

solid houses, the most influenced progress took place. Just so from this to the one which gave to the letter thousand tongues; to the wheel the speed of the wind; to the transmission of thought the speed of lightning. So on in general and the whole. A certain kind of things is between them, which we do not actually call necessary, useful, instructive, or agreeable, but which we call beautiful. These we separate and select from the many, to explore, investigate, and unite scientifically; and this is the problem of art history. To recognize their beauty and prominently the spirit of them, is the subject matter of the fine arts, or esthetic, in a limited sense.

The word esthetic means every observation made by our senses. In such an expansion it was used, setting in opposition esthetic and logic in relation to the sensible observation and reason. In the late new language, it is confined only to beautiful things, and we understand, in general, by esthetic, the science of the beautiful.

VII. CONTINUOUS PROGRESS IN ALL THREE SPHERES.

The progress in intellectual, ethic, and esthetic relation increases in an uninterrupted succession, notwithstanding the seeming retrogradation and stagnation in the activity of man; and with his larger achievements grows his next problem, and so on; thus a never-resting process of development is uninterruptedly effected, being the result and consequence of preceding conditions and the necessary conditions of all later exertions. Then it seems as if at many times, many nations were at a complete standstill; that the development and progress of the human race was at rest. This was even only seemingly. Unobserved, here and there, are germs of culture formed, and at another place just at the same time important visible steps of progress are made. An illustration may be cited: the first centuries of our independent Christianity. They discarded the old culture, philosophy, forms of state, literature and art, and returned in thinking and forming to cruder customs, their ethic feeling inclined to supersensible fanaticism, and missed frequently the right position and relation to actual life. But notwithstanding this clearly visible retrogradation, the most powerful progress was effected in the necessary fundamental principles, and later centuries proved that this time was of a far-reaching consequence, and its appearance was conditioned by the inner necessity.

VIII. COMMUNITY IN ALL THREE SPHERES.

The expression of the esthetic impulse in man is the first; then, before he is capable and in a position to think and to act morally, other objects impress on his mind, through his senses, and his necessary wants and requirements compel him to approach them direct, and unknowingly make them serviceable to himself. His first exertions are instinctively those of forming, moulding. From the simplest forms of formation, the club, broken from a tree, with which he killed an animal, men progressed continuously to make a multitude of well-formed instruments and tools, made well-arranged habitations, hereby above all assisted by the prometheic gift of the fire. But now he began to act; the one was the master of the other; parents brought up their children; families united to larger communities; and, lastly, originated from many such families and communities a whole—a State—in which ruled a law made and sanctioned by all, or they were governed by the fancy of a chief. In the same time the unknown impulse led men to inquire of the cause of the nature surrounding him, and also of himself, and brought him to think of the same as of a divine spirit. So was religion formed. Inasmuch as not one has much truth, as imperfection and sham is in each, they are, nevertheless, the most important means of culture of the human race, and early man manifested the desire to make himself of that which he venerated as the highest cause, a picture or image, to give to his sensitive views a nutriment heretofore required. If now he venerated the fire, it was easily made; was it an animal, he shaped it as well as he could, or something similar; was it a higher developed spirit, he fell to the impossibility and adhered to the commands which the servants of this god, the ecclesiastics, proclaimed as his divine will. Fitting samples are the Brahman pictures of the India people, with their fantastic monstrosities. Liberal thinking outside of the ecclesiastic rules could alone be serviceable in this direction, and, consequently, art returned to the simple and natural. So with the Greek nation. When the human race has once outgrown its primitive condition, its impulses are rarified and refined from the instincts to the known, and are in a constant reciprocity, leading in a constant flow to a harmonious expression of all impulses together. The action must be forethought; the forming and shaping desired and wanted; and even thinking itself can only, by exercise, give sense to those of action and forming and made capable to turn to the abstract; then a purely contemplative

condition towards nature cannot be thought of. In this large, general, and intensive reciprocity, men strive together for truth, liberty, and beauty, and try to perfect their beings in every direction.

(To be continued.)

The Average Life of Buildings.

How long does it take for a city to re-build itself? said the Building Inspector. "Well, that depends upon the progressiveness of the city. I should say about seventy-five years. That is the average life of a building now-a-days. There are very few houses in this city that were standing seventy-five years ago. The old houses on North Capitol Street, built by General Washington, are older than that, and there are other old buildings, but I am speaking of private houses. The buildings erected by the Government, under careful supervision and at great expense, of course, are more durable structures than those erected for private residences. The building which is being erected by Mr. Abell, on F Street, will cost more per foot, I suppose, than most Government buildings. No; it may not be a good investment, but it is not being put up as an investment; it is a monument. The new State, War, and Navy Department Building is, however, just as well built as that. That building will be standing a thousand years from now. It may, of course, need some repairs before that time, and the roof, of course, may have to be rebuilt. No material or work is allowed to go into that building unless it is up to the standard. The army engineers who have charge are very strict. Of course a private individual would not put up such a building. It would not pay. Yes; good brick ought to be as durable as stone. It depends a great deal upon the manner in which the bricks are laid. Good mortar becomes harder with age. It becomes harder than the brick itself. When dry bricks are laid during the warm months the bricks will absorb all the strength of the mortar. Brick laid at such a time ought to be wet. A wall erected in April or May, or October and November, of sufficient thickness, ought to last two or three centuries."—*Washington Star*.

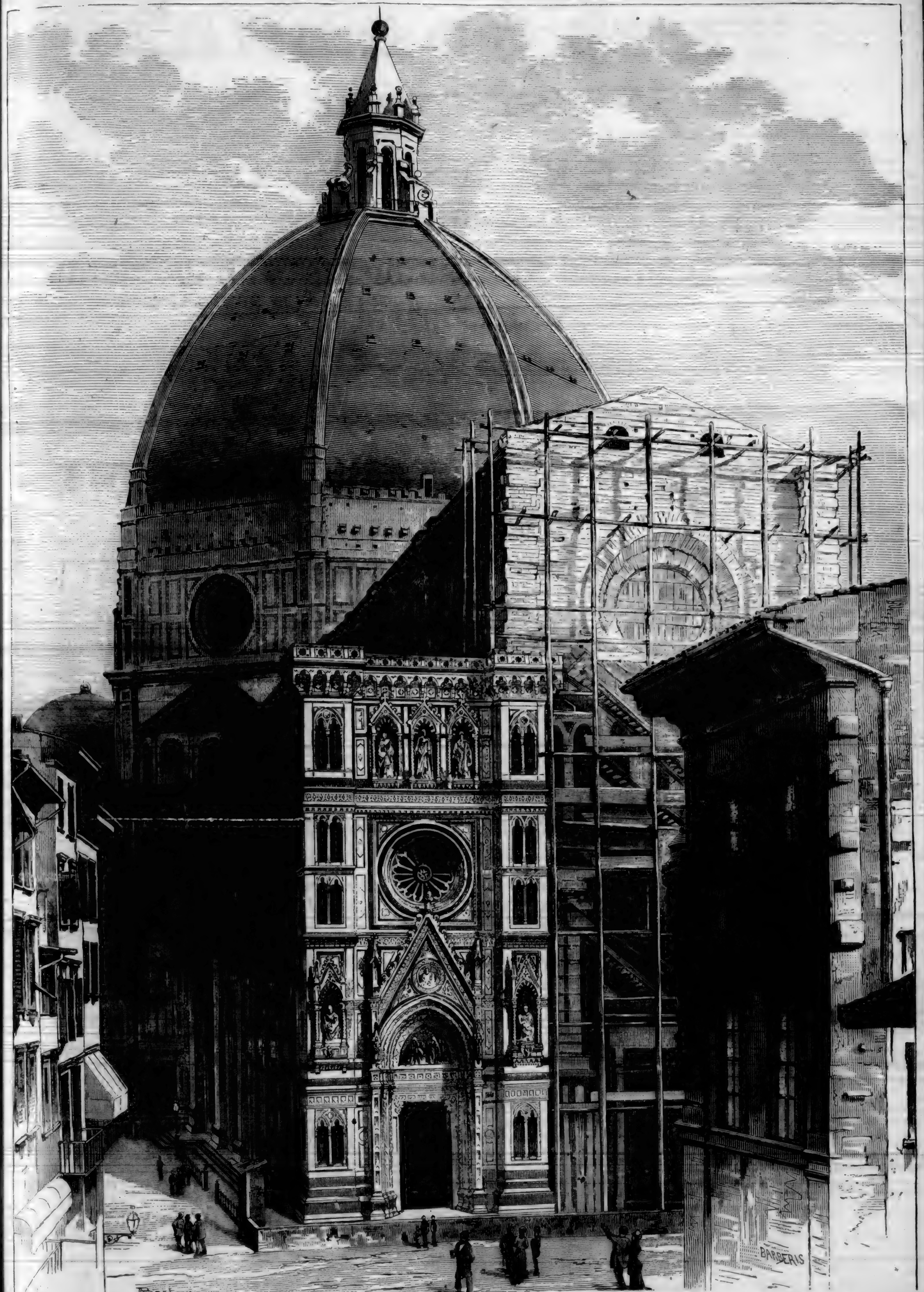
In a recent editorial article entitled "Architectural Conservatism Indoors," the *British Architect* draws the following characteristics of English architecture:—

"We are, as a profession, too conservative, and too apt to reject a useful suggestion because it happens to be new and contrary to our preconceived notions of what is right according to recognized rules and practice. We think some of the fault of this conservatism can be traced to a lack of thorough education, and the consequent inability to found a correct judgment upon things practical and theoretical, which may not have been included in past experience. Then, again, we need a more liberal spirit of inquiry amongst us, and instead of using a material or an article merely because it is made by a particular firm, there should be some certain knowledge on the part of the architect that no better is in the market. And when a new suggestion is made, or a new invention brought out, which has a reasonable likelihood of being turned to practical account, it is as well to try how best it can be utilized, rather than to see how effectually we can put stumbling-blocks in the way of its adoption."

Much of which is, without doubt, equally true of our American architects.

According to the *British Architect*, there is some talk of erecting the huge metallic tower invented by M. Eiffel, the mechanical engineer, on some convenient site within the precincts of the Paris Exhibition Buildings, and it is also satisfactory to know that a jury of experts will be impaneled to decide upon its structural safety prior to its erection. It will be 300 meters in height, and entirely constructed of iron. It will rest on five pillars, forming four immense arcades, lofty enough to exceed in height the towers of Notre Dame. On the summit of the tower will be erected an electric light-house, and a terrace to which visitors will be admitted. The form of the tower is specially adapted to give it stability in high winds. The oscillation at the top, under the influence of the most severe storm, will not exceed 75 centimeters. On a first platform, at a height of 70 meters, there will be a gallery of glass, which may be used as a café, or restaurant. A lift will take visitors to the summit. The expense of construction is estimated at from 5,000,000 to 5,500,000 francs.

The elaboration of interior decoration with hard woods is increasing to a great extent in the cities, and daddoes of satin, maple, cherry, mahogany, etc., are freely used.



THE NEWLY-CONSTRUCTED PORTION OF THE FACADE AT SANTA MARIA DEL FIORE, FLORENCE.—PROF. DE FABRIS, ARCHITECT.

THIS JOURNAL

WITH ALL ITS INTERESTS,

WILL BE DISPOSED OF

TO

Parties Qualified to Assume Its Management
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THE

California Architect & Building News

IS THE PIONEER JOURNAL

Published Within the Boundaries of the Pacific States of America,

IN THE INTERESTS OF

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AND THE

Manufacturing and Labor Arts and Interests.

Its publication as a Monthly was inaugurated during the dark and gloomy period of 1880 preceded by the Quarterly of 1879. And from the feeble beginning, which then lacked all the essential elements of journalistic experience, in addition to the absence of innumerable facilities requisite to its publication,

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Until It Is Now Recognized,

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Representative and Leading Class Journal

Published West of the Rocky Mountains,

IN THE INTERESTS IT ADVOCATES.

The Following Notices, Selected from Scores of Like Character, Illustrate Its High Position and Standing in the Field of Class Journalism.

The CALIFORNIA ARCHITECT AND BUILDING NEWS is considerably enlarged and very much improved mechanically and editorially, which places it in the fore rank of class journals, where it belongs. It is a credit to this coast, and we take pleasure in perusing its clear and entertaining pages.—*Alameda Semi-Weekly Argus*, Jan. 28, 1886.

Another old friend, the CALIFORNIA ARCHITECT AND BUILDING NEWS, is greatly improved by its new form and style.—*American Architect*, Feb. 13, 1886.

The first number of the eighth volume of the CALIFORNIA ARCHITECT AND BUILDING NEWS appears in an enlarged form and new type. These signs of prosperity denote an appreciation of the journal by those in whose interests it is ably conducted.—*S. F. Chronicle*, Jan. 18, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS.—We find it one of the best architectural journals published, and, unlike some journals, it believes in justice to all, and upholds all legitimate efforts for the elevation of mankind, whether "professionals" or "laboring men." We wish it success and recommend it to our readers.—*Granite Cutters' Journal*, Philadelphia, Pa., Feb., 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS has been enlarged and much improved. The number issued to-day would be a credit to any city.—*S. F. Daily Report*, Jan. 16, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS in its new dress and make-up renders it more acceptable than ever. It is always replete with valuable matter, and is ever an acceptable visitor.—*Alameda Encinal*, Feb. 8, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS appears in greatly improved and enlarged form. The current number, we think, is the best that has been issued. It shows wonderful improvement within the past two years. It is just such a journal as is needed for the Pacific Coast.—*Northwestern Farm and Dairyman*, Feb. 11, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS, enlarged and much improved in appearance. As to its contents, it has always been good. It is the best class paper that comes to our table, and we always find it worth perusal.—*Lakeport Democrat*, Feb. 20, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS appears in an enlarged form and new type. These signs of prosperity denote appreciation by those in whose interest it is ably conducted. It has a large circulation. We wish it success.—*Weekly Sun*, Jan. 23, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS is the leading architectural monthly of the Pacific Coast. Its articles are well written on important topics.—*Brooklyn Real Estate Review*.

The CALIFORNIA ARCHITECT AND BUILDING NEWS is the official organ of the association of architects, and is a fit representative of that interest. It should find a wide circulation.—*Petaluma Weekly Argus*, Jan. 28, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS comes to us this month very much improved in every way—a decided credit to the Pacific Coast.—*Brick, Tile, and Pottery Gazette*, Jan., 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS is a very useful and interesting publication. It is handsomely illustrated with designs for home and business buildings.—*Reno Evening Gazette*, Jan. 21, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS is a monthly journal devoted to architecture, building, decorating, and furnishing, and is the official organ of the Pacific Coast association of architects. In its enlarged form it is most admirable.—*New Age*, S. F., Jan. 21, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS, in its enlarged and improved form, is a publication which will interest all who are connected with the building trade.—*News Letter*, Jan. 30, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS comes to us very much enlarged and improved. It holds its own remarkably well against the older Eastern journals of the same class.—*American Building Association News*, Chicago, Feb., 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS is an invaluable periodical, not only to architects and contractors, but to house owners as well. It gives valuable plans for houses, and careful attention to drainage, ventilation, and sewerage.—*Daily San Jose Herald*, Feb. 3, 1886.

The CALIFORNIA ARCHITECT AND BUILDING NEWS comes to our table enlarged and materially improved. This enterprising journal, we are pleased to note, is keeping pace with the demand of a growing constituency.—*Northwestern Architect*, Feb., 1886.

ITS PUBLICATION IN SAN FRANCISCO,

DEVELOPED IN THE FULLNESS OF ITS POSSIBILITIES, is a universally accepted necessity; and under increased,

ENERGETIC, ENTERPRISING, AND COMPETENT MANAGEMENT,

Parties who can and will devote their TIME and TALENTS to the work, it is destined to become

A PEER IN AMERICAN CLASS JOURNALISM.

If from the adverse surroundings of its inception, with the many divided professional and other engagements and duties of its founder, it has been brought to its PRESENT, but by NO MEANS

ITS POSSIBLE STANDING AND REPUTATION,

What may it not become, with its interests and destinies under more Efficient, Diligent, Capable, and Scholarly Editorial and Managerial Control and Direction?

THE ARCHITECTURAL PROFESSION requires a Journal of its kind to represent its interests; to assist in sustaining unselfish and generous relationships; to advocate the right and expose wrongs wherever found in architectural circles, and assist in promoting fraternal ethics, and every right and reputable course calculated to elevate the honorable and worthy members of the profession far above the reach of reproach or disrepute, and, by all reasonable, right means, fix upon those who degrade and disgrace the profession, the mark of professional ignominy. In these directions this Journal has accomplished much, but more remains to be done.

CONTRACTORS AND BUILDERS of every class need it as a medium through and by which they may learn of every new fact and principle in mechanical science, and cultivate and develop into practice, those rules and methods best calculated to improve them as men and master mechanics—to furnish them with all current, local facts of interest, and give information from every city and town upon the Coast in reference to prospective works of public and private character.

TO MECHANICS AND WAGE-EARNERS it is a great necessity, as all men, high and low, learn and grow wiser by what they read, and the impressions made upon the senses by lines and figures representing ideas and conclusions of facts.

MANUFACTURERS AND PRODUCERS of building materials and devices of every kind need it as a means of communication with consumers.

THE COMMON INTERESTS OF THE STATE require it as a means of information at home and abroad, as to its unbounded resources in timber, building stone, marbles, iron, and numerous other valuable deposits and productions.

OWNERS OF PROPERTY require it as a channel through which they may be informed upon all matters relating to the erection of buildings.

CARPENTERS, MASONS, PLASTERERS, PLUMBERS, PAINTERS,

DECORATORS, FURNISHERS, AND ARTISANS GENERALLY,

Require it as a nucleus in and around which their interests may center, and through which each alike may derive special benefit.

Its Future is Full of Assurance and Promise.

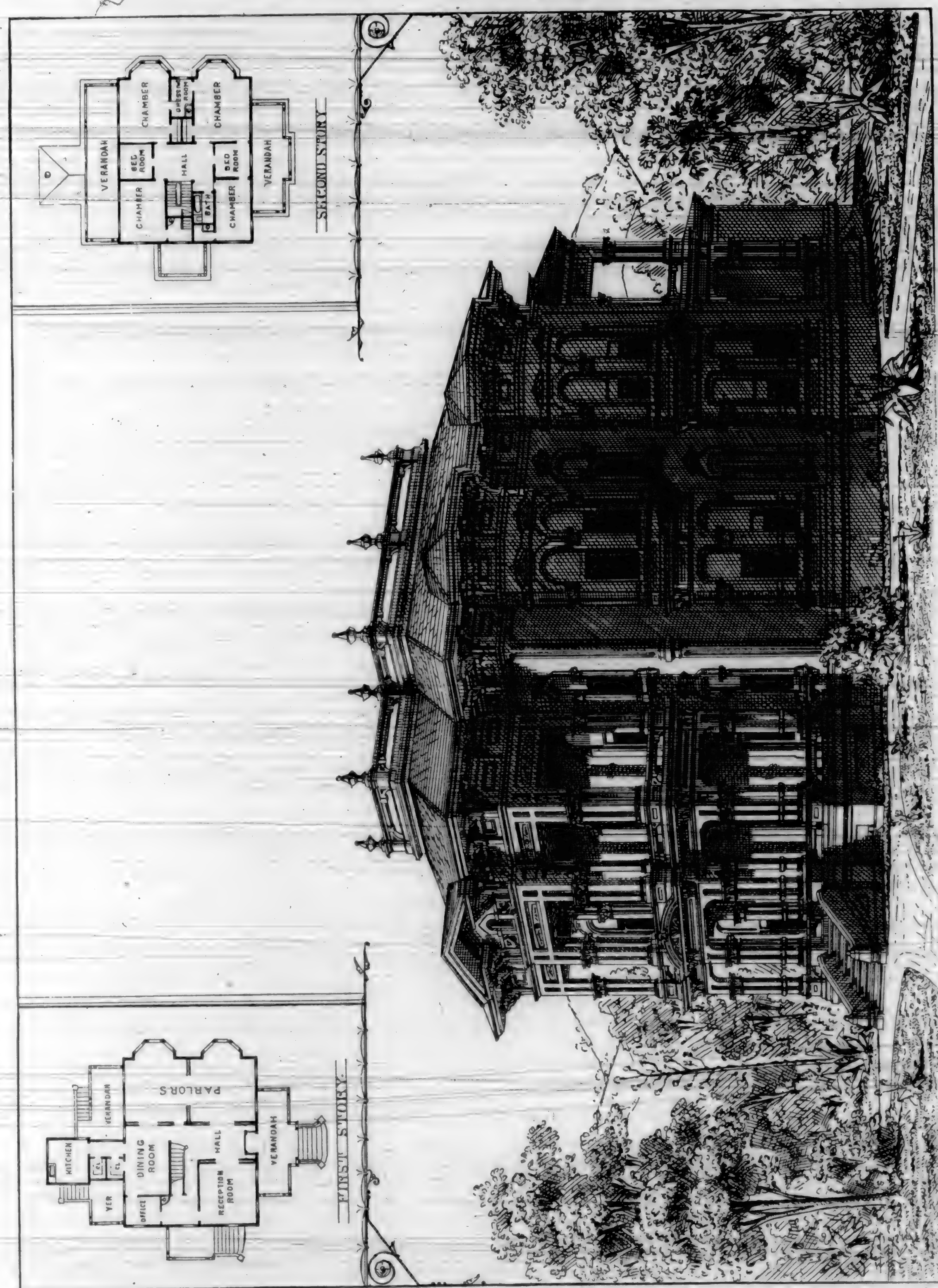
With All Possibilities Wisely Utilized and Judiciously Handled, but which, from force of circumstances, have been to a large extent hitherto neglected, it may be more than doubled in every interest.

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But few Class Journals present better evidence of substantial prosperity and general favor than is shown by the advertising column of this Journal. Yet not one-half of what may be, has been reached. LOCAL ADVERTISEMENTS can be greatly increased and a large, neglected PATRONAGE FROM THE EASTERN STATES SECURED.

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Is made to relieve ourselves from the excessive and double cares and responsibilities involved in editing a Class Journal and pursuing the responsible duties of practicing architect—to the latter of which we propose to devote our undivided attention, yielding control of the Journal, we hope, to more able and competent hands. We also hope its future will pass to some one of the manor born—some live Californian, familiar with all coast and local interests and requirements, either individually or in the form of an incorporated company. But if not this, then that some Good—Eastern, Western, Northern, or Southern—Man will enter the field with complete connections with all great centers of business and life, east, west, north, and south, and give not only to California, but to the people of the United States, Europe, and All Civilized Places on the Globe, a Journal of Peerless Merit.



PERSPECTIVE AND PLANS OF A COUNTRY RESIDENCE (ERECTED AT HONOLULU, M. L.)

EDITOR CALIFORNIA ARCHITECT—Dear Sir:

As I have been frequently requested by some of the most able and competent master builders to give an easy rule for finding the cuts and covering of conical, hexagonal, and octagonal roofs, I offer the following, trusting it will be of service to them in laying out this kind of work.

The accompanying cut shows the timbers in position over ground plan. The method of obtaining this result is as follows: 0, 0, 0, 0, 0, 0, is the ground plan; 1, and 3, is the height of elevation. Make 1, 2, in ground plan, equal to the elevation, viz., 1, 3; after which connect 2, 2, in the ground plan, which will give the length of hip needed. Square out from O, H, right and left, indefinitely, then take the distance 2', 2 in the compass and stand in O, describing curve, cutting line squared from H, then cut at X, as shown; move compass to 2', and cut at X, and Y; move compass to O, and cut at Y, right and left; move compass to 2, and cut at Y, and X; move compass to O, and cut at X, and H. Thus obtaining the accurate length of all timbers, lay the jack rafters, or cripples, a suitable distance apart, and the problem is finished. To make a stand-up model, cut all around the outside, following the straight lines, viz., H, to O, to X, to 2', to Y, to O, to Y, to 2; to X, to O; to H. Now weaken on all the base lines, fold from you, and the model will show all timbers in their correct position. Yours truly,

M. J. MARION.

the marble in Oran, ready for shipping, at a price of 450 francs—90 dollars per cubic meter. The marble of this quarry, originally of a pure white color, has assumed an ivory tint due to presence of oxides of iron. There is also a pink variety, capable of being highly polished. Other varieties are also found, notably a yellow marble, similar to the *giallo antico*, a dark red marble, resembling the *rosso antico*; another variety called *panazzo*, on account of its resemblance to the colors of the feathers of a peacock. Some of the varieties of marble were used in the construction of the English church at Algiers. It is also rumored that a French geologist has discovered clues towards the finding in Upper Egypt of the Lucullan marble, a pure black variety, used in Roman architecture.—*Building*.

Book Notices.

"A PLEA for Sanitation in Factories and Workshops." By Wm. Paul Gerhard, Consulting engineer for Sanitary Works; 6 Astor Place, New York.

Author of the following works: "House Drainage and Sanitary Plumbing," "Hints on the Drainage and Sewerage of Dwellings," "Diagram for Sewer Calculations," "Sanitary Questions," "Sanitary Drainage of Tenement Houses," "A Guide to Sanitary House Inspection," "Domestic Sanitary Appliances," etc. Mr. Gerhard offers professional advice on questions of Drainage, Sewerage, Sewage Disposal, Water Supply, Ventilation, Heating, and Sanitary Architecture. Plans and specifications also prepared for house drainage, and the sanitary arrangement of plumbing work. Correspondence solicited.

"BUILDERS' Work and the Building Trade." By Col. H. C. Sheldon, R. E. Bound in cloth; price, \$4.00. For sale by Jos. A. Hofman, 208 Montgomery Street, San Francisco, Cal.

This is an English work just published by the Rivingtons, of London, England, and makes a valuable addition to the two volumes, "Notes on Materials and Building Construction," published some time since by this firm.

This work has nearly 300 illustrations, showing nearly every style of brick and stone work, diagrams of constructive carpentry and joiner's work, tiling and slating, and a lot of other information pertaining to the building trades.

There is a very useful and practical chapter on bricklayers' work; also one on concrete and plastering; and some useful information is given on painting, coloring washes, and the tools used for cutting and rubbing for ornamental brick work. Very useful hints are also given for estimating the cost of all kinds of brick, stone, and concrete work. The methods of framing, in the chapter on carpenter's work, will be found very explanatory, as many illustrative diagrams have been given. The other trades appear to be thoroughly dealt with. There are several useful appendices, giving experiments upon concrete slabs, forms of specifications for concrete floors and roofs, and several valuable tables.

This work will undoubtedly take its place as a text-book of technical reference in all that relates to practical building operations.

Copp's Lists of Patented Mines.

HENRY N. COPP, the land and mining lawyer of Washington, has issued a book of 150 pages, which gives lists of about 10,000 mines patented by the United States up to January, 1886. These lists are arranged by States and Territories, and thereunder by counties and districts. It also gives instructions for the restoration of lost and obliterated corners of the public surveys.

This publication is an added evidence of Mr. Copp's industry, and will, without doubt, be in every mine owner's library. In it we observe the names of many of our wealthy and enterprising citizens. Parties contemplating the purchase of a mine can now readily determine if it has been patented. The purchase of unpatented mines is a risky business, as lawsuits are frequently purchased at the same time. The book sells for fifty cents, and can be had through the news dealers and of the publisher.

ARCHITECTS and sculptors will be much interested in the statements recently published in some of our foreign exchanges, that the long-lost quarries of valuable ancient marbles have been rediscovered. Among colored marbles employed by the Romans in their palaces and monuments some authors quote the Numidian marbles. But this name is misleading, for several quarries containing the genuine *giallo antico*, also a rose-hued marble, and a brown *breccio*, are located outside of the geographical limits of Numidia. One of these is situated east of Numidia, near Simmittu, in the Medscherdan Valley, along the railroad between Algiers and Tunis. The other quarry is said to have been discovered by a Mr. Delmonte, dealer in Carrara marble, and is described as being situated along a line of hills near the village of Kleber. Mr. Delmonte offers to deliver

Publications Received.

THE May number of *Art and Decoration* contains fifty-four illustrations among which are pictures in the National Academy, two studio interiors in perspective, designs for stained glass window, suggestions for panel in lobby of theater, suggestions for *rapousse* work, designs for tapestry painting, and twenty illustrations by Raguenet, with many short, interesting, and instructive articles pertaining to interior and exterior ornament. Subscription price, \$2.50 per year. Single copies, 25 cents. Published by Art and Decoration Company, 7 Warren Street, New York.

