The collections of the former class occupy eight halls of the Museum, those of the latter, thirteen.

SYSTEMATIC GEOLOGY.

The subjects illustrated under the Division of Systematic Geology are six in number, as follows: Paleontology, Geographic Geol-

ogy, Meteorites, Systematic Mineralogy, Structural and Dynamical Geology and Lithology.

To the section of Paleontology three halls are devoted and about 5,000 specimens are here displayed. These are arranged in an order which passes from left to right, and which corresponds to that found in following the stratified formations of the earth's crust from the lowest up to the highest. One may therefore read from this collection, as he would from a book, an account of the progress and characters of life upon the globe from its earliest forms to those of the present time. While the primary plan of arrangement is stratigraphical, secondarily it is biological, the fossils of each epoch being placed in accordance with their rank in the scale of being.

As specimens especially instructive or valuable in this collection may be noted the following: A complete series of *Eozoön* from the Laurentian beds, trilobites of the Cambrian and Lower Silurian, a number of perfect specimens of *Eurypterus* and allied genera from the Water-lime of New York, fishes of the Old Red Sandstone, concretions bearing *Pecopteris* and allied genera, of the Carboniferous, specimens of *Lithostroton*, *Melonites* and *Pentremites* of the same era, reptile tracks of the Triassic, a large number of well preserved remains of insects and crustacea from the lithographic limestones, *Ammonites* *Belemnites* and *Ichthyosaur*, including one large, complete skull of the latter, of the Jurassic, leaves of angiosperms, specimens of *Rudistes*, and *Baculites*, of the Cretaceous, teleosts from the Green River beds, portions of skulls and limb bones of *Oreodon* and *Titanotherium* of the Tertiary, various bones of *Elephas*, *Mastodon*, *Ursus*, and *Dinornis* of the Quaternary and two practically complete mounted skeletons of *Mastodon* and *Megaleros* of the same era. There are also casts or restorations of full-sized skeletons of *Megatherium*, *Dinoceros*, *Hadrosaurus* and *Glyptodon*, casts of skulls of *Elephas*, *Dinotherium*, *Mastodon* and other large quaternary mammals, and restorations of the *Mammoth* and the Indian turtle, *Colossochelys*.

The section of Geographic Geology illustrates, in a vivid and realistic way, the surface configuration of the earth and the geological processes which have been instrumental in shaping it. The chief feature of the exhibit is a series of about fifty relief maps which reproduce on a representative scale the topography and structure of selected portions of the earth's surface. Many of the maps are colored so as to indicate the geological formations of the region and some are also dissected so as to allow a more intimate study of these. Among the more important relief maps shown may be mentioned two of the United States and Gulf of Mexico modeled on a section of a globe sixteen and one-half feet in diameter, relief

map of the Yellowstone National Park, of the Vinta and Wahsatch mountains, the Grand Cañon of the Colorado, the State of Massachusetts, the Henry mountains and Palestine. A very instructive series of ideal reliefs illustrate typical glacier, volcano, valley and sea-coast regions. There are also exhibited stereogram, hypsometrical and geological maps and globes of various sizes.

The collection of meteorites, occupying one hall, may claim recognition as one of the largest in this country. Here are shown specimens representing 180 separate meteoric "falls" or "finds" which have an aggregate weight of 4,745.6 pounds. These are grouped into the three classes of aërosiderites, aërosiderolites and aërolites, and placed in chronological order under each group.

Here may be seen the largest meteoric stone in the world, that of Phillips County, Kansas, weighing 1,184.5 pounds; also two masses weighing respectively 465 and 344.5 pounds with several smaller ones of the Kiowa County, Kansas, meteorite; two masses weighing 1,013 and 265 pounds respectively, and several smaller ones of the Cañon Diablo, Arizona, meteorite; about 650 complete individual aërolites of the Winnebago County, Iowa, fall, and many other unique specimens. About sixty casts illustrate the shape and size of notable meteorites, including the huge masses of Chihuahua, Mexico.

In the section of systematic mineralogy, about 5,000 specimens are displayed, which represent quite fully the various mineral species and the localities which produce them.

These are arranged in an order similar to that given in Dana's new system of mineralogy, that is, are classified according to the chemical constitution of each species. Case labels indicate the chemical groups that are represented and supplementary cards show the chemical composition and system of crystallization of each species. The following species and localities may be mentioned as being especially well represented: native copper, Lake Superior; fluorite, Cumberland, England; amethyst, Lake Superior; agate, South America; agatized wood, Arizona; calcite, Big Rig mines, England; aragonite, Styria; malachite, Arizona; lazulite, Chile; rubellite, California; titanite, Cumberland, England; and selenite, Utah.

In addition to this series, smaller groups illustrate pseudomorphs, the physical properties of minerals and their crystal forms. There is also a case containing several hundred gems and cut stones, and adjacent to it, two which show the minerals from which gems are obtained.

In the section devoted to Structural and Dynamical Geology, are shown specimens illustrating various geological processes or phases of structure. The causes now in operation in the formation,

alteration and disturbance of rocks are exemplified, as well as evidences of their action in former periods of the earth's history.

These include slabs bearing ripple marks, rain drop impressions, glacial groovings and scorings, specimens showing varieties of erosion, faultings, joints and concretions. A comprehensive group of the latter with their modifications into septaria, make a prominent feature. Typical volcanic and cave products may also be seen here.

In the section of lithology is contained a very complete collection of the varieties of the present day. Fifteen thousand of these specimens are of the size, 3x4x1 inch usually adopted for rock specimens while about 400 larger polished slabs exhibit in greater detail the ornamental character of many of the varieties. The collection of marbles, in the latter class, is very complete and illustrates almost every variety of this stone known to the decorator. The rocks are divided into the three classes of eruptive, sedimentary and metamorphic, and under each of these groups are arranged according to some well-known system of classification, thus facilitating their examination by the student.

ECONOMIC GEOLOGY.

The collections of the division of economic geology were obtained through the efforts of the Chief of the Department of Mines, Mining and Metallurgy of the World's Columbian Exposition from exhibits made in that exposition.

Being designed to illustrate the practical bearings of the science of geology, they consist chiefly of specimens which show modes of occurrence in nature of the minerals which have economic importance and the localities where they may be obtained.

In addition to these, however, are many illustrations of the processes employed in the extraction and treatment of such minerals or ores and of the application of resulting products to human arts and industries.

While these ultimate products may seem to have little relation to geology, the fact that they are the ends sought by the application of its principles entitles them to a place in the series. Moreover, as denominators of groups, they furnish the simplest and most readily understood basis of classification.

The following are the groups into which the collection is divided, those mentioned together being found in one hall:—Marble and decorative stones; building stones; coal of the United States;

carbon minerals; petroleum; platinum, gold, silver and lead; copper; iron, zinc, tin, nickel, mercury, antimony and manganese; fictile materials; non-metallic minerals of use in the arts; mineral statistics.

The groups of marbles and decorative stones contain varieties of marble from Norway, Greece and Italy, verde antique marble from several localities, chiefly California, sandstone from Ohio and Indiana, red slate from New York, and others.

Under the head of building stone are shown about 200 four-inch cubes of stone from various quarries of the United States all showing on each of the six surfaces a different style of rock finish. Other larger blocks and pillars from important quarries illustrate their products. One case is devoted to the building stones of Mexico of which the Museum possesses a good representation, and another of varieties of artificial stone.

The collection of coals of the United States contains specimens of coal from every developed coal field of the United States. These are shown in connection with a large plate glass map, on which the fields are represented and which bears numbers corresponding to those on the specimens, thus indicating the locality from which each was obtained.

The group of carbon minerals contains representatives of the different forms of carbon, from diamond and graphite to asphaltum. The different varieties of coal from all parts of the world are well represented, also coal seams, fossils of the coal measures, etc. The collection of native asphalts is especially large and complete, as is also one illustrating the uses of asphaltum.

Under the group petroleum, are shown specimens of crude petroleum from every oil well in the United States and of the sands from which these are obtained. A large chart and several sets of borings show the geological character of the strata which produce petroleum.

The processes and products of refining are fully illustrated as well as the applications of these to various arts and industries.

The group platinum, gold, silver and lead, as has been intimated, is devoted chiefly to ores of those metals but processes of extraction and applications of the products are also illustrated.

Under the ores of each metal are shown first, type specimens of the minerals which enter into its ores, arranged in order of their richness; and second, the ores of different localities, placed in geographical order, passing eastward from California.

The collection of platinum ores and concentrates is particularly representative, embracing as it does a specimen from almost every

known locality where that metal is found, and excellent illustrations of the processes of concentration carried on at the Russian mines. The gold ores include a large number of specimens of gold-bearing quartz from various localities in California, of the telluride and pyrite ores of Colorado, of Mexican and Brazilian ores, a complete series of the Dolgelly, North Wales, ores and others. A series of gold nuggets having an aggregate weight of 133 ounces, from the placer mines of the State of Washington form a part of this collection, and there is also shown a complete series of gold alloys.

The ores of silver are represented by specimens from the mines of Nevada, Colorado, Mexico, New Granada, and New South Wales, with other localities in less degree.

The localities producing lead ores represented are chiefly Colorado, Wisconsin, Illinois, British Columbia, Mexico, Great Britain, Germany, Spain and Greece. The collections of British and German ores are particularly complete and attractive, the character of the associated rocks and minerals being fully exemplified.

The arrangement of the collections of the group, copper, iron, zinc, etc., is made upon a plan similar to that already described for platinum, gold, etc. As examples of copper ores are shown those of California, Colorado, Michigan, Pennsylvania, Vermont, South America, Germany, Greece, New South Wales and an especially large representation of those of New Mexico and Arizona. One complete series from the Copper Queen mines of Bisbee, Arizona, shows the rocks and ores found at each of the different levels of the mines. Different methods of extracting copper and some of the varied uses of the metal are also fully illustrated.

