

flected from a surface of water at the same angle as the entrance beam, and was their guide in cutting that passage. And all this was so exact that to-day astronomers can detect no error greater than about five minutes of space. This gives us some idea of the genius that directed the building of that structure.

Another interesting fact is, that this pyramid is placed almost exactly upon the parallel of 30° of N. Latitude, whatever significance this fact may have. Then a vertical plane north and south through the pyramid marks the zero meridian for Egypt; and that entrance passage to the pyramid is in the plane of this meridian. Some other curious facts are these: This entrance passage has an angle of altitude of 26° 18' about; and its direction is not to the exact pole of the heavens, but to a point 3° 42' below that pole. Now it has been ascertained astronomically, that about 2170 B. C. the star called Alpha Draconis—or the brightest star in the Dragon—was just 30° 42' below the pole, and its light would therefore shine down that passage, so that it was their north star. Showing that our north star was not their north star. At the same time Alcyone, brightest of the Pleiades, or seven stars, was on the meridian south, in the vertical plane of direction of Grand Gallery of the pyramid. At the same time also the celestial meridian of the Vernal Equinox coincided with this same Alcyone. It is supposed by those who think this pyramid is an astronomical building, that the Egyptian year began at the time thus indicated, viz., in the autumn, when the Pleiades crossed the meridian. Judge Haliburton of Halifax, by a remarkably patient research, has shown that many primitive nations and also uncivilized tribes have always begun their year at this time. But a profounder problem than the beginning of an Egyptian year lies in the fact that this remarkable conjunction of stars shows also that it was the beginning of a cycle of the precession of the equinoxes, a period as before said of over 25,000 years. If, as Smyth says, this problem is recorded in the architecture of this pyramid—it is an astounding fact. Such are some of the wonders of the measurements of the great pyramid. If the conclusions are correct, they are verily wonderful. It is wonderful that any one at that age of the world, beyond the period of written history, could know the true relation of the circumference of a circle to its diameter—carried to five places of decimals; could know the shape of the earth, the length of its axis of rotation—therefore its size; and could derive a unit of linear measure from it as a standard; could know the diameter of the earth's orbit—therefore its circumference—deriving thence the sun's distance—length of a solar year and day; could so place the building that a vertical plane in it should give the true meridian for Egypt; that the opening of the entrance passage should admit the light of a star in the true north, and at the same time another passage admit the light of a star in the meridian in the south. More wonderful still, that they

should know that cycle of the precession of the Equinoxes. If they did not know these things, how does it happen that the geometry of that structure gives the information? is it all assumption? has it been tortured out of the lines with no basis of fact?

Different mathematicians, by simply taking the measurements of the lines put there by the architect and solving the problems suggested by them, have made the astonishing revelations. If the results can be shown to be true, and the designer did not know the hidden secret in those lines—did not have any knowledge of the astronomical truths involved—can we help concluding, also, that he was guided and controlled by divine inspiration?

A Remarkable Work.

THE opening of the Darien Ship Canal re-directs attention to one of the richest portions of the globe, which has been unnoticed for the greater part of the century. To understand its capacities we must go back to the records of the first discoveries and conquest of the Isthmus, when it paid tribute to Spain in thousands of gold and silver, and baskets of the finest pearls. Its great cities held palaces whose walls were a mile square, and fortresses which surpassed those of Europe. The ceiba tree and the tropic creepers have hidden the site of these grand ruins, but, guided by the light of history, the daring explorer will yet find not only these, but the deserted mines of gold and beds of sacred turquoise and of pearls. The history of Mexico and the Isthmus, in their early days, is one of the most fascinating pages in the world, whether to scholars or men of business, and it is fortunate that the period of reviving interest in these centuries, also, sees the announcement of the remarkable literary work which includes their history. The wealth of preparation lavished by Mr. Hubert H. Bancroft on his great "History of the Pacific States" affords a satisfaction to the world of which the volumes so far issued are a rich and surprising foretaste. The story of the conquest of a new world must have an absorbing interest, but the splendor of the natural resources of the countries reads like the tales of Eastern romance. From the treasures of material at command in his matchless library of 35,000 volumes on Pacific history, for which he has ransacked American and continental collections and Government archives, Mr. Bancroft has drawn a story of plain, authentic fact, which wears the coloring of romance. Old manuscripts, unknown to recent historians, and archives, supposed lost but brought to light by intelligent research, have added of late the missing links in the wonderful history of the discovery of America. The archives of Central American Governments, rare Spanish works, and manuscripts from the collections made by the Emperor Maximilian, and the eminent Mexican, Ramirez, have been sources of fresh and extremely interesting material, to fitly condense and convey which has been the labor to which Mr. Bancroft has devoted his best energies for twenty years,