THE May number of the *Inland Architect and Builder* is unusually attractive and valuable. The leading articles are reminiscences of the late architect, H. H. Richardson, who ranked at the head of his profession in the U. S., written by P. B. Wight, and a practical illustrated essay on Brickwork, by George Beaumont. Reports of the Nebraska State Convention of Architects and of the Cleveland meeting of the National Engineers' Society are given, besides building news from over one hundred Western cities. Among the illustrations are the new Court House at Madison, Wis., the West Chicago Club House, a design by Architect Beman for a Grant memorial, and several well-designed residences by prominent architects. Architects and others interested in building will find the *Inland Architect and Builder* profitable reading. Published by The Inland Publishing Co., Chicago. Subscription price, \$3 a year.

THE *American Architect and Building News* (Gelatine Edition). The following is the table of contents for the May number:—

CONTENTS.—Mural Painting—Wood Architecture of the Northern Hartz—The Erection of Colossal Statues—Concrete Floors—Pile Driving—Communications—Notes and Clippings—Trade Surveys.

ILLUSTRATIONS.—Rood-screen in St. Peter's, Louvain—House at Ottawa, Canada (Gelatine Print, issued only with Imperial and Gelatine Editions)—Wood Architecture of the Northern Hartz, Germany—Court House, Clar on County, Pa.—House at Garrison on Hudson, N. Y.—Ancient Light-house, Island of Pharos—Modern Light-house, Island of Pharos.

Subscription for the Gelatine Edition, \$7.00. Published by Ticknor & Co., 211 Tremont Street, Boston, Mass.

THE June number of *Mind in Nature*, discusses the question of "Mind in Animals," by Lady Murray-Aynsley, followed by notes on "Intelligence of the Elephant and the Orang." Doctor Valin continues his quest for the "Spiritual Evidence of Man's Descent," this time in the "Demon of Science." A. N. Waterman asks, "Is Spiritualism Only a Nervous Disease?" and F. A. Becher contributes "A Few Notes upon Mental Phenomena and Mathematics." Professor Thwing tells, "How to Induce the Trance." John Wetherbee reviews "The Spirits of Darkness." H. M. Hugunin describes an "Electrical Cloud Birth." Wm. Q. Judge in his remarks on "Matters Touching Theosophy," replies to the discussion on "The Occult World" in former numbers of "Mind in Nature."

There are also extracts from Rev. T. T. Munger on "Truth," from Doctor Pettegrew, on "Faith as an Element in the Cure of Disease." "More Metaphysical Twins," is a report of several cases where persons were seemingly united in some psychical manner, that caused one to suffer the same mental or physical pains that disturbed the other, even though they were hundreds of miles apart. All those interested in the problem of "Mind in Nature" will find this little magazine well worth ten cents. COSMIC PUBLISHING COMPANY, 171 Washington Street, Chicago.

DECIDEDLY unique and original is the little cycling scrap-book just issued by the Pope Manufacturing Co., of Boston, Mass. Upon the covers are fac-similes of the covers or front pages of thirty-seven of the leading American publications, and inside are between two and three hundred newspaper and magazine clippings and quotations from prominent personages pertaining to the hygienic, business, and pleasurable advantages of cycling. By an arrangement of tint and type, the selections have the appearance of genuine pasted scraps, which makes the book worth possessing as a curiosity, as well as for the really valuable information it contains. The book will be sent upon request free by mail upon receipt of stamp, to any one interested in cycling.

COMPLAINTS are often made by those using iron saw-tables that the table becomes charged with electricity to such an extent as to be disagreeable. The table is undoubtedly charged by the friction of the belt. To prevent the table from becoming charged run a small copper wire from the leg of the table to a water, gas, or steam pipe. Anything that will carry off the current as fast as produced will do the work effectually.

Master Plumbers' Association.

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The Building Interest of Woodland and Yolo County.

FOR THE SECOND QUARTER OF 1886.

EDITOR OF THE CALIFORNIA ARCHITECT: In comparison with the corresponding three months of 1885, the reader will readily see a decrease in the amount of capital invested this quarter, and as a ready conclusion infer that the building interest has taken a retrograde movement, and the following report is conclusive evidence. But when the true cause is considered, the effect is not serious nor depressing, but, to the contrary, is believed as an indication of prosperity.

The present outlook of the grain crop, the fruit of the orchard and vineyard, are, beyond a doubt, better and far more promising than ever before known in this county; therefore all are too much engaged in preparing for the coming harvest to look after building, which is considered of second importance, and the lull is only an index of better and more prosperous times in the near future; and with the coming fall it is anticipated that building in all its branches will be brisk, and there will be plenty of work.

CITY OF WOODLAND.

15 frames, value	\$40,005
7 improvements, value	4,550
Total	\$44,555

YOLO COUNTY.

22 frames, value	\$35,150
4 improvements, value	1,600
Total	\$36,750

Total for city and county, 48 buildings; value, \$81,305. Number for corresponding months of 1885, 45 buildings; value, \$120,600, presenting a decrease of \$39,295. Accept our thanks for past favors and courtesies. Respectfully yours, GILBERT & SON.

Woodland, June 4, 1886.

The Building Interest.

SOME idea of the relative spread of the rapidly growing cities in the United States may be gathered from the following statistics of buildings erected during 1885:—

Philadelphia	5,937
St. Paul	3,451
Minneapolis	3,370
New York	3,368
Chicago	3,133

There were 7,900 building permits issued in Philadelphia during the year. In the above computation, however, the only buildings included are 5,627 dwelling houses, and 310 other separate and substantial buildings for factories, stores, etc. Smaller structures, or additions to buildings already erected, are not included. It will be seen that Philadelphia is 2,500 buildings ahead of its foremost competitor. Twenty-five hundred buildings of this class furnish enough accommodation for a new city of 10,000 inhabitants.—*Iron Trade Review*.

Carpenters.

AND others interested in building: We call your attention to the advertisement of *Ives' Patent Sash, Lock, and Door Bolt*, on page XI. Mr. Ives offers to forward to any carpenter one *Ives' Patent Sash Lock* for ten cents in stamps to cover expense of mailing. These locks are undoubtedly the best we have seen, and we think it would be an advantage to all interested in building to send for one of these samples before selecting any other style, and see the advantages obtained by using the *Ives' patent*.

San Francisco Chapter of Architects.

OWING to death and sickness in the family of the Secretary, the usual postal notices were not mailed in proper season, and but few members received them until after the evening of the meeting. Consequently, there were so few in attendance that all business, and the discussion of the subject appointed for the evening, was deferred until the July meeting, reports in the daily papers to the contrary notwithstanding.

The San Rafael Unpleasantness.

WE have received several letters in reference to the school building at San Rafael, in which the position is assumed that the Chapter of Architects should take the matter in hand, as the name of one of its officers is, to some extent, mixed up in the affair, which, as far as the purchase of the school-house lot is concerned, has led to the resignation of the Board of Trustees and their arrest for bribery, etc., terminating in the suicide of one of the parties to the transaction—a man who, until the exposures in the case became a matter of public concern and notoriety, had maintained a good reputation for integrity and good citizenship.

As far as the architect in question is concerned, the reflections thrown out are wholly speculative and inferential, beyond the fact that the new Board have found, or claim to have found, the necessity for, and have advertised to "receive sealed bids for doing certain work in the new school-house on Fourth Street, in the town of San Rafael," etc., with all of which the Chapter certainly can have nothing to do, nor is it a part of the Chapter work to interfere in matters of the kind, unless the same is brought before it in some tangible form by the parties aggrieved.

Our Illustrations.

TWO sketches representing views in Chinatown are from life, and correct in every part, except that there is but one Chinaman represented for every twenty to be seen in the same locality from early morn till midnight. The front elevation, perspective, and plans of cottage are self-explanatory.

The perspective and plans for a residence are those of a building planned by us, and erected at Honolulu, H. I. The remaining illustrations carry with them sufficient explanations.

Market Report.

Pine, Rough	per M feet	\$15 00
" " No. 2	" "	12 00
" " 2 in lengths	" "	13 00
" " 40 to 60 feet lengths	" "	17 00
" " 50 " 60 "	" "	18 00
" " Selected	" "	20 00
" " Clear	" "	25 00
" " Fire Wood	" "	8 00
T. & G. Flooring, 1 x 6	" "	27 00
" " 1 1/2 x 6, 1 x 4, 1 1/2 x 4, 1 1/2 x 3	" "	30 00
" " 1 x 3, and narrower	" "	22 00
" " No. 2	" "	35 00
Sepping	" "	27 50
Furring, 1 x 2	per lineal foot	00 1/2
Redwood, Rough	per M feet	18 00
" " No. 2	" "	14 00
" " Surfaced	" "	30 00
" " T. & G. 6 in. 12 ft. and over	" "	28 00
" " " 7 to 11 ft.	" "	25 00
" " " under 7 ft.	" "	20 00
" " Rustic	" "	30 00
" " No. 2	" "	26 00
" " T. & G. Beaded, 12 ft. and over	" "	30 00
" " " 7 to 11 ft.	" "	25 00
" " " under 7 ft.	" "	20 00
" " Siding, 1/2 inch	" "	22 50
Pickets, Fancy	per M	25 00
" " Rough Pointed	" "	16 00
" " Square	" "	14 00
Battens, 1/2 x 3	per lineal foot	00 3/4
Shingles	" "	2 00
Laths, 1 1/2	per M	3 25
" " 1 1/2	" "	3 75

NAILS—Rates were recently reduced to:—

200 keg lots	2 70
100 keg lots	2 75
Smaller quantities	2 80

PAINTS AND OILS:

Pioneer White Lead (local factory), 5 ton lots	6 1/2 @ 6 1/2
Cal. Linseed Oil, raw (single bbl lots)	45 1/2
" " " " " "	47 1/2
Turpentine, per gallon	58
BRICK—California Building Description, soft, per 1,000	5 50
" " " " " " " " " " " "	6 50
" " " " " " " " " " " "	7 50

Building Intelligence.

Where owners' names are left blank, it is so done in most instances by special request.

Baker , near McAllister. One-story frame.	Golden Gate Avenue , bet. Pierce and Scott. Two-story frame.
O.—John Boyd.	O.—J. P. Lartigan.
A.—Eisen & Pierce.	A.—T. J. Welch.
C.—D. Perry.	C.—H. Monrad.
\$2,500.	\$8,000.
Baker , bet. Washington and Jackson. Four two-story frames.	Golden Gate Avenue , southeast cor. Larkin. Additions.
O. and B.—W. F. Lewis.	O.—Michael Skelly.
Day work.	A.—H. D. Mitchell.
\$14,500.	C.—Owens Bros.
Baker , bet. Washington and Jackson. One-story frame.	Green , bet. Powell and Mason. Two-story frame.
O. and B.—W. F. Lewis.	O.—Y. Meniani.
Day work.	A.—G. Y. Coppelletti.
\$8,000.	C.—J. Dunn.
Baker , nr. Golden Gate Avenue. One-story frame.	Greenwich , bet. Kearny and Dupont. Two-story frame.
O.—J. T. Fitzhenry.	O. and B.—Thos. Merry.
C.—C. Carberry.	Day work.
\$2,000.	\$4,500.
Bryant , bet. Twenty-fourth and Twenty-fifth. One-story frame.	Gough , cor. Grove. Three-story frame.
O.—J. Belle.	O.—R. E. White.
A.—J. Gash.	A.—McDonnell & Son.
Day work.	C.—H. Townsend.
\$2,000.	\$9,000.
Broadway , cor. Laguna. Two and one-half story frame.	Golden Gate Avenue , cor. Lyon. One-story frame.
O.—Peter Hopkins.	O. and B.—J. McPherson.
A.—Clinton Day.	Day work.
C.—R. T. Gilbert.	\$2,000.
\$12,500.	Grove , bet. Octavia and Laguna. One-story frame.
Birch Avenue , nr. Larkin. Three-story frame.	O.—M. Kelly.
O.—F. Fanstman.	Day work.
A.—P. R. Schmidt.	\$600.
C.—A. Norton.	H
\$3,000.	Howard , cor. Tenth. Improvement for school-house.
Brannan , bet. Sixth and Seventh. Alterations.	O.—P. Scanlan.
O.—E. L. Goldstein.	A.—T. J. Welch.
A.—P. R. Schmidt.	C.—John Blake.
C.—H. Keenan.	\$6,000.
\$1,300.	Haight , bet. Webster and Fillmore. Two-story frame.
Bryant , cor. Second. Three-story brick addition to wine cellar.	O.—T. Brown.
O.—Lachman & Jacobl.	A.—T. J. Welch.
A.—P. R. Schmidt.	C.—Jas. Haven.
C.—Mahoney Bros.	\$3,000.
\$9,250.	Hayes , southeast cor. Laguna. Two three-story frames and brick basement.
C	O.—L. M. Fabry.
Clay , bet. Dayisadero and Scott. Two two-story frames.	A.—Miller & Armitage.
O.—D. S. Culp.	C.—R. Mitchell, brick and iron work.
A.—Copeland & Banks.	\$5,315.
C.—O. E. White.	Balance of contract not yet let.
\$10,000.	Hayes , bet. Gough and Octavia. Two-story frame.
California , cor. Baker. One and one-half story frame.	O.—H. Tobemann.
O.—C. Denervand.	A.—H. D. Mitchell.
A.—W. F. Smith.	C.—Chase & Taggart.
C.—Gray & Stover.	\$4,000.
\$3,000.	Hyde , cor. Sutter. Two and one-half story frame.
E	O.—Dr. J. Rosenstern.
Eddy , bet. Octavia and Laguna. Two-story frame.	A.—Pissis & Moore.
O.—L. Kaplan.	C.—A. Jackson.
A.—P. R. Schmidt.	\$15,000.
C.—Comary & Beardsley.	Howard , bet. Fourteenth and Fifteenth. Two-story frame.
\$5,500.	O.—Wm. T. Dowling.
Ellis , bet. Van Ness and Franklin. Alterations.	A.—M. J. Welch.
O.—J. Levy.	C.—R. Sinnott.
A.—E. John.	\$2,000.
C.—B. Dryer.	Harrison , bet. Twenty-fourth and Twenty-fifth. One-story frame.
\$1,000.	O.—T. O'Brien.
Eighteenth , nr. Castro. Two-story frame.	C.—Jos. Sullivan.
O. and B.—J. M. Comerford.	\$1,400.
Day work.	Hartford , nr. Nineteenth. One-story frame.
\$2,000.	O.—A. F. Thing.
Eddy , cor. Laguna. Six two-story frames.	A.—G. F. Bordwall.
O.—W. F. Smith.	C.—J. Bruce.
C.—J. Robinson.	\$2,000.
\$80,000.	Haight , bet. Webster and Fillmore. Two-story frame.
F	O.—R. Sutherland.
Fulton , nr. Larkin. Three-story frame.	C.—H. Lukes.
O.—F. Fanstman.	\$4,200.
A.—P. R. Schmidt.	J
C.—A. Norton.	Jackson , cor. Franklin. Two-story frame.
\$4,500.	O.—W. H. Martin.
Fell , bet. Laguna and Buchanan. Two-story frame.	A.—Curlett & Outhbertson.
O.—R. J. Stinsen.	C.—D. Perry.
A.—T. J. Welch.	\$23,050.
C.—Bateman Bros.	Jones , bet. Lombard and Chestnut. Two-story frame.
\$5,500.	O.—S. Castle.
Fourteenth , nr. Howard. Two-story frame.	A.—Miller & Armitage.
O. and B.—L. Cuner.	C.—F. W. Kern.
A.—W. Mooser.	\$9,750.
Day work.	L
\$4,000.	Liberty , nr. Guerrero. Two-story frame.
Fifth , bet. Mission and Howard. Three-story frame.	O.—Jos. Hutchensin.
O. and B.—A. Zehn.	A.—W. F. Smith.
Day work.	C.—R. O. Chandler.
\$5,000.	\$3,000.
G	 Linden Avenue , bet. Octavia and Laguna. Additions.
Guerrero , nr. Twenty-first. Additions.	O.
O.—J. Davis.	C.—A. Allspaugh.
A.—B. E. Henriksen.	\$700.
C.—John Apel.	M
\$2,200.	Mission , north side, bet. Fifth and Sixth. Alterations.
	O.—Sol. Tesmore.
	A.—B. E. Henriksen.
	C.—John Apel.
	\$5,750.

McAllister , nr. Steiner. Two-story frame, two flats. O.—John Dunhand. A.—E. John. C.—J. F. Long. \$4,000.	Pacific , bet. Mason and Taylor. Additions and alterations. O.—S. McAllister. A.—Miller & Armitage. C.—B. Kroeger. \$1,500.	Sacramento , bet. Jones and Leavenworth. Two-story frame. O.—B. H. Gallagher. Day work. \$2,250.	Union , bet. Octavia and Laguna. Two-story frame. O.—G. and L. Ratto. A.—W. Mosser. C.—G. B. Caraglia. \$3,500.
Market , bet. Tenth and Eleventh. Three-story frame store and two flats. O.—Mendo estate. A.—T. J. Welch. C.—Anderson Bros. \$12,000.	Post , nr. Pierce. Two-story frame. O.—B. J. C. Wier. Day work. \$8,500.	Steiner , bet. Pine and California. Two-story frame. O.—Chas. McLane. A.—C. J. I. Devlin. C.—Lufkin & Kerrigan. \$2,764.	Van Ness , cor. Clay. Repairs. O.—Mrs. Greenwald. A.—J. E. Wolfe. Day work. \$1,200.
Madison Avenue , off Harrison, bet. Fifth and Sixth. One-story frame. O.—Thos. McCreagh. A.—Elias & Moore. C.—G. Tressler. \$2,500.	Pierce , bet. Post and Sutter. Two-story frame. O.—Mrs. Durand. A.—T. J. Welch. C.—Samuel T. Green. \$3,500.	Sacramento , bet. Jones and Leavenworth. Two-story frame. O.—Win. Hogan. C.—H. Gallagher. \$2,000.	Valencia , nr. Twenty-second. Two-story frame. O.—P. Dean. A.—J. E. Wolfe. C.—Alexander Flood. \$2,000.
Market , bet. Church and Eighteenth. Additions. O.—G. Smith. A.—Miller & Armitage. C.—R. Doyle & Son. \$2,200.	Page , cor. Broderick. Four two-story frames. O.—B. John. Hinkle. Day work. \$16,000.	Sutter , cor. Laguna. Additions. O.—W. Butt. Day work. \$1,500.	Valencia , junction of Mission. Three-story frame. O.—F. S. Wensinger. C.—J. H. McInnis. \$11,000.
Mission , bet. Third and Fourth. Four-story and basement brick. O.—Hermann Meese. A.—Miller & Armitage. C.—Brick work, C. Morrell. \$10,000.	Quinn , bet. Valencia and Guerrero. Two-story frame. O.— A.—T. J. Welch. C.—J. W. Smith. \$2,500.	Twenty-second , nr. Valencia. Two three-story frames. O.—Dr. T. D. Whitney. A.—R. E. Henriksen. C.—Jos. Steele. \$11,300.	Valencia , cor. Twenty-fifth. Two-story frame. O.—A. Merry, M. D. C.—A. Nelson. \$2,500.
Market , bet. Sanchez and Noe. Two-story frame. O.—John Johnson. A.—Chas. I. Havens. C.—Jas. Geary. \$3,000.	Sutter , bet. Pierce and Scott. Two-story frame. O.—Mrs. Brainer. C.—A. Walker. \$3,300.	Twenty-third , bet. Valencia and Guerrero. One-story frame. O.— C.—H. Norris. \$1,501.	Washington , nr. Fillmore. Two-story frame. O.—A. M. Starr. A.—S. & J. C. Newson. C.—John Rehman. \$5,000.
Noe , cor. Ford. Two-story frame. O.—C. Gallagher. Day work. \$3,000.	Sanchez , bet. Seventeenth and Eighteenth. Two-story frame. O.—Jos. Clark. A.—J. Marquis. C.—Chalwin & Wilson. \$3,000.	Turk , nr. Pierce. Two-story frame. O.—Mrs. J. Webster. Day work. \$3,500.	
Olive Avenue , bet. Polk and Van Ness. Two two-story frames. O.—J. W. Bridgeman. A.—H. T. Bestor. C.—Thos. Rendell. \$6,350.	Seventeenth , nr. Sanchez. Two-story frame. O.—P. Hallahan. A.—J. J. Clark. C.—J. B. Gunyan. \$3,500.		
Oak , cor. Divisadero. Three one-story frame stores. O.— C.—J. Sheppard. \$2,000.	San Jose Avenue , nr. Twenty-seventh. Two and one-half story frame. O.—B. J. M. Comerford. Day work. \$4,000.		
Oak , bet. Pierce and Scott. One-story frame. O.—A. Wolf. C.—B. Dryer. \$2,500.	Stevenson , nr. Herriman. Two two-story frames. O.—Mrs. H. A. O'Brien. A.—T. J. Welch. C.—H. A. Conrad. \$7,000.		

HILL'S PATENT INSIDE SLIDING WINDOW BLINDS

Are Adapted to Any Style of Window

And Suitable for all Buildings, Dwellings, Stores, Office Buildings, and for Houses Built to Rent, Boarding or Lodging-Houses are Unexcelled.

THEY are entirely inside of the window casing, and while requiring no furring out or boxing, make it an impossibility to tear curtains, interfere with plants or window ornaments, or become broken by contact with chairs or other movable articles.

The light can be admitted and sunlight excluded from any part of the window; can be instantly removed and taken to any part of the house to clean, and as easily replaced.

They can be opened or closed with the window raised, and without removing articles from the window-sill, and cannot blow open or rattle. The Blind is very light (one-half inch in thickness) and strong, possessing more durable qualities than a hinged blind one inch in thickness.

There is NO SAGGING, BANGING, OR GETTING OUT OF ORDER!



They are made in three sections in height (each section sliding past the others), and any number of divisions in width corresponding to the folds in the old-fashioned folding blinds. They require no HINGES—all trimmings furnished with blinds—are MADE OF ALL woods, finished or unfinished, and COST LESS than old-style folding blinds. They have been extensively used by the best architects and builders throughout the East and West, and have given perfect and entire satisfaction wherever introduced.

The following are a few of the owners who have adopted the HILL BLIND in preference to any other:

U. S. Government, four sets officers' quarters, Presidio Res., S. F.; H. F. Bruns, cor. Geary and Taylor, S. F.; J. C. Weir, Post, near Scott, S. F.; John MacKenzie, cor. Grove and Broderick, S. F.; L. H. Sweeney, San Rafael; R. B. Gray, cor. Pacific and Van Ness, S. F.; Raymond Hotel, 1,600 windows, Pasadena, Cal.

ENGLISH AND AMERICAN VENETIAN BLINDS

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THE CALIFORNIA ARCHITECT AND BUILDING NEWS.

VOLUME VII.

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NUMBER 7.

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Subscribers will please notify us promptly of any failure to receive this journal, and also of any change in their address.

Advertisements inserted at reasonable rates.

SAN FRANCISCO, CAL., JULY 10, 1886.

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Building Intelligence Facts.

ALTHOUGH there has been a great deal of complaining about dull times during the past month, the number and cost of buildings reported as commencements since our last issue, show that the work still goes bravely on, and that many owners of property are by no means inclined to allow their real estate to lie unimproved. This would not be the case were the indications not encouraging and promising. Those who buy or own building lots are, as a general thing, competent to judge correctly the advisability of planting more of their means in building improvements. And, further, such persons are generally cautious and calculating, and require good and sufficient evidence to induce them to invest, which they are not apt to do unless there exists at least fair assurances of satisfactory returns upon the money invested. Hence it may reasonably be inferred that the outlook is sound and prospectively good.

There is a permanent, healthy tone and under-current which stimulate many owners to active operations in building improvements, while others, who hold back, are strongly inclined to break away from the influences that restrain them, which state of facts assures of a continuation of activities. For those who "want to improve," and do not from trivial cause, will not long remain inactive, while others go ahead and reap the results of their greater confidence.

As will also be noticed by the report, many of the improvements are of the better class, and in the list of "flats" and houses for renting, the cost indicates good buildings generally. The labor agitation has had a somewhat retarding influence, as some owners are disposed to resent by withholding expenditures, when seeming arbitrary demands are imposed. But in the building trades in San Francisco, there have been no strikes among operatives calculated to unduly advance prices. The tendencies have rather been, among contractors, to under-value and underbid on work offered; so much so, that during the season the *pro rata* settlements have been numerous.

REPORT FOR JUNE.	
79 frame buildings.....	cost, \$512,526
2 brick ".....	" 29,000
18 alterations and improvements.....	" 111,195
99, total of buildings.....	total " \$652,721
FOR SAME PERIOD IN 1885.	
96 engagements at a total value of.....	\$457,721
Showing a gain for 1886 of.....	195,311
And a gain on preceding month of 1886 of.....	251,182

Negotiations not Concluded.

THE announcement in its last issue, that the entire interests of this Journal could be purchased, has resulted in large numbers of inquiries and offers, but none as yet conclusive. The opinion that it is

"A SPLENDID PROPERTY,"

Has been freely expressed, but the query of personal qualification to edit and manage such a Journal seems to intervene. There has not been to us a single doubt expressed that, in right hands, it is the

BEST CLASS JOURNAL PLANT WEST OF CHICAGO;

Still, the "peculiar personal qualifications and fitness" called for seem to be a barrier, and a thousand suggestions have been volunteered as to the class of mind, intelligence and executive abilities required in its conduct, all of which we know from experience to be more or less imaginary and hypothetical; for when the present management began its publication, in 1879, it was without the slightest experience in connection with the publication business, and equally as little as editor and manager; besides which, at the time of its commencement, the building, financial and all other interests of the State, were encompassed and engulfed by the terrible state of depression brought about by sand-lotism, and the fearful gang of demagogues and panders, to the worst and most wicked passions and fancies of the deluded and thoughtless crowds of unreasonable men, who were incited to clamor and hope for *Reform!* with the ultimatum of murder, arson and the annihilation of all "bloated bond holders," which included a large proportion of the successful and well-to-do citizens of this city. This state of things brought about a condition of approximate or absolute poverty and distress among mechanics and the working classes, and great financial contraction in all directions. Yet with all these

MOST TERRIBLE CONDITIONS,

Which passed away only by slow degrees as time rolled on, *this Journal worked and paid its way*, increasing in influence and public favor, until it has reached its present high position among the class journals of the country.

If, therefore, from a beginning unaccompanied by a single encouragement, other than a personal determination and purpose to brave the issue, so much has been accomplished, what we ask may not be anticipated for its future, with its foundations well and firmly laid and cemented, its superstructures all well proportioned, and its surroundings all of the most favorable character.

WHO SHOULD OWN AND CONTROL IT?

Many personal propositions have been made to purchase, by men seemingly well, if not in every respect qualified for its management, but who have not the financial resources.

The more general sentiment prevailing is, that it should be controlled by the architectural profession as a whole, or by a *syndicate of prominent architects*, to make it absolutely THE REPRESENTATIVE ARCHITECTURAL JOURNAL of California and the entire Pacific States and Territories.

Under such management and control, the splendid reputation it has already gained by the unaided efforts of a single individual, would be increased ten-fold.

At present there exist jealousies and prejudices, which would disappear, with the Journal under the general, interested management of a number of reputable architects.

If, as some now suppose and say, the present and past successes of the Journal are the results of the influence of one architect and his office, is it not then fair to presume that if twenty or more architects should concentrate their personal and office influence in its favor, its

FUTURE WOULD BE GRAND BEYOND COMPARISON.

Present management urged to continue. A large number of personal friends and patrons, among them many of our most prominent professional brethren, leading contractors, advertising patrons, and owners of real estate, have urged us to continue our publication labors, adding, "The Journal must be continued;" "It is a necessity on this coast;" "Such a Journal we must

have," etc., to all of which we have given the one reply stated in our first announcement, that we want and must have relief from the excessive cares, labors and responsibilities imposed by the triple duties of editing and managing the Journal, and as practicing architect,—a complication of more than any one individual can master successfully, without compromise of all personal comforts, and undue strain upon the mental and physical strength and energies.

Many well-informed parties have said to us during the past month, "We know of no one in San Francisco qualified to assume its charge." This may be true as far as individual knowledge is concerned, but it is not so as a general fact. There are, beyond question, in this city,

HUNDREDS OF COMPETENT MEN

Who, if not familiar with all the details of monthly publications, are sufficiently qualified to master the situation within sixty days, during which time the assistance that will be given by the present management, will perfect them in the entire work.