The zinc ores shown are chiefly those of Missouri, Wisconsin, Great Britain, Germany, Spain and Greece. The series of German ores is especially instructive as showing the mode of deposition of the blendes and the minerals associated with them. The ores of Greece are of interest on account of their beauty and purity. A series, as yet incomplete, shows steps in the process of reduction of zinc.

Many of the important iron mines of the United States are represented by specimens in the collection under that head, those of Virginia and Michigan being most fully exemplified. Among foreign iron ores are shown a complete series from Russia and miscellaneous specimens from Great Britain, Germany, France, Greece and New South Wales.

Illustrations are given of various types of blast furnaces and of processes of reducing iron ores.

Without describing in detail the collections which illustrate the other metals, mention should be made of the complete series of tin ores from the North Dakota and Cornwall, England, mines; of the complete series of mercury ores and associated rocks from New Almaden, California; of the ores and concentrates of the same metal from Spain, and of the manganese ores of Arkansas and New South Wales.

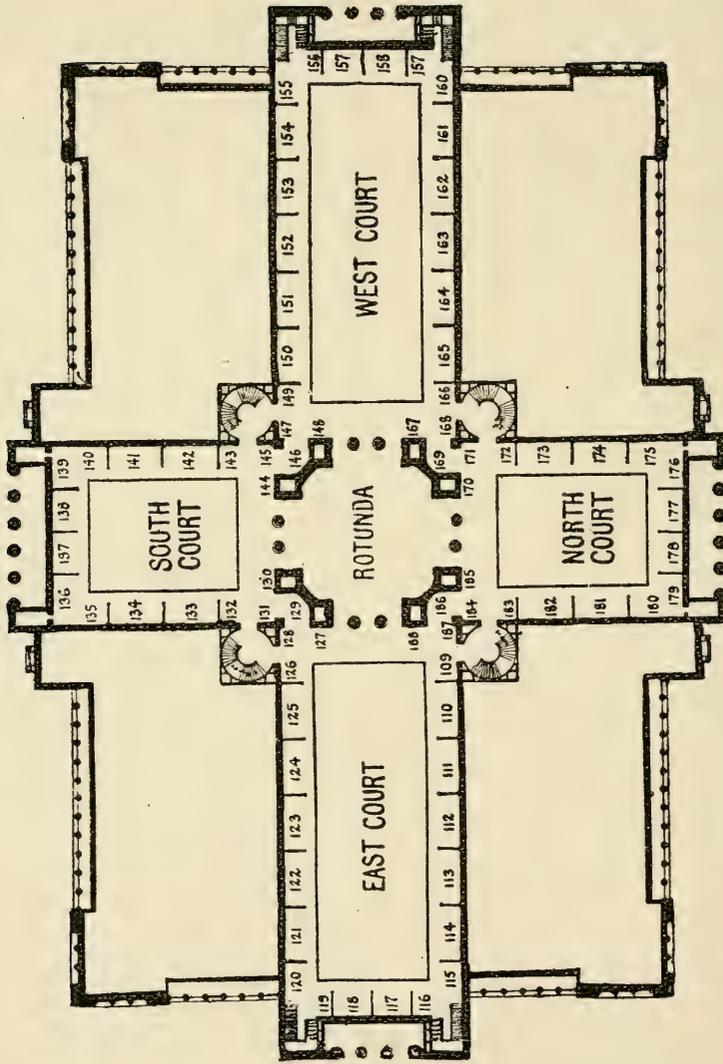
The group of fictile materials contains chiefly representative specimens of clays of different localities, both domestic and foreign, and illustrations of the uses of these in the making of stone ware, tiles, terra cotta, fire brick and assayer's apparatus. A series as yet incomplete illustrates mineral paints in their many modes of occurrence.

The non-metallic minerals of use in the arts include a series showing specimens of crude asbestos from almost every known locality and illustrations of the uses of asbestos in various manufactured articles; a collection of varieties of Florida, South Carolina and Canadian phosphates; varieties of salt from different parts of the world; sulphur from several localities; specimens of mica, fluor-spar, pyrite, selenite, etc., all of which have industrial application.

The chief feature of the collection illustrating mineral statistics is a column made up of cubes of different minerals, the volume of each of which is the output of that mineral by the mines of the United States for each second of time for the year 1892. This is supplemented for successive years by exhibition of the charts published by the U. S. Geological Survey which shows the mining statistics of those years.

In the laboratory of the department, tests of minerals and ores are made and a type series of blowpipe tests are shown.

Here also are exhibited sketches enlarged from wood cuts in *De Re Metallica* which have historical interest as showing the methods of mining and metallurgy in use in the sixteenth century.



PLAN OF DEPARTMENT OF BOTANY.

THE DEPARTMENT OF BOTANY.

Upon careful consideration of the mass of material comprising the collections in botany and forestry the Director decided that the galleries of the building would furnish the best light and most advantageous position for the riches generously donated for this department of natural history.

On the first of February the installation began. The plan decided upon was that the arrangement should be by countries and they in geographic sequence. The installation commenced in the south-east corner of the south court gallery, and extended to the right through the galleries of the four courts; the sequence of the countries represented being Russia, Corea, British India, Ceylon, Johore, Siam, Turkey, Spain, and Australia; then beginning at the Straits of Magellan, Argentine, Paraguay, Uruguay, Brazil, Equador, Venezuela, British Guiana, Curacao, Trinidad, Colombia, Guatemala, Mexico, United States, British America and Alaska, the collections of Alaska ending where Russia began.

The Imperial Commissioners of Japan having donated to the Museum all of their cases in the Manufactures Building, these were reconstructed by forming two cases out of three of the originals, thus casing the entire galleries uniformly from this donation alone. The special aim of the installation has been to insure scientific arrangement, although when possible without detriment to the natural sequence of species, an attempt has been made at sufficient display to please and attract the general visitor. The objects installed from all countries were taken with the labels as placed upon them during their exhibition at the Exposition. Sufficient time has not yet elapsed to study into the correctness of these identifications. This is especially to be remembered by all who desire to enter into a discriminative study of the collections as they are now installed.

Full identification of all specimens in this department is now proceeding, and the labeling will be corrected from time to time until scientific accuracy shall be attained.

A number of special collections not accreditable to any special country were donated or have been formed. These are placed around the central rotunda upon the transept gallery floors.

In order that some idea may be gained of the character and value of the donations acquired for this department, description will follow of the specimens in gross of each country.

Russia donated a collection of tobacco comprising the original natural species (*Nicotiana rustica*) from which most of the finer cultivated forms have sprung. The balance of the specimens are varieties of the form known as "Turkish leaf" illustrating the growth of this form in different sections of the country. These are installed in the first case. The second case contains a fine collection of dressed and undressed flax, together with the plants from which the forms were obtained. Following this is a complete collection of products of the linden, or lime tree (*Tilia parviflora*), from the last layers of which the Russian peasant derives the major portion of his household appurtenances. Among the specimens will be found the natural bark and fiber both crude and macerated, bags, mattings, ropes, harness, shoes, trunks, etc., etc. Following this is installed twenty-one logs and twenty-three planks of the principal construction timbers of Russia and in the end case of the section, the products of the distillation of refuse pine. Within the section are arranged seven cases in which are installed samples of the cereals and legumes, being probably as complete a collection of the species and varieties of the agricultural seeds of Russia as was ever brought to this country.

Following this collection is a case devoted to the few timbers and other products exhibited from the peninsula of Corea. It might be remarked that the timbers of Corea bear strong resemblance to, and in many cases are of the same species as those of Japan. Among the other products of Corea here displayed, the most interest lies in the dried persimmons and dates, and in the silvernuts and lotus seed.

Japan gave to this department her complete display from the Forestry Building, as well as a full set of her agricultural products from the Agricultural Building. Her section as installed, is surrounded by a reconstruction of her bamboo pavilion from the Forestry Building, and contains a very complete exposition of her timbers, ornamental woods, teas, rices, and minor products. The first case in the section contains the useful fibers of Japan, the tobaccos, and fifty varieties of tea. The second case contains thirty species of insects injurious to the useful plants of that country. This

beautiful and highly scientific collection, showing the successive phases of insect development, also the injury caused by them to the plants upon which they prey, was prepared for exhibit in the Japanese section at the Exposition, but, on account of lack of space, was not unpacked. The collection of timbers and small woods is very complete indeed, comprising over eighty species, all of which are represented both by the wood and the bark, and in most instances the botanical features are also illustrated by excellent colored plates from a work now in progress of publication in that country upon the sylvia of Japan. The series is very comprehensive and contains also many specimens representing the utilization of the wood. Large paintings accompany the collection showing timber operations in Japan. These are particularly interesting on account of the similarity they bear to those carried on in this country. Although originally no bamboos grew upon the islands of the Japanese Archipelago a collection of fourteen varieties, excellent examples, of great strength and beauty, will be found in this section. The cultivation of the bamboo has been a special study among the Japanese who by careful horticultural processes have brought forth these useful products. Among the various minor products of the Islands, the collection comprises various starches, charcoals, camphor, lacquer, edible mushrooms, and many other important products. The wood pulp and wood acid industries are also well represented. The rices, cereals, legumes, tan barks, fibrous barks and dye stuffs in the collection deserve special mention. Among the ornamental woods great interest lies in the standard of Toko posts, natural trunks of ornamental trees, either denuded of their bark or with the bark intact used in the construction of the Toko or ornamental place of honor in the Japanese parlor where ceremonial tea is served. This place is dear to the heart of the Japanese hostess, and is generally furnished in the height of Japanese neatness and artistic taste. These posts support a canopy, and are always of some natural unhewn wood, often decorticated, or partially so. The woods chosen for Toko posts are generally those of high commercial value or especial rarity.