with the assistance of from twelve to twenty educated secretaries in translation and reference work. The history thus produced by an author of uncommon ability must take place as a standard authority on Western America, giving not only its past, but its natural history, in accounts of the scenery, productions and inhabitants of the countries from the Rocky Mountains to the Pacific, from Darien and Sonora to New Mexico, Arizona, California, Oregon and their sister States. The information of all the writers that have ever written about these countries will be contained in Mr. Bancroft's Pacific History, a work so interesting that we expect to see it in every town and school library, if not in every household—the delight of the school-boy, for its marvelous stories of adventure; of the politician and the literary man alike, for its clear precision and its rich grasp of fact. In Europe an order of nobility would be the honor assigned a labor of such value—but the author's best reward will be to see his work read and beloved by the people for whom he wrote. The praise of the great scholars of Europe and America, of Carlyle, Herbert Spencer, Whit-tier, Longfellow and Draper, has been warmly given to his work, which, however, was written with the purpose to bring the information of a princely library within the reach of American homes. The large, open print, firm paper and binding have been selected to make a book welcome to the eye and lasting for use; one which will take the first rank among standard histories, and equally so in the interest of general readers.

Information in regard to the prices, etc., of this remarkable series, can be obtained by addressing Bancroft & Co., San Francisco. Inquiries addressed to this office will also receive prompt attention. Eleven volumes are now ready, and it is the intention to have a volume ready every fourth month until the series is completed.

LOW BEDS.—The use of the low bedsteads, with the trundle-bed, ignore a great and important principle, that relating to the fact that near and on the floor will be found the most poisonous gases, the carbonic acid of the sleeping room, since this is heavier than the air, falling and flowing into the lower parts of the house like water. It is cruel enough to put the children in a room which is already occupied by a sufficient number of persons—two are enough—without putting them, at the time when they are growing, and need every possible favorable condition, where they continually breathe the worst air—all of it being filthy enough—malaria!

Lumber Receipts.

THE following statement in regard to lumber receipts for the first six months of this and the preceding year may be of interest to many as showing the forward state of the building interests at the present time:—

1882.	1883.
Lumber, ft. 69,359,381.	Lumber, ft. 76,280,301.
Shingles, No. 13,823,761.	Shingles, No. 13,610,000.
Laths, No. 6,558,100.	Laths, No. 8,289,920.

The Material and Manufacture of Canes.

THE manufacture of walking-sticks and umbrella handles is an industry in which a great deal of capital is invested. The material is as various as can well nigh be conceived of. The *Chicago Times* recently had an article on the subject, from which we extract:—

Many are of imported woods, some from the tropics, China, and the East Indies. The celebrated Whongee canes are from China, where they are well known and celebrated for the regularity of their joints, which are the points from which the leaves are given off, and the stems of a species of phyllosiachys, a gigantic grass, closely allied to the bamboo. The orange and lemon are highly prized and are imported chiefly from the West Indies, and perfect specimens command enormous prices. The orange stick is known by its beautiful green bark, with fine white longitudinal markings, and the lemon by the symmetry of its proportions and both prominence and regularity of its knots.

Myrtle sticks possess also a value, since their appearance is so peculiar that their owner would seldom fail to recognize them. They are imported from Algeria. The rajah stick is an importation. It is the stem of a palm, and a species of calamus. It is grown in Borneo, and takes its name from the fact that the rajah will not allow any to go out of the country unless a heavy duty is paid. These canes, known as palm canes, are distinguished by an angular and more or less flat appearance. Their color is brownish, spotted, and they are quite straight, with neither knob nor curl. They are the petioles of leaf stalks of the date palm. Perhaps the most celebrated of the foreign canes are the Malacca, being the stems of the Calamus sceptonum, a slender climbing palm, and not growing about Malacca, as the name would seem to indicate, but imported from Stak, on the opposite coast of Sumatra. Other foreign canes are of ebony, rosewood, partridge or hairwood, and cactus, which, when the pith is cut out, present a most novel appearance, hollow, and full of holes.

The manufacture of canes is by no means the simple process of cutting the sticks in the woods, peeling off the bark, whittling down the knots, sand-papering the rough surface and adding a touch of varnish, a curiously carved handle or head, and tipping the end with a ferrule. In the sandflats of New Jersey whole families support themselves by gathering nanteberry sticks, which they gather in the swamps straighten with an old vise, steam over an old kettle, and perhaps scrape down or whittle into size. These are packed in large bundles to New York City and sold to the cane factories. Many imported sticks, however, have to go through a process of straightening by mechanical means, which are a mystery to the uninitiated. They are buried in hot sand until they become pliable. In front of the heap of hot sand in which the sticks are plunged is a stout board from five to six feet long, fixed at an angle inclined to the work-

man, and having two or more notches cut in the edge. When the stick has become perfectly pliable, the workman places it on one of the notches, and, bending it in the opposite direction to which it is naturally bent, straightens it.