If it passes to parties who are not practical architects, it will gain instead of

LOSING ARCHITECTURAL FAVOR,

As such a change will secure patronage in directions at present inimical to its success; and influences now opposed to it among mechanics will change to support, and so give it additional strength and prosperity.

The many offers thus far received are held contingent upon those that may follow. As we are not in haste to make the change, we shall deliberate thoughtfully upon each proposition submitted, hoping that when a change is made, it will be such as to place the Journal in right hands, and thus make its future an assured success for all time.

Appropriate Souvenir.

MR. JAMES E. WOLFE—Dear Sir: In laying the cornerstone for the new Methodist Episcopal Church South, of Woodland, on the 10th inst., we took the liberty to present to the officers of the church the last number of the CALIFORNIA ARCHITECT, with your regards, which was accepted with thanks, and the volume placed in the casket with many other valuable articles, and the casket was sealed and deposited in the cornerstone of the edifice, there to remain until some future generation may, perchance, open it and again unveil to the world that *May number of 1886*, from its long and peaceful rest, and those columns you have so earnestly and ably furnished will be perused by many an ardent observer, who will carefully scan the record of the past and mark the infinite diversity of human aims in this short-lived struggle of dependent humanity. Let us work and work well, while the day lasts, and be ready when the great Architect of the universe has need for us, and hope that our bodies may rest as secure and peaceful as the volume in the corner-stone, while our spirits and good influence will ever on.

Respectfully yours,

GILBERT & SON.

Woodland, June 14, 1886.

Press Excursion.

THE annual excursion of the Press Association will take place this month. The members, in a special train over the C. P. R. R., will leave this city on the 19th, and will visit Reno, Truckee, Lake Tahoe, Carson, Virginia City, and other points of interest. As press of business will prevent a personal inspection of the country in regard to building news, we have secured the services (kindly volunteered) of a brother editor, and will report in this Journal the state of building activities as they exist over the line traversed by the excursionists.

ALL law-abiding citizens regret the late terrible scenes of riot and bloodshed in Chicago, caused by the misguided anarchists, and every true American citizen, whether native or adopted, is ready to advise that they be stamped out, and to assist, if necessary, in doing it. But that riot has been of value to the trade organizations of the country in showing the public the great difference between the anarchists and organized labor, offered by men who are outspoken upholders of law and order, and who seek to hold in check the vast heterogeneous mass comprising their assemblies. They counsel peace, moderation, arbitration, and when very serious grievances appear they are ready to say to employers, "Come, let us reason together."

A bound volume of this Journal, for either of the years 1880, 1881, or 1882, will be sent free to all new subscribers for balance of this year and 1887.

Twenty-first Industrial Exhibition of the Mechanics' Institute.

THE annual exhibition of the Mechanics' Institute will be opened in this city on Monday, August 16. Its general character will be similar to that of its predecessors. The Directors have separated the exhibits into two classes, viz., those that are entered for exhibition, and those for competition. If the latter, they must be in position, and receipted for, on or before August 26. If not entered by that time, under no circumstances will such articles be allowed in competition, except with the written consent of all the contesting exhibitors, and the sanction of the Board of Trustees.

The following extract from the Rules and Regulations will be of benefit to those desiring to enter articles for either exhibition or competition:—

The award of a gold medal for best general display will debar any article in the same from competing for any other premium.

Space applied for and not occupied by August 21, may be assigned to other exhibitors.

No articles will be allowed in the Exhibition of an explosive, inflammable, dangerous, or offensive character.

No nostrums allowed in the building.

Articles must remain on exhibition until the close of the Fair.

All exhibitors will be required to keep the space under their control clean, and in good order. All coverings over goods to be removed before 11 A. M.

The greatest care and vigilance will be exercised by the managers, and the most effectual means taken, through the agency of the police and otherwise, to effectually guard and protect the property on exhibition; but under no circumstances will the Mechanics' Institute, or the managers of the Fair, be responsible for any loss or injury to articles placed on exhibition. *The owner must take all risks.*

The list of articles in the premium list is divided into forty-seven classes. The prizes consist of gold, silver, and bronze medals, and diplomas. Coin prizes will be given in the various classes as follows:—

Horticulture and Farm Products. In the former class the first, second, third, and fourth prizes are, respectively, \$75.00, \$60.00, \$40.00, and \$25.00. In addition, special prizes will be awarded to best display of flowers from private gardens. Premiums in this class will be a medal and coin, the latter being in amount, \$15.00, \$10.00, and \$5.00, according to merit.

The largest premium to be given is in Class 47, Farm Products, viz.: For the best, most extensive, and varied exhibit of farm products (exclusive of live stock) by any county in the State, Gold Medal and \$250; second best display, Grand Silver Medal and \$150; third best display, Silver Medal and \$100; fourth best display, Bronze Medal and \$75.00.

All articles entered under the headings, Fruit, Dried Fruits, Nuts, Canned and Preserved Fruits, Vegetables, Dairy Products, Honey, Meats, etc., Wools and Cottons, will be subject to competition for medals or diplomas, and a monetary prize, ranging in value from \$75.00 to \$5.00.

The Directors have been very earnest in their endeavors to include in the different classes all articles liable to be placed on exhibition, but should anything be entered not included in the list, they have reserved the right to declare the exhibitor entitled to a special prize.

We sincerely hope that the Directors will take measures to illustrate to their patrons the *practical* workings of technical schools. This can be readily done, and perhaps be the means of inducing some of our moneyed men to encourage the establishment of such schools in many different portions of the State.

As an inducement to increase their membership, the Directors wisely adopted a rule by which each and every one belonging to the Institute can purchase a season ticket to the Fair at one-half the usual rates.

Risk of Contractors.

ONE of the most serious risks which building contractors incur and yet one which many of them habitually overlook till a costly damage suit opens their eyes, is the civil responsibility of an employer for injuries suffered by his employees while in his service. A recent suit in Paris, reported in *La Semaine des Constructeurs*, is instructive as showing the tendency of French courts to hold contractors to increased responsibility for their workmen. A mason employed in the erection of a building in Paris was struck on the head and instantly killed by a large piece of iron, which was accidentally dislodged from an upper floor directly over where the mason was at work. His widow sued the contractor for twelve thousand francs dam-

ages. It was held to be a contractor's duty diligently to care for the safety of his men by all reasonable means, to warn them of the dangers attending their employment in various locations, and to furnish adequate protection where possible. In this case, the contractor, failing to do this or even to warn the man of his danger, was responsible for the fatal accident, which a little more care on his part might have prevented. The editor remarks, in comment, that the tendency of the French courts is to increase severity in estimating the responsibilities of employers for the safety of their workmen, and cites another case where it was explicitly held that contractors are bound "to care for the safety of their men, and to protect them from the dangers incident to their work;" that "under penalty" they must anticipate "possible causes of accident," and take, and cause to be taken by their agents, all necessary precautions to prevent or avert them; that "they are bound even to guard the workmen against the consequences of their own imprudence." The general rule of the French courts is, further, to acquit the employer of responsibility only where "the imprudence of the victim has been the sole cause of the accident." This looks severe, but we should hesitate to say it is not in strict accord with the dictates of a sound public policy, as well as of humanity. It would certainly be well for American contractors to lay it to heart, as a measure of their moral, if not legal, responsibility.

In connection with the rigid rulings of the French courts, it may be well to note the tendency of English law on the same subject. A recent case, that of Griffiths against the St. Katherine's Dock Co. of London, reported in the *Building and Engineering Times*, furnishes an illustration. The plaintiff was injured by the fall of an iron door, which had been in an unsafe condition for a long time previous to the accident, and this fact was well known to the defendant company, as was proved and admitted on the trial. The court held that this alone was not sufficient to make the company answerable in damages, that it was necessary further to prove that this danger was unknown to the plaintiff, up to the time of the injury. The general principle was laid down that, "if a servant enters or continues in an employ, knowing of the danger incident thereto, he cannot recover, since he might have escaped by leaving the service." It may be well, perhaps, to admonish some classes of employees, that if they continue in dangerous work, they do so at their own risk; but it is not difficult to imagine cases where the peculiar nature of the business or of the workman's position is such that he is practically unable to leave his employment, though he knows it to be dangerous. In overcrowded London, a man who should throw up one place might suffer much privation before he could get another, and the new place might prove yet more dangerous than the old, and farther from his home and in many other ways less desirable. But it is difficult to imagine a reason other than criminal negligence, why a corporation should knowingly permit the premises occupied by its workmen to be in an unsafe condition and remain so; and the law which relieves a corporation of responsibility for accidents which happen to its men through such willful neglect to repair its own premises, on the heartless excuse that the injured men knew of the danger, looks more like a temptation to manslaughter than anything else. We trust it will not be considered an authoritative precedent for American courts.—*The Inland Architect and Builder.*

Farm and Fireside of April 1 gives some interesting figures showing how the mechanics of Springfield, Ohio, are kept in poverty. It cites two cases of losses, the first being a loss of \$25,000 a year on coal. "The retail price of coal in Springfield has been a dollar a ton higher than in Columbus, the difference in price being more than double the difference in cost of hauling." The five thousand families will burn during the year not less than fifty thousand tons of coal, on which they have been wrongfully taxed more than a half dollar a ton, or \$25,000 per annum, which might have been saved by uniting in the purchase of coal. The other loss is one that comes through rum. Springfield maintains 175 saloons, and the estimate is made that the 25,000 inhabitants expend \$350,000 annually, which enormous sum is mainly drawn from the pockets of laboring men.

The first Bessemer steel converted in the South was made at Chattanooga, Tenn., on April 19, by the South Tredegar works. The experimental cast of two gross tons proved excellent steel under all tests applied. The material used was pig-iron from Cranberry ores, North Carolina, and shows that ore to be excellent steel material. The plant has a capacity of eighty-five tons per day. The success has caused much gratification among Southern iron-masters.

A bound volume of this Journal, for either of the years 1880, 1881, or 1882, will be sent free to all new subscribers for balance of this year and 1887.

Building Permits.

AS we understand it, in nearly all the Eastern cities, laws or ordinances exist, requiring the obtaining of building permits in all cases of the erection of new or remodeling of old buildings. Such a regulation is good, and should be in practice everywhere, as it would regulate procedures and prevent many of the difficulties which so often arise in San Francisco, particularly in connection with the alteration of buildings within the fire limits. At present, there are ordinances requiring permits to open streets, for the putting in of sewers, etc., on which a deposit of twenty dollars is required, to insure the proper replacing of the street, and also permits to occupy a certain portion of the street during the erection of buildings, building areas, etc., in certain parts of the city, at least. If this permit rule was general and imperative in all cases, it would furnish an easy method of ascertaining the extent of building improvements made during the year. As it is now, everybody does and acts as he pleases, and there is no check upon irregularities. There should be a compulsory and imperative law upon this point. It would be an easy matter for an owner, architect, or builder, to report every improvement entered into, and obtain a permit; and a penalty should attach to every violation of the rule. The do-as-you-please practice is all well enough in most matters, but there are others in which individual rights and privileges should be made to subserve public interests. No harm could possibly result from such a regulation, while the general information afforded by it would be at least gratifying to every one interested in the growth and improvement of the city. Speculative estimates are often indulged in as to the amount of work under way at certain periods, often varying materially from actual facts. The permit system would remedy this, and furnish daily statistics of what was being done in the building line. Excessive or diminished estimates of business conditions sometimes do harm, and the degree of business prosperity is often misrepresented, leading to wrong conclusions. In cases of death, and in other matters, obligatory ordinances compel notices of the occurrences, because the public good seems to demand it, and the growth and prosperity of the city is a matter in which all citizens are interested, and in reference to which they have a right to be informed, which would be the case if a perfect permit system was established; one which could not be ridden over with impunity, as too many of the regulations on the ordinance book are.

The modern improvements of the past few years have received great favor and general adoption in nearly all classes of buildings—but practically in the better kind. But with the convenience afforded by them, they have been the medium of a vast amount of sickness, suffering, and loss of life,—not of necessity, but because too great neglect and carelessness have been practiced in their application, and too much indifference to serious consequences. The modern improvements as a general thing are good, but the best invention in the world may be rendered worthless, or injurious by being tampered with by unskillful hands. There are hundreds of *pretending* mechanics, to whom it would be unwise to intrust anything requiring good judgment and practical mechanical skill, and the greater number of defects and failures in connection with the introduction of these improvements, grow out of this one cause or fact. There is no good reason why wash basins, etc., may not be set in any chamber or place, with perfect freedom and security from all bad effects, yet there are *hundreds of ladies* who object to their introduction, because of known cases where they have proved offensive,—while in fact, the whole difficulty exists in the incompetency of the superintending party, or the mechanic doing the work, and not in the thing objected to.

Circumstances.

THAT circumstances have a great deal to do in shaping a man's life, no one can deny; for experience teaches us, and observation and historical research prove it so.

Shakespeare says, "There is a divinity [or something else] which shapes our ends, roughhew them as we will." There is no absolute dictation or iron-bound fatality in this quotation, but rather the opposite. While we would not ignore the existence of a divine power in the universe, in whose hands, and under whose control are all things in heaven and earth, while there is at times some circumstances over which man has no control, still there is nothing in these two facts which in any way hinder man from being successful and happy if he observes well the laws of his being and the laws that govern and control the movements of ordinary life.

We are not, by any means, mere living and breathing human machines, but, on the contrary, we are free, responsible agents, gifted with the power of choice, and capable of discovering right from wrong, and with full liberty to do what we will, and be what we may.

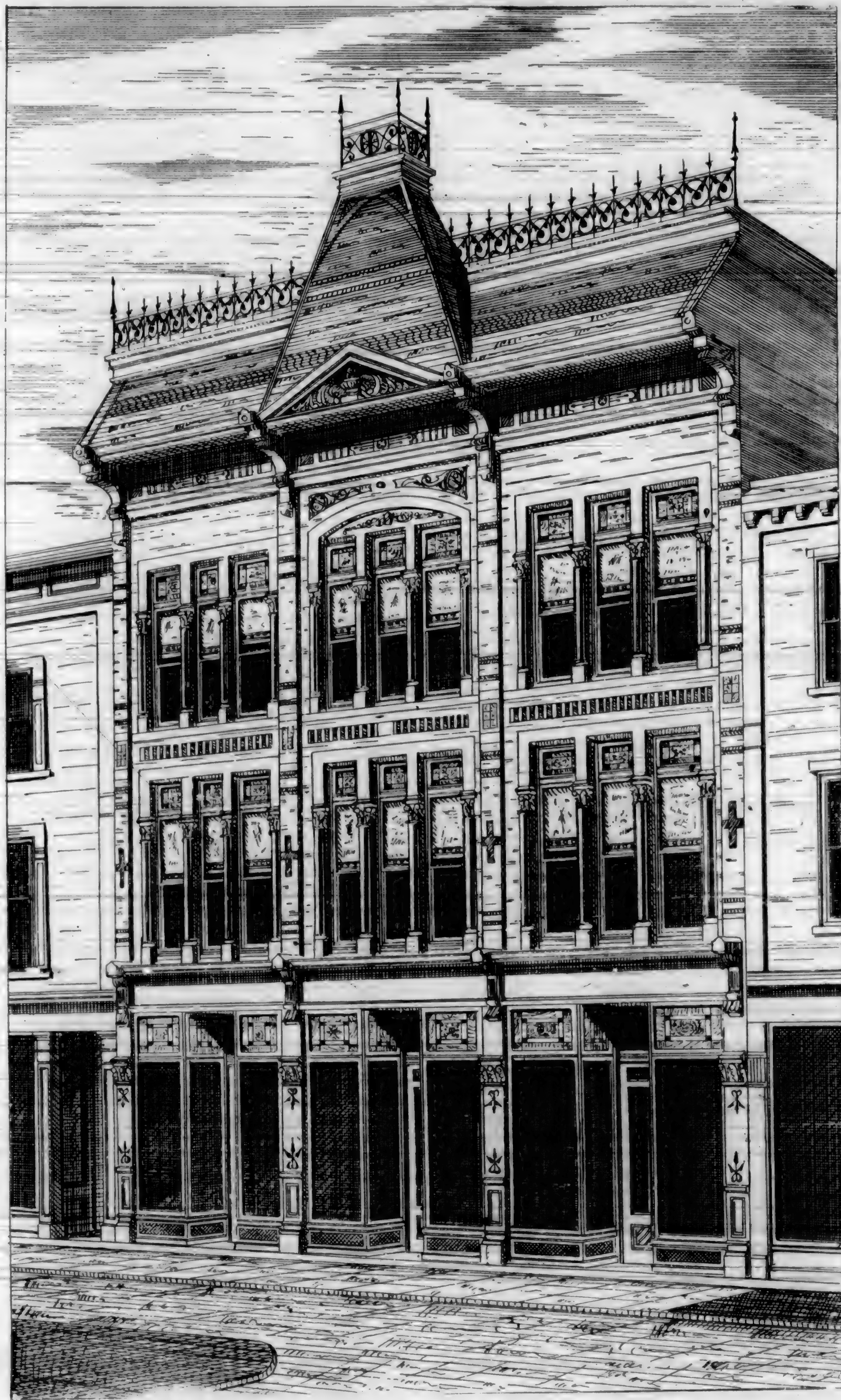


PLATE 1.—FRONT ELEVATION FOR A MERCANTILE EDIFICE.

S. F. Chapter of Architects.

THE regular night for the meeting of the Chapter occurring this month on the eve of the holiday, the attendance was limited to but a few members. The time was, however, profitably spent in general conversation and discussion of topics of interest to the profession. The reading of papers by Mr. Sanders was postponed until next month, when it is hoped there will be a full attendance.

Ash, oak, walnut, etc., must step down and out before many years, and give place to mahogany, which is now used for insides and for ornamental work on railway coaches; 10,000,000 feet of mahogany annually is now the figure, as against 500,000 feet five years ago. It is said that the mahogany is now but slightly dearer than our native woods—walnut and cherry—but that it is superior to them, in that it does not warp nor check.

Eight-Hour Movement.

THE full strength of the eight hour movement at the end of the first week after May 1, the date of its attempted inauguration, was clearly shown by statistics published. The total number of workmen committed to it in all parts of the country was estimated by *Bradstreet's* at 325,000. The demand for shorter hours was early conceded to 150,000 without a strike, and to 356,000 as the result of the strike, leaving 140,000 still striking at the time referred to, or defeated. The trades in which the movement was most successful are those connected with house building, agricultural implement making, furniture making and machine building. These trades are not subject to foreign competition. In those which are subject to such competition, either in the way of exportation of the domestic product or importation of the foreign, the movement met with very little success. The whole movement may be regarded as experimental. In those branches of industry which yield sufficient profit to warrant an increase of wages, for that is what shorter time most commonly signifies, the increase has been very generally granted. In others it has not been granted, or, if granted, it will be withdrawn later. The principal part of the loss entailed by such an experiment proceeds from the stoppage of machinery. This machinery may be of the nature of general business superintendence, clerical force and organized system, as well as actual machines and tools in use. A deduction of 20 per cent. from the producing power of a large manufacturing establishment means more to the community than the loss of one-fifth of the laboring force.

The organization of labor has thus far proceeded upon a false assumption, namely, that the wage-earners are a class having rights and interests other than and different from those of other classes. In a republic, where all men are equal before the law, and where the theory of government presumes that the greatest good of the greatest number will be sought in the framing and execution of all statutes, the idea of class rights and interests is mischievous. The interests of the wage-earner are the interests of all citizens. The time cannot be far distant when the need of yet another organization among the workmen of this country will be recognized—an organization to protect intelligent and conservative men in the exercise of their civil rights against the oppression of those who follow the lead of dangerous demagogues, and are blinded by ignorance, prejudice, and passion, to their own welfare. The happenings of the past six months have been very instructive as emphasizing the tendency of labor to oppress labor, and the need of protection for those of independent thought and action against its cruel coercion. The order of Knights of Labor, however restrained, cannot accomplish this object. Its purpose, as defined in its fundamental law, is not that to which a majority of the thoughtful and intelligent wage-earners of the country can subscribe. It demands a scheme of national and State legislation inconsistent with the best interests of the community, and especially of the wage-earner. Those who are attracted to the order by its profession of principles are not safe leaders of a movement which wise men can follow.—*Carpentry and Building.*

Proportion of Rooms.

SPEAKING on the subject of proportion of rooms, with reference to their sanitary features, Douglass Colton says: "For purposes of ventilation the height must bear some relation to the size. Adequate movement in the currents of air cannot be secured in a room unless the height be proportioned to the width and length. The minimum height must be fixed with reference to that which will allow the currents of air to circulate without being inconvenient to the occupants. Therefore, in proportion as the width and length of a room are increased, so must the height be increased. On this account it is not advisable to make rooms much less than ten feet high. With large rooms, as the height should be increased in proportion to the size, if the cubic space be the measure of the number of occupants, the area or floor space per occupant would diminish with the size of the room. As, therefore, the height of rooms is necessarily variable, it follows that it is rather the floor space which must be considered in allotting accommodation to the occupants of a room than the cubic space. In barracks a floor space of from 50 to 60, and occasionally 80, square feet is allowed per occupant. These are for rooms occupied by day as well as for sleeping-rooms. In work-houses, for dormitories, a minimum floor space of 25 square feet has been admitted, provided the ventilation was carefully attended to. In nurseries and servants' rooms from 50 to 60 square feet are desirable per occupant—that is to say, a room 10 feet square, or 10 feet by 12 feet in area, should not contain more than two persons. In school rooms which are only occupied during parts of a day, and where the air can be changed between the periods of occupation, a less amount would suffice, and from 15 to 20 square feet are sufficient."

OUR ILLUSTRATIONS.—

Plate 1, front elevation for a mercantile or business house. Plate 2, a cabinet and case of drawers. Plates 3, 4 and 5 descriptions of the ferry steamer *Solano*, the largest ferry boat in the world. Plate 6, the better class of Chinese garden huts, many of them being far more wretched in general appearance, the walls and roofs being covered with old tin cans, etc.

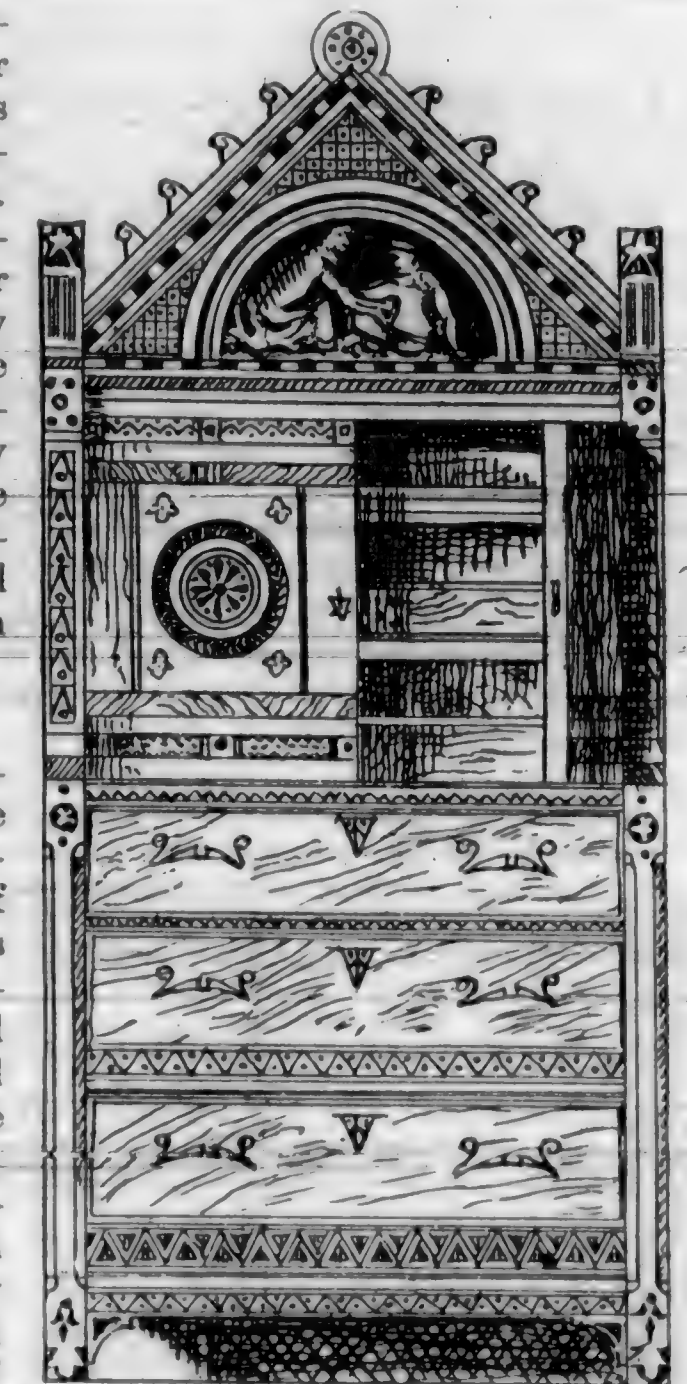


FIGURE 2.

BUT few fully and rightly understand or realize that errors may be committed in the erection of a home for their families calculated to produce sickness and death to loved ones. Yet it is so, and those who contemplate the erection, particularly of private dwellings, cannot exercise too much care and caution in every particular, so as to avoid mistakes and errors of every sort. Too often pretenders, willing to render services for nominal compensation, whose knowledge beyond the mere matter of drawing lines and coloring plans is exceedingly limited, and so far as possessed, of an imperfect character, are intrusted with the responsible duties of an architect. Consequently when they enter into detailments by specifications of that which is to be done, they conglomerate ideas so badly, and specify so much at variance with good mechanical judgment and common sense, that a superabundance of serious blunders and impracticabilities at variance with all proper mechanical principles follow. This is particularly the case in reference to plumbing and sewer work, than which there are no more essential features in connection with house-building. They commit, virtually, criminal errors; for their mistakes sometimes destroy more valuable lives than their own. Both owners and architects should consider this subject carefully, the former to avoid the mistake that all men are competent in the lines of business or profession followed by them, and the latter, not to claim an understanding of matters beyond their actual qualifications and the reach of improvement. No man is fitted to perform duties in any connection, who conceives the notion that beyond the bounds of his own knowledge there can be no advancement. Advancement and progression have been going on since the day that Noah left the ark, and sensible and practical men realize the fact that there is and ever will be more to learn, and that the fountains of improvement and knowledge will continue to flow so long as life lasts. It is only simpletons who *know it all*, and assert for themselves absolute superiority of thought and practice. Care is therefore necessary in the selection of parties to intrust with responsible duties, and owners will best subserve their own interests by its fullest exercise in connection with the erection of homes for their families. There can be no question but that *tens of thousands of lives* have been sacrificed by the employment of cheap, incompetent architects, plumbers, etc., resulting in imperfect dwellings, where, through defective plumbing and sewer work, the poisonous gases have entered buildings, to work out their own terrible results. The veriest fraud of a plumber will often assert, absolutely perfected knowledge of the intricacies in this connection, and with the cavalierism of a highwayman claim that those things that have occupied and puzzled capable minds are, to him, well understood. Good meaning, honest owners are often entrapped by such deceivers into a reposal of confidence, which results injuriously. If the plastering, painting, and other works of a building are poorly executed, each and all are annoyances, but not fatal to health and life. Hence the importance of certainty in these special directions, by and through which alone healthful homes can be secured.

It would require 50,000,000 pounds of wire to erect a telegraph around the earth at the equator, and but a half-pound of the thread made by a certain species of spider.

The Ferry Steamers of California.

GREAT credit is unquestionably due those who conceived the plans, and to the skill and genius of California mechanics and artisans in the production of the many elegant and powerful steam vessels used as "ferry-boats" upon the bay of San Francisco and its tributary waters.

Pre-eminent for massiveness and power is the *Solano*, the special object of the accompanying illustrations, plying between Benicia and Port Costa, across the flowing and ebbing waters of Suisun Bay, and completing the connection of Central Pacific Railroad travel to and from Sacramento and across the continent, while the *Piedmont* and many other large and commodious passenger ferry-boats, fill out the link between San Francisco and Oakland. The *Tiburon*, *Newark*, *Bay City*, and numerous other elegant ferry vessels—population and travel considered—provide ferry facilities as great and comfortable as are to be found in any part of the world; and in the matters of convenience, size, and completeness, the ferry steamers upon the bay of San Francisco are unsurpassed.