The next section, that of British India, contains a large number of specimens of the minor products of the country, including dyes, lacs, starches, oils, gums, etc., etc. The woods of the country are excellently represented by over one hundred species arranged against the walls of the section. A beautifully carved *padouk* doorway is flanked on each side by carved blackwood jardinières. Among the specimens of the principal woods of the country are to be found log sections with and without bark, satinwood, sandalwood, teak, blackwood, and others of great interest. A single piece of *padouk*

board cut in a circle six feet eight inches in diameter, intended for a table top, is mounted in the center of the section.

The next country in sequence, Siam, is represented by seventy-two specimens of her commercial woods and many examples of starches, oils, gums, dyes, etc., etc.

Johore follows with two hundred and twenty-seven specimens of her woods with bark intact, in excellent form for study, together with many specimens of the more commercial timbers in board shape, and a large collection of the different varieties of rattan which form so great a portion of her commerce.

In the west court may be found among the gifts from Ecuador fine examples of her woods represented by two hundred specimens, and her economic forest products and agricultural grains by over one hundred specimens.

The next installation is that of the United States of Colombia with seventy specimens of woods and nearly one hundred peculiar products of the forests of that country, including gums, resins, oils, and other tree products.

In the Venezuelan section will be found a most excellent series of typical specimens illustrating their timbers, and in the cases a fine set of their fibers, including cottons, barks, cereals and medicinal plants.

The British Guiana section is rich in the timbers of that country as well as in the starches, oils and other economic products.

Trinidad contributes forty-one fine specimens of the woods of the island to the wealth of specimens in the forestry section of this department, and many specimens of economic plants, gums and cereals.

Curacao contributed sixty-seven fine specimens of her woods all retaining the bark; wax replicas of her fruits, and numerous specimens illustrating other economic products of her vegetable wealth.

In Guatemala, the next section, is installed a complete series of the timber trees of that country, represented by three hundred and fifty specimens and a large number of fibers, including cottons, together with a full representation of her cereals, legumes, gums, resins, *chicle* and rubber.

In the Jamaica section, the installation of one hundred and thirty beautiful specimens of her woods brings this island into special prominence. These woods all retain their natural bark. The cases in this section illustrate through her generous donation the various starches, oils, gums, resins, cereals and other products.

The Mexican section well illustrates the remarkable vegetable wealth of that country. Here will be found installed a very complete set of maguey (*ixtle*) fibers, while the cottons are also excellently

represented. A very large and complete collection of the medicinal plants and seeds of the country is contained in five large cases, and a full set of the timbers, tan barks, gums, resins, etc; a collection which represents all of the principal states of the country.

In the order of the installation this completes the galleries of the west court. Passing thence to the right in the north court will be found installed principally the collections "loaned" to this institution by the Government of the United States; exhibits comprising that of tobacco and cotton from the Agricultural Building, fibers and fiber yielding plants, and a nearly complete representation of the sylvia of the United States, from the Government Building, with many fine series presenting the results of timber tests as made by the Section of Forestry, Department of Agriculture. In this court are also installed a number of standards containing types of herbaceous plants and specimens representing various forms of marine vegetable life.

The galleries of the south court contain at present a miscellaneous installation of peculiar timber specimens either excessive in size, beautiful in makings, or of rare occurrence, that were contributed to the collections of this department by the states of Kentucky, Washington, Oregon, Louisiana, Virginia and California, and a number of full trunks and planks of the four principal commercial timber trees of Alaska. These galleries, now temporarily occupied by this miscellaneous collection, are reserved for a complete forestry and economic plant collection of North America, to be specially made by this department. The various home forestry collections exhibited at the Exposition which were obtainable by the Museum were mostly of a more or less heterogeneous character as to shape and size, and of an ephemeral nature as they were gathered while the sap was in the pores of the wood and had commenced to decay in large part before the end of the Fair. For these reasons a few especially fine or rare specimens only were retained.

On the east side of the south court is installed a complete set of indigenous and cultivated trees of the State of Illinois represented in trunk form showing the grain of the wood. This collection is supplemented by a case of the agricultural grains of the state.

Hung upon the walls of the central rotunda is a set of large frames containing the principal genera of North American plants arranged in their natural order.

A case placed at the beginning of the north court gallery contains a very complete and scientific set of the insects injurious to the timbers of Sweden with sections of wood showing their destructive action. Oposite this collection is a case containing a complete representation of specimens of the manufacture of household imple-

ments from wood pulp. Next to this case in the east court is installed a similar one containing specimens illustrative of the manufacture of paper from wood. On the transept floor of the north court three cases are placed—one containing marine algæ, the second a very full collection of North American lichens, the third a representative set of North American mosses. These cases are intended to illustrate some of the lower forms of vegetable life. At the end of the east court is installed a large case showing specimens of a complete set of cereal foods of North America. On the transept floor of the south court a case is placed in which is also partly installed a set of replicas of tropical fruits together with various products that are gained from them.

At the beginning of the south court gallery is placed a case containing a set of the products of the Cork Oak (*Quercus Suber*) with many sections of the bark showing the effect of peeling. Accompanying this case is a complete peeling of a whole trunk and its three branches, a valuable example of dexterous decorations.

It is the intention of this department, in time, to fill the galleries of this east court entirely with a representative collection of the sylvæ of the United States, both commercial and non-commercial, together with as complete a collection as possible of all the economic plants of North America.

These collections complete two sides of the south court gallery. Passing into the west court, the first case is devoted to the plant economics of Siam. Many curious and noteworthy products are well represented.

From Siam westward no products were gained east of Turkey, whose commissioners donated a fine set of natural woods, which, even a casual observer will note, bear a striking resemblance to those of our country.

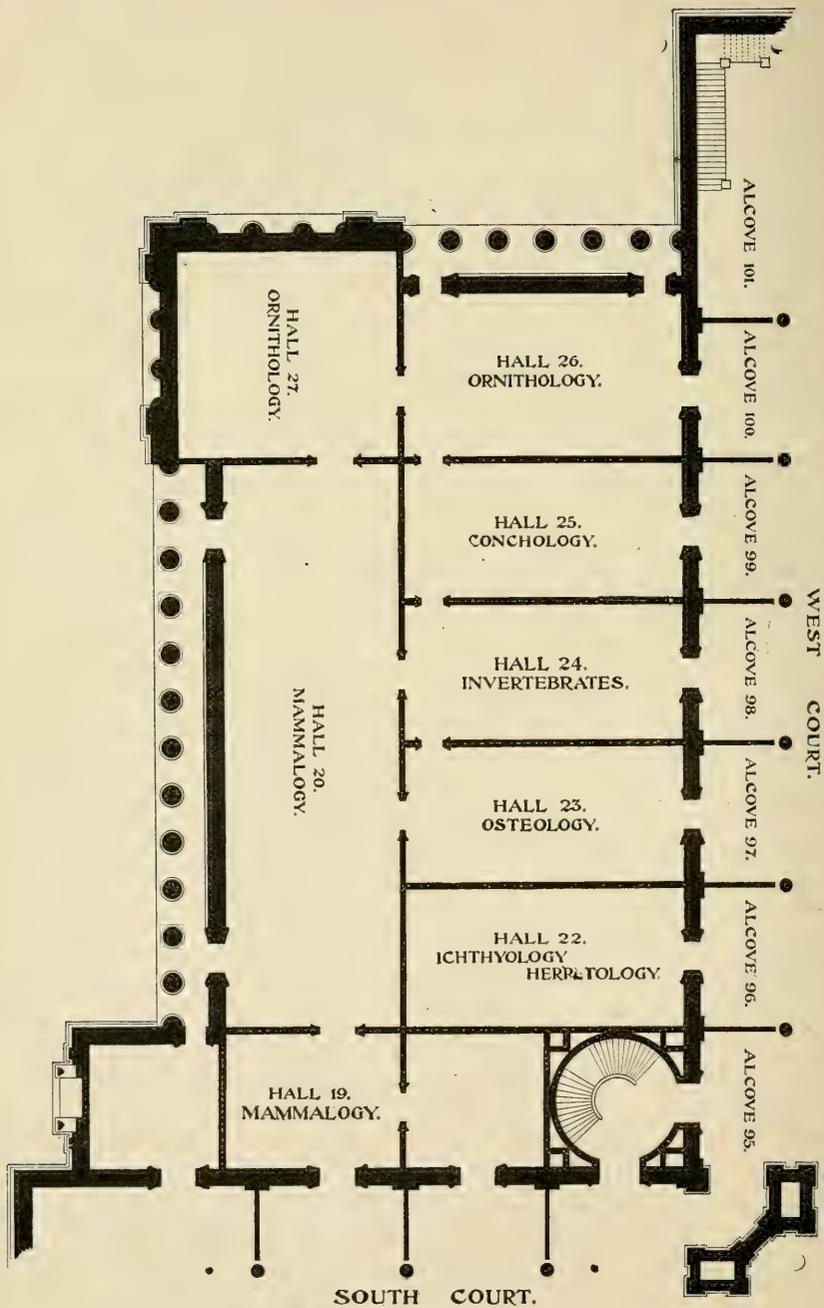
Spain follows with forty-six examples of her natural timbers, many natural fibers and tan barks, and especially interesting is a large comparative collection of her olive oils representing the product of the various provinces.

In the order of installation, Liberia follows with a case of various minor products, notable among which are vegetable ivory, cam wood, India rubber, calabar-bean and various cereals and legumes now cultivated by this new civilization.

The New South Wales collection is particularly interesting in the size and beauty of the timbers exhibited. The most important came in immense timbers of fine grain and excellent quality. The tan barks and other minor products have also a place in this collection.