Thus sticks apparently crooked, bent, warped, and worthless are by this simple process straightened, but the most curious part of the work is observed in the formation of the crook or curl for the handles which are not naturally supplied with a hook or knob. The workman places one end of the cane firmly in the vise, and pours a continuous stream of fire from a gas pipe on the part which is to be bent. When sufficient heat has been applied, the cane is pulled slowly and gradually round until the hook is completely formed, and then secured with a string. An additional application of heat serves to bake and permanently fix the curl. The under part of the handle is frequently charred by the action of the gas, and this is rubbed down with sandpaper until the requisite degree of smoothness is attained. —*Scientific American.*

Why Some Mechanics Don't Get On.

WE were much interested the other day in drawing from one of the oldest practical mechanics of Cleveland the secret of his success.

Said he: "I have always made it a rule to do my work so well that it left a good impression on my employer." There is more in this than at first appears. Hard work is one thing; conscientious work is another. The hard worker may outwardly conform to all the requirements of the shop; he may always be in his place at the starting of the machinery; he may take short noonings, and he may be among the last to drop his tools at night, but after all he may utterly fail to get on in the world, and why? Let our experienced informant answer: "I know of a young man of just that kind. He works hard enough and wants to succeed, but somehow he can't. He came to me for counsel, and I found that he was slighting his work. That is, in his anxiety to turn off a large amount, he neglected the finish which always tells on good work. The consequence will be that, unless he makes a change, when times are dull he will be one of the first to be dropped by his employer." Superintendents and foremen notice these defects more closely than many are aware. The man who slides over his task, who lacks in thoroughness, who lets an unfinished piece of work leave his hands, is marked. In the unwritten law of the shop he is barred from promotion, while the conscientious workman is morally certain of advancement. Is the tendency of the day in the direction of a better finish to work? We think it is. As machinery is brought into competition the strife will be to secure superiority in cheapness, simplicity, and finish. Here it is that the thorough workman brings into play all the resources of his skill and honesty—his "mechanical moral sense," it has aptly been called. Here it is, too, that the slovenly, or careless, or hasty

workman utterly fails. There are some forms of bad work that can be deftly covered up, but the compensations of life bring the inevitable result—failure to him who does not put his heart in the work, success to him who not only does his task, but does it well.—*Trade Review.*

Whitewashes.

THERE are several methods of making serviceable wash. One is made as follows: Three pecks of water lime, one peck of silver sand, and half a peck of salt. This is used for old, rough fences and outbuildings. The common whitewash is made by putting quicklime into a tight barrel, pouring on water to slack it, and adding water till it is of the consistency of cream. This is used for ordinary work. But a much better whitewash, which stands weather well, is made as follows:—

Put half a bushel of quicklime in a barrel and add boiling water until it is covered nearly six inches deep; cover the barrel to keep the steam in, and when the violent ebullition is over, add water enough to bring it to the consistency of cream, allowing four pounds of rice flour to each half bushel of lime, or the rice flour may be mixed with the water for slacking, mixing the flour carefully in cold water, before putting it in the hot water. Stir constantly in the hot water until thoroughly set, and then pour it all over the lime, as directed.

To improve the above, add two pounds of sulphate of zinc and one pound of salt. To change the color, add yellow ochre for cream tints, raw umber and lampblack for gray tints, and umber, red, and lampblack for fawn tints. The permanence of whitewash thus prepared is remarkable, and, when once tried, will be used to the exclusion of the ordinary mixture. —*The Pacific States Watchman.*

M. FAYOL, a French investigator, has found that the creosote treatment for the preservation of wood sometimes doubles the durability of oak timbers used in collieries, but has little influence on pine. He further says that oak prepared with ferrous sulphate lasts ten times as long as in its natural state. It should be immersed twenty-four hours in a solution of 200 grammes of ferrous sulphate.

THE cable system for street-car traffic seems to be making some headway in England and Scotland. At a Council meeting in Edinburgh, lately, permission was given to lay down a length for trial, the Council reserving the right to reject it, if deemed desirable, after an inspection of the Highgate, London, cable railway system in June next.

ACORNS from America are in demand in Europe, for the propagation of oak forests. A special agent for the forestry department recently shipped 300 bushels of red-oak acorns and 120 bushels of pignuts to England and Germany, where they are to be planted next spring.