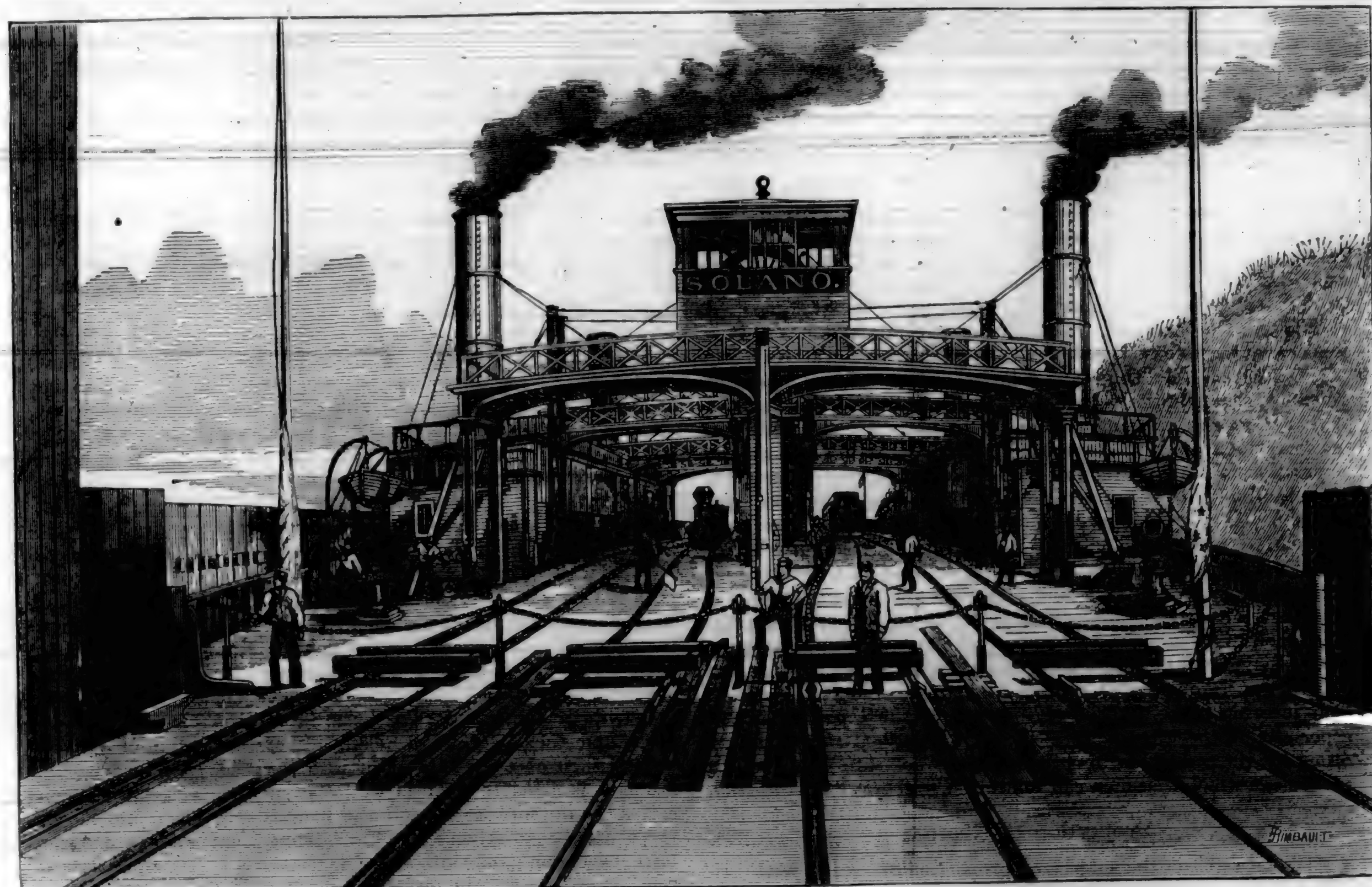


PLATE 3.—THE "SOLANO" IN DOCK, SHOWING GENERAL LONGITUDINAL APPEARANCE.

Equal credit is also due to the companies who have by their means brought about these handsome results, in that home labor and material have been employed in nearly every instance, and local industries encouraged. Large amounts of money have been disbursed among mechanics and working people in steam ferry enterprises. The first connection between San Francisco and Sacramento by Central Pacific Railroad was by way of Niles; but the considerable grades on that route and the greater business promise of a shore route, induced the company to seek a right of way along the margins of San Francisco, San Pablo, and Suisun Bays, and the straits of Carquinez. But the first change made in the location of the road, while it avoided grade, did not diminish the distance, and this fact, combined with other considerations, culminated in the building of a shorter and more direct line of travel. The distance between San Francisco and the capitol city, Sacramento, by the "old river route," is one hundred and twenty-five miles, and about the same by the first located roadways. To overcome this, and remedy the discomforts of tedious traveling by water, the project was conceived of building an air-line railroad across the tule and marsh land and through the counties lying westerly from Suisun Bay. To this end, proper surveys were made, showing a decrease of nearly forty miles.

In order, however, to render the proposed new route practicable, it was found necessary to establish a ferry at Port Costa,

situated thirty-two miles from San Francisco. To gain time was the principal idea which led to the conception of the largest ferry-boat in the world. Size, indeed, was needed in order to accommodate the numerous trains, crossing and re-crossing, in order that travelers and merchants would not suffer from long and tedious delays incident to small boat accommodations.

It will be noticed that there are four lines of rails on the deck of the steamer. To show its immense carrying capacity, the following measurements will enable any one conversant with railroad cars to estimate the number the *Solano* will take at one time. The extreme length of the main deck is 494 feet 8 inches; length of hull, 406 feet 2 inches; width over all, 116 feet; width between wheel casings 64 feet; height amidships, 18 feet 6 inches; height at ends, 15 feet 9 inches; draught when loaded, 6 feet 6 inches; tonnage 3540 tons. From the above measurements, it will be seen that there is ample accommodations for forty-eight freight cars, or twenty-four passenger cars, besides locomotive and tender. As long trains have to be divided, it is necessary that an extra locomotive accompany each

train that is ferried over. Our engraving also accurately shows the arrangement of the apron or stage by which trains are transferred to and from the boat. This is so nicely arranged and balanced that scarcely a jolt is felt by the passengers in the cars when the train leaves the steamer for *terra firma*.

Two separate vertical beam engines propel the boat. These were built by Messrs. Harlan and Hollingsworth, of Wilmington, Delaware. The cylinders are 5 feet 2 1/4 inches in diameter, with 11 feet .28 inches stroke. Each engine is fully capable of developing 2,000 horse-power. Steam is furnished by eight boilers, each 7 feet .25 inches in diameter and 16 feet long. They are made of steel, and have 143 tubes 3.94 inches in diameter, and 16 feet long. The total heating service is 19,630 square feet. No coal is used, the steam being developed by the burning of crude petroleum. The wheels are 30 feet in diameter and have 24 floats. Each wheel can be worked independently of the other. Unlike any other steamer that we have seen, the wheels are not on a line, one being considerably in advance of the other; this was done so that the boat could be easily and quickly turned in order to enter the slips on each end of the ferry route without injuring the same.

The above engraving represents the general construction of the *Solano*. Beneath each line of rails runs a deep Pratt truss, the top flange of which is attached to the deck and the bottom to the hull of the boat. The latter is divided by bulkheads into

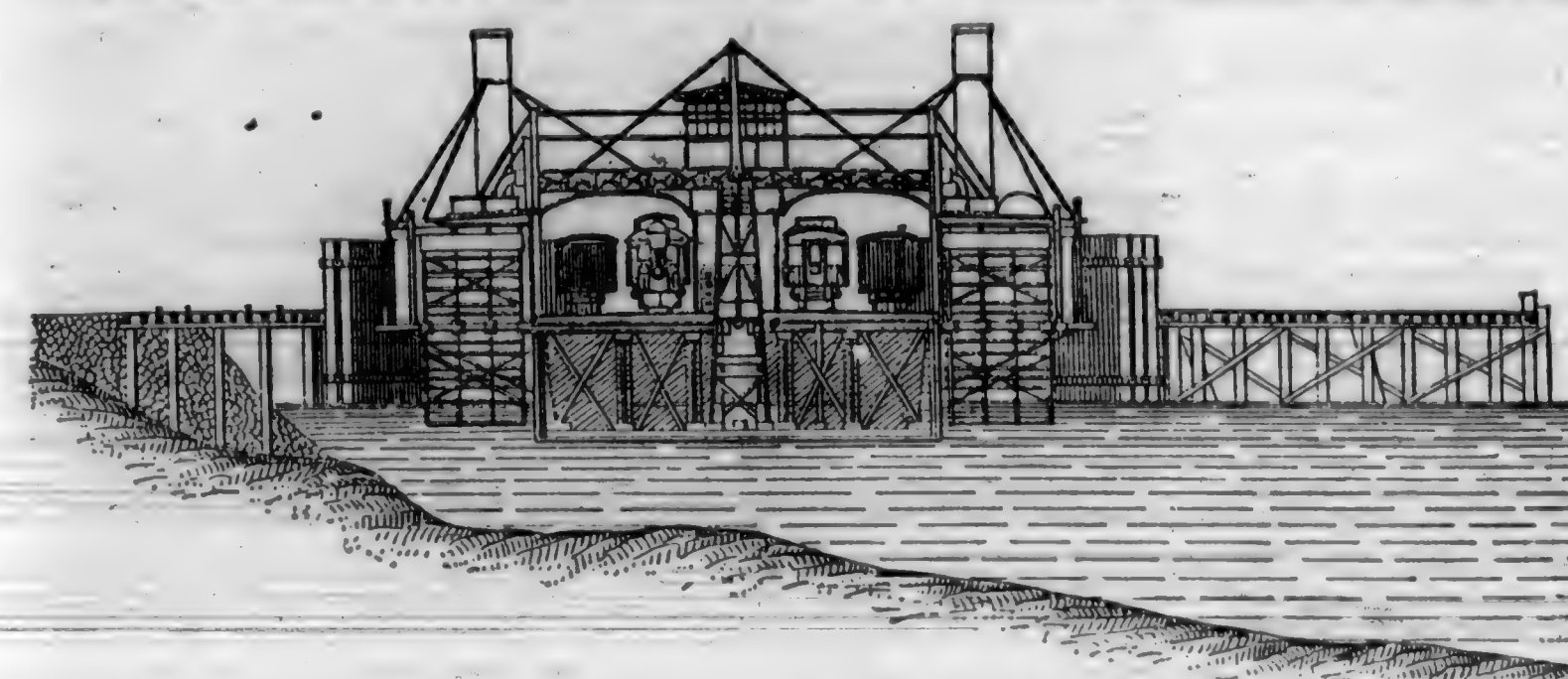


PLATE 5.—FIG. 2, SECTIONAL VIEW OF HULL.

twelve compartments. There are four balanced rudders at each end of the vessel, 10 feet 6 inches long and 6 feet 6 inches high. These are worked by hydraulic steering gear, but can be actuated by hand when desired. The pilot-house is more than 40 feet above the deck. The stages, or aprons, for embarking and disembarking trains, are massive iron structures, 98 feet 6 inches long and weighing 150 tons. They are provided with four lines of rails, and are controlled by hydraulic gear to adapt their position to the rise and fall of the tide.

The two towers seen in the back ground (Figure 2) near the center of the engraving, are similar to those near the slip where the *Solano* is at rest. They mark the entrance to the slip on the Benicia side of the bay. The large mountain on the right is called Mount Diablo. The track on the right is the one by which passengers and freight are conveyed to Stockton, Los Angeles, New Orleans, and way stations. It also connects at Lathrop with trains for Sacramento and all points east to New York, via Central Pacific Railroad. Immediately around the turn as shown, are the immense warehouses and docks of the Nevada Transportation Company.

Some difficulty was experienced in selecting a name for the subject of this article. The inhabitants of Benicia, with a just pride, desired the leviathan to be named after that place. After careful deliberation, the company decided that too much confusion would likely be caused in regard to the distribution of mail matter. Letters and packages intended for the boat *Benicia*

might be delivered to the town by that name, and *vice versa*. So the name of the county in which Benicia is situated was given to the magnificent specimen of marine architecture, justly entitled to be called the largest ferry-boat in the world.

Why Nearly All the Railroads Are Four Feet and Eight and One-half Inches Wide.

A CORRESPONDENT asks: "Why was the standard gauge of railroads fixed at 4 feet 8 1/2 inches? What was the scientific reason for adopting the fraction of an inch?"

There is no scientific or any other reason for it, except precedent and custom. In fact, all scientific or practical considerations that can enter into the question are against it. When Mr. Stephenson built his first locomotive, he, for some reason best known to himself, built it to the gauge of the old tramways—for vehicles drawn by horses—in England, which was 4 feet 8 1/2 inches. That became what was known as the "narrow gauge" in England, and was naturally followed in this country to a very great extent. Some of our roads have a gauge of 4 feet 8 1/2 inches; others, 4 feet 8 3/4 inches; and still others, 4 feet 9 inches. In England they have a 6-foot "broad-gauge," and at one time, for a very little while, tried a 7-foot gauge. The Erie road, built by English capital, was at first a 6 foot gauge, but in 1876 the changing of it to 4 feet 8 1/2 inches was begun, and now it is all of that gauge. The Pennsylvania Railroad Company uses a gauge of 4 feet 9 inches, because that is a compromise gauge between the former gauge of 4 feet 8 1/2 inches on the Eastern lines and 4 feet 10 inches on its roads west of Pittsburgh. It would be well if the 4 feet 8 1/2 inches gauge could be widened a little, to enable greater width of the fire-boxes of locomotives, and consequently more powerful engines, such as it would be desirable to employ.

Light colors absorb less and reflect more heat than dark colors. White is the best reflector, and black the best absorber and radiator, provided the colors are not covered by coatings of varnish.

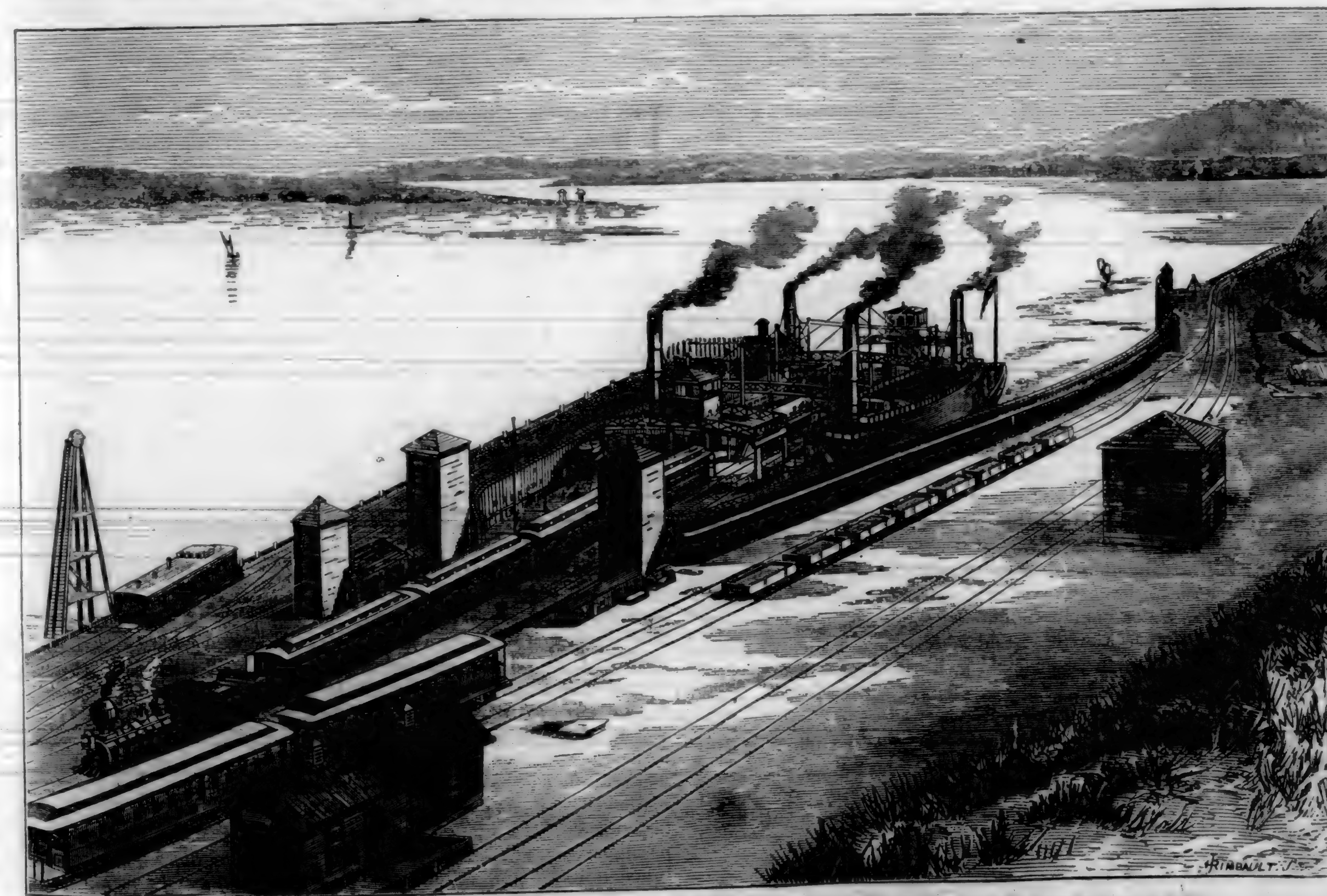
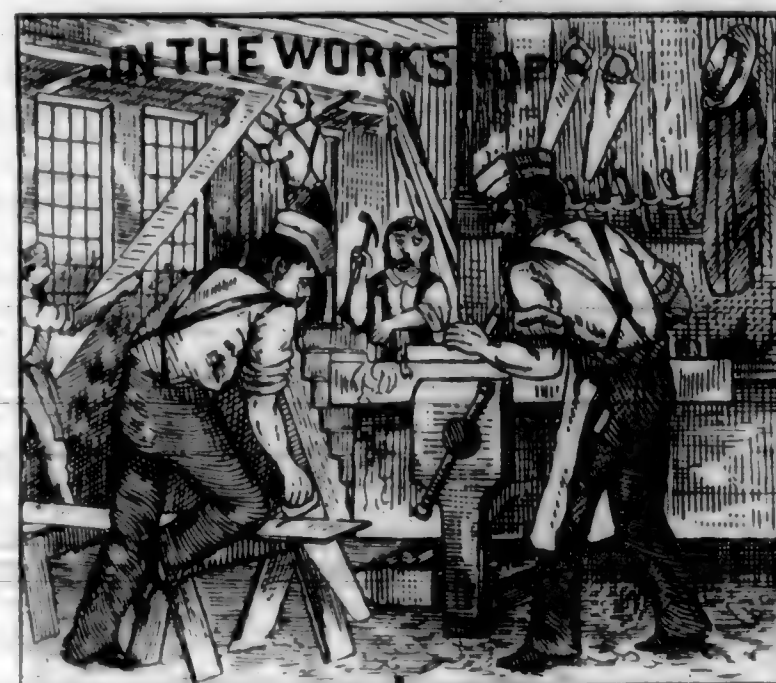


PLATE 4.—ISOMETRICAL VIEW OF "SOLANO" SHOWING WHARVES AND GENERAL APPROACHES.



We will be pleased to receive for publication in this column items of information in regard to practical ideas connected with the mechanical part of the building trade. We especially invite suggestions from apprentices and young mechanics.

"A CARPENTER is known by his shavings." He is also known by the character of his work, and the state of his tools may be known by the same standard.

TO FIND NUMBER OF STUDS REQUIRED AROUND THE OUTSIDE OF BUILDING.—Take three-quarters of the circumference—in feet—of the outside of the building. Add one stud for each corner, angle, and opening; or, allow one stud for every foot of the outside measurement.

In planning stairs, think of your head room from the lowest starting point to the highest landing, or somewhere in ascending or descending stunning falls and broken limbs may accompany bruised foreheads and broken heads.

THE "Steel Square and Its Uses," as it originally appeared in these columns, will not be published in book form. We have, however, a work by that name which we will forward to any address upon receipt of \$1.00, either in coin or one-cent stamps.

Bad work is set out by the "rule of thumb."

DRIVING NAILS.—The handle of a hammer should be grasped at a short distance above the end of the handle, in such a manner that the end of the handle projects an inch or more beyond the side of the hand. The hand and the eye act so well together in concert that, after a little practice, the amateur will have no difficulty in hitting a nail square on the head. If not so hit, the force of the blow will be partly lost, and the nail will be moved out of position. In driving nails in hard wood, a hole should first be made, either with a brad-awl or a gimlet. Sometimes a knot will cause a nail to swerve from its right direction, and even to curl up, thrusting the point through the wood at no very great distance from the hole at which it has entered, "coming out," in workman's parlance, "to have a look at the fool that is driving it."

ONE thousand feet of lath are 2,000 pieces, and will cover 120 square yards.

JACK PLANES; WHY SO CALLED.—"Since every Jack became a gentleman, there's many a gentle person made a Jack." So wrote W. Shakespeare, Esq., in his immortal tragedy, "Richard III." The term "jack" seems to have been applied to any mechanical contrivance for replacing the personal service of an attendant, or to an implement subjected to rough and familiar usage. In England the most common name is John, and the familiar synonym of that cognomen—Jack—was applied to the plane. It is derived from the Jewish word "Jacobus," and was corrupted into "Jacques" in France, and, being the commonest Christian name in the latter country, was used as a contemptuous expression for a common man; hence the term "jack" is applied as mentioned above. Besides the jack plane, we have roasting jack, jack screw, boot jack, jack towel, jack boots, black jack, etc.

ONE and one-fourth yards of good sand will suffice for 100 square yards of plastering; 1½ barrels of lime for one coat, and 2½ barrels for two coats, for same number of yards; one bushel of hair to above quantities. One-third barrel plaster will harden 100 square yards.

TALL CHIMNEYS AND SPIRES.—Lowell has four chimneys over 200 feet high. The Merrimack Company has two chimneys

283 and 206 feet respectively; also 110 steam engines. Glasgow, Scotland, has a 446-foot chimney, not for smoke, but for chemical fumes, and another chemical chimney of 350 feet; and Manchester, England, has one of 415 feet. The Merrimack Company's is the tallest smoke-chimney in the world. The Tremont and Suffolk Company has one 225 feet, and the Lawrence Company one 211 feet. The chimney of the Pacific Mills, Lawrence, is 227 feet; that of the Navy Yard, Boston, 239½ feet. Bunker Hill monument is 221 feet tall. Trinity Church spire, New York, is 284 feet.

FIFTY pounds of building paper will cover sixty yards.

MANY thoughtless workmen seem imbued with the notion that the more glue there is used in joining wood together, the stronger will be the joint. This is a great mistake, for a *thick layer of glue makes a weak joint*. Indeed, the thinner, in reason, the glue, the stronger will be the joint, the great desideratum being the exclusion of air. If the air could be entirely expelled from between two surfaces, they would adhere one to the other without glue. In the manufacture of a certain sort of glass, where one piece is ground against another to bring them to a face, it is sometimes the case that the air is so perfectly excluded that the two plates adhere so firmly to each other that they cannot be separated without fracture. Glue should be used while hot, and the surfaces to be joined rubbed together before the clamps are applied.

WHITEWASH.—One-half bushel good, fresh, unslaked lime. Slake it with boiling water, covering it during the process, to keep in the steam. Strain the liquid through a fine sieve or strainer, and add to it a peck of clean salt, previously dissolved in warm water; three pounds of good rice, ground to a thin paste and stirred in while boiling hot; one-half pound powdered Spanish whiting, and a pound of clean glue, which has been previously dissolved by first soaking it well, and then hanging it over a slow fire, using an ordinary glue pot. Add five gallons of hot water to the mixture, stir it well, and let it stand a few days, carefully covering it over. *Must be applied hot.* One pint will cover one square yard of finished surface. This wash retains its brilliancy for years; can be applied to surfaced lumber instead of paint.

TINTS may be imparted to whitewash by adding a little blue black, or indigo, or orange red, or Venetian red.

The Flight of Time.

ITS tramp is steady, quiet, rapid, sure, and its periods certain. It has been flying for myriads of ages, carrying with it growth and decay, happiness and misery, light and darkness, sunshine and storm; and still it speeds its onward course, heeding not the wails of grief and anguish, as it lands one after another of the human family beyond its confines. Its history is made up of joys and sorrows, hopes and disappointments, bright suns and dark hours, silvery lit and starry skies and midnight gloom; balmy zephyrs and resistless storms, each and all passing away in the breath of time. Millions of years mark its duration, and millions more will yet pass to its account; yet it matters not how fast it flies, if in its flight it bears no story of misspent days and hours, as far as those now wafted upon its ever-vanishing course are concerned. Its records will tell how well or badly each has improved its fleeting moments. That which has been and is we know. That which is beyond in the vast immensity of the great hereafter, is hidden from human knowledge by the dark and impenetrable veil of uncertainty, through and beyond which no mortal eye hath seen or penetrated, except so far as revealed to multitudes who live in the light of faith in things not made manifest by sight, allured by the angel Hope to realize that when time and mortality to them shall have passed away, a brighter and better condition awaits them, where, purified from all the entanglements and ills of time, the realms of purity and perpetual rest will be entered and enjoyed; where, in the immortality that will abide forever, they will revel in scenes of perpetual peace and uninterrupted love and purity. Thus the votaries of Hope, holding faith in future bliss, draw consolation to themselves, and the embitterments of time are mellowed and softened by the dews distilled from faith in things hoped for. Still flying time stops not nor pauses in its speedy passing away, nor stays its onward course, because from its embrace millions and millions of human kind have passed away, nor any remain beyond their allotted time to enjoy its enchantments and opportunities.

ASKED, ANSWERED, AND COMMUNICATED.



Architects, Contractors, Carpenters, and Mechanics generally are respectfully requested to furnish us items of interest for this column. We will gladly answer any and all questions pertaining to the architectural and building interests. If illustrations are necessary to explain your ideas, send us a sketch of them and we will make the cuts.

A YOUNG mechanic inquires for a "correct method of finding the length of one of the sides of an octagon, the diameter being given."

Rule.—Knowing the diameter of an octagon and the length of one of its sides, to find the length of side of any octagon, add or subtract, as the case may be, to the known length, two and one-half inches for each six inches of diameter.

In order to use this rule, it will be necessary to remember some one certain measurement. Assume 8 feet as the average width. The length of side will be 3 feet 3¾ inches. Paste this with the rule on inside of your tool-chest lid. Suppose diameter is 9 feet 9 inches. Difference between 8 feet and 9 feet 9 inches is 21 inches. Apply the rule, and we have 3½ × 2½ = 8¾; add this to the length of side given, and the result is 4 feet ½ inch, which is the correct length of side.

THE weight of zinc per superficial foot is as follows:—

Nos.	10	11	12	13	14	15	16
Weight, oz.	9	11	13	16	19	22	25

NEVER use iron nails in laying zinc, as iron and zinc combined, causes galvanic action, which ultimately destroys the latter named metal.

THERE is no absolute need of painting zinc work; for exposing it to the atmosphere has the effect of coating it with a thin film of oxide, which protects it from the further action of the air as effectually as paint.

PAPER HANGER'S PASTE AND HOW TO APPLY IT.—Good paste for paper hanging is made of old flour, mixed to a milk-like consistency with water. When put in a kettle to boil, a little size or glue may be added, which will increase its tenacity. A little alum may also be added, in order to keep the paste sweet and to cause it to spread more freely. When boiled, it should be of the thickness of ordinary gruel, and laid on the paper smoothly and equally with backward and forward strokes of the brush. Care should be taken not to load the brush with too much paste at one time, lest the paper be rendered too damp. When an over-abundance of paste is used, a little is pressed out at the edge when the cloth is used to dab the paper against the wall. This may be removed by a sponge dipped in clean water.

In answer to a student; there are three primary Greek orders: Doric, Ionic, Corinthian, to which the Romans added the Tuscan and the Composite.

THE ancient Greeks seem to have been unacquainted with the principle of the arch, all their doorways, windows, and spaces between columns being on the principles of the architrave. In Roman architecture, the arch is one of the principal features. In Greece, the rivers are very small and the means of crossing them were simple; but in Italy the width of the rivers necessitated the use of arched bridges.

DORMER windows are small windows built out of a high-pitched roof; they are so called because they were originally used for dormitories or sleeping chambers.

A WOMAN made the first orange box in California, and has built up an industry that now amounts to 50,000 boxes a year. —*Ex.* Truly, Californians have to go away from home for items.

INDICATIONS point to an increased price for tools in the wood-working line. Mechanics should make calculations accordingly.

MORTAR and paint may be removed from window glass with hot, sharp vinegar.