Probably one of the finest collections ever taken out of Paraguay forms the next installation. The timbers, one hundred and thirty-two species in all, are represented by large log sections having one face dressed, while a complete set of tan and dye barks, one hundred and seventeen in all, are included; a large number of charcoal and many fiber producing plants show well her resources in minor products. A very complete collection of two hundred and thirty-four medicinal plants fill the cases of the three sections devoted to this country. An exposition of her *yerba* fills one of the cases.

Any visitor to the Exposition who noted the wealth of materials that Brazil contributed to increase the interest of the Forestry, Agricultural and Manufactures Buildings, will recognize the large collections in all these departments that go toward filling the five sections devoted to the display of her natural products. In timbers alone, more than a thousand specimens were donated to us, many of which are not yet prepared for installation, while of oils, gums, resins, fibers, fruits, seeds, grains, coffee, etc., an almost complete representation may be found in the cases of the sections devoted to this country. Each state of Brazil contributed from her forests toward this wealth of specimens. Medicinal plants are also excellently represented by over two hundred specimens.



PLAN OF DEPARTMENTS OF ZOOLOGY AND ORNITHOLOGY.

THE DEPARTMENT OF ZOOLOGY.

This Department includes all the classes of animals except that of the birds. For this material six large halls of the museum building have been set apart. These halls bear the numbers nineteen, twenty, twenty-two, twenty-three, twenty-four, and twenty-five. In several of them new cases of the most modern style will soon be built, and these will show the materials to be exhibited to the best advantage.

One of the most interesting and valuable of the zoological collections is that of the Coelenterata, a group which includes the jelly-fishes, the hydroids, the sea-anemones, and the corals. Of the corals there are about 300 species. Many of these are represented by from two to ten examples. The collection includes a number of specimens which have served as types of new species. Many of the specimens are large and fine, and the collection gives a fair impression of the great variety of form, structure, coloration, and luxuriance of growth of these "flowers of the sea." Accompanying the collection of corals is a number of glass models which show, on an enlarged scale, the structure of the corals and especially that of the animals whose united skeletons form the solid mass. Several of the more interesting of the corals, especially those which do not secrete a firm skeleton, are preserved in alcohol. Glass models also show the form and structure of some of the jelly-fishes, the Portuguese man-of-war, etc.

The subkingdom of animals known as the Echinodermata includes such animals as the crinoids, the brittle stars, the starfishes, the sea-urchins, and the sea-cucumbers. This is represented by about 300 species and something over a thousand specimens. The greater number of these are prepared dry, but there are many preserved in alcohol, especially specimens of the holothurians and crinoids. The sea-urchins are shown both with and without their armour of spines; and some are divided so as to show the internal surface and the dental apparatus. The collection is sufficiently large and varied to give

the observer a conception of the structure and the strange and various forms of these creatures, many of which present an appearance wholly different from that of any other group of animals.

The subkingdom of worms is very indifferently shown in the museum collections. The same is true of both the bryozoa and the brachiopoda, although there are representatives of both groups.

The class of crustacea is represented in the Museum by about 225 species, sixty genera, and fifteen families. Many of the specimens belong to the larger and more strangely modified forms, and the collection, so far as it goes, is valuable.

Insects are represented by an exhibition collection of the more conspicuous of the butterflies and moths.

The mollusks are arranged in Hall 25. The specimens are mounted on blocks of wood and are contained in flat cases, which furnish about 1,260 square feet of space. There are now present about 3,000 species. These are arranged in sets, so as to show age, manner of development, and amount of variation; classes, orders and families are indicated by printed labels, which state the principal characters of each group. The collection was intended to be a representation of the molluskan subkingdom; and, as far as possible, species typical of the various groups have been included. About two-thirds of the sections and valid subgenera are shown. A large proportion of the species in the collection are represented by very fine specimens, while a considerable number, especially those devoid of shells, are preserved in alcohol. This includes more than twenty species of cephalopods, and among these is an unusually perfect specimen of the pearly nautilus. There are also glass models, made by Blaschka of Dresden, which illustrate some of the species and their anatomy.

The classes of vertebrates are very unequally represented; of the fishes, there are at present but few in the collection and these are stuffed and mounted. These include sharks, rays, the sword-fish, etc. There are also about seventy casts of the food-fishes of Norway, of life size and painted so as to display their natural and often brilliant colors. These casts formed a part of the Norwegian exhibit at the Columbian Exposition.

Of reptiles there are about sixty species in the cases. Most of them are the larger and more conspicuous forms, such as the gavia, cayman, alligator, pythons, large tortoises, and some of the larger lizards.

The collection of mammals occupies Hall 20. As in the case of the other groups of animals, the effort has been to bring together specimens that would illustrate the whole of this important class. Accordingly, there are included representatives of all the liv-

ing orders of mammals. No attempt has been made so far to illustrate the fauna of any particular region of the globe; and accordingly, the great majority of species are wanting.

Among the more interesting of the species in the collections of mammals are, a young gorilla and some of the other man-like apes, a number of species of lemurs, species of the family of cats, civets, hyænas, the panda, bears, seals, the walrus, the Malayan tapir, the zebra, bison, the musk-ox, the Rocky mountain sheep and goat, giraffe, a number of genera of the insectivora, fruit-eating bats, manatee, dugong, the ant-eaters, armadillos, sloths, a considerable number of Australian marsupials, the echidna, and the platypus.

The osteological collection occupies one hall. It includes representatives of thirty-three orders of vertebrates, 149 families, and 225 species. Nearly as many genera as species are shown. The skeletons of the mammals and birds form the greater portion of the collection, but there are twenty skeletons of reptiles (sixteen families), ten of amphibians (seven families), and fourteen of fishes (fourteen families.) Among the more interesting and conspicuous of the skeletons are those of the larger monkeys, lion, tiger, hyæna, grizzly bear, polar bear, sea-lion, walrus, sperm whale, right whale, manatee, dugong, rhinocerus, hippopotamus, giraffe, elephant, many rodents, marsupials, echidna, platypus, the golden eagle, hornbill, carnivorous parrot, owl-parrot, ostrich, emu, apteryx, and flamingo.

The museum has recently purchased of Ward, of London, and of Prof. Steere, from his Philippine collection, a number of skins and skulls as well as mounted specimens that will materially strengthen the mammal collection.

THE DEPARTMENT OF ORNITHOLOGY.

The Department of Ornithology has for its present quarters, Hall 26, which is occupied as an exhibition room for the mounted birds, and a gallery six feet in width around the walls of Hall 27, besides one small ante room in the main south court.

The mounted collection, as it stands to day, is essentially one of comparative ornithology, in which the bird fauna of the world is represented by some 650 species, typifying the eight principal orders of the class, as set forth, or characterized, by G. R. Gray in his hand list of birds. Examples in ninety odd families are presented for comparison.

In a collection so limited as to numbers and species it is, of course, impossible to find the special form of any particular area or region adequately shown. Consequently it will not surprise those conversant with such matters that our North American bird life is only very meagerly displayed by some 150 species out of a possible 825.

Among the treasures of which the Museum can, however, boast is an excellent pair of the now (probably) extinct Labrador duck (*Camptolaimus Labradorius*).

The gallery in Hall 27 is occupied by 'bird cans' containing the bulk of the 'Cory collection' of West Indian birds. Also the excellent ornithological library, formerly the property of C. B. Cory.

The 'Cory collection' is probably without a rival in West Indian material. But while in its formation special attention was bestowed on the West Indies, yet the American fauna as a whole was not neglected and material is abundant for serious and profitable study and investigation in any department of American ornithology.

The collection to-day is neatly and carefully arranged in 130 large cans, chests and cases, that are made practically moth and dust proof.

In additton to the Cory collection the study series of skins was enriched during the year by the acquisition, through gifts, and by purchases of several small lots of North American birds from Mr. H. K. Coale, of Chicago. Also by gift from the Commissioners of the Exposition from the Argentine Republic, an interesting collection of South American birds. Recently Mr. Frank Vincent, Commissioner of the Exposition from Trinidad, presented a lot of mounted birds from the Island of Trinidad.

The Department has sent a representative to the Island of San Domingo to make explorations in the southern and interior part of that now little known land, while the Curator is at work in Florida.



AYER HALL.

THE DEPARTMENT OF ANTHROPOLOGY.

Anthropology, covering a wide field in the interests of the race and furnishing a vast range of materials available for museum purposes, naturally becomes a prominent feature in the young Museum. The founders were fortunate beyond precedent in securing at the outset extensive and important collections representing many widely separated portions of the world. The materials relating to Anthropology in its widest sense are not assembled under a single head, but are separated into two departments. During the Exposition a great group of exhibits had been brought together within the Department of Transportation to illustrate the evolution of the carrying industry, beginning with its inception in remote times and extending down to the present day. These exhibits when transferred to the Museum building were largely augmented by collections from other departments. All of this material, together with a number of exhibits illustrating other industries of especial importance to civilized man, including ceramics, the textile art, the leather industry, jewelry, etc., were brought together in a Department of Industries, leaving to the Department of Anthropology such of the field as relates to comparative primitive culture, besides such of the phenomena of higher culture as have little direct bearing on the material interests of civilized peoples. Belonging to this department are also the psychical and physical laboratories and collections of cranic casts, etc., illustrating the physical characteristics of man. Another limitation of the department not yet fully defined, may be referred to in this place. The fine arts proper and especially painting and sculpture, are not at present made a feature of the exhibits, although their beginnings among all primitive peoples are necessarily included. It may in time be found essential to an ideal completeness of the department to extend the limits to include more fully the systematic presentation of all the phenomena of art, although works of painting and sculpture

and allied arts of taste, illustrated by extensive collections, are properly assembled in Art Museums, where they serve a practical purpose of great importance, affording necessary facilities for the study of art.