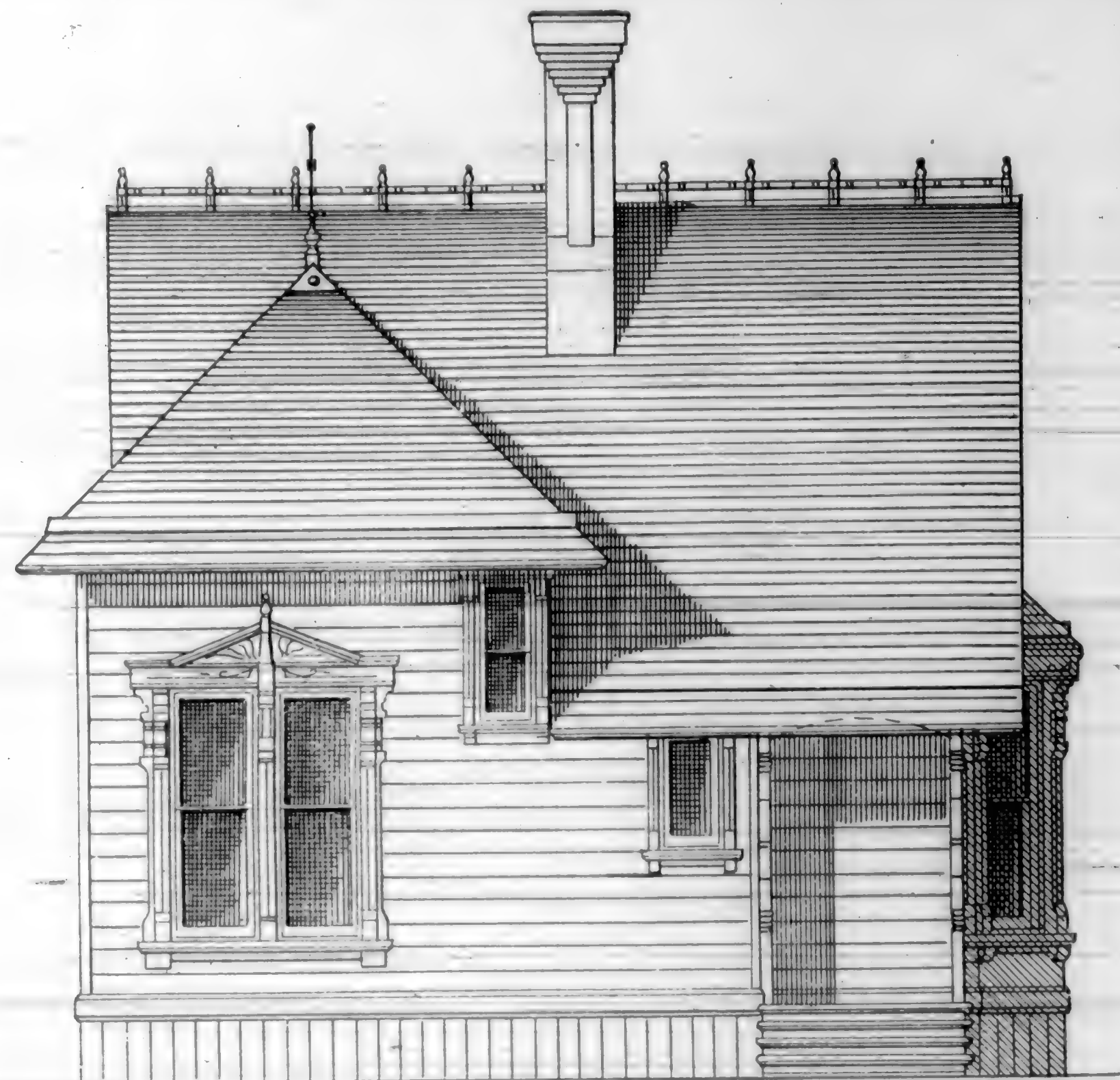


PLATE 6—A COUNTRY COTTAGE. FRONT VIEW.



PLATE 7—A COUNTRY COTTAGE. SIDE VIEW.

Arbor Day.

THE people of this State should rise up and demand that one more holiday be added to the too few which we celebrate. And no more appropriate day could be named than to follow in the footsteps of some of the Eastern States, and name a day on which all could join together and have a merry time planting trees. We hope our next Legislature will take this matter in hand and establish a grand State holiday to be known as Arbor Day; and let old vie with the young in transforming our valleys into magnificent wooded districts. Should our wise Solons establish such a holiday, it is to be hoped that they will provide for the proper maintenance of the trees after they have been planted. This might be accomplished by offering premiums for a certain number of trees that present a healthy appearance after a certain period of growth. We sincerely hope that the journals on this coast will discuss this matter in full before our next Legislature meets.

Draughts or Slow Poison.