SOOT falling on a carpet, if covered thickly with salt, can be removed without injury to the carpet.

A GOOD moth powder is made of ground hops one dram, Scotch snuff two ounces, camphor gum one ounce, black pepper one ounce, cedar saw-dust four ounces; mix thoroughly, and strew among the furs and woollens to be protected.

LARGEST MASS OF SOLID BRICK WORK.—The Mengoon pagoda is one of the most interesting sights in Burmah, and in its unfinished state is the largest mass of solid brick work in the world.

ORIGIN OF THE DORIC SHAFT.—The Doric shaft, with its characteristic diminution and channelings, was known in Egypt more than 1,000 years before its introduction into Greece, as is proved by the monuments of Beni-Hassen. Commercial relations had existed between the two countries for centuries, and it cannot be assumed that the Greeks had not seen Egyptian works of architecture. They could not have arrived at precisely the same results by independent invention.

NEW YORK CITY embraces an area of 24,394 acres.

"TOO MANY IRONS IN THE FIRE."—This is an old proverb, another version of which is: "He that hath too many irons in the fire, some of them will burn." This morsel of metaphorical wisdom, evidently the work of a blacksmith, is, of course, intended as a warning against undertaking too much, and, at first sight, sounds like a prudential maxim, well adapted to secure efficiency and singleness of aim on the part of all workers. But, more closely considered, the precept shows for itself what it really is—a piece of narrow-minded, petty prudence, adapted only to the guidance of incapables and fools.

The fact is, nobody who is good for anything needs any such cowardly caution about having "too many irons in the fire." Your active, efficient characters, they who do the largest share of work in the world, are the men who want and will have a great many "irons in the fire." Shovel, poker, tongs and all, these masterly workmen keep them always hot and always busy. The rapidity of their daily accomplishment is only equalled by its variety. Both their combinations and their execution are such as perplex and startle little minds, and lead them to repeat in full chatter much such petty maxims as the one now under consideration. It is by such men that human progress is advanced, inventions and discoveries are made, fortunes are won, and all valuable improvements and reforms are achieved.

ONE cwt. per superficial foot is an ample allowance for the probable load on an ordinary dwelling-house floor, exclusive of the weight of the floor itself. Two cwt. per superficial foot is sufficient, in many cases, for warehouses and factory floors.

THE weight of a crowd of men closely packed is about 84 pounds per superficial foot.

GIRDERS are often sawn through the middle, and the two pieces bolted together with the sawn sides outwards, not, however, as is often erroneously supposed, to increase the strength of the girder. It is really weakened by such an operation. The main benefit to be derived is that an opportunity is given to examine the heart of the timber, and thus expose cases of rotteness. Girders cut as suggested are much less liable to rot. The oldest author on architecture, Vitruvius, "directs a space of two fingers' breadth to be left between the beams for forming the architrave over columns in order that air may circulate between and prevent decay." Every observing mechanic has noticed that decay begins at the joints and other places where the pieces are neither perfectly close, nor yet sufficiently open to allow any dampness to evaporate.

In Amsterdam, there is a floor constructed which has no joists whatever. The room is sixty feet square. The floor consists of three thicknesses of tongued and grooved flooring, each layer being one and a half inches thick. The first course is laid diagonally across the opening; the second, also diagonally, but the reverse of the first; and the third course is laid parallel with one of the sides of the room. Each layer is securely nailed to the other. The middle of the floor is kept about two and one-half inches higher than it is at the sides of the room.

Art and Architecture.

(Special for this Journal. By F. HILLERT, Architect and Mechanical Engineer.)

IX. THE SENSE FOR BEAUTY.

AS the first efforts in forming must naturally have been crude and simple, nevertheless man tried any way to give to the objects of the same a form which pleased him, if only by its agreeability the purpose in view was expressed. So is it proper, even on the most



primitive or simple building, a projecting cornice is attached, that the rain-water falling from the roof does not run down the wall; but this cornice gives to the structure an inditing and marked form, pleasant to him if only by the purpose which is by it expressed. Gradually we seek, with consciousness to perfect the necessary and required raw material to such forms, agreeable to the purpose, which, on the whole, finish and complete a work pleasant to our view. In this way manifests itself in the highest degree the impulse or drift to form the sense for beauty. But this sense for beauty is manifoldly graded, and shows itself in most different ways; nevertheless it is the highest ornament of a nation, and the high perfection of the same by the Greek people, giving to them as such the brightest luster, and shine for all time to come. With the development of such perfections is necessarily united and conditioned a high standard of culture of the impulse for liberty and truth; then the last impulse could not express itself either with a nation existing in brutal stupidity, or with such living in despotic fetters and bondage, or living together in immoral concubinage. There would be the sense for beauty, and its expressions and manifestations for nobody's approbation and admiration, and never would come to a perfect execution. Here it would shrivel through fear, or grow wild in licentiousness. Uniform harmonies, development of thought and will, are indispensable for his own perfection, and by the same he gains such active capacities as he can and must use and apply for the general culture of mankind.

X. ITS IMPORTANCE FOR THE EDUCATION OF THE HUMAN RACE.

That the sense of beauty is necessary and unalienable for the promotion of the education of the human race, is clear and evident in every way. If we would take the sense to feel it from our world, we would cease to be human beings. Not only would it destroy the one who is used to live in artistical ideas, and find in its enjoyment the highest pleasure and satisfaction, but even of the most modest and contented every attraction to live would be taken away; from the simple peasant girl, the pleasure of a flower; from the wild man of the desert, the delight in his plumage and colored adornment.

With necessity is the sense for the beautiful implanted in humanity, and in each human being are unquestionable traces to be found. By the awakening, enlivening, and cultivation of the same will be effected the imperceptible, uninterrupted, and most powerful influence on the whole human race. He knows to give form to the first religious inspiration; he permits the eye to rest always, and always with love, on nature; it leads to deep meditation over the same; it leads to respect of the sexes, to mildness of manners, and, lastly, to art; and by artistical works a considerable retractive effect is exercised. The importance of the sense for beauty has been intelligently explained and made to become universal property. It would therefore appear as if beauty is only the servant of attaining truth; but this is an illusion; for if this be true, it must be first established that the highest purpose of life would be exclusively the attaining of truth. But who will assert this, since the purpose of life could be, with the same right, the perfect ennobling and refining of our soul, the reaching of the highest good? And, lastly, should not also the attaining of the highest beauty, in the viewing of the "epitome of all heavens" be revealed and disclosed,—be a worthy purpose of life, but not an exclusive one? But also this cannot be correct. The spheres do not exclude, but condition each other; are inseparable, and act always through and by each other, so that it is no profanation of Christian mysteries, but a deep, in its self supported, truth, when in the meaning and comprehension of the sense of the "undivided Trinity,"

truth, goodness, and beauty, the common aim of the intellectual, the ethical, and the esthetic impulses of men have combined. So aspires the sense for the beautiful to the same aim, and finds, lastly, its termination in the same idea, in which rest the origin and fulfillment of truth, and liberty, God.

XI. ART AND POETRY.

As far as history dates back, we find in the earliest nations the coincidence of activity in the sense of the beautiful in the most differing and manifold manner. The first traces of the same appear in the habiliments of man, his utensils, arms, and such like, which were embellished, not showing directly their practical purpose, i. e., the seam in a cloak being covered by a strip of cloth of a different color; or such as by the form of the object the purpose and its conditions were directly visible and evident, as in a column, as of something free-supporting. To such structures nothing compels man but his own instinct and drift, so that which he makes he gives its form a charm, pleasant to the eye or ear, to read on his mind by the two organs, to give him pleasure in the object made.

Such exertions in the sense of beauty we name art, in the widest sense, or poetry, poesie. Then here are the arts of forming and sounding not yet separated, and the Greek word and meaning taken therefrom means a making, producing, and forming by tradesmen as well as artists and poets. The law which guides and inspires him is his own feeling and sense. He is able to bring the undetermined into form and shape. He is able to perceive, if his inner instincts and impulses are expressed, that his sense of beauty is satisfied. The process which goes on in the mind of men we lead back to the fancy or imagination, that is, the capacity of the soul to conceive and put before her things or objects which the organs of sense do not observe. Free and independent out of his imagination and conception, man learns to make and form beautiful objects and things, and he uses for this purpose the natural material and stuff, to bring them (beautiful things) into existence.

XII. DIFFERENCE IN THE ARTS OF SOUNDING AND FORMING.

Is the material or stuff used or employed words or sounds, then the objects formed belong to the dominion of the sounding arts, poetry in the closer sense and the art of sounding or music. Are the former objects of a bodily form, then they belong to the domain of the forming arts, such as the art of building, sculpture, painting. The means of the first group, that is, the condition by which necessarily the work of the same reach our observation, is time. Those of the latter group is space. The objects of the first group act on the ear, and its forms are conditioned by the motion in the time. Those of the latter act on the eye, and its form is conditioned by bodily stuff being in space. Different are both kind of objects, not by their origin and meaning, but merely by the way and manner in which the originators brought them to appearance and expression. There exists not only no opposition and contradiction between each of them, but more of a complete uniformity in their origin. Both are only daughters of the same mother; but she gave them to different husbands, and the children of the one worked with rule and square, the chisel, the palette, while those of the other took to the pen and to the lyre; but not one of them denies the common origin, and they acknowledge and recognize each other as sisters and brothers, and all breathe the same inspiration.

A series of pursuits and activities are rightfully included in the arts, but with the same rights the objects of the same belong to the beauties of nature. Those are all living, and man only forms the living, without taking from them the conditions of their origin and the passing from their existence. They form and make a transition from nature to art, and consist principally in the art of gardening, dancing, with the art of riding, to which may be added mimic and the art of play acting.

XIII. ART AND THE BEAUTIFUL.

The common definitions and explanations of "Art" and its spirit are, as known, insufficient and partly empty phrases. This lays in the difficulty of giving a definition of "Beauty," and we must limit ourselves to understand and comprehend the capacity of man to produce beautiful objects, either immaterial, as the bodily or the sounding, and further expanded and narrowed down to the totality of all such things, which we call works of art, although we should use analogy, as in the dominion of nature (kingdom of animation), the kingdom of art. If we would give an abstract definition of art, we would lose ourselves in the domain of phrases, or proceed solely descriptive, by separating the human action from its subject and make it objective. In the last manner may be seen in art a presentation, that is, an activity, by which the inner thought or spirit comes to appearance. But this illustration is hereby so limited and bounded that

this activity has no useful, practical purpose, but only to produce or represent. It is clear that by this definition man is forcibly removed, but again being introduced in the same, it would only make clear that art is nothing else but man's activity, respective capacity, to produce and make beautiful things. In the same time it has been tried, those which are beautiful things, to be solved with this definition. Nobody and nothing gives us the right to exclude man from this definition of art, since art is not conceivable without a human representative, or its products without a human originator. Art, man has alone.

XIV. WORKS OF ART.

The object and purpose of art are the making and creating of beautiful things. Beautiful things made by man are therefore works of art, and only because they are beautiful are they works of art. The spirit of a work of art is its beauty, and, figuratively speaking, the purpose of art is beauty. Things having another purpose are called useful, lovely, agreeable, useless, or bad.

If now we review a multitude of such things, which generally are included within the sphere of art, we find between them a large number of such which, to us, do not appear beautiful, and which we must call ugly as the works or objects of remote people; nevertheless we don't object to adopting them as works of art. The reason therefor is that such things and objects, at the time they were made and to their people, appeared beautiful; or were considered as such by their own maker. Who could in real earnest call beautiful the images or figures of the Assyrians at Khorsabad, the paintings of the Egyptians, or a Madonna of the Byzantines; and who could call beautiful the abortions of the Rococo? The decision on all these objects is, that they were produced by the originators in a clear, or in an indistinct and with an unconscious intention to make beautiful objects; or that, at the time of their creation and making in general, they were thought to be beautiful.

A complete contrary and contrast would be that which was made intentionally to be ugly and was made ugly. Such an idea of ugliness does not exist, since all which is ugly or kindred to it has other purposes to fulfill; let it be for the existing of fear or grief, a tickling of a sensual pleasure, or other perceptions or objects, transformations and deformities, as exist in nature. The humorous, the comic, and the satirical are connected herewith, and will be mentioned hereafter.

An uncultured, coarse sense and mind will hold that as beautiful which appears to a cultured and refined mind, hard, ugly, and such like. With the general advance of education and culture, the appreciation of beautiful things will increase with the individual man as well as with whole nations—and the human race. In regard to its originator, he shows by his work of art his own coarse or refined sense, and since the same, with very few exceptions, always corresponds and is the outgrowth of the sense of beauty commonly existing in his people; then this work of art will show the sense, way of thinking, and sense of feeling of the whole nation. In the series of the works of art made by the same is revealed its inner and particular development and historical culture, which would, without the same, be forever lost and unknown to us. What would we, for example, know of the Greeks, if of the high temples and towns, of the marble figures of the gods, of the pictures and utensils, no trace was preserved; the genius of Homer would be dumb and silent to us, the muse of Sophocles lost forever, and all that which, being kindred to those spheres, would be to the slightest presentiment strange to us. To think this, though, is already impossible, since Greek life without art is not conceivable. By our works of art we will be judged by posterity, justly, according to the merits of the present age.

XV. BEAUTY.

Since the purpose and the spirit of a work of art is the beautiful, we have now arrived at the question: What is beauty? A general logical definition of beauty cannot, by any means, be established or put up; since it must be brought back to that capacity of man which is not of a logical nature, the mind. But the beautiful is, nevertheless, not possible without certain practical relations; the same are again to be put up with difficulty and explored, as the reasonable necessity of a conclusion is missing. Then, from the divided opinion of men, and the want of proof bearing the logical test of such opinion, to call an object beautiful is to raise the question, Are objects beautiful themselves, or do we only feel in our minds the impression of beauty; or, Is beauty an objective property of bodies, such as gravity, expansion, color and such like; or, Is it only a subjective sensation in man transferred to one subject? Without illustrating these points for and against it, and perhaps arriving at a result, it may be sufficient to state that beauty is neither purely objective nor purely subjective, but is both at the same time. If beauty

was purely objective, she must appear to all men alike, as a red colored body must appear red to all; but would beauty be purely subjective, she would not make on the many one and the same impression, but would appear different to all; so much different from each other as each individual man's form, mode of thinking and of feeling, differs from those of another. At the same result we would arrive, when we reflect that beauty is not purely spiritual, but is attached to a certain concrete form, through which it operates on our senses by our eyes and our ears. The peculiar form being unconditionally attached to the object, is inseparable from the beauty of the thing itself; then the same would, when changed in its form, cease to be beautiful. In this sense, beauty is something objective, adhering to the thing itself. Otherwise is this form, for such a one not comprehending the same, just as incomprehensible as if beauty did not exist, and he would not call the thing beautiful; but only the one will find the same beautiful, having a suitable fine feeling, refinement, a fit and proper way and manner of perception, from which it can be concluded that the beauty is transferred to the things by the person enjoying it.

But how are we to proceed? If from general truth, a logical conclusion of the spirit of the beautiful cannot be formed, lays therein generally the impossibility to get closer and nearer to the same? or does a method exist which at least approximately leads to this aim? This is the empirical method, which tries to deduct from experience a principle. It has been truthfully said that we cannot proceed in the same way as in geometry, which goes from the general to the special, and singly and from the spirit of the thing to their properties and concludes, but we must content ourselves, from only single pieces, to draw probable conclusions. Of what sort or kind these conclusions must be is clear; that they cannot be purely defining the object; nor be purely of a physiological kind, to explore and investigate the affections and emotions in the human mind; but must refer themselves from the relation of the beautiful thing to man, which in the main will be objective and formative explanations. But the conclusive characteristic signs or marks which we perceive by viewing beautiful things are these—that the thing itself pleases us well, and that we in the same thing, merely as stuff and as a body, positively take no interest. When we, for example, find a bronze monument beautiful, we do not consider by far the value of the material which, when coined to pennies, would make to many no indifferent object. In this feeling, not wished for nor desired (disinterestedly) lays a deep satisfaction in the mind of man to make and produce beautiful things. The capacity and ability on which this satisfaction and pleasure is based, is "Taste," which is man's esthetic capacity of judging things in regard to the beauty of the subject; taste is ruling. The word "taste," being raised to a school expression, is nothing else than the sense for beauty of the single individual man, so that it is eas to be seen, in regard to the definition for the beautiful, we move around in a circumference. Two illustrative reflections come to our aid,—one that the pleasure of the beautiful is not purely sensitive, and the other, that in the appearance of the beautiful thing lays direct the semblance of a spirit; both differences we must recognize clearly and plainly by our intellect and reason. If now this contentment and pleasure are not purely sensitive and expanded, are not exclusively in our feeling, then they exist necessarily in accord with feeling and thought, the mind and the spirit, or, as may be expressed, in the harmonious play between imagination and intellect. But that in the appearance of the beautiful lays direct a spiritual sense, leads to the recognition of the purpose of the beautiful thing, which directly becomes perceptible; without that the intellect sees directly the purpose. The point in question is the spiritual meaning of the beautiful thing, which in the aspect comes directly to view, in the most suitable manner, so that a perfect harmony between the spiritual meaning and contents—the idea, and the outward appearance of its form, exists.

XVI. BEAUTY OF NATURE.

It is now the time to mention in a few words the relation of beauty in nature to beauty in art. In nature all things have certain practical reasons and purposes, and undergo and underlay an uninterrupted change; and beauty is here only an adornment of the necessary, even if the same in a higher sense itself is needed, and so united, that with and by each change, the same itself is changed, dissolved, or destroyed. The conditions under which beauty is attached to nature are inconstant, continuously beginning and ending. Man alone is capable of producing things of which beauty is not a subordinate aim, but is the sole and exclusive purpose, untouched by the changes of nature, unalienable, retaining its beauty, giving a presentiment of eternal duration.

(To be continued.)



PLATE 6.—CHINESE GARDEN HUT.

Graining.

IN graining work that is paneled, the lights and shades of the panel should be stronger than on the rest of surface. The rails and stiles of doors should be more simple than the panels in the imitation of dark decorated woods, as rosewood. If the cross rails are full of work, make the upright stiles plain, for their appearance is changed by their position with regard to light. Perhaps the greatest triumph in staining is imitating successfully the curls of mahogany. Graining in maple wood is suitable for dining-rooms; the color of maple varies very much, and therefore it is necessary to select a choice piece for imitation. Pollard-oak graining suits well for a dining-room, with its warm color and rich effect, the color varying from the lightness of maple to the darkness of mahogany, so affording a range of choice. Oak color is adapted to all styles of wainscot, harmonizing with warm colors on wall space, whether this be papered or painted, and making pleasing contrasts with cold ones. It also looks well on the ceiling cornices of lobbies. In wainscot graining the lights and shades on the panels should be the strongest. If the prevalent color of a room be warm, the graining of the wood-work should correspond; if crimson, maple, satin wood, or oak graining may be employed; if green, some cool-toned and light-colored wood. Smoothness of surface is important in the grained imitation of woods, as well as the rendering of deep, transparent, and shadowy half tints. The grainer should not revel, as we have seen some do, in knots, which, indeed, should be left out, as well as the representation of cross-grained stuff, which the architects would avoid in real wood, whether for stiles, rails, or panels. Where wood has been previously painted, the grainer should examine it closely to see that it is not liable to peel off, and so spoil his work. Where marble has to be imitated, in order to secure a transparent effect the best polished copal should be used with colors, never turpentine.—*Painters' Magazine and Coach Painter.*

THE world moves on, inventions and progress still rush together for the benefit of the present generation; but we look back with a feeling of veneration to the art and talent displayed in ancient architecture. In all the modern edifices of which we pride ourselves, the striking features are but a reproduction of the thought of the old masters, with the exceptions that we build in a few months buildings that would have taken them years to complete. We are gradually returning to the age of artistic

wrought iron, cunning designs in brass, elaborate wood carving and marble tessellate pavements. Acquiring wealth rapidly, we are less inclined to look at the cost of the work so artistic and durable. The old Romans prided themselves on the marble floors of their dwellings, and the proof of their knowledge of its durability is demonstrated by the recent discoveries made in Roman ruins, where the marble mosaic pavement retains its original designs and colors. Of late years, an Italian artist, Mr. Caretti, has introduced this work in some of our new-fashioned residences, and a handsome design for the hall of Mr. A. D. Kohn's house is his latest work. Should, in centuries to come, Macaulay's New Zealander be digging in the ruins of Chicago, a marble mosaic pavement may be brought to light, and create a discussion as to whether Chicago was an old Roman city or the creation of a more modern age.

SOME of our scientific exchanges are describing a kind of concrete that is said to be in use for building purposes in France. It possesses the desirable qualities of solidity and hardness. It is said to be composed of 8 parts of sand, gravel and pebbles; 1 part of common earth, burnt and powdered; 1 part of powdered cinders, and 1½ parts of unslaked hydraulic lime. These materials are thoroughly beaten up together, their mixture giving a concrete which sets almost immediately, and becomes in a few days extremely hard and solid, which property may be still further increased by the addition of a small quantity—say 1 part—of cement. Among other constructions to which this material has been applied is a house three stories in height, 65x45 feet, standing on a terrace, having a perpendicular retaining wall 200 feet in length and 20 feet high. Every part of this structure was made of the hard concrete, including foundations, vaults of cellars, retaining wall, and all walls, exterior and interior, as well as the cornice work, mouldings, string courses, balustrades, parapets, and the building is without band iron, lintels, or wood throughout.

In order to render glue insoluble in water, it is only necessary to add a little potassium bi-chromate to the water in which it is dissolved, and expose the glued part to the light. One-fiftieth part of the bi-chromate will suffice.

A bound volume of this Journal for either of the years 1880, 1881, or 1882, will be sent free to all new subscribers for balance of this year and 1887.

Glimpses of Sunshine.

MECHANICS are apt to compare their life of toil and scanty pay to a long season of cloudy weather. They feel that they are under a shadow, hemmed in by circumstances which they cannot control, and that they must keep on treading, as does the horse, on an endless treading-machine. Skilled mechanics here and there have good-paying positions, but the great mass have all they can do to make ends meet. Probably this is partly due to this era of extravagance in the mode of living and of dress. The American mechanic cannot submit to live like a savage, nor even like some in our midst, who swarm together like pigs. He is fond of home, and no matter how humble it may be, he will make it as bright and cheerful as his means will permit; in fact, he is more likely to spend a little more than he earns, than he is to pinch and deny himself to save a few dollars every year.

But in the last ten or fifteen years the men who work at trades have experienced a steady decline in their incomes, partly from lower wages, and partly from lack of work.

It used to be that men were employed from January to December, but that day is past, and nine months is now about the average time made. Week and piece-work prices were formerly higher, and probably the employers obtained better prices than they do now. But labor-saving machinery has placed the employers on a footing by which they make as much clear profit as formerly, but it is distributed over an increased output.

The mechanics, especially the skilled ones, have had no means of competing by their labor, as an offset to the rapidity of steam power. The effect has been to push them aside, or compel them to accept greatly reduced pay, or turn their hand to something else. There has been a steady weeding out of good mechanics, and a steady influx of laborers who had brains enough to feed a machine.

Crowded out of their regular work, and compelled to squeeze in wherever there was an opening, it engendered a spirit of unrest, and a determination to make an effort to better their condition by concerted action. We now witness the result in the gigantic organizations that have been formed, and which are making demands that are rapidly being acknowledged by the public as reasonable and just.

For a time there was a chaos of doubts, fears, and misapprehensions on the part of the public, and even many workmen stood trembling, and fearful that the demands of organized labor would but increase their burdens. But when the workmen stated their case calmly and fearlessly, and showed that they were in earnest, and that nothing could swerve them from their purpose to gradually and lawfully compel just treatment, a little blue sky began to appear, letting in glimpses of sunshine in the form of concessions by a generous firm here and there over the country.

The Saturday half-holiday movement among merchants has grown out of the great labor agitation, and it is plain to be seen that capital is on the giving hand. Labor must not make unreasonable demands, even under sore oppression; but having once decided on what is fair and just, it should not cease all lawful efforts until its claims have been granted. The crying need of the hour among mechanics and laborers is a little business knowledge. They need to learn that but a small proportion of men have the ability to start and develop an enterprise which may give employment to hundreds of men.

They need to learn that out of these one hundred that are steadily employed probably not one of them has the business capacity to carry on the works for a single day. They need to learn that the finished products must find a market, and that the profits over and above the cost of labor, stock, and contingent expenses are not always sufficiently large to warrant an increase in the first cost.

When the majority acknowledge the above stubborn facts, they will be much stronger in self-defense, for it will guard them against foolish outbursts of temper, and strikes, which always result in heavy losses of money and great privation in their families. What labor needs is perfect organization, guided by common-sense views of business, and plenty of money to stand out against oppression.

The money can be easily had; for if one million wage-people pay in but one dollar a year apiece, a fund is at once created that in a few years will command the respect of even the most exacting capitalist.—*Painters' Magazine and Coach Painter.*

THE *Journalist* for March says: "The trade journals are a recognized and important factor in the journalistic profession, and many of the brightest and ablest men in the country are engaged in their conduct."

Amateur Carpenters.

IT is an excellent thing for any man, whatever his business in life may be, to acquire a fair degree of mechanical skill and familiarity with tools and machinery. Such knowledge never comes amiss, even if its possessor is so fortunate as to be under no necessity of ever using it as a means of livelihood; just as a thorough practical acquaintance with the minutest details of housekeeping is valuable to any woman, though she may be surrounded by luxury all her life, and have a servant to wait on her at every turn.

But it does not follow, by any manner of means, that an amateur or half-trained workman is profitable to his employer, even at half price, or at any price. Experiments of that kind are oftener made, it would seem, in the various branches of carpenter work than in most other trades—for the reason, probably, that it is easier and more common to pick up in a desultory way a superficial knowledge of carpentry than of other callings which do not in fact require so much skill and judgment for their thorough mastery. To become a good carpenter, capable of estimating a job fairly and performing it honestly, is a matter of not a few weeks or months, but of years of diligent and conscientious work. And while the temptation is very great, in awarding the contract for a job, to give it to the lowest bidder without due regard to the probability of getting the worth of one's money, it is generally found that a single lesson of that kind is sufficient. In a broad sense the rule that "the best is the cheapest" holds good in carpenter work, as in nearly every other.

A vigorous protest against the employment of what it calls "saw and hatchet carpenters" is made by the *Southern Lumberman*, which imputes to them not only want of skill, but want of honesty as well. As an illustration, it mentions a building contract which one of that class of carpenters offered to take for \$500, while the material alone came to \$570. Somebody was badly cheated, of course, and probably the lumber dealer, the workmen, and the owner of the building all suffered more or less. Incompetency and false pretense in all trades and professions should be steadily discouraged; and the only way to put an effectual check upon them is to give the preference invariably to the trained workman, who has earned and can rightfully wear the title he claims.

What Will Come of the Labor Troubles.

DEFINITE and excellent results will come out of the chaos of strikes and violence and the accompanying discussions. Experience is a thorough teacher.

The first result will be the cutting loose of respectable workmen from association with the anarchists. They see with consternation the hideous purposes of these social bandits, and are hastening to denounce them. The manifesto of the Chicago Knights of Labor has the right ring.

A second result will be an end of strikes and boycotts to force non-union men out of employment. The utter collapse of the great St. Louis strike and of the Third Avenue strike in New York, and the multiplying arrests of boycotters for conspiracy, settle that question. If men want to strike on their own account, they can do it; but by the same measure that their right to quit work is defended, the right of other men to earn a living by any employment that is offered them will be defended also, and at any necessary cost.

A third result will be a little longer in coming, but it will come. American workmen will learn the lesson which a majority of British workmen learned several years ago, that the only successful strike is the one that never occurs. The waste of strikes has become so enormous that the imagination can scarcely picture it. It has become a chief factor in trade depression, and, as such, a prime cause of low wages. The only way to raise wages is by keeping at work, respectfully presenting the demand for an increase, and abiding loyally by the decision of conference or arbitration, holding the strike in reserve as a last and extreme resort.