The separation of an æsthetic group from the great body of anthropologic materials is exactly paralleled by that of the segregation of an industrial department. The one has, or should have, in view the material, industrial benefit of the race, present and future, bringing together such illustrations of past and present progress as will point the way to higher development; the other comprehends the æsthetic in material form and has functions of the greatest possible moment to the progress of enlightenment. While it is necessary that these departments be built up as great practical schools, they should not so absorb or separate any single part of the whole field of anthropology that the general effect is lost. The great function of an anthropologic museum or museum department, however subdivided, is to place illustrations of man's works, and, to a certain extent, of man himself in such relations that all possible lines of progress may be discovered and utilized,—that men may learn every secret of development, every law of progress, so thoroughly that the knowledge can be utilized intelligently in the making of future history. The institution that can bring together this department in all its completeness, together with the departments of Nature-Botany, Zoology and Mineralogy, representing that upon which progress feeds, in the most thoroughly connected view is the grandest possible institution that man can conceive.

It will be impossible to present in this place a complete account of the various collections now assembled in this department. Much of the materials acquired through the Exposition will no doubt, be fully described in the various reports of officers, exhibitors and judges, and it is expected that, from time to time, bulletins, memoirs, etc., will be issued by the Museum, giving exhaustive accounts of the more important collections in each department.

The collections may be classified as to their immediate origin under the following heads: First, those acquired by the Department of Ethnology of the Exposition, by collection, purchase and gift and transferred to the Museum at the close of the Fair; and second, those acquired by the Museum directly, by collection, purchase and gift during the period of twelve months intervening between its inception and the present date. Aside from these resources the presence of a number of loan collections adds to the volume of exhibits.

Among collections of exceptional importance are: The collection from the Haida Indians, North Pacific coast, by James Deans; donated by the department of ethnology, W. C. E. Archeological collection from the Hopewell group of Mounds, Ross county, Ohio, made by Warren K. Moorhead; donated by the department of ethnology, W. C. E. Archeological collection from New Jersey, made by Ernest Volk; donated by the department of ethnology, W. C. E. Collection of casts and ruins of Yucatan, made by E. H. Thompson; donated by the department of ethnology, W. C. E. Archeological collection from Ancon, Peru, made by Geo. A. Dorsey; donated by the department of ethnology, W. C. E. Collection from Bella Coola Island, Canada, made by Phillip Jacobson; donated by the department of ethnology, W. C. E.

The following purchases are especially of great extent and value: Collection from the inhabitants of Yucon Valley, made by Marcus O. Cherry; donated by the department of ethnology, W. C. E. Archeological collections from the Southern States, purchased of C. W. Riggs. Collection of gold and silver ornaments and other specimens, purchased from Gen. Manuel Flores. Ethnological collection from Paraguay, purchased of Dr. Emil Hassler. Archeological collection from Wisconsin, purchased of Walter C. and Edward T. Wyman. Collection of gold jewelry from Colombia, S. A., purchased of the Columbian Commission, W. C. E. Collection of Irish antiquities, purchased of Edmund Johnson.

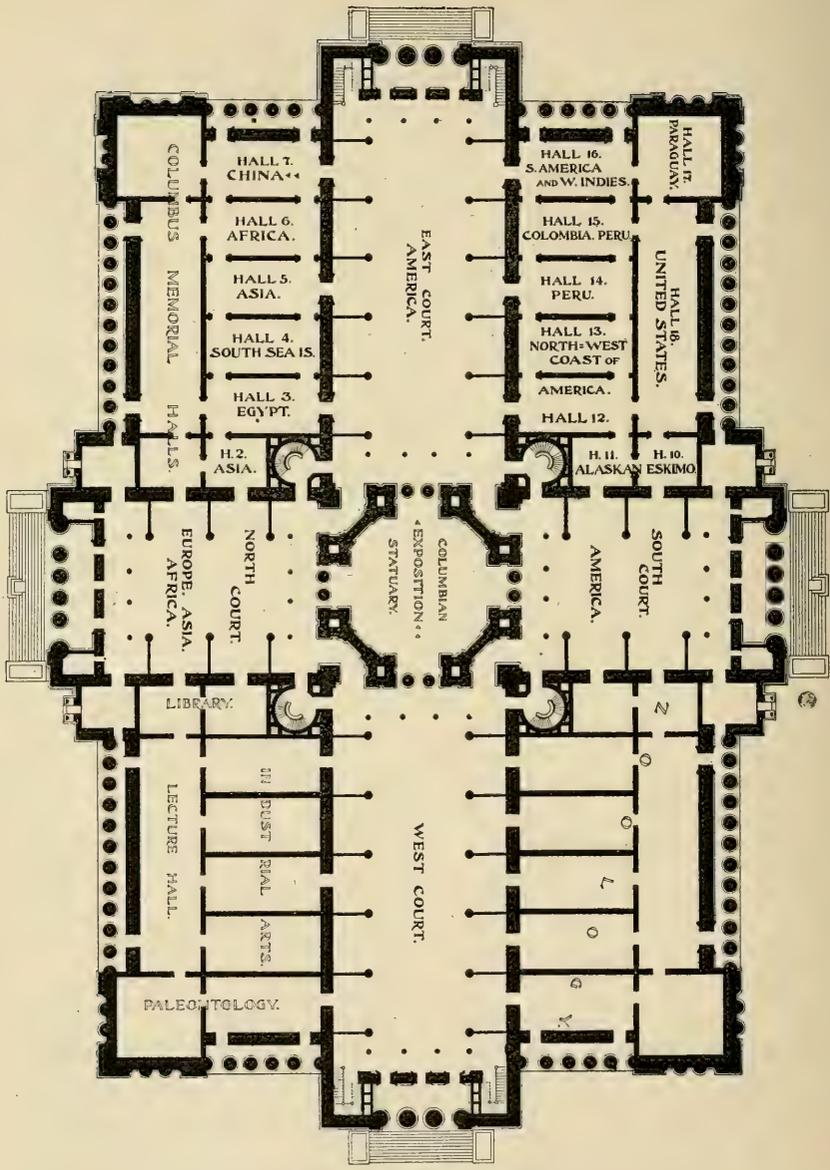
The grouping at the present time is very considerably changed from that of the opening day, June 2nd, 1894, and changes are still going on as installation is improved and new collections are added. A sketch of the present placement may well be given here. The floor space occupied approximates 80,000 square feet and includes fifteen halls and most of three great courts. It is estimated there are 48,000 entries for the catalogue now under preparation in this department.

SOUTH COURT—HALL OF ABORIGINAL AMERICAN SCULPTURE.

This court is occupied by a great series of casts of Central American sculptures, and a number of similar exhibits from Mexico and Peru. There are also four imposing totem poles or heraldic columns from the North west Coast tribes, and a series of photographs representing Central American sculptures and architectural remains.

EAST COURT.

This court is at present largely occupied by collections illustrating the archæology of North America. In two instances the alcoves which surround the court are filled with exhibits germane to the halls for which they serve as lobbies; thus alcove 82 contains collections



PLAN OF DEPARTMENT OF ANTHROPOLOGY.
 (Comprises Sections with heavy face titles).

relating to the archæology of Egypt, and alcove 93 is occupied by works of the Northwest Coast tribes. A group of boats, mainly pertaining to primitive peoples, is installed in the court near the west end and it is expected that in the near future these and the several unclassified exhibits, now occupying the east end of the court, will give way to the Viking Ship and the Columbus Caravel "Santa Maria."

NORTH COURT.

The following rather miscellaneous exhibits occupy the north court: A model of the new Reichstag, or Parliament House, at Berlin, Germany; a collection of musical instruments, filling five cases; a collection of antique objects of bronze and glass from various localities in Southern Europe, filling five cases, and three cases of reproductions of Irish antiquities. In alcove 118 is the nucleus of a collection intended to illustrate the development of printing; alcove 122 contains the Gunning loan collection of idols, etc., and alcoves 123 and 124 are occupied by casts of Assyrian antiquities forming a part of the collection installed in the adjoining Hall 2.

THE HALLS.

Hall 2 contains the Berlin collection of plaster casts of Chaldæo-Assyrian antiquities.

Hall 3 is occupied by the collection of Egyptian antiquities.

Hall 4 is devoted to much diversified collections of ethnographic material from the Pacific Islands.

Hall 5 contains Siberian, Japanese, Javanese, Singalese and East Indian materials.

Hall 6 has an extensive series of ethnologic exhibits from Africa.

Hall 7 is occupied by the contents of a Chinese Joss House or temple, consisting in the main of gaudily dressed *paper mache* figures forming religious tableaux.

Halls 10 and 11 contain the larger part of the Eskimo material representing North Greenland, Alaska, and to a limited extent, Eastern Siberia.