AFTER all that has been said and done about the so-called "ventilation" of our public rooms, the people who frequent them are still shut in, in nine and a half cases out of ten, to a choice between taking poison and getting a chill—with the facilities much greater for the former. The average assembly room is still typified by the "hot air receiver" in which Adirondack Murray was once lecturing. It was built in the regulation fashion, with close walls on two sides, pierced in four places with small openings into dead-air flues, called, by a fiction of the architect, "ventilators" but up or down which no current was ever known to pass. The ceiling was, of course, solid, and the only chance to let in fresh air to the thousand people who were trying to keep up their heart and brain action on an atmosphere composed of lung exhalations, burnt-up air, and unconsumed gas, was to let down the large windows in the end. Up and down went the rattling sash and rustling curtains, as the gaspers and freezers took turns at the windows. Finally, the lecturer stopped and said, with the coolness and humor that characterized him: "Friends you may fix the windows any way to suit yourselves; only if I am to finish my lecture, I should like to have them stay fixed, one way or the other. For myself, if I am to have a choice between freezing to death or suffocating, I should prefer the former method as being cleaner. But, if the world stands for another year, and this dreadful hall with it, and you are to have another course of lectures, I would advise you to punch a hole through that roof," indicating the highly frescoed ceiling with his superb gesture.

The process hinted at in this rough suggestion has been followed in many of our pretentious halls and theaters. The builders have "punched a hole through the roof," in a more or less ingenious and artistic fashion; but, in thus providing an escape for the bad air, they

have exposed a large percentage of the occupants of the room to direct or cross-currents of air every time a lobby door is opened or a window is raised. There is yet no science of ventilation; or, if there be, it has not been applied where it is most needed. Many fairly effective devices for taking the overheated air out of a room have been invented; but the rooms are rare into which any adequate supply of pure air is introduced. The furnace fiend in the cellar will belch his blighting breath into a room as fast as it can find a way out—and too often faster, as the baked brains and laboring lungs can testify. But a rational system of ventilation, based upon the law of demand and supply, and avoiding stagnation on one hand and draughts upon the other, has not yet been brought within the reach of the general public. People susceptible to the insidious effect of foul air, and who visit places of public amusement, know what a "theater headache" is. They have a reminiscence of the taste of the atmosphere in their mouth the next morning, though they may not know what it is. Of all places in the world, except sleeping or thinking rooms, where pure air is needed, a public dining-room is the oftenest neglected in this particular. Added to the heat of the furnace or the steam-pipes, is the smoke of the gas and the scent of the dishes, and sometimes the fumes of the kitchen. In our grand hotels, elegant and perfect in all their other appointments, there is often—we may say commonly—no way of reducing the temperature and freshening the air except by lowering a window—with what effect Mr. Fitz feelingly hinted in the humorous speech to which we alluded in the opening. It destroys half the enjoyment of a good dinner to introduce pure air in this fashion, merely as an *entre* in the elaborate *menu*. One does not want to carry away incipient pneumonia or an aggravated catarrh as the penalty for dining away from home.—*Ex.*

PRACTICAL CARPENTRY.

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A guide to the correct working and laying out of all kinds of Carpenters and Joiners' work. Solutions of the various problems in Hip roofs, Gothic work, Centering, Splayed work, Joists, Hinging, Dovetailing, Mitering, Timber Splicing, Hoppers, Skylights, Raking mouldings, etc. This work should be in the hands of every mechanic. One of the features to which this book will undoubtedly owe its success, is the absence of those numerous formulas which serve only to confuse the ideas of so many workmen. Everything is written in a clear, concise, and practical manner, and its utility is brought within the grasp of those workmen who have not had the benefit of a school education. We will send the above work to any address upon receipt of \$1.00.

If the manufacture of glass is being tempered according to the building developments of the country, then the sash, door, and blind manufacturers can be said to have before them a prosperous demand. It is stated there are fifty new glass factories being built in the different States. To quite an extent glass means sash, and sash means doors and blinds.