The present disturbances are deplorable and disastrous, but they will clear the air.—*Ec.*

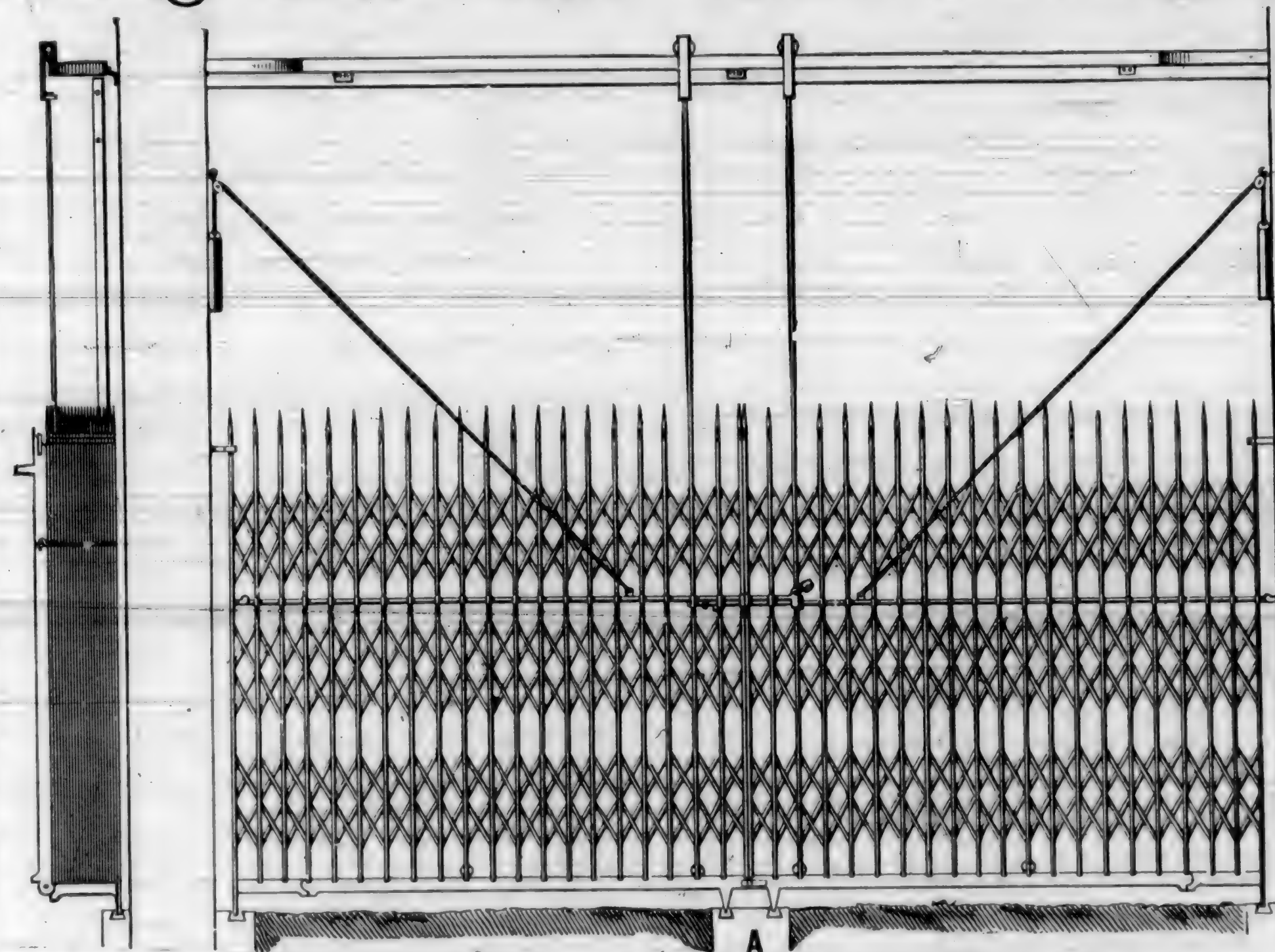
Book Notices.

OSBORN'S TABLES OF MOMENTS OF INERTIA, AND SQUARES OF RADII OF GYRATION. By Frank C. Osborn, C. E. Is designed to supply partially, at least, a need felt by engineers and draughtsmen engaged in structural works in iron and steel.

DIRECTORY OF ARCHITECTS FOR 1886. By Bryan & Co., Holyoke, Mass., and New York. Supplies in main part the names and addresses of architects in the United States, California included.

Folding Gate and Guard Company.

These Gates and Guards are manufactured to order in San Francisco, to fit and fill openings as desired. Descriptive Catalogues and Price List furnished.



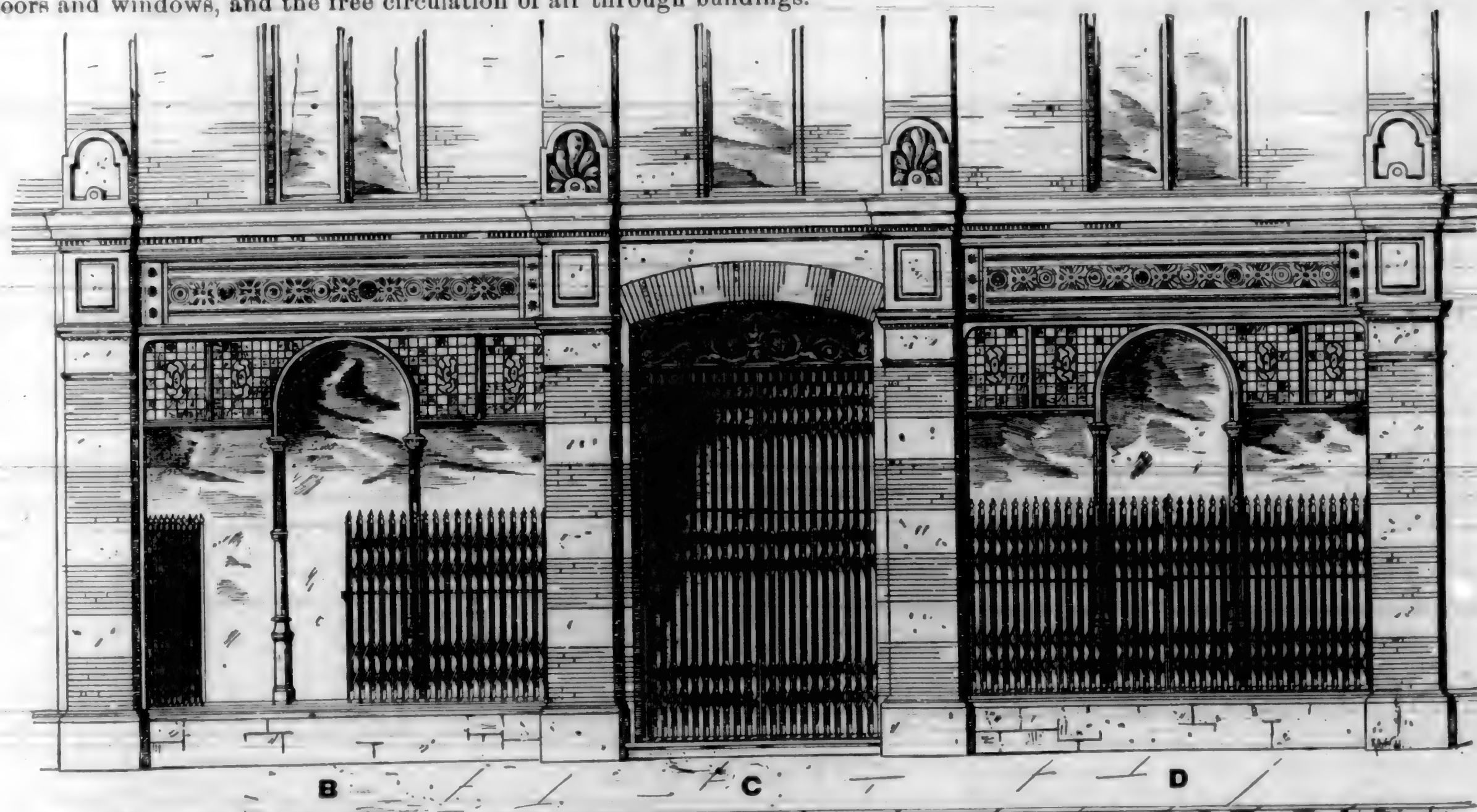
ABSOLUTE SATISFACTION GUARANTEED.—They are easily handled and adjusted, and are the most perfect device in use for the purposes for which they are intended.

Protect Your Homes and Business Houses

WITH THE IRON FOLDING GATES AND GUARDS.

They are ornamental in design, and afford perfect security when applied to store doors and windows—to vestibules, doors and windows of dwellings, and at stables, elevator wells, etc.

When in position they are an absolute safeguard against Burglars, Thieves, Tramps and Designing Persons, and can be removed and replaced without unbarring. As a Sanitary Device they are superb, permitting the opening of doors and windows, and the free circulation of air through buildings.



DESCRIPTION.—A represents the guard suspended overhead; B—Store window partly closed; C and D—Store door and window fully closed.

CEO. H. RICE,
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109 California Street, San Francisco, Cal.

J. P. LECOUNT,
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Advertisements inserted at reasonable rates.

SAN FRANCISCO, CAL., AUGUST 10, 1886.

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Building Summary.

As will be noticed by our monthly report, the number of contracts let since our last issue is considerably less than those for the similar period of 1885. How far the G. A. R. Encampment may have contributed to this result, is a matter of conjecture. One thing is certain, that the encampment business engrossed the attention of a large number of our citizens, and business generally was greatly affected by it.

REPORT FOR AUGUST, 1886.

64 frame buildings, value.....	\$376,431
8 alterations and additions, value.....	12,950
72, total number of engagements, total value.....	389,381

REPORTED IN AUGUST, 1885.

95 engagements of the value of.....	395,150
August report, 1886, less than 1885.....	5,769

The Offered Sale of This Journal.

SINCE the first announcement in its pages that the entire interests of this journal would be disposed of to competent parties, a great many personal inquiries have been made, and propositions submitted and declined.

A sale contingent upon certain stipulations might have been made a month ago, but as we propose an unconditional surrender of the situation, we shall hold the fort until a competent commander-in-chief shall arrive, with satisfactory financial credentials.

Negotiations now pending with parties and firms east of the Rocky Mountains, may result in a full change of management by the first of January next, if not sooner. In the meantime the journal will be continued as heretofore to the best of our overburdened abilities.

A GENERAL EXPLANATION.

Those who have made inquiry by letter, and personally, have asked for all the facts of the case, and what will be included in the sale.

As a general answer, we state: A sale will include every interest of the publication,—its good-will, subscription list and advertising patronage, office appointments, desk, bound volumes and back numbers since 1879, outstanding accounts due from all sources, five hundred copies, more or less, architectural, mechanical, and other publications (optional), and all else pertaining to the publication and circulation of the journal.

We state, in answer to the question repeatedly asked by correspondents, in reference to

COMPOSING ROOM AND PRESSES,

That there are none. The journal has been conducted incidentally in connection with our architectural pursuits, and printed and bound ready for distribution by contract.

But with these limited facilities and restricted advantages, and personal attention divided between two great interests—editor and manager, and practicing architect—each demanding our whole time and energies, we have continued our publication work for eight years (less four months) with a profit to ourselves, making a most enviable reputation for the journal, as evidenced by the hundreds of complimentary notices from time to time published by technical, class, and other journals, and preparing the way for some one to continue its publication with great success and profit.

G. A. R.

THE Twentieth Annual Encampment of the Grand Army of the Republic, held in San Francisco, has been a grand affair, meeting the highest expectations of the home guards, the citizens of the Pacific Coast, and the visiting host from all quarters of the United States.

But our daily contemporaries of this city have so fully and elaborately chronicled all matters pertaining to this great and ever-to-be-remembered gathering of patriotic men and women, that anything on our part, more than a mere notice of the event, is unnecessary.

One remarkable feature, however, is worthy of special mention; that while the number of men, women, and children moving to and fro through the streets of San Francisco, entering and leaving the city by trains and ferries during the period of the encampment, aggregated hundreds of thousands, approximating 2,000,000 persons, not a single accident to life or limb has occurred in connection therewith.

Aggregating the number of trips of street-cars during each day, from 3,000 to 4,000 cars were moved daily, or for the week, some 25,000 to 30,000 trips on all the lines—perhaps more—yet the accidents reported in this connection do not reach the average of such happenings during ordinary times. This is the more remarkable in view of the fact that Market Street was "swarmed all day long" with the living masses, and parts of each day hundreds of cars passing a given point each hour; while at the Pavilion, on several occasions, the Larkin street-cars were run through surging crowds, and at the park terminus, frequently from one to two thousand people at the same moment transferring to and from cable to steam-cars, or in and out through the entrances to the park. Yet, under all those risky conditions, the week passed without leaving any sad and mournful monument of sorrow to mar the pleasures which seemed to flow in all directions.

The Circus Style.

CIRCUS in this sense—that a circus is a place that offers to the public a variety of funny things, as well as a few instructive and pleasing features, and the more really funny the entertainment, the better it draws, consistency being but incidental in its make-up.

In this view of the case—true merit and pure architectural rules and principles aside—the numerous clownish structures erected in San Francisco and elsewhere, are so thoroughly funny in general appearance, effect, and detail, that every intelligent architect or competent architectural critic can but laugh at the endless contortions, distortions, ill proportions and abominations set up to public gaze, and the whim of prevailing taste with those who seek and accept these structural malformations, are something astonishing.

The modern idea of house-designing, in the hands of competent and artistic architects, has, in some cases, evolved neat and pretty delineations. But the liberties possible under the false guise of Eastlake have also made it possible for consummate pretenders to operate, and conceal and disguise their ignorance of true principles, and practice their abominations under the pretext of a fancy name, used to excuse error, and gull clients to accept ignorance and incompetency as a style of architecture.

There can be no objection to any neat, consistent, and meritorious departure from the old order, in which symmetry, proportion and good taste has been respected and blended. The progressive age in which we live, not only commends but invites innovation upon the forms and features which have held the world subjugated to the creations of the ancients. Beautiful and to be admired, the grand old structures the world over stand as exemplifications of that depth of conception which evolved the classic orders, and will so stand until the curtain of time is rung down at the close of all human existencies, and the consuming flames lick up every vestige of human thought, and crumble into ashes the last evidence of human—architectural—skill, if such an event shall ever transpire.

But in architecture, time must work, and has worked, changes, and those possessing true merit and excellence will become renowned and admired, and be placed side by side with those of the early ages; but the nondescript passed off under the name of Eastlake—meaning any structural abomination, however erroneous, as well as those of modest neatness and pleasing appearance—can exist only as remembrances of the freaks of fancy of the period, to be looked upon in future years as most singular exhibitions of the reckless corruptions tolerated in the latter periods of the nineteenth century.

This is none too severe criticism, as much that is now practiced is defenseless upon any hypothesis of refined ethics, good taste, convenience, or consistent form, and in details innumerable, fearfully at variance with rational comparison with anything in true art or nature, and inclining in harshness and hideousness in general effect, to structures among barbarous races, or the semi-civilized and idolatrous nations.

In many of the examples the ill-shaped lines and inconsistencies are positively repulsive to the eye of those who have studied the beautiful from forms, as handed down to present generations through successive ages; yet there is at the present time a too general disposition to favor extravagancies in house designing, as in all other things, and to recognize as good the wildest imaginations and concepts of men, who in the attempted pursuit of classic architecture would fall to the deepest depths of obscurity.

Life of Cast-Iron Pipes.

THE fact is well sustained that the wear, by rust, in uncoated cast-iron pipe exposed to the action of clean, fresh water on both sides, is not more than one-eighth of an inch in three generations. With the present method of protecting such pipe with asphaltum, the life of the ordinary cast-iron pipe, used in building construction, may be greatly prolonged; indeed, even an ordinary coating of coal-tar pitch, when properly applied, is sufficient to add at least a score or two of years to its durability. The life of a soil pipe, even when quite thin and uncoated, has been found, by experience to be so great that it is not unreasonable to suppose that the greasy matter contained in sewage serves to coat and protect the iron from the corrosive action of the water and the acid components of the sewage.

The defects and leakages more generally met with in such pipes, are caused by the defective manner in which the joints are made, and improper placing and securing. Materials and devices used in buildings are often made to bear the faults of bad workmanship, and frequently "tearing to pieces" is done under the presumption that the things torn out are worthless, or not good, while the real difficulty lies in the defective handling and fitting.

Copper Boiler Explosion.

THE explosion of a copper boiler, in the kitchen of the Winchester House, in this city since our last issue, by which human life was jeopardized, and property damaged to the value of nearly \$2,000, was an occurrence of infrequent happening.

The possible explosion or collapsing of copper boilers connecting with ranges or stoves, is a matter well understood among plumbers and competent architects, and as a rule, precautions in the shape of tanks and steam pipes are applied in all such cases, and when sufficient and properly connected, there can be but little danger of either collapsing or explosion, even if the sheet metal of the boiler is light. Consequently the fact that a copper boiler did explode in the kitchen of the house named, is *prima facie* evidence that the vent—the "steam pipe,"—was too small, was trapped, or choked by corrosion or otherwise. To produce an explosion by steam, the vapor must be confined and accumulate until its force becomes greater than the resistance afforded by the vessel or chamber in which it is bound. An insufficiency of water alone would not cause an explosion in any case where a vent was applied capable of carrying off all excess of power in the steam beyond the strength of the holder. Hence it is fair to conclude that the cause of the explosion was the absence or obstructed condition of such proper vent or escape. There might have been but a fractional part of the quantity of water required to fill the boiler, and no explosion occurred, if there had been a sufficient escape for the steam produced by the water passing through the water-back. The boiler may have been constructed of light material, but that fact alone would not have been sufficient to produce the explosion, if the precaution against the result had been free and of sufficient size.

The fact that the boiler was thrown to a great height, and the building construction in which the accident happened demolished, proves that there was a considerable accumulation of steam in the boiler, and that it was so bound as to obtain a force beyond the resisting and retaining capacity of the shell in which it was held.

The lesson to be drawn from the case under review is, that vent pipes of sufficient capacity to boilers are most important and necessary adjuncts, and that they should be kept free from corrosion or stoppage of any kind.

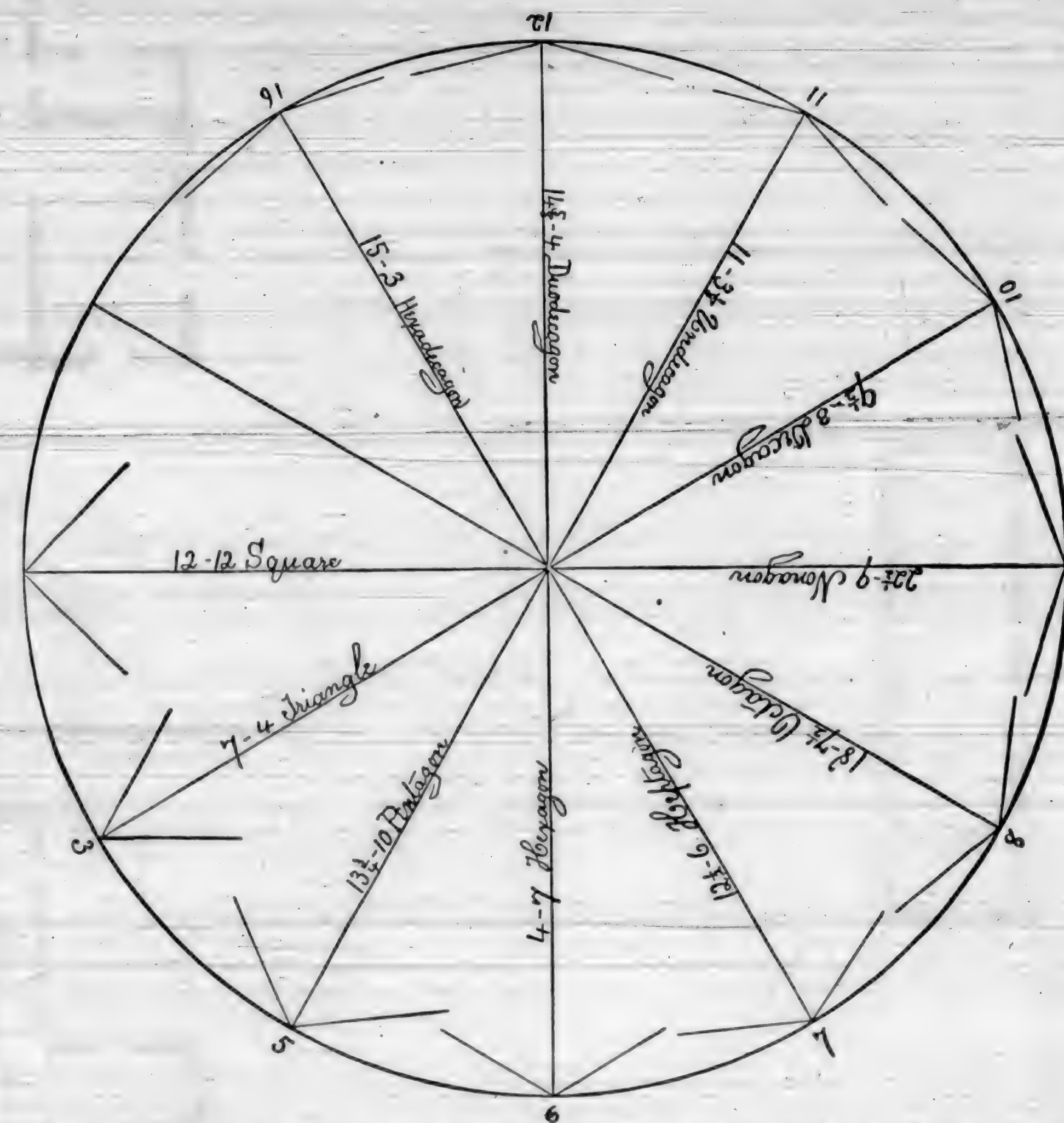
A second lesson suggests itself to manufacturers of boilers, and plumbers, not to make or use those of thin metal. Had the boiler in question been a little heavier, say five dollars' worth more of copper in the weight of the sheet-metal, the accident would not have occurred just when it did, and might not have happened at all. The repeated and frequent draining of water for dish-washing and kitchen purposes, after meals, the time when the explosion in question occurred—just after breakfast—when the fire in the range was less than it had been in cooking the meal, clearly indicates that there was a chokeage in the vent pipe, terminating as stated, in the explosion of the boiler, loss of a sum in damages to property sufficient to build a neat little homestead for a family, and the severe scalding of one of the helps, and some injury to others.

STAINING MARBLE.—The art of staining marbles in a permanent manner has long been lost, but an American has rediscovered the process or discovered a new one equally effective, so that it is now possible to paint a marble surface with pigments which sink into the substance of the stone to any desired depth and then to polish the surface as highly as before the marble was treated.

ACID PROOF CEMENT.—A cement for resisting sulphuric acid even at boiling heat may be made by melting caoutchouc at a gentle heat and adding, with constant stirring, from six to eight per cent of tallow. Then mix therewith enough dry slaked lime to make the whole the consistency of soft paste; finally, add thereto about twenty per cent of red lead, whereby the mass immediately sets hard and dry. A solution of caoutchouc in twice its weight of linseed oil, aided by heating, and the addition of an equal weight of pipe-clay, yields a plastic mass which will likewise resist most acids.

SHINING BLACK INK.—The best shining black ink, used for mourning paper, and the manufacture of which has up to the present time been kept a secret by the makers, may be prepared, according to the *Papier Zeitung*, of lamp-black, borax, and shellac. The ink is made as follows: In one liter of hot water sixty grams of borax are dissolved, and to this solution three times the quantity of shellac is added. After this mixture has been properly dissolved, the necessary quantity of lamp-black is added, the whole thing being constantly stirred. Should the luster not be satisfactory, more shellac is added.

Every Mechanic Should Paste This Page on the Inside of His Chest Lid.



In 1881 a series of articles on the "Steel Square and Its Uses" was commenced in this journal. They were continued until late in 1883, and received with great favor by our mechanics. In June, 1882, we presented the above original design by which mechanics at a glance could, by the shortest possible method, determine the proper bevel necessary to make a figure of any given number of sides. The edition containing the above cut has long been exhausted and we have been opportunely over and over again to reprint the illustration and explanation. Many other articles found in back numbers of the CALIFORNIA ARCHITECT have been inquired for with the request that we republish the same; our rule is always in each number of this journal to furnish to our readers entirely new matter and we for the first time lay aside our rule and republish the above cut with its explanation.

The above design is an ORIGINAL and very simple illustration by which the mechanic can see at a glance the necessary bevel to be obtained to enable him to make a polygon of any number of sides, by simply using the STEEL SQUARE, no drawings being necessary. With the exception of the triangle, all the bevels used are those formed by the SHORT ARM of the square; the three-side figure being formed by the bevel of the LONG ARM.

But little explanation is necessary to thoroughly understand the cut. If a nonagon is wanted, look for the figure 9 outside of the circle; following the line inside, we find the figures 22½x9. Place your square against the STRAIGHT edge of—say a piece of lattice, using the above figures to form the bevel. Mark bevel on SHORT ARM; cut nine pieces of the same length, with the same bevel; fit the nine pieces together, and you have a nonagon, or polygon of nine sides. Proceed in the same manner with any of the sets of figures given.

By cutting out the above figure, and pasting it on the inside lid of his tool chest, the mechanic will always have handy a guide by which he can easily obtain the bevel of any cut illustrated above.

The lines forming the "crow's feet" at the end of each of the radii, show the direction of the sides necessary to be made to form the figure required, indicated by the number on the outside of the circle.

Floor Plans for a Seaside Cottage.

THE accompanying engraving represents the plans for a building to be erected near the sea-shore. One of the first things to be thought of in designing houses to be built near the water is the arranging of the various rooms in such a manner that perfect light and ventilation are secured without the windows being too much exposed to the fury of prevalent storms, or the regular blow of trade winds. This fact has been carefully kept in view in the plans as presented on this page.

Another fact must be kept in view: Such houses as the one illustrated must be provided with suitable bath and dressing-rooms, handy of access from the beach. By examining our first-floor plan, it will be seen that two such rooms are provided for. They are directly in front of the intended building and can be entered very easily. The front, as shown, faces the sea, the main entrance being in the rear. Following out the suggestion given above, no windows have been placed on one side of the building, thus presenting a blank surface to the fury of the storm which may happen to rage. The plan may be reversed so as to have said wall face any point of the compass and still carry out the general design shown.

The arrangement of the first story will commend itself especially to those who find it inconvenient to have servants around among the living rooms. Ample accommodations are found in this floor for all kitchen work. By the means of a dumb waiter, the meals, after being cooked, can readily be transferred to the dining-room; a large cellar affords ample room for the storing of coal, vegetables, etc., while the servants are provided with a fine front room, with a beautiful room.

Via parenthesis, we may remark that one of the principal reasons why servant girls are so hard to keep in one place is the insufficiency of their bedroom accommodations. They are put anywhere, and often sleep in rooms in which the sun never shines. This is radically wrong; servants are hard-working people, and nature demands that they should have proper rest and well-ventilated rooms. There are already too many houses in which the servant's room opens directly out of the kitchen; consequently the room is filled with the smoke and fumes arising from the cooking; the bed clothes, etc., are permeated with the noxious vapors, and when the weary servants retire for the night, they are compelled to breathe the same kind of greasy air that is inhaled during the day. The result is a few months' stay in one place and then a change. By all means, ladies, see that your houses are so planned that the servant can have a sunny room.

Ample bedroom is provided for a family of at least eight persons, and by doubling up in the beds, many more can be provided for. Should an attic be wanted, the stairway can be carried up similar to that shown on third-story plan. The rear portion of the attic could be fitted up as an observatory, with the telescope, etc. Children living in such a house could thus be early taught the rudimentary principles of astronomy. The front portion of the attic would make a fine billiard room, leaving ample room between stair hall and observatory for a children's play room.

While the arrangement as shown will not be acceptable to many, it must be remembered that a sea-side cottage is not intended for a permanent residence. Compactness with ample accommodations; every convenience and yet only a moderate outlay of money; these two facts must be well borne in mind when planning a house of the character shown. Being away from a town, no water pipes are indicated, nor gas pipes marked; to those wishing to go to the expense, an artesian well and windmill and pump complete will supply the one, and a gas machine the other.