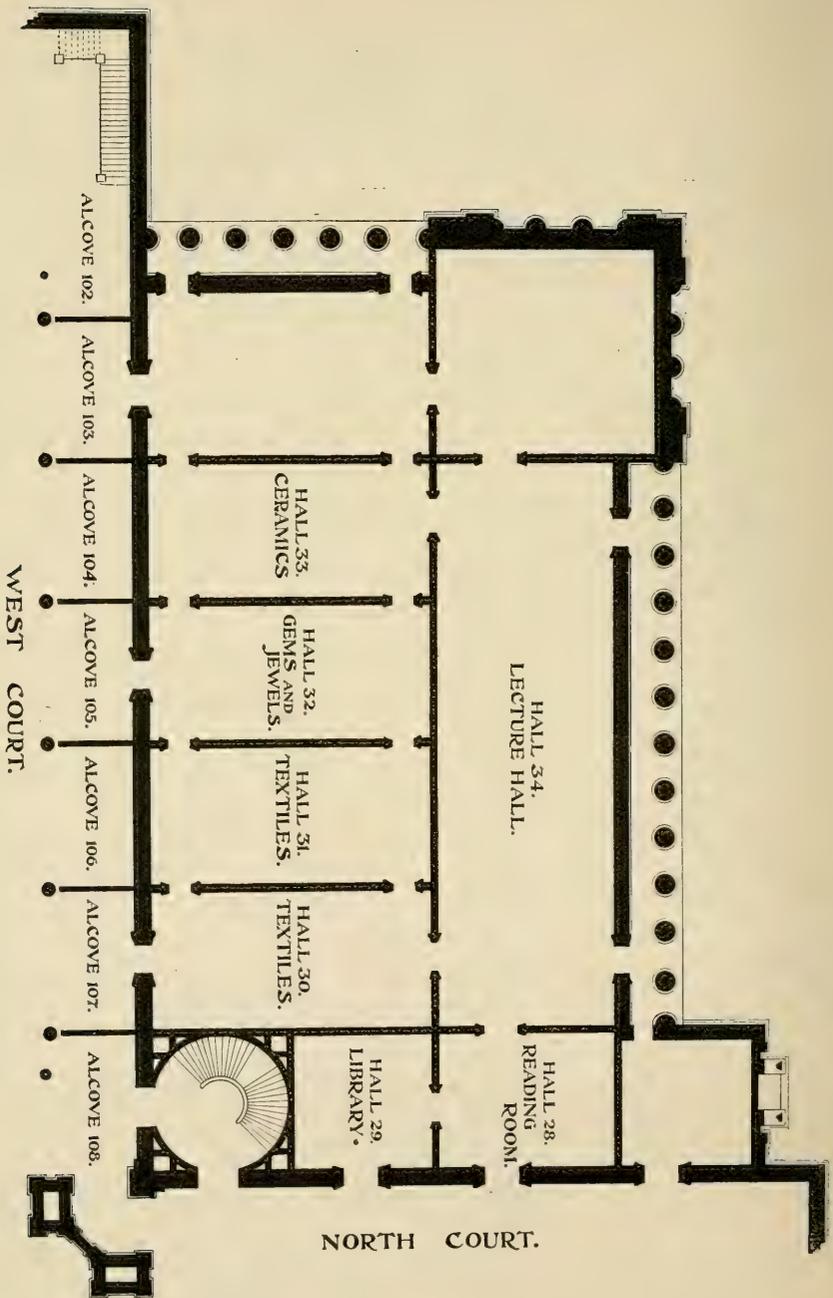
Halls 12 and 13 are filled with a fine assemblage of ethnologic specimens from the Northwest Coast.

Halls 14 and 15 contain extensive collections of antiquities from Peru, Colombia and other South American countries.

Halls 16 and 17 are occupied mainly by ethnologic collections from South America including superb materials from Paraguay and British Guiana.

Hall 18, Ayer hall; in this fine hall is placed the great collection of North American ethnologic material presented by Mr. Edward E. Ayer.

The physical laboratory and collections illustrating the physical character of the race together with the apparatus of the psychological laboratory are installed in the gallery of the East Court occupying the south and east sides.



PLAN OF INDUSTRIAL ART SECTIONS, LIBRARY, ETC

THE DEPARTMENT OF INDUSTRIAL ARTS.

The collections in the Department of Industrial Arts have been arranged to show as far as possible the more important steps which have led to improvement in handiwork, or progress in the invention of those implements, machines, and processes which have proved to be important factors in the world's material development.

TEXTILE INDUSTRIES.

It is intended to show in the section of Textile Industries the beginnings and development of the art of weaving and spinning.

One hall of this section has been set aside for the installation of such old looms as can be obtained and models of the more modern types together with the appliances used by uncivilized peoples. Sufficient material has been obtained and is now being installed to justify the belief that the collections when properly arranged will be of much interest and instruction to visitors and students.

The objects of greatest interest in Hall 31 are two old looms—one constructed and used on the Kentucky frontier during the last century, with a well preserved specimen of the weaving in process of being made, and one of the first, if not the first, Jacquard loom used in America for the manufacture of what is known now as ingrain carpet. These looms are in excellent condition, there being nothing missing or any modern addition made to them.

In a half completed condition there is an example of what the Jacquard loom has done in the way of weaving carpet—an excellent specimen in the way of construction—being of old Germantour yarn.

There is also a model of a Japanese hand loom such as is used to-day for the weaving of silk tapestries, also a small pattern in many hues partly woven, and a metal model of the mechanical portions of a Jacquard loom of the present day.

Uncivilized races of North, South and Central America have furnished a few very interesting specimens of their handiwork in the construction of looms and the material thereon.

There is to be found in this hall a well arranged collection of various specimens of flax, hemp and jute and the processes under which these products are treated before being placed upon the market in a manufactured state.

In an adjoining hall will be found one exceedingly interesting specimen of antique weaving, a Persian altar rug, composed of twelve individual prayer rugs joined deftly and with considerable effect. This rug is of unknown age, but the donor states that it is several hundred years old. Two of its colorings—a most beautiful velvet green and a blue—resembling shades of malachite, are remarkably rich.

Of modern weaving there is an exceptionally valuable Japanese tapestry—Tsuzure Nishiki—representing the religious rites of the famous Nikko Temple, the magnificent architecture and the beautiful site of which are now widely known and admired. The manufacturers of this tapestry specially deputed an eminent artist to visit the temple in person for the purpose of drawing the original picture for this fabric, while historical authorities were freely consulted in reference to the costumes of those engaged in the religious celebration. In size it is 22x13 feet, and the fact that it required four years of skilled manipulation of fingers, unaided by any mechanical appliances, bears testimony to the wonderful skill of the Japanese people.

Americans looking forward to the development of the manufacture of art fabrics in the United States will view with great pride and interest an exact counterpart of the celebrated Gobelin tapestry in the form of a chair seat. This is the second piece woven on the Western Continent; it was made at the factory of Mr. Wm. Baumgarten, in Williamsburg, New York. The materials used in the production of this fabric are wholly American.

The Museum has been fortunate in securing a collection of about 800 splendid specimens of antique textiles dating from the third century, to and including the eighteenth century, embracing many rich

designs and coloring of brocades, velvets, damasks, and embroideries of many combinations. Also a striking collection of Italian tassels of probably the seventeenth century.

A recent acquisition to the Section of Textile Industries worthy of note is the collection of more than eighty well selected specimens of Indian fabric, of a brocade pattern.

GEMS AND JEWELS.

The collection of gems and precious stones installed in Higginbotham Hall is believed to be the most complete collection of its kind. It contains nearly every known gem or precious stone, in the finest cut examples, in crystals, cleavages or rolled grains, always of gem value.

Many of the objects in the collection are of historical interest and world-wide reputation.

The collection as a whole illustrates the Oriental, Singalese, Aztec, English, German, French and other methods of cutting, polishing and engraving gems and precious stones.

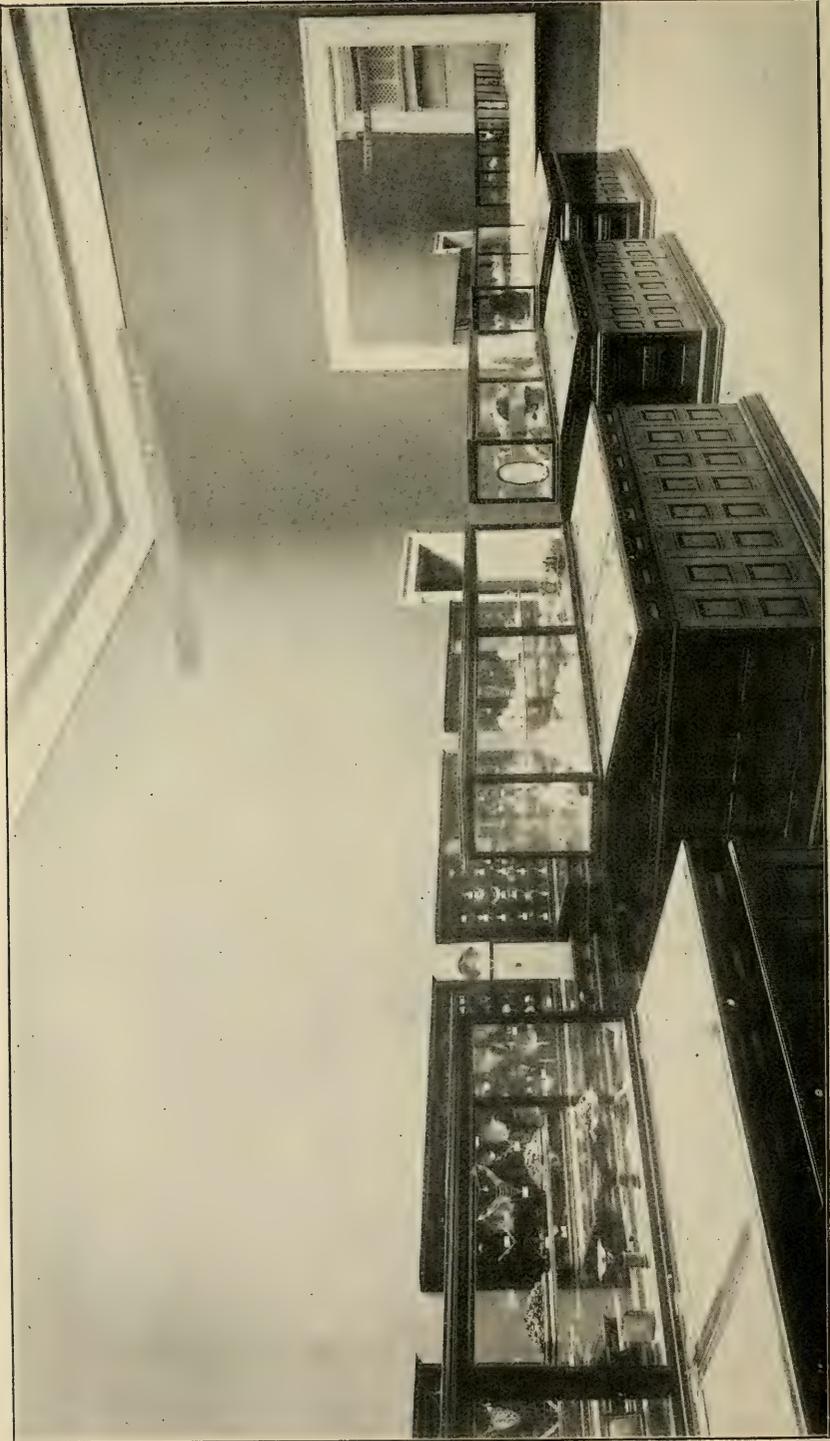
Among the objects attracting the most attention are: A screen "The finding of Moses" engraved on a thin section of rock crystal 9.3 inches in diameter believed to be the largest of its kind in existence.