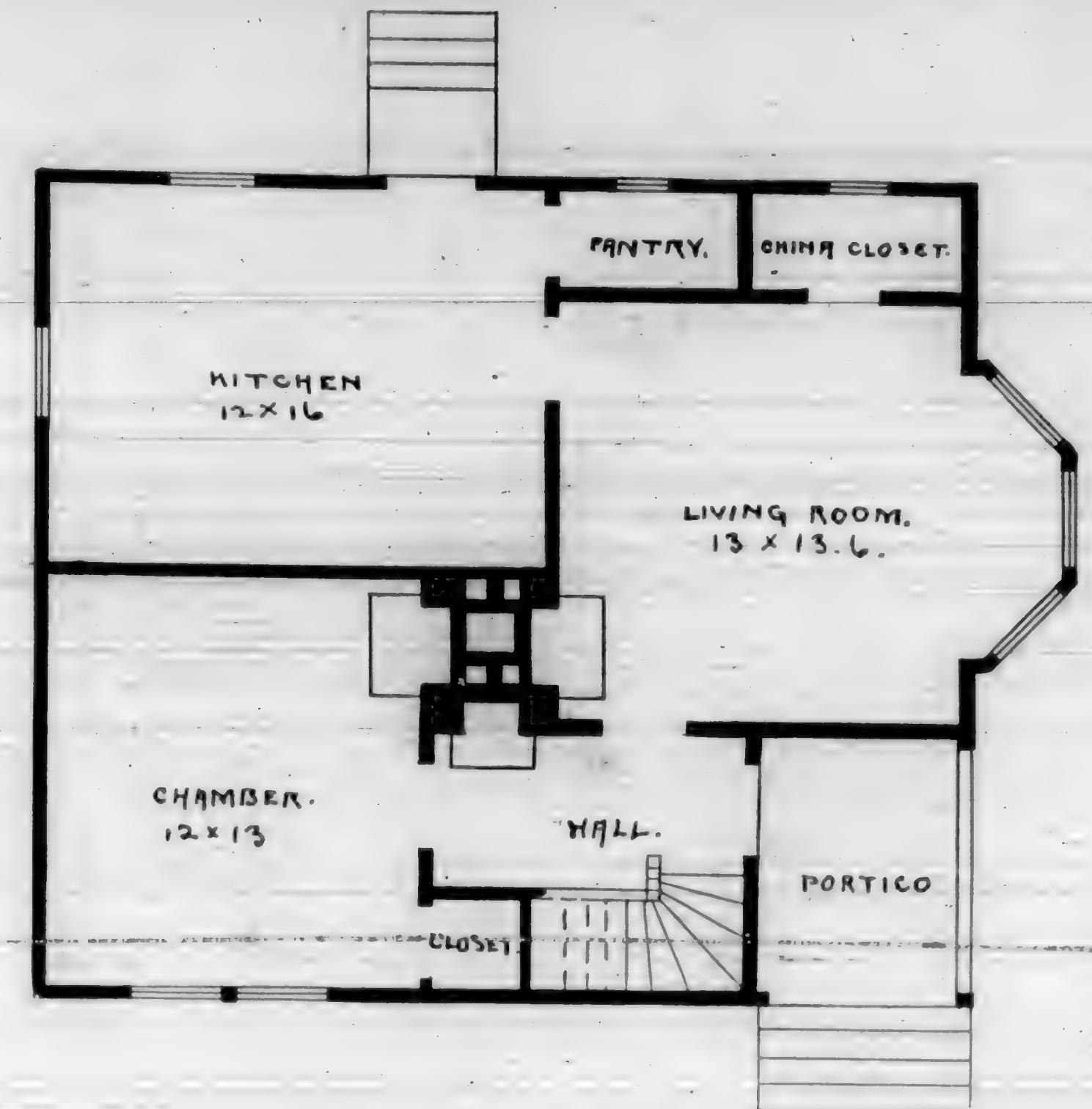


PLATE 8—A COUNTRY COTTAGE. FIRST FLOOR PLAN.



PLATE 9—A COUNTRY COTTAGE. SIDE VIEW.