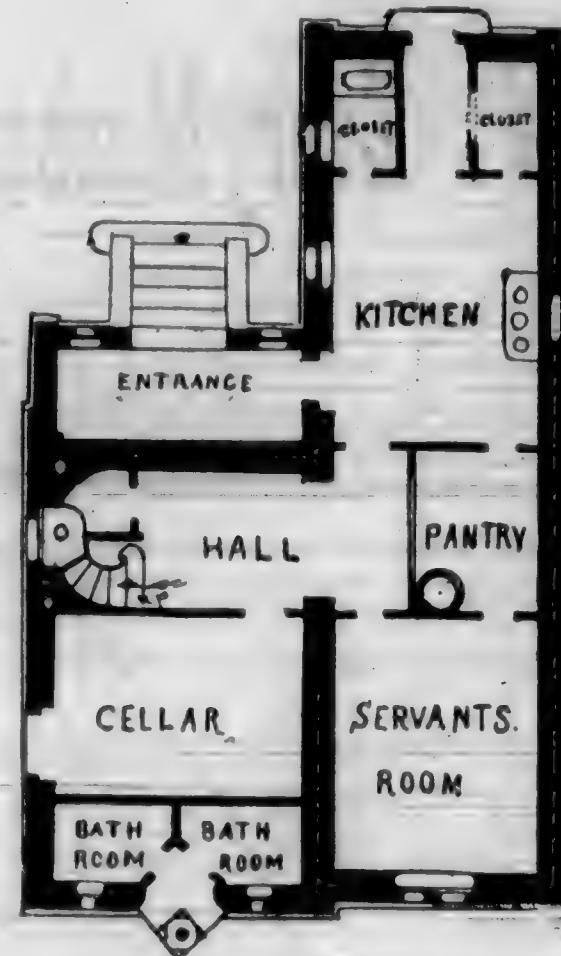
The front elevation we do not give. This may be varied to suit the tastes of those building. We have only endeavored to present the general plan of the house, leaving

it to an architect to supply the balance of the drawing. A house of the character shown can be built in this section of the country for any amount from \$5,000 upwards, depending greatly upon the accessibility of the different materials required in its erection.

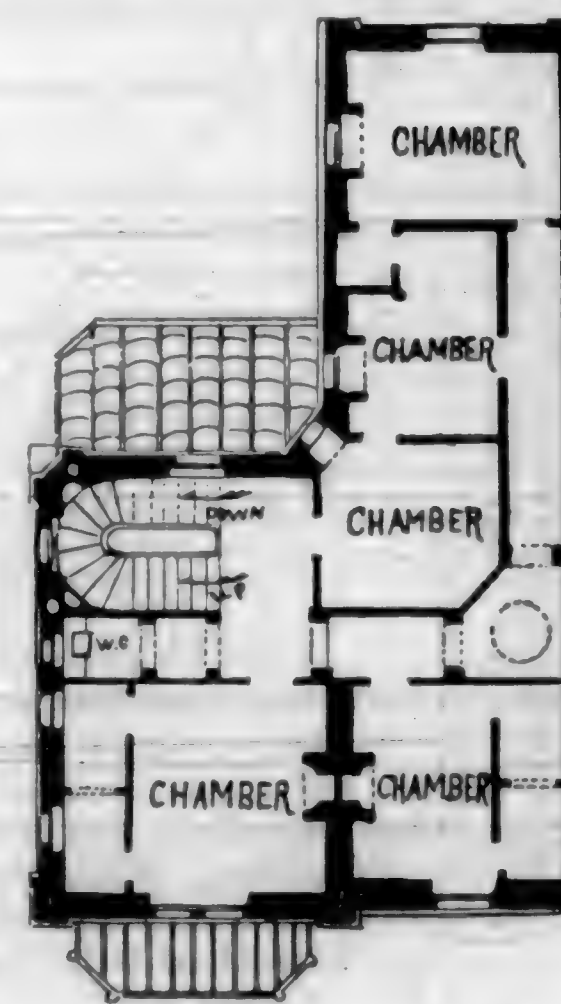
Painting Floors.

NOW that the fashion is more and more prevalent of using carpets that do not completely cover the area of the floor, and which thus escape distortion by being so cut as to coincide with every angle, recess, or curve of the walls, floor painting should certainly be more generally adopted. Painted borders are all well enough, but the whole area of the floor may be advantageously laid out in color. This painting necessarily involves priming, which, in itself, as applied to floors, is hygienic, as having the effect of closing the pores in which dust lodges, the dust, with its darkening and forbidding effect, never failing to obtain lodgment unless, indeed, the boards should be of costly hardwood, which is the exception, not the rule. It may be said that a floor painted all over will not be seen, but, without replying that a painted border where the whole area is not colored is a deception, we may remark that the entire treatment of a floor or cover affords a security against unsightliness should any portion of the central carpet be accidentally raised, and that in the event of its removal for purposes of cleaning the painted ground suffices, more especially if enriched with a few rugs or tinted or patterned mats.

In the hot summer months a floor artistically painted will be often found preferable to carpet, as aiding in the movement of the air, not harboring dust, and proving on the whole cooler. Paint may be so compounded and laid on floors as to suffer but little injury, even when exposed, in a long course of time. Should the colors become dull, a slight varnishing will suffice to renew much of their pristine freshness. There are many rooms in a house which would be all the better for not being fully carpeted. Such especially are bedrooms. When we speak of painting a floor we do not refer to giving it a uniform hue. The handsome designs carried out in encaustic tiles may be repeated in color. Geometrical figures centered with small leaf patterns are peculiarly appropriate; so, too, a host of fresco patterns, these being varied in successive tiers. Longitudinal lines representing the chromatic scale of colors might be repeated at certain intervals. Diagonal lines in different hues, lying thwart each other, in basket-work style, would have a good effect. The borders, as a matter of course, should be differently treated.



FIRST STORY



THIRD STORY

DOVETAILING.

THE art or mechanical science of dovetailing consists in fastening boards or timbers together by letting one piece in the form of a *dove's tail spread*, or wedge reversed, into a corresponding cavity in another, so that it cannot be drawn out. The mere fact that a mechanic can explain what a dovetail is, does not imply that he is therefore fully acquainted with all the mechanical skill necessary to perform the operation required with artistic ability. Practice alone, with a careful attention to details, is the main requisite necessary to perform a neat and accurate joint.

Again the mechanic must study; because he has practiced enough to enable him to make joints hardly discernible to the naked eye, is no reason why he must consider himself as perfect. He must have a thorough conception of the proportion which a piece made to fit into another should have toward that into which it is fitted, so as to produce the greatest strength with the least possible waste of material. He must also know how to proportion a joint so that it shall not fail or give way before another.

It is in the latter particular why so many joints made by the most skillful workmen separate with a trifling strain, or from being bound too tightly together, fly and split in all directions. This is owing to want of study on the part of the mechanic, as he is lacking the information necessary to estimate the strength required to resist the stress on the joint.

In Fig. 1 we represent the common dovetail. The projecting ends are called the *pin* of the dovetail, and the aperture into which this pin is fitted is called the *socket*. The form shown is the strongest of all the various patterns, and is used in tool chests, backs of

drawers, and in places generally where strength is considered of more utility than beauty. In laying out the dovetail, it is best to allow the pin to be a little long, so that after the work has been put together, the projections can be smoothed off with the plane, thus making a clean surface.

The strength of the joint depends on the form of the dovetail, as well as on the proportion it bears to the parts cut away. No absolute rule can be given for the bevel of the *pin*; in ordinary work an angle equal to about 75° or 80° is that usually employed. To those who do not understand how to obtain the angle required, we would say, take a pair of compasses and scribe a circle; draw two diameters at exactly right angles to each other; the arc of the circle will thus be divided into four parts, each equal to 90°; divide the arc of one of these sections into five equal parts; draw a line from the center of circle to the point nearest the perpendicular; this line in relation to the diameter will give the bevel necessary for the *pin* of the dovetail.

Young mechanics are apt to allow too great a bevel for the *pin*. This fault must be carefully guarded against. Too much of a bevel decidedly weakens the joint. The best rule to go by is to study the nature of the wood, and give as little bevel as possible and still prevent the possibility of the pieces pulling apart. Hard or tough wood admits of much greater bevel than redwood or pine.

Fig. 2 represents the *lapped* dovetail. In this form the ends of the dovetail show on one side of the angle only, and is generally used in the front of drawers in cabinets, bureaus, etc., where the side cannot be seen unless the drawers are opened.

Fig. 3 represents the *mitred* or *secret* dovetail. In this the dovetails are not seen at all. While, admittedly, this is the weakest form of all the various patterns, still it is very useful where neatness is required, and is generally employed in making fine boxes, etc., for the parlor or library.

As represented in Fig. 4, a tenon may be held tight in a mortise, by framing the latter in the shape of a dovetail, and *fox-tail wedging* the tenon into it; this is done by four thin wedges into and projecting from the end of the tenon, so that on coming in contact with the bottom of the mortise hole, they may be driven into the tenon and enlarge it sufficiently to fill up the dovetailed mortise. Care must be taken to so arrange the wedges that the two outer ones may be driven first, and then the inner ones; by this means only thin pieces of the tenon are split and

turned outwards at a time, thus avoiding the risk of splitting the tenon beyond the shoulder, which might occur if fewer and thicker wedges were used. Light blows should be given at first so as to cause the tenon to gradually split.

The mechanic must have his tools in perfect order. Only dull instruments as well as tools slip over work. If the edges are keen, they will *grab* hold of the wood as if eager to do their part. In fine work it is absolutely essential that the tools be in perfect condition, as a slip of the plane or saw may cause damage which cannot be easily repaired.

Scribing.

SCRIBING is the operation by which a piece of wood-work is made to fit against an irregular surface. Thus, for instance, the base-board of a room, by scribing, is made to meet the unevenness of the floor. To determine just the amount of wood necessary to be removed, take a pair of compasses and open them to a width equal to the greatest distance or space between the base-board and the floor. Having set the compass, draw them along the floor so that a mark will be scribed in the board, corresponding to the bumps on the floor. Cut the wood away according to this line, and on refitting the board, a good joint will have been obtained.

A CURIOUS flower was recently discovered on the Isthmus of Tehuantepec, Mexico. It has a faculty of changing its color during the day. It grows on a tree. Another peculiarity of this floral chameleon is that it only gives out perfume at noontime. One of the strangest things about this flower, however, is that it should be found in Mexico when its colors are those of the United States flag. In the morning it is white; at noon it changes to red, and at night it adopts a soft blue color.

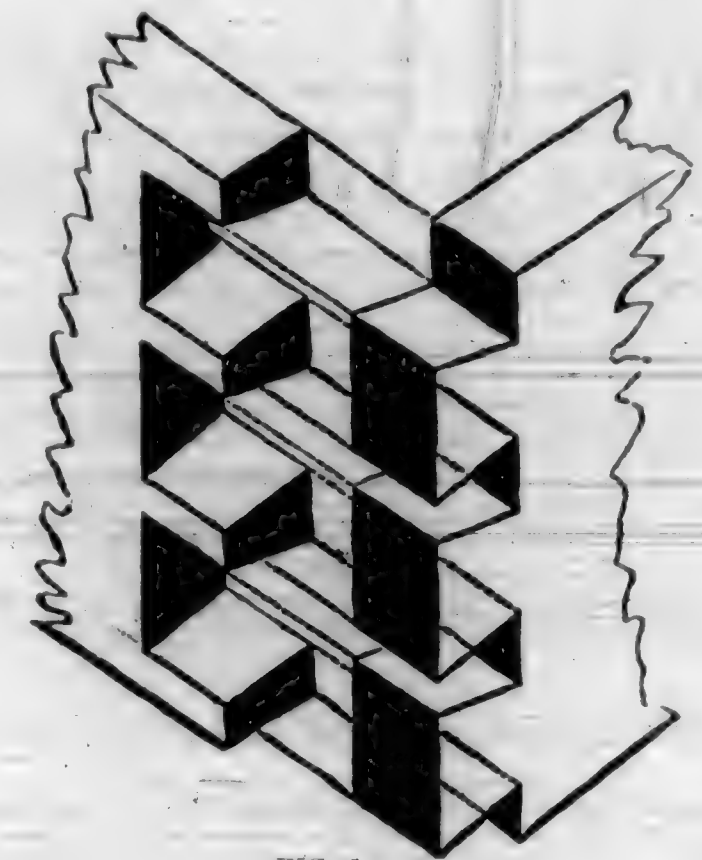


FIG. 1.

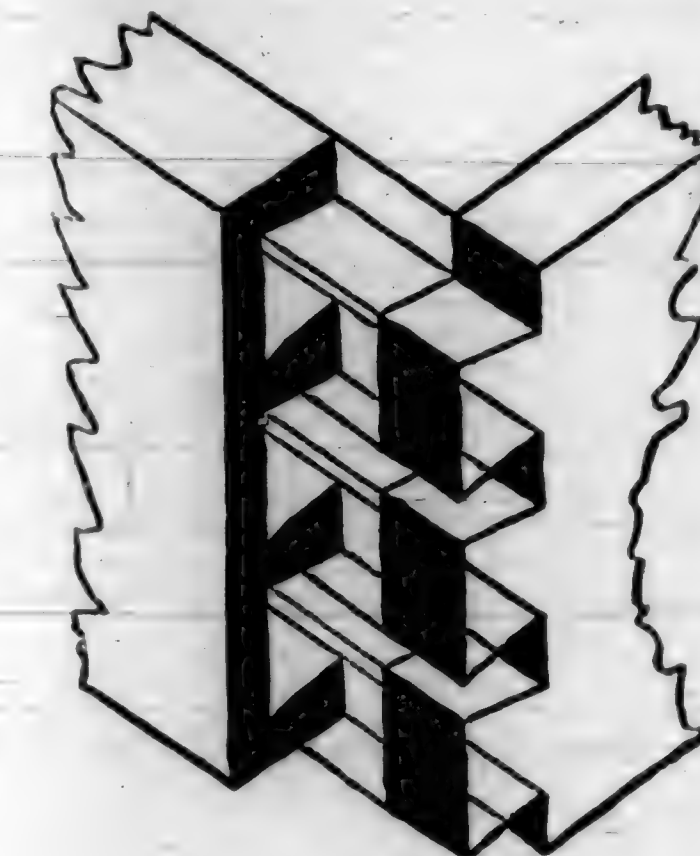


FIG. 2.

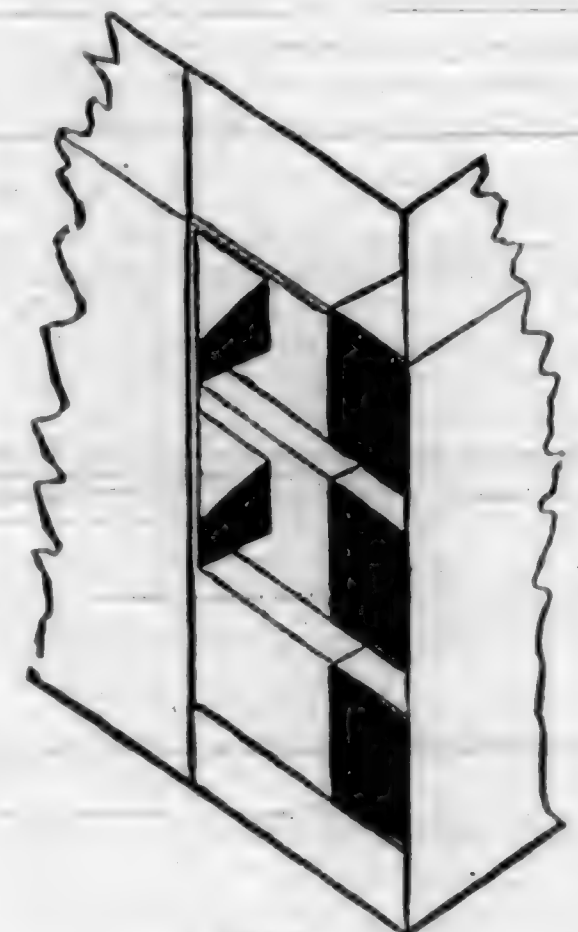


FIG. 3.

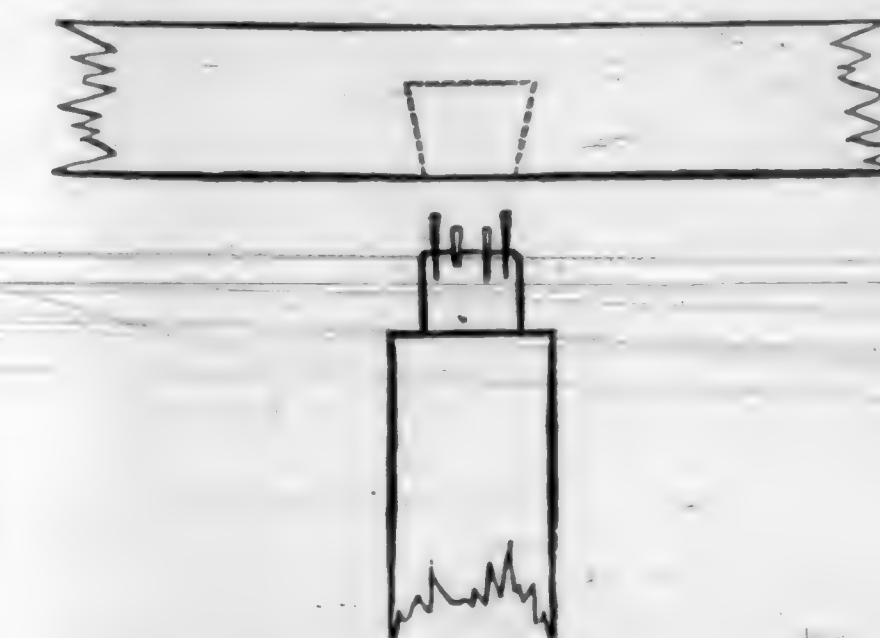


FIG. 4.

American Institute of Architects.

WE have received a copy of the proceedings of the Institute at its nineteenth annual session, 1886, containing also an expressive likeness of the first president of the Institute (deceased), Richard Upjohn.

The address of welcome was delivered by Dr. Thomas A. Atchinson, which was responded to by Mr. Kendall, in which the following occurs: "Additional associations for the furtherance of professional interests have been formed under most favorable auspices, and we must feel especial gratification in the increased facilities for the study of architecture, which are offered by the Institute of Technology, in Boston; by Architectural Department of the School of Mines of Columbia College, in New York; by the Illinois Industrial University, at Champaign, and by other institutions of learning in various parts of the country, so that the student in America can now obtain a professional training, which will be of greater practical value to him than the architectural courses of Paris, Vienna, or Berlin."

The addresses, containing many interesting references, were listened to with deep attention, and received hearty applause from members and guests. The following extracts from the proceedings indicate the spirit and feelings actuating our professional brethren—members of the Institute:

"It would seem desirable that some effort be made to bring about a closer union and relationship between the architectural associations of this country. To this end it seems but proper that some advance be made by the American Institute of Architects, as the oldest organization of architects on the continent. As a means to that end, it would seem desirable that this Convention take some action looking to a representation through a regularly appointed delegate at all conventions of architectural societies throughout the Union, and that such societies be requested to send each a delegate to all conventions of the A. I. A."

San Francisco Chapter is duly noticed in the report of proceedings.

Matters relating to supervising architects to public works, compensation, competitive plans, etc., were considered.

A "Bill to establish the office of Commissioner of Architecture, and a Board of Public Biddings, and for other purposes," was presented by the committee previously appointed to prepare such a bill, in which among other things occurs:—

"Section 27.—That any contractor who shall construct the building on which he is engaged in a different way from that prescribed in the plans and specifications, or who shall supply different or inferior material from that called for in the specifications, or who shall cause the work to be done in a manner different from that called for in the specifications, or in his contract, except as provided for in this act, shall, on conviction of such offense, be fined in any sum not less than five hundred dollars."

Reference is made to the following "words of our first president, Richard Upjohn, spoken at the convention of 1867. After sketching the early struggles and history of the Institute, Mr. Upjohn said further: 'It is the duty of every one of its members to throw the full force of his abilities and influence, so far as the demands of his first duties toward himself and his dependents will permit, into combined effort to make the Institute attain its object, and realize its noble ideal. If we do so, if we show that we respect our work, and ourselves as its doers, that we know what we mean, and mean to do it, so far as our providential opportunities will permit, if we make what we have done apparent, and show that we have well laid out our plans for the future, and have the men, the intellect, and the culture to carry them out well, we shall find that Providence will not fail us, but will, through the medium of outside co-operations, supply us according to our need and progress with the material means requisite to make our mental capital available.'

"Eighteen years have passed since these words were spoken. The Institute has developed and grown strong under its federal system of united chapters. A bright and useful future seems to be open before us; the art of architecture is more appreciated, and the practical science of building is more generally and better understood. To be members of the American Institute of Architects should be our pride, and an attendance upon its annual conventions a journey of pleasure and profit to all fellows and associates."

The many reports of committees, and speeches by able representatives of the profession, contain a large amount of instruction, and furnish data and facts of great value to those earnest in desires to improve themselves in the practice of a profession time-honored and noble, yet ever challenging the best efforts of the human mind to keep pace with its unfoldings, and ever

furnishing new bases of thought, and revealing new beauties through each succeeding generation.

The suggestion expressed, that every chapter in the United States should be represented at the annual councils of the grand body, is a good one, and honored, indeed, will be the man who shall be the first from California to represent San Francisco Chapter and the architectural profession upon the Pacific Coast.

Technical Terms.

SOME of the technical terms used in the building trades are very curious, and while many of them have some direct clue as to their derivation and meaning, others possess nothing whatever to show their signification or origin. Technical terms vary to a far greater extent than one would imagine. Even in different sections of the same district one will often find a considerable difference in the pronunciation and manner of spelling technical words; in fact, it is often difficult to determine what the correct spelling and pronunciation should be. An instance of this variation may be found in the word "rebate" in the Dictionary of Architecture, which is therein given, spelt in no less than twenty-three different ways: Rabbet, rarebet, rabbit, rabit, rabbit, and others are given. Other words, equally as well known, vary in as great a degree.

At a recent examination in building construction the following question was given: "Give a short description and sketch, where necessary, explaining the meaning of each of the following terms: 'Tumbling In,' 'Welsh Arch,' 'Dutch Arch,' 'Birdsmouth,' 'Hot Short,' 'Cold Short,' 'Natural Bed,' 'Sandwich Girder.'" Although the terms all refer to well-known features of construction, some of the terms are sufficiently uncommon to render an explanation of their meaning of some interest to our readers.

"Tumbling In" is a term in brick-work used to denote the way in which the courses of bricks are built out of the horizontal when it is wished to reduce the width of a chimney or buttress, or the length of a wall.

"Welsh Arch" is another term used in brick-work, and refers to a bad piece of workmanship. When beams of any considerable thickness are built into walls, when, in fact, they are more than about seven inches in width, a single brick over them will not carry the superincumbent load, and it is therefore usual in good work to turn a ring arch over the end of the beam, leaving a small space around it for the purposes of ventilation. Bricklayers often do not take the trouble to turn a fair arch, but compromise the matter by constructing what they term the "Welsh Arch," which simply consists of a brick splayed at each end, supported on the splayed ends of the adjacent bricks. It need scarcely be added that this construction should not be permitted in any good work.

"Dutch Arch." This refers to another form of bad workmanship of the bricklayer. The strength of this "arch"—there is really not a single quality of the arch about it—lies wholly in the adhesive power of the mortar.

The word "Birdsmouth" has two meanings. First, it is a term used by framers as applied to the joint made at the foot of a common rafter, where it rests upon the wall plate; and, secondly, it is applied to the cutting of bricks where it is necessitated by the corner of a building coming at an acute angle.

"Hot Short" and "Cold Short" are both terms applied to defects or impurities in iron. The presence of sulphur, and, probably, also, magnesium, makes the iron red or hot short, that is, brittle at a high temperature; and the presence of phosphorus and silica, cold short or brittle at a low temperature. Both are serious defects; the latter the more so. These impurities come either from the ore or from the coal and flux used in course of its manufacture, and certain materials are, where necessary, used to remove them, common salt being usually employed for the purpose.

"Natural Bed" is of considerable importance to masons. It refers to the plane of deposit of aqueous or sedimentary rocks. It is very advisable that all such stones should be laid on this bed in order that the stone may the better resist the action of the atmosphere upon it.

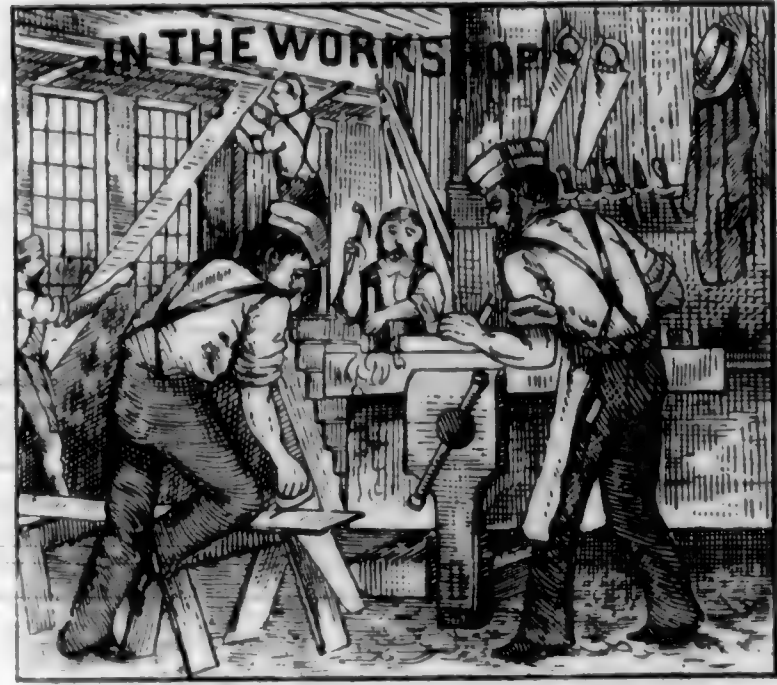
"Sandwich Girder" is simply a vulgar name given to the fitch girder, consisting of a beam of wood sawed longitudinally down the center, the two portions being reversed or the faces of the parts previously forming the center being placed outside, a plate of wrought-iron placed between them and the whole well bolted together, forming a strong, light, stiff girder suitable for many positions, and more particularly for loads and positions like those of a breastsummer.—*Artus, in Building.*

PLUMBERS should be careful not to use lead in contact with oak, unless the latter is perfectly dry and free from sap, otherwise the gallic or acetic acid in the wood will turn the lead into acetate of lead or ceruse.



FRONT ELEVATION FOR A COUNTRY MANSION.

THE above unique illustration was designed especially for this journal. If surrounded by trees as shown it will present a very striking and handsome appearance. Much depends upon the manner in which it is painted. Rich, warm colors should be used. The arrangement of the porches and verandas is such as to give shelter from the sun in summer and the storms of winter. The cost may be varied anywhere from \$10,000 upward. There is no economy in trying to save a few hundred dollars on such a design as that shown. Only the best material and skillful work should be used and employed. Special pains should be taken to have the chimneys built in a substantial manner.



We will be pleased to receive for publication in this column items of information in regard to practical ideas connected with the mechanical part of the building trade. We especially invite suggestions from apprentices and young mechanics.

Do not attempt to peep through key-holes, for in the future disappointment will follow. A new lock is now out, and will soon be on general sale. The key-holes for opposite sides of the doors are out of line with each other, and the locking bolt has two key-bit receiving notches, and there are also special key-hole guarding plates, making a simple but strong lock, not easily picked, and entirely preventing the pernicious habit of peeping through the key-hole.

It is a common idea that a "chimney cannot be too large," in other words, the larger the area of the flues, the better the draught will be. This is not always the case. In many cases—in foundries, manufactories, etc.—where a chimney has been built large enough to serve for future additions to the boiler power, the draught has been much improved as additional boilers have been set to work. The cause of this is to be found in the increased steadiness of draught, where several boilers are at work and are fired successively, as also in the better maintenance of the temperature of the flue.

One thousand brick, closely stacked, occupy about fifty-six cubic feet.

A cubic foot of good gas, from a jet one-thirty-third of an inch in diameter, and a flame of four inches, will burn sixty-five minutes. Internal lights require four cubic feet, and external lights about five cubic feet per hour. When Argand burners are used, from six to ten feet will be required.

Dry bricks will absorb about one-fifteenth of their weight in water.

A CORRESPONDENT desires information in regard to seating space in theaters. There is no general rule in universal practice regarding the space to be allowed each person. Boards of Work, Boards of Supervisors, and architects, in different parts of the country, have endeavored to formulate certain dimensions to be used for each individual present in the theater, but when there is a rush, the rules suffer as well as the visitors, in the general squeeze for a place. Generally, the following figures will represent the minimum space to be allowed in the different parts of the house: Width of seat, in dress circle, eighteen inches; family circle, sixteen inches; orchestra seats, same as dress circle; gallery, fourteen inches. To be comfortable, not less than eighteen inches in width should be allowed for each person. The above measurements apply only to those theaters not using the new-fashioned tip-up seats. Desks used by scholars in our public schools are in length as follows: For two scholars, three feet ten inches long; for one scholar, two feet long. A chair for a scholar five years of age, should be nine and one-half inches high; ten years of age, thirteen and one-fourth inches; fifteen years of age, fifteen and one-half inches; over fifteen years of age, sixteen and three-fourth inches.