A large pearl casket composed of twenty-six engraved crystal stones mounted in jeweled and enameled silver; style of the seventeenth century.

An engraved diamond by De Vrees of Amsterdam, shown in 1878 at the Paris Exposition. This, it is said, employed all of the engravers' spare time for five years.

A ninety-nine (99) and a sixty-six (66) karat yellow sapphire (oriental topaz) a fifty-nine (59) karat blue sapphire, also yellow, pink, white and other colored sapphires.

The Hope aquamarine 352 karat and other fine examples of sea-green, sea-blue, and other colored beryls.



HIGINBOTHAM HALL.

The collection of quartz and quartz cutting is considered equal if not superior to any in the world—notably:—

A large crystal sphere from the summit of Mt. Antero, Colorado, believed to be the largest crystal ball ever polished.

A group of crystal balls mounted on a stand of metallic leaves, representing fruit and foliage.

A series of fourteen crystals intended to show the various steps in the cutting of a brilliant.

A cut crystal from Mexico, the finest specimen of aboriginal work of this kind ever found in that country.

A collection of cut amethysts.

A fine specimen of hydrolite, the bubble, of symmetrical shape, being two and a half inches in diameter.

Opals in the native state, also engraved and polished—including the famous Sun God opal from the Hope collection said to have been known in a Persian temple for three centuries.

Superb moonstones from Ceylon.

Two large pearl shells from the west coast of Australia, weighing together 151.55-1,000 ounces.

A collection of cameos and intaglios—exceedingly fine examples of the glyptic art, containing many specimens cut previous and subsequent to 500 A. D. Among the stones used are red jasper, cornelian, onyx, chalcedony, sardonyx and smoky quartz.

The Tiffany collection of India jewelry forms the most complete series ever exhibited; many of the pieces are very old, of rare forms, consisting of rings, armlets, bosom ornaments, surah holders, ornaments for the forehead, hair, ear, nose, waist, ankles, upper arms, etc., together illustrating the remarkable variety of the ornaments and of the jewelers' handicraft practiced in India for more than 2,000 years.

This collection is divided into three sections:

1st. Objects made from pure unalloyed gold, as worn by the higher caste only, containing diamonds, rubies, emeralds, sapphires, pearls, garnets, rock crystals, etc., and embellished with rich red and green enamels peculiar to the Indian.

2nd. Collection of silver jewelry consisting of many large and beautifully wrought examples, worn by a lower caste.

3rd. Base metal jewelry, worn by the lowest caste.

The gold jewelry is from the cities of Delhi, Bijapore, Gujarat, Gwalior, Pajputava, Amritsar, Jeypore, Buddhi, Muttra, Bombay and Goa, with some excellent examples of Brahman work.

This collection also contains two large and handsomely designed maces of solid silver which were carried in advance of a maharajah by his attendants or on state occasions. Very few maces have ever been brought out of India.

CERAMIC INDUSTRY.

More to preserve the harmony of the general plans of installation in the building than to convey the idea that any particular headway has thus far been made in this very important division of Industrial Arts, a brief description of the more important items in Hall 33 is given.

The most striking possession is a handsome pair of large royal blue Berlin porcelain vases, nine feet high.

A large porcelain table centerpiece of Limoges ware.

Several interesting examples of Venetian glass.

Mexican, Swedish, Central American, Jamaican and Venezuelan pottery and earthenware

Contemporary types of Royal Worcester porcelain; also several porcelains from the Japanese Government in plates and small vessels.

A number of replicas of famous pieces all very faithfully reproduced and of much interest to collectors.

Among the vases are some admirable contributions from the Academy of Tokio, Japan, and from Stockholm.

A collection of English blue in plates and platters with American colonial decorations.

It should be stated that no effort has been made in the Ceramic Hall to other than care for and arrange with some attractiveness the material that has found its way naturally to the Museum. But this section will receive the attention and assistance it deserves the coming year.

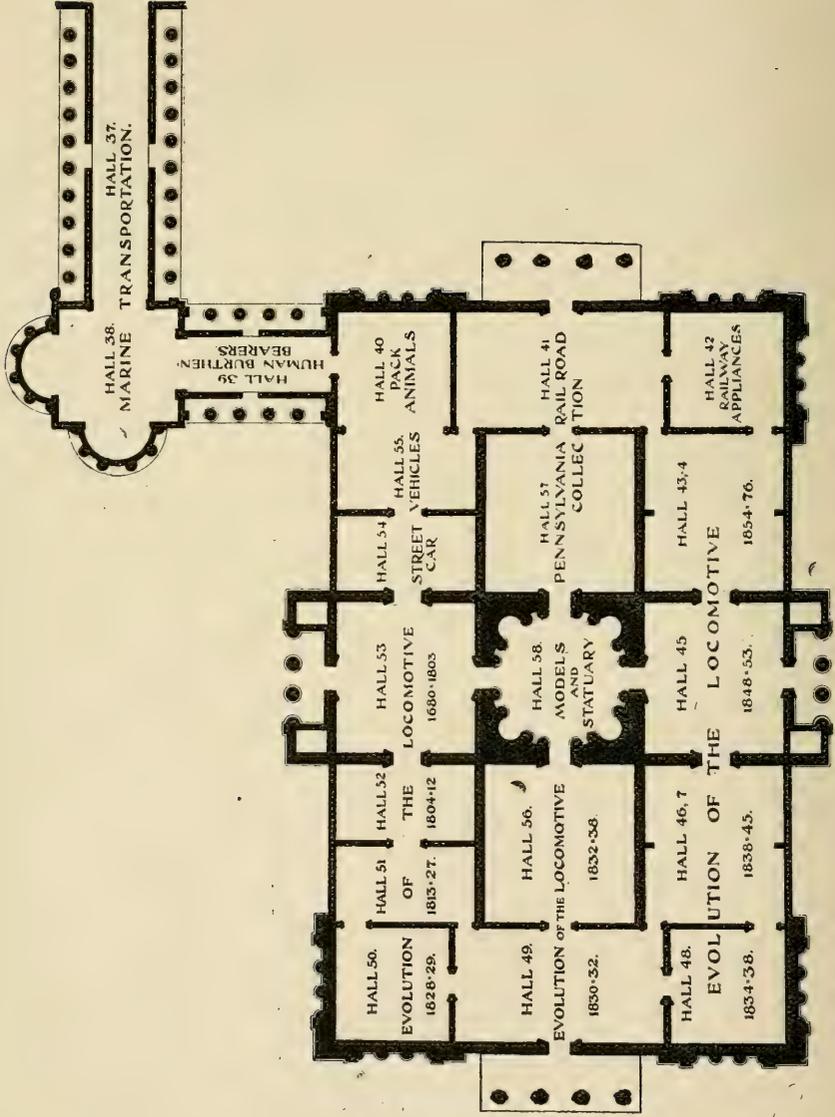
NOTE.—A collection that attracted no little attention during the Exposition and which is unique in character, is the Tiffany collection of skins, embracing dressed samples from all the mammals, birds, fishes and reptiles that it has been found possible to employ in the arts and industries. The collection was purchased of Tiffany & Co., New York, at the close of the Exposition and is installed in alcoves in the west court.

TRANSPORTATION.

The transportation division of the Field Columbian Museum embracing one of the largest divisions of the Department of Industrial Arts of the Museum, begins with marine navigation. In this collection is represented a series of original boats and models illustrating the various methods of propulsion; towing by men and beast, by pole, oar, sail and steam, the exhibit being arranged in order of development from the floating log to the steam boat, beginning with the original boats and models of primitive crafts from China, India, Burmah, Ceylon, Africa, Europe, countries and islands of the Pacific Ocean, South America and North America. Other important objects in the collection are the pleasure boats from different countries, barges of state from Turkey, India and Venice; sailing vessels, types from Norway to the Mediterranean countries, a series of models of river steam-boats and steam tow boats, showing the methods of transportation of large quantities of coal, lumber and logs. In connection with this are a series of photographs, prints and lithographs illustrating the development of the sailing vessel and the steamship.

Next in order of transportation are human burthen bearers, a collection of life size figures, male and female, illustrating the primitive method of transportation throughout the different parts of the world, and including a series of pictures which adds much to the interest of the exhibit. In addition, the collection embraces a series of models and originals of palanquins, sedan chairs and traveling hammocks. The palanquin which Mrs. French Sheldon used during her explorations in eastern Africa is here shown.

Following the human burthen bearers are the pack animals, acquired by gift from the World's Columbian Exposition through the Chief of the Department of Transportation Exhibits. The collection illustrates the modes of transportation by camels, donkeys, burros, mules, and llamas, in many foreign countries. In addition to these is shown the evolution and development of the pack and riding saddle. Land vehicles come next in order with specimens from widely separate portions of the world, the Scythian racing chariot of ancient Italy and Assyria, the decorated Sicilian cart, the Turkish holiday wagon, and the rolling hogs-



PLAN OF DIVISIONS OF TRANSPORTATION AND THE RAILWAY.

head, a relic of American colonial days. The Cuban volante, the carreta, ox cart of Mexico, and the Red River cart from the great Northwest and a series of models demonstrates the widely diversified construction of wheeled vehicles in all parts of the world. In addition to this is a very large collection of photographs, prints, and lithographs of vehicles.

Next to the wheeled vehicles is the street car, an excellent specimen of the early cable car, and the first grip car run for public use, invented by Mr. A. S. Hallidie of San Francisco, Cal. A series of photographs of street and tram-cars illustrate the beginning of the present railroad system.

THE RAILWAY.

In order following is the division of the railway which occupies the greater part of the east pavilion, and is one of the most striking features of the Museum. The nucleus of this representation is in the extensive collection made by the Baltimore & Ohio Railway Co., for the World's Columbian Exposition, and purchased by the Field Columbian Museum.

At no time previous to the World's Columbian Exposition had there been a fitting illustration of the evolution and development of permanent way, structures, motive power, equipment and appliances of the railroad such as is illustrated in this section. The exhibition is an exceptionally interesting and valuable historical collection, embracing thirty-eight full size working reproductions of locomotives, made from the most careful measurements and drawings of the originals and covers a period from 1680, when the first idea of steam propulsion on land was originated, to 1848, and includes fifteen original locomotives of the type followed from 1832 to 1876. The examples are arranged in the order of development and demonstrate the principle of construction.

The exhibit begins with the first method of propulsion by steam on land, that of Sir Isaac Newton, in 1680. The evolution is carried through the Cugnot, France 1769, the first actual propulsion by steam on land in the world; the Murdock of 1784; and the Read of 1792. The latter was the first steam wagon in America, and its originator, Nathan Read, of Salem, Mass., was the inventor of the first multi-tubular boiler in the world. Then follows the first Trevithick, the initial design of 1800, by the father of the locomotive, Richard Trevithick. In 1803 he built the first locomotive that ran upon a

rail, a full size reproduction is here represented with two of the first original cars it drew upon the Merthyr Tydfil, Wales, colliery road. They stand on a road bed that formed a part of the original stone sleepers and track first built in 1800.

In the way of original old engines this collection embraces the most valuable historical examples in existence of American progress. Standing in their original form are four of the original Grasshoppers, and as none were built subsequent to 1836, not one of the quartet is less than fifty-seven years old.

The first, the Atlantic, built in 1832, is the oldest locomotive in its original form in America; the Traveler, 1833, the first distinctively freight engine built in America. It has been over sixty years in continuous service; the Mazeppa, 1835, the first of the crab type; and the Thomas Jefferson, 1836, the last of this famous quartet.

The contributions to the Museum by the Illinois Central Company are the original old engine Mississippi, 1836, the first locomotive in the Gulf States; by the Chicago & Northwestern Company, the original old engine Pioneer, 1848, the first locomotive in Chicago; by the Mount Washington Ry., the first mountain climbing locomotive in the world. The World's Columbian Exposition through the Chief of the Transportation Department presented to the Museum the Sampson, 1838, and the Albion, 1839, the original old numbers one and two of the Nova Scotia Coal Road and the Philadelphia & Reading R. R., the original old No. 1 of that road, 1838.

In the collections of the nine original engines of the B. & O. Company are the Dragon, 1848, the only example of the early type of the once noted New Castle locomotives; the Camel, 1852, the first of the type of Camel Back; the Mason, 1853, the American model passenger engine; the Perkins, 1863 the earliest type of the tremendously powerful freight locomotive; the 600, 1876, the first mogul passenger locomotive, which formed a part of the B. & O. Railroad Centennial exhibit, 1876. Throughout the exhibit in each instance the engines, the originals, and reproductions stand upon either the original or the exact counterpart of the track of their period.

A strong feature in this collection is the extensive series of large black and white drawings which show in greater detail than could be done in full size actual reproductions, the evolution and development of motive power in all time and in all countries, representing a series embracing the sail period, the horse period, the manual period, the early traction power period, and the tramway period. In addition to these are a series of photographic detail drawings of old historical

locomotives and a gallery containing upwards of eighteen hundred uniformly framed examples of detail plans, photographs, and prints, and lithographs of locomotives, passenger cars, royal trains, and various railroad appliances, indicating progress in connection with the great locomotive manufacturing companies and car builders of the world. There are also a series of drawings illustrating the development of the air brake, a series of maps showing the railroad occupation of the United States by decades from 1830 to 1890; and "The West" series complete, consisting of fourteen plates showing in detail the evolution and development of the English locomotive.

The evolution and development of permanent way is here illustrated in a series of wash drawings embracing a hundred different types. With this is a series of pen and ink drawings, and models showing the development of the American railway bridge, by Theodore Cooper and Benjamin H. Latrobe, including the first original iron railroad bridge ever erected in America, and with it a series of photographs of the great Memphis bridge across the Mississippi river, and other equally noted structures of the kind.

The collection made and presented to the Museum by the Pennsylvania Railroad Company for the World's Columbian Exposition is installed in Halls 41 and 57 of the Museum, and in an interesting manner brings out the progressive growth in this great railroad system.

The exhibit embraces:

A series of models illustrating the method of transportation in early days prior to the railroad, beginning with the old Conestoga wagon, the stage coach, etc.

Sectional canal boats transported on railroad trucks over the mountains.

The machinery of the inclined planes on the old Portage railroad.

A large model showing the system of the old and the new Portage railroads crossing the Allegheny mountains, with the modern system of today.

A series of models of the famous John Bull locomotive and other early engines of the road.

The development of the railroad car.

Models illustrating the development of the Company's system of railroad signals and the system of transfer of passengers and freight in New York Harbor.

Relief maps of the Company's terminals at Jersey City and Philadelphia.

Panels in bas-relief representing four centuries of progress in transportation from 1492 to 1892.

A series of publications and documents covering the whole history of the Pennsylvania Railroad.

Relief charts showing the organization of the Company from its inception.

An extensive series of models illustrating the growth of this great corporation.

A large globe showing the traffic of the Pennsylvania Railroad system.

Following these are many relics of old time railroad appliances, of permanent way, and of transportation before the railroad, a section of the original old Portage road bed and track on which is placed one of the old original passenger coaches built in 1836.

A series of original rail sections illustrating the development of the iron and steel rail form a part of this interesting exhibit.

Added to this is a large collection of maps of the road, photographs of locomotives and views along the line of the road covering the whole system of the Pennsylvania Railroad.

THE LIBRARY.

The library of the Museum is confined to the literature of the various sciences and arts illustrated in the Museum. The aim therefore is to equip it along these special lines. It contains also standard sets of reference works, encyclopædias, atlases, dictionaries and bibliographic apparatus as well as the reports, transactions, and proceedings of leading philosophical and scientific societies. The size of the library is at the present writing 8,300 numbers of which about 1,000 are pamphlets.

The more general works are all on the shelves of the principal library room situated on the north court, but working libraries are being formed in several of the departments and already contain sets of books of special value to the department.

The library in the Department of Ornithology contains 445 volumes on that subject alone; that in the Department of Geology, 685 volumes, including many complete sets of geological surveys.

The reading room is connected with the main library. On its tables are placed the current numbers of the principal scientific and technical reviews, journals and magazines. A certain proportion of these relate to each department of the Museum. About sixty such periodicals are received, and many of them are on the shelves of the library complete to the first number.

The public is at liberty to use freely all the periodicals exposed on the tables. The books in the library are intended primarily for the use of curators of the Museum, but students are given access to the book shelves and the general public may draw books for perusal in the reading room.

The nucleus of the library was in the special collections made by the Department of Ethnology and the Department of Mines and Mining of the Exposition. These collections were presented to the Museum and later were increased by the purchase of the Kunz collection of works on precious gems, mineralogy, geology, etc.—gathered under

the selective care of Mr. Geo. F. Kunz, the well known author of "Gems and Semi-Precious Stones of the United States." This collection included a large number of rare works of the sixteenth and seventeenth centuries, containing chapters treating of the subjects on which Mr. Kunz is an acknowledged authority.

This branch of the Library was further increased by the donation of the private collection of Mr. F. J. V. Skiff containing valuable works on mining, metallurgy, geology, and mineralogy.

Another collection that materially strengthened the library and brought it to the front rank in one specialty was the library on ornithology purchased of Mr. Charles B. Cory of Boston. Mr. Cory had made his library as comprehensive as were his bird collections in which he had a professional pride. It contains the proceedings and transactions of the leading ornithological and zoological societies; the individual works of different writers on the class Aves are numerous, and standard reference books of the working ornithologist. In this connection it may be mentioned that the Museum is to become the recipient of the extensive ornithological library of its President, Mr. E. E. Ayer. The combination of the collections of Mr. Cory and Mr. Ayer will place the library in the first rank of libraries on this specialty.

The extensive collection on railway evolution prepared for the exhibit of the Baltimore and Ohio Railroad at the Columbian Exposition has been loaned to the library and furnishes very complete data on this branches of the transportation industry. This literature is of great use, accompanying as it does the large collections in the east annex of the Museum.

The purchases that are constantly being made are placing upon the shelves the best reference literature on Geology, Botany, Zoology, Anthropology, and the Industrial Arts.

In alcove 118 adjoining the Library, is displayed a small collection of early printed books illustrating several stages in the history of printing from movable type and the development of the book. This will in time be supplemented by examples of the modern graphic arts and typographic as well as bibliographic curiosities.