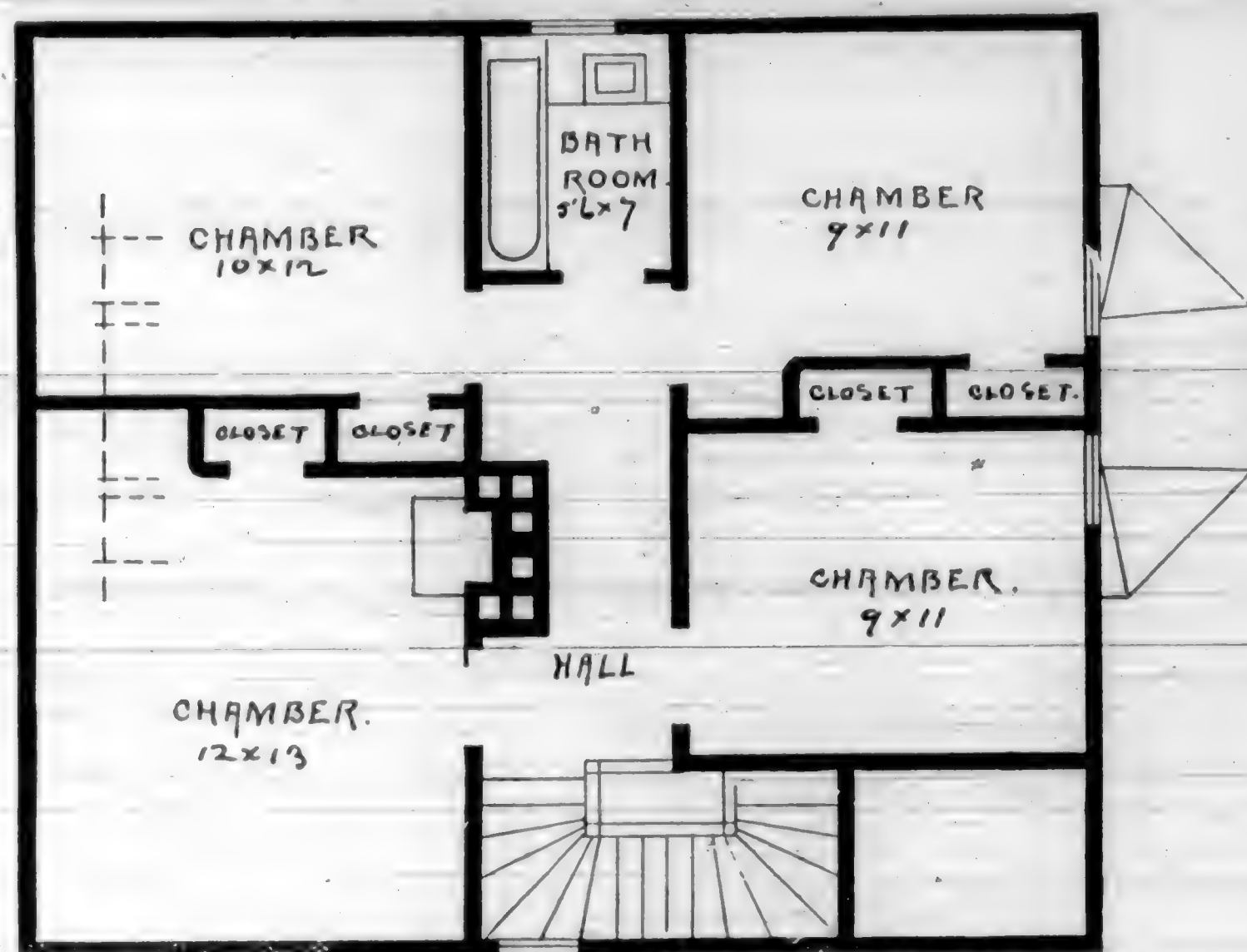


PLATE 10—A COUNTRY COTTAGE. SECOND FLOOR PLAN.

A Practical Answer to the Dr. Ayers' Theory.

THE following letter from one who is a prominent business gentleman, residing in one of the choicest elevated sections in the city, in a ten thousand dollar residence, is a conclusive contradiction of the fallacy recently promulgated before the Medical Society of California:—

"JUNE 3, 1883.

"MR. WOLFE: We are all down with malarial fever, and I am satisfied that the sewerage and plumbing of my house has much to do with it. Yesterday I noticed a terrible smell in the basement, coming from where the wastes connect with the sewer and hopper. The basement was closed, and no water being run through the pipes during the day, the smell was intense, and as soon as I let the water on, the smell went away. Whether the sewer is broken, or the joints in the sewers or plumbing pipes bad, I do not know, but we smell the sewer gas through the house and are all sick. I want you to examine where the fault lies, and have it remedied. My wife threatens to leave the house. The plumber has not done his work right, and we are alarmed for fear of the consequences. See whether the sewer trap is all right, and have large vent pipes put in, and make them run up above the shingles. I am afraid that the trap under the bath tub is not safe and it syphons out. I am greatly alarmed, for we have never had any such sickness before, and all the indications are that our present troubles come from the sewer gases. This is the opinion of our physician also. Please attend to the matter at once."

The foregoing is but one of hundreds of similar cases in San Francisco, and an exemplification of the folly of owners' purchasing houses built years ago, when sanitary science was in its infancy, and architects, owners and

builders had not acquired the knowledge since obtained in reference to the importance of perfect sewer and plumbing work, nor learned to realize that the underground conduits with which all buildings are connected, contain terrible death-producing agencies. The residence in question was built some ten years ago, by one of the present popular architectural firms in San Francisco, who may have exercised the best judgment then enjoyed, but which now develops a degree of error illustrated by the foregoing. After the recent purchase by the present owner, he made, as he supposed, all necessary improvements to correct the existing evils, but failed in his attempt, and to obtain perfect immunity from the effects of sewer gases, will be required to expend considerable more money; but when that shall have been done, it will require time to remove the impressions produced by present family afflictions, and establish a feeling of confidence that loved ones are safely protected from the bad consequences which follow in all cases where sewer gases are allowed to work their way into dwellings. If sewer gases are not promotive of any "special type of disease," they are nevertheless a means by which thousands are daily prostrated on beds of sickness, and thousands consigned to that slumber from which nothing short of the Gabrielic trumpet will ever awaken.

PLEASE NOTICE.

The 75-cent edition of the Steel Square and its Uses is OUT OF PRINT. We cannot supply any more, as we have received notice from the publishers that their stock of that edition is completely exhausted. We have a number of the new and enlarged edition, which we will mail direct to any address upon receipt of

ONE DOLLAR.

This edition contains 30 more pages than the first one issued.

The Care of Fixtures.

THE most troublesome of all is the ordinary house sink, into which the bulk of the greasy water from dish-washing is emptied. Contained in the hot water, the grease is dumped into the sink and out at the drain. Being chilled, however, in its contact with the cold metal of the sink or drain, it is at once deposited about the strainer and proximate waste pipes, the greater portion being deposited on the inner surface of the traps, where it remains to decompose. Here something more than water is necessary, and when, as with the modern flat or tenement, the sink is made the receptacle of the suds on wash-days, the drain is kept moderately and sometimes perfectly clean by reason of the various washing-sodas now in use. Though the grease has been deposited by means of hot water, it is not safe to expect that hot water alone will remove it, since it was the chilling of the hot, greasy water that first deposited the refuse grease. There are special fixtures for catching this greasy deposit at various points along the drain, but the better way is to eradicate the objectionable and carry it off altogether.

Where the sink is used for kitchen purposes alone, and there are no weekly flushings from the wash-tub, it is necessary to take pains to remove the grease by special means, introducing into the dish-water some one of the sodas or ammonia. The tubs, whether in the laundry or bath-room, require moderate though timely attention. In the case of the laundry tubs, the deposit of soft mud, left from clothes washing, is partially deposited at the lowest portions of the tubs, or sticks to the corners or joints, and if, as is often the case with what are called stationary tubs, a quantity of water is left in and the lids shut down, decomposition soon sets in, and an odor far more offensive than the sewer gas is experienced on lifting the lid or stirring the water. The tubs have to be thoroughly washed and flushed before the odor is thoroughly removed.

The application of disinfectants is of no use; cleansing must be resorted to. So, too, with the bath-tub, a similar deposit is left from the water either at the bottom of the tub or in the drain, or more especially in the trap.

All this trouble from the tubs can be prevented by proper care and cleanliness after use. They should be thoroughly washed and flushed after each service.

With urinals another special method of cleanliness is necessary, for while there are no greasy deposits, such as already described, there is, owing to the very rapid decomposition that sets in, a special demand for immediate flushing after use, or they will shortly become most offensive. Constructed of a proper non-absorbent, non-porous and non-corrosive material, a liberal flushing immediately after use will be sufficient, unless contained in a close and warm room. If the room is not properly ventilated, it is next to impossible, even with a most liberal flushing, to prevent an unpleasant as well as an unhealthy odor arising.

Exterior Painting.**THE BEST MATERIAL.**

THE public are indebted to the architect and builder for accurate and becoming designs, and for good and careful construction of buildings, but not always for their methods in painting. Frequently their specifications for material and their methods of application are mistaken, and do not result in the best and most economical work. For instance a contract may require that the exterior of a house shall be painted in pure white lead and linseed oil. Undoubtedly pure white lead has superior covering properties, and with good linseed oil makes a handsome surface, but it is not by any means the most durable or cheapest coating available. A proportion of zinc white, depending upon the amount of coloring matter employed, mixed with the pure white lead, will make a much better paint. There are technical reasons upon which this assertion is based, and they will be appreciated by every one, though he may have no practical experience with paints. It will be readily seen that the adhesive properties of the paint consist in the vehicle with which it is mixed. If water were used the adhesion would continue only so long as the paint should retain its moisture and the dry powder would be easily rubbed off. The same result would follow if the pigment were mixed with oil, as soon as the vehicle were absorbed, disintegrated, or otherwise removed from the powdered lead. Now it is a fact that a paint consisting of pure lead and the best linseed oil will soon disintegrate, leaving the powdered lead free to be easily rubbed off. On the other hand, the oxide of zinc forms with oil a paint which when dry assumes the appearance of an impervious enamel. This comes from the nature of the pigment, by which a chemical combination is effected. The writer, therefore, after many tests, does not hesitate to recommend a mixture of zinc with lead for all exterior paints. We said the proportion of zinc should depend upon the colors with which the paint is to be mixed, for ochres, umbers, siennas, and Venetian red act in the same way as zinc, and are preventives of the chalking difficulty to which clear lead is subject. As to the proportion which is the most economical with the best results, the writer would recommend that for the upper coat, say of a three coat job, standard white lead will bear 25 to 35 per cent. of zinc. If any considerable proportion of the colors named were employed in the mixture the smaller percentage has, in the experience of the writer, worked best. Many painters use the zinc in the priming coat, but clear lead, from its great covering power, is regarded as preferable. The inexperienced reader may ask, If zinc is so good why not use it clear? There are two technical objections. First—Zinc lacks body or covering properties, being much less opaque