In selecting house decorations see that the effect is not destroyed by the surroundings; for instance, when the carpet is faded and the furniture shows many years of faithful service, by no means indulge in bright colors, plush and satin chair seats, elaborately embroidered table coverings. Where it is necessary to conceal defects, subdued colors have a more pleasing result.

TO RESTORE DISCOLORED IVORY.—Wash well in soap and water, cleaning out any carving with a small brush, and place while wet in full sunshine. Wet for two or three days, several times a day, with soapy water, still keeping the article in the sun with a glass shade over; then wash again and the ivory will be beautifully white.

We have repeatedly called the attention of carpenters and painters to exercise more care in the building of scaffolds, as they are certain death-traps where improperly constructed. There is scarcely a day but what the papers record the death of either a carpenter or painter, resulting from the falling of a scaffold, and it is certainly strange that these repeated warnings do not have more effect upon the workmen who build them. They not only owe it to themselves, but to their families, and we would urge that it be the duty of the architect, builder, or boss, to thoroughly inspect each scaffold erected. By so doing serious accidents will be avoided.

The houses which sell the quickest are the ones which contain the latest improvements. Improvements are in their very nature such as to add to the convenience and comfort of their possessors. And the old-fashioned portable wash-tub and the cistern, hand-maids of the ancient days, were at one time designated "improvements." But the march of progress has not only carried them, but all other kindred household appliances, to the realms of shade, and so in degree the same may be said of everything pertaining to architecture, sanitation, and equipment. From the cellar to the garret whatever conduces to make a well-appointed, finely-equipped, and properly-piped and ventilated house, is that which is rewarded by prompt and profitable returns. And what is applicable in one sphere of action applies with equal force to all others. Those who are heedless of this are always left behind, and make up the long line of "disappointments" which strew life's pathway.

TO PUT AN EGG-SHELL POLISH ON FANCY WOODS.—Three parts of shellac, one part of gum mastic, and one part of sand-arac gum are dissolved together in forty parts of alcohol, and form a beautiful polish, which may be applied with a brush or cloth.

SALT AND DIGESTION.—If a piece of salt is taken into the mouth, the flow of saliva is temporarily increased, though it is not certain that the amount secreted in any given time is any greater than it would have been had no stimulants been used. It has been argued, also, that the effect of salt on the gastric juice in the stomach is the same, and that its use promotes digestion. Some recent experiments, however, on a man who had an artificial opening into his stomach to supply food, which he could not take through the mouth, seems to negative this assumption, and that salt hinders the secretion of the gastric juice and digestion rather than promotes them. If the amount of salt is considerable, digestion almost ceases. Experiments like these have great value, for they help to clear away the superstitions of past ages, which seem to be held by the educated and the ignorant alike.

STEEL NAILS.—Establishments for the manufacture of steel nails and steel nail plates are on the increase in this country. These nails, it is alleged, are produced much more cheaply than those of iron, owing to the cheaper process—the Bessemer—in preparing the metal, but their grip is less than that of iron nails.

A BILL of goods had been sold, and when the proprietor came in he saw the sales book and hurriedly called the salesman: "Did you sell Eiddler this bill of goods?" he inquired. "Yes, sir, I did," was the reply. "How did you sell them?" "On time, sir." "On time! good heavens, young man, why didn't you sell them on eternity, so the account wouldn't be outlawed by the statute of limitations."

WOOD PRESERVATIVE.—Introduce into the pores of the wood the following solution: Mix two parts of gutta-percha with one part of paraffine, heat to liquefy the mixture and apply while hot.

A FINE LUBRICANT.—A good lubricant for fine machinery and one which will not gum or corrode may be obtained by putting pure olive oil into a clear glass bottle with strips of sheet lead; expose to the sun for two or three weeks and then pour off the clear oil for use.

TO POLISH GLASS.—To polish plate glass and remove slight scratches, rub the surface gently, first with a clean pad of fine cotton wool, and afterward with a similar pad covered over with cotton velvet which has been charged with fine rouge. The surface will acquire a polish of great brilliancy, quite free from any scratches.

The heaviest wood known among the four hundred species of trees found in this country is said to be the black ironwood of Southern Florida, which is thirty per cent heavier than water. Sixteen of the species, it is stated, are so heavy that their perfectly dry wood will sink in water.

ASKED, ANSWERED, AND COMMUNICATED.



We, Architects, Contractors, Carpenters, and Mechanics generally are respectfully requested to furnish us items of interest for this column. We will gladly answer any and all questions pertaining to the architectural and building interests. If illustrations are necessary to explain your ideas, send us a sketch of them and we will make the cuts.

LOS ANGELES, CAL., July 21, 1886.

EDITORS CALIFORNIA ARCHITECT AND BUILDING NEWS.—Gentlemen: I observe in your July issue some one asks for "correct method of finding the length of one of the sides of an octagon, the diameter being given."

The rule is given, but the writer cannot exactly see into it. Will you kindly, in your next issue, try to explain the rule more clearly, and illustrate or suppose a case where the diameter is less than twelve inches. By so doing you will greatly favor one of your readers.

The rule, as given in our July issue, is applicable to any octagon, regardless of the length of side. If our correspondent will read carefully, he will find that the rule says, "add or subtract, as the case may be, to the known length, two and one-half inches for each six inches of diameter." Thus the mechanic must remember some one certain measurement for a certain given width. To illustrate, we will use a different width from that given in the July issue. An octagon 7 feet in diameter, the length of one of the sides will be 2 feet 10 1/2 inches. Now to find the length when diameter is 12 inches, the difference between 7 feet and 1 foot is 6 feet; allowing 2 1/2 inches deduction for each 6 inches of the 6 feet, will give 2 feet 6 inches; subtract this from the known measurement given above, and we find 2 feet 10 1/2 inches less 2 feet 6 inches, leaves 4 1/2 inches, the correct length of side when octagon is 12 inches in diameter. We simply used 9 feet for width of octagon, as that is the average width for bay windows. The following are some of the measurements in practical use:—

Diameter.....	7 feet 6 inches;	side, 3 feet 1 1/2 inches
".....	8 " 0 " "	" 3 " 3/4 "
".....	9 " 0 " "	" 3 " 8/8 "
".....	10 " 0 " "	" 4 " 1/4 "
".....	10 " 6 " "	" 4 " 4/4 "
".....	12 " 0 " "	" 4 " 11/4 "

The rule can be applied whether the diameter is 8 inches or 80 feet.

DRIERS IN PAINTS.—What are they, how used, and how do they act?

The above three questions are asked by a young apprentice. Their brevity pleases us. The drying of linseed oil is due to the readiness with which it absorbs oxygen, and any material which promotes this absorption is termed, in painters parlance, a "drier." These, by yielding up the oxygen they contain, encourage the oxidation of the oil.

As many pigments retard the drying of the oil, the addition of driers is necessary to prevent the paint from remaining sticky, or "taeky," as it is termed.

The principal driers are acetate, or sugar of lead, sulphate of zinc (white copperas), and litharge (oxide of lead).

Observe the following points in using driers:—

Not to use them unnecessarily with pigments which dry well in oil color.

Not to employ them in excess, which would only retard the drying.

Not to add them to the color till about to be used.

Not to use more than one drier to the same color.

Avoid the use of driers in the finishing coat of light colors, as they are liable to injure the color.

Our correspondent should procure a standard work on painting, and spend his leisure time in study; this office can furnish any work published in any branch of the mechanical, scientific, or professional occupations and trades.

A BRICKLAYER'S hod, measuring 1 foot 4 inches by 9 inches by 9 inches, equals 1,296 cubic inches in capacity, and contains 20 bricks.

WHAT is meant by "larrying," a term used by bricklayers?

The best way of laying the paving or bricks in the body of the wall, after sufficient facing bricks have been laid, is to lay in between the face bricks a thick bed of "larry," or rather liquid mortar, and then slide each brick along in it into its proper place, in doing which the mortar rises to the top of the joints, the process being called "larrying."

Please state specifically the difference between carpenter's work and joiner's work.

Carpenter's work, as distinct from that of the joiner, consists of framing and putting together all the wood-work connected with the proper construction and stability of a building or other kind of structure. He supplies all the wood-work required to be built in or bedded on brick walls, such as plates, templates, etc.; also all centers, turning pieces for arches, etc.; the carpenter constructs roofs, lays the floors, erects partitions, nails on the rustic outside, and what is usually termed inside finishes.

It is seldom that a carpenter is a first-class joiner. The larger timbers with which the carpenter has to deal, and the comparative absence of that high finish which is essential to joiner's work, render it almost impossible for the same man to be a first-class hand at both branches of the trade. A first-class joiner is always too slow and cramped at carpenter's work, and a first-class carpenter is not usually sufficiently attentive to those details which constitute highly finished joiner's work.

After a house has been built and covered in, the joiner takes in hand all the wood-work, as a rule, connected with paneled partitions, doors, skirtings, dados, etc. In joiner's work, close-fitting joints and smooth surfaces are the chief objects in view, whereas the aim of the carpenter is to give strength to resist the strains to which his work may be exposed.

All surfaces left exposed to view are worked smooth with the plane by the joiner. He must also exercise great care in fitting and framing the various parts together, that they may be affected as little as possible by the shrinking or warping of the material used.

We have stated the difference between a carpenter and joiner as the terms are generally used. In San Francisco, and, in fact, all over the Pacific Coast, the term joiner is seldom used except in connection with cabinet work. The first question a foreman asks of an applicant for work is, "Are you a full hand?" and the answer establishes the questioned mechanic's abilities to perform any certain work. "First hand," "second hand," "floor nailer," "partition setter," "inside finisher," etc., are terms used by men applying for the honor of swinging a hammer or pushing a jackplane, etc., on any certain job. We remember seeing a sign as follows:—

JOHN SMYTHE.

CARPENTER, JOINER, & PIECE WURKER.

Floors naled and Sash put in.

If the man's abilities were equivalent to the knowledge of grammar, as evidenced by the sign, we pity the looks of the work with which he was connected. Piece workers are the scabs in the carpenter's trade.

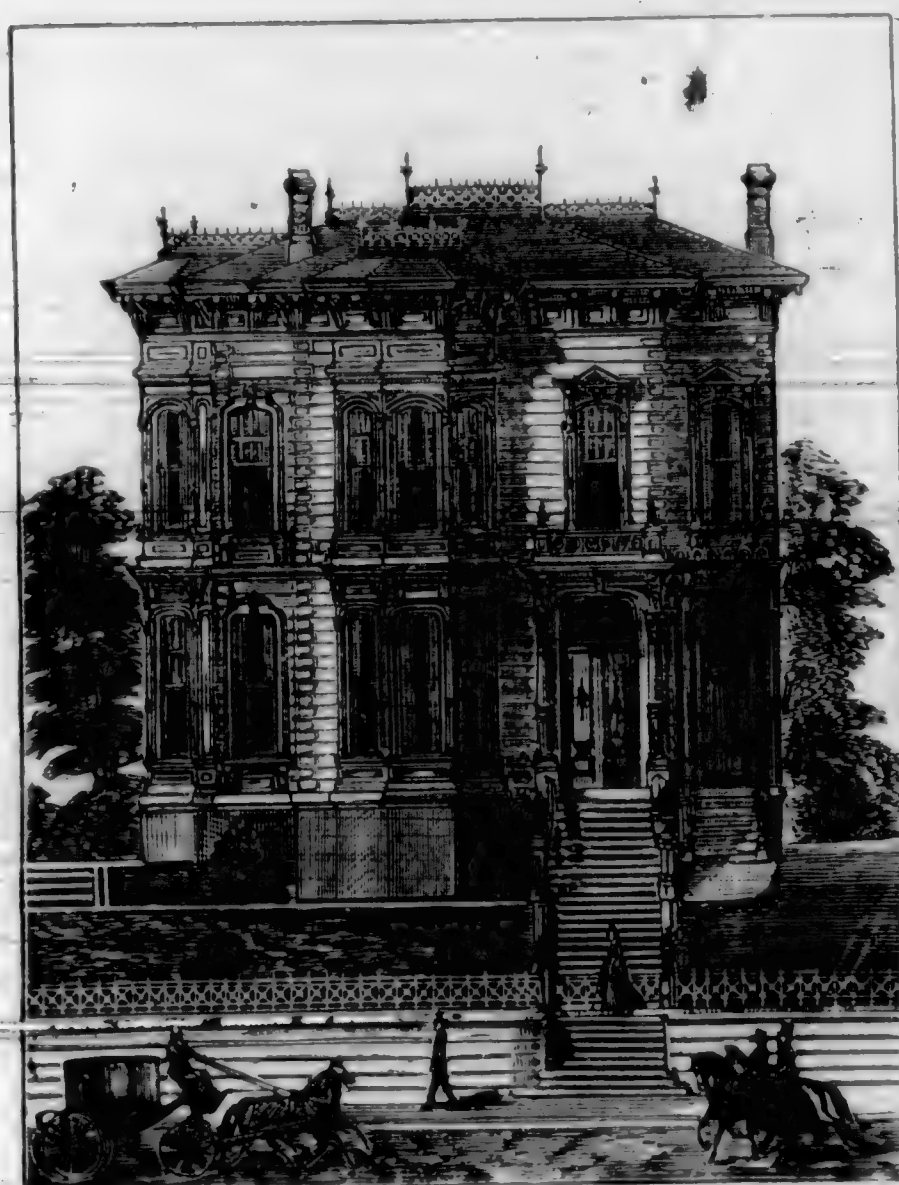
LEAD DOTS.—In securing lead to wood-work on roofs, etc., and to effectually protect the nails from rust, etc., the following method is used: Wherever a nail comes, hollow the wood out slightly; drop the lead into the hollow; drive the nail in through the center of the hollow, and then fill up level with solder. The same may be done without hollowing out, but then the lead dot covering the head will project above the surface of the lead work.

In giving old lead in exchange for new lead, it is generally customary to allow six pounds per cwt. discount on the weight of the old material, on account of the latter containing dirt, etc.

FISH VS. SCARF JOINTS.—When the beams abut end to end, and are connected by pieces of wood or iron placed in each side, and firmly bolted to the timbers, the joint is called a fish joint. When in a joint the pieces overlap each other, and are bolted together, the joint is styled a scarf joint.

An average gas burner consumes about four feet of gas per hour. Windows, as ordinarily constructed, will admit about eight cubic feet of air per minute.

At the drum-tap 9,000,000 drilled soldiers would take arms in Europe.



Art and Architecture.

[Special for this Journal. By F. HILLERT, Architect and Mechanical Engineer.]

XVII. BOUNDARY OF PERCEPTION.

TO enter on the many explanations of beauty which partly contradict each other is impossible, since the best of them can be referred back to the harmony of spirit and form, and the accord of the power of imagination with intellect when divested of the learned shroud. The difficulty of the subject matter lies herein, that we must abstract the spirit of the beautiful from a number of beautiful things; that our feeling, depending on many conditions, will always speak with it; and that objectivity and subjectivity, principally and with lasting truth, cannot be parted and separated from general views and definitions, which, in themselves, would be comprehensible. Human speculation finds here a boundary she cannot pass, but could she succeed in uncovering the secrets of the human heart, and the miraculous blending of spirit and mind, as they are shown by the pleasure in the beautiful, and discover sober and intelligent laws, it may be that the finest ornament of beauty worth living for would be lost irreparable to humanity.

XVIII. IDEAL OF BEAUTY.

By such characteristics of beauty, as well as a pleasurable sensation of man, the quality and nature of things point by the impenetrability of its spirit back to a mystic cause, without which we cannot conceive or think of the consummate perfect beauty. Then as to man indeed the truth of yonder unapproachable image always will remain, but will destroy him as soon as he lifts the veil; but, nevertheless, he anyway incessantly aspires and presses towards the eternal tree of knowledge, hunting and seeking his liberty in vain, through all zones and seas, and at last, beginning with the smallest, wrestling with himself, must gain his liberty; so he also strives mightily towards the beautiful, but the highest fulfillment of the same remains to him always concealed. Man has presentiment, demand, and pursues to the highest aims of truth, liberty, and beauty, but he never reaches them. Name the primeval cause to which those aims point, as we like, put the relation to a supersensible cause, if we want to express ourselves generally comprehensible; and still more, to give to the human being a contentment of mind, we must, then, always say that the highest truth, and the highest good, as also the highest beauty, rest in God. The being of God once settled, out of him flows the wonderful harmony, which in our feeling, in our mind, solves, in fact, the problem of the spirit and conception of beauty.

The highest beauty is in God, has been said with categorical decisiveness of conviction. And in fact if we speak, from things which by our intellect we do not comprehend, the secret precedence in our breast, but anyway are touched in our deepest mind by unexpressible beauty, and almost raised above ourselves, then we find the purest and only fulfillment in the belief in the existence of God. We see then in beautiful things the images of eternal beauty, and in nature the appearance and phenomena in which only one highest spirit, God, is expressed;

and in art the secret revelation of the human spirit, in which rushes the aspiration of the divine breath,—truly a noble and exalted vision of nature and of art. And if we look back to our inward mind and place together and compare the manner of sentiment of man himself, we recognize that in yonder trait is divine beauty; and where we find it expressed clear and shining, we stop there admiringly and say, A godlike, a beautiful soul. The pure inner harmony of mind, undisturbed by any blemish, any uneasiness, finding in itself and its God the most perfect satisfaction, and anyway knowing nothing in its own heavenly purity and innocence, but in sacred aversion and awe recoils when compelled to approach divinity by a worldly symbol. The same speaks wonderfully and enchantingly, and in the figure and in the eyes of such men rests, visible glorious, and magnificent, a beauty which could be called superterrestrial if she would not appear visible on earth; but even in death such a soul may be able to effuse over its dying feature the purest luster, the noblest peace. Nobody praises the soul higher than a poet. To him she stands higher than beauty of nature or beauty of art, and well may be added, unknown to himself, the beauty of his own soul, untarnished by meanness and coarseness.

We can easily realize and perceive that with such supersensible and figurative illustrations for our knowledge, nothing is to be gained where our sensitive faculties come direct to play, as with the beautiful.

XIX. SPIRIT AND NATURE OF A WORK OF ART.

When the beautiful, as has been explained, in respect to the thing, is perfect, harmony of idea and appearance, or, as we commonly say, in accord and harmony with sense and form, so is herewith expressed the characteristic of the meaning of a work of art. But how is this harmony between the spirit and form to be understood? In the inward, immediate, and direct manner, and so that the meaning, the idea, of a certain work of art cannot appear in a changed form; not to be represented and made to appear in other stuff, without itself being changed and altered. Hereby is, in the same time, the impossibility expressed, to bring the idea of a work of art to view by words; what direct can be seen at each piece of music, on every object of the forming art from which, by the most correct description, a clear view and conception never can be gained; the same finds, in a closer sense, its unlimited application on poetry. Then, as soon as it is tried to reproduce the meaning of a tragedy, of a poem, in other words, the insufficiency and inability appear. The work of art is inseparable from its own peculiar exclusive form, which necessarily belongs to its spirit and meaning, as the body to the soul of man; but the form is enlivened and spirited by the idea showing and existing in the work of art, as its soul, which is invisible, as the soul of man. Considering, and not to drive the comparison of a work of art to its highest pitch, and arrive at discouraging results for the human mind, that man is a living organization, having a purpose of his own will, when the work of art is a make, having only the semblance of an organic life. But since the work of art does not know a purpose of will, but only wants to fulfill this one, to be beautiful, it can attain the same more perfect, as in general the natural organization, having other purposes to fulfill.

The idea of a work of art only originates in the fantasy of man, i. e., it originates in the power of his imagination, his mind; without that the intellect in a rational way can get to the same—in direct excitation, with which throughout a more or less raised effect of the mind is connected. The idea of his own imagination, man will and must, by his own inner urgency and drift, make visible and conscious to himself, and in doing this he creates at least a basis for his work of art. He does not sober down the charm of his own inner vision, in giving the same in words, and with his intellect seeks an expression accordingly for it; but his inner vision of mind flows direct into the lines, in the color, into the modeling clay. He touches the lyre and draws from it melodious sounds which, in his own imagination, presageful and yet knowingly lived, or he powers them in words. He does not seek the whole richness of his soul. So works of art are produced, noble, high, and beautiful in all, perfect and well equipped.

XX. RETROSPECT.

Connecting all together, we obtain from all our observations which we, in regard to the explanation of beauty, as well as in creating a work of art and its enjoyments, always and unalienably, were referred to incidents of our mind, taking away therefrom all logical perception and arriving in us to a consciousness which distorts, stains, and destroys, so soon as we wish to convey them to bases of reason, to establish and prove the same by ideas of reason. But if we now consider that the happiness and the pure contentment is poured out by the world of the beautiful, and when we think that the highest reward for a good and

noble act done disinterestedly lays in our soul, and if, lastly, we must acknowledge to ourselves that even the abstract thought gives the highest contentment to man, only then, when in a victorious satisfaction out of a conflict he has gained to the world a truth, can rest a moment,—well might we throw up the question, since such moments to the human being grant a complete satisfaction, and hereby a presentiment of the highest happiness is accorded. Does, then, the inner essence of human life lay more in the pleasurable perception, or, as we might believe, in the thinking?

Before we proceed any farther, we should attach here some remarks on the other kind of the aesthetic effect on our mind. We spoke of the beautiful, but with it the whole dominion of sensible impressions is not exhausted in regard to the form and its signification. But since to our feeling, if otherwise we do feel, nothing is indifferent, it follows we distinguish only that which is agreeable to our senses from that which is disagreeable. The former is positive; the last negative. The last we call ugly, terrible, monstrous, and such like, but here we cannot enter on its explanation.

XXI. THE SUBLIME.

The positive does not exhaust itself alone with the beautiful, it includes in the same time the sublime and the cheerful, and between these two lies the beautiful. The sublime exists only in nature, and only such things are for us sublime which bring us direct by the power and might of their aspects to the presentiment of a divine cause of their creation. Not the magnitude of the spiritual meaning for itself is decisive for the sublime, but this religious relation; not the preponderance of the ideas over the form, but the indirectness with which our mind, by its aspect, is directed to God. But if art wants to effect such like, she becomes symbolic; man can only express that by his work, what he comprehends; that lying and being in the sublime, he does not comprehend; he has only a presentiment, and therefore can never make the sublime. But the perfected work of art, we say, originates by a breath of divine inspiration, and therefore must, in the perfect work of art, lie a touching point of the sublime, even only a touching point.

XXII. THE CHEERFUL, MERRY.

The cheerful (jolly) is not in nature, but only in art. If before the sublime our disposition becomes one of veneration, even of worship and adoration, then we want to enjoy the beautiful, full and whole; but over the merry we want to laugh. But as not all that we venerate is sublime, that we enjoy is beautiful, so is not all over which we laugh, merry.

To explain, the cheerful or merry, or, as it may be called, the comic man, has not been successful. The question, What is comic? has not been solved. We decide, with surprising security, this or that is merry or that is not; but why we do so we cannot support by a general everywhere-satisfactory definition. Since Aristotle, all aesthetics on the definition of the merry, became themselves merry aesthetics. The grades and undergrades of the merry in all possible arts make it more difficult to bring them to a common subordination, to one definition, which we will leave to the reader to bring under one cap, the humorous, the witty, ironic, the caricature, the burlesque, grotesque. If we limit ourselves to the forming art, we recognize that in all comic works pure harmony is disturbed in a manner, that subject matter belonging together are set up, that is, that contrarieties are united in an unusual manner, and that matters belonging together are connected in an unusual manner. To this opposite only spiritual, only in the idea, then, the work produced is humorous; but if it appear in form, it becomes a caricature.

XXIII. THE HUMORISTIC, THE CARICATURE, AND THE SATYR.

The humorous picture, the truly proper form of the appearance of the comic in art, is always without a sting and harmless, and follows the general rules of form.

This meaning is in the spiritual conception, in the manner with which the artist entangles the contrarieties and solves them again. With humor we can only view general evil, folly, and weakness, and humorous work, therefore, can only in a general sense point its expressions against a certain person; then the conditions of human society furnishes stuff for the forming and introduction of contrarieties. Inasmuch as the plastic in single works can be humorous, painting is any way the dominion in the forming art, and indeed a part of the mythological objects, the animal, fable, etc.

Caricature is wit drawn, and has always the purpose to ridicule, to scoff, to mock, to humble; is mostly directed against a certain person. She has therefore a point. She is an exaggeration and therein lies her comical result. But since the same already pursues an outward purpose, she does not belong any more to

the dominion of the pure art; she uses art as a means for its purpose; may be that the figure is stretched, and that to the same is given an excessive large head; and may be that the same introduced in extraordinary relation to other figures and things. The caricature always remains a certain premeditated disfiguring and deforming of the peculiar form, and therefore in this sense does not belong to the domain of art. An intermediation between her and the humorous work is the figurative satyr, which, as it were, in a harmless way, secures its victim, and, when secured, and begins to rejoice over the humor, the person of the same unaware, is struck a blow in the face with the satyr's cloven foot. Hereby is a regular form observed, but the spirit is directed against a certain object with the intention of a covered assault. This particular moment taken from speech is in art difficult to represent, but it may be introduced in the same with the assistance of the comic allegoric.

We must desist here from a further expounding of these difficult relations, which would remove us from our purpose, and point only to the fact that as the beautiful in its highest perfection touches the sublime, so its lowest state has already mixed with the ugliness, that is, its own negation; it is in us a gradual succession of aesthetic impressions and feelings; but when the merry passes over us without any deep impression, the sublime captivates us, the beautiful gives us full, pure, and noble satisfaction, which remains with us and is lasting.

The morning gate of beauty is the consecrated land of perfect humanity; behind him lies the merry world, before him the sublime infinity; but only under the ark of peace, which is a protective haven adorned with all the gifts of art expanded over the race of mortals, men thrive, whole, good, able, and noble.

XXIV. THE DIFFERENT ARTS, THE THREE DIVISIONS.

We have before already separated the forming from the art of sounding, according to their marks of perception, and both only in the manner as to their expression, designated them as different. We turn ourselves exclusively to the first, which we, in future, will abbreviate, simply calling it art, when the sounding art generally is introduced as poetry and music, which is the plain language therefore in general use. Of the art in the closer sense we have the art of building (architecture), of sculpture, and of painting, the two latter united to the arts of forming. They are founded throughout on the same origin, and their differences are again only in their peculiar condition in which each of them in their manner brings its work to appearance.

XXV. THE ART OF BUILDING (ARCHITECTURE).

The art of building is the least art in all its parts since the inventing or designing artist does not himself execute his own work, but has the same done by others, under his direction. The sole artistical effect lies in the conception of the plans which he makes and fixes, and accordingly the building is executed.

At such designing the artist's fantasy must be in complete and full tension, to bring to him in his mind the building to be designed so clear and visible that he can oversee it as with a single glance, detecting no faults and finding it satisfactory. Then with the plan once decided and determined and the execution started, the same, on the main, must be proceeded with, as changes of any considerable extent and importance are not admissible; when the other artists, and fully the poet and the musician, have unlimited sway. But not only this, but more the mechanical fitting together of the building material, the construction based on the statistical laws; but, before all, the problem that the building itself must satisfy its practical purpose, gives to the art of building an unartistic addition, and yet are all these moments absolutely necessary to give to the building a beautiful appearance. Then were the same put up without connecting and joining of material, without construction, hewn and worked out as a whole of the natural rock, as perhaps the free-standing buildings and cavern temples of the Indians, it will always bear the character of the crude and accidental; but when a building has no practical purpose whatever, or at least not a reasonable one, as, for instance, some monuments erected in our time, it brings forth the impression of the gloomy, uncomfortable, and senseless. From this we learn that the purpose is the essence of the artistical idea; that a building without it misses its vital part, as a work of art is in want of the spiritual sense and meaning. It is, then, no more a work of art, but a nonsensical play work; just as a purposeless heaping up and adorning of heavy and huge masses of stone would be a senseless play. Herefrom it would also appear that the art of building with its practical purposes could not produce a work of art, which would for itself be beautiful, and in fact and in the face of the higher demands of art ceases to be art. But the artistical lies in the conception of the purpose in its perfected sense, and in the effort to show this in the building as a direct expression. This is the principal thing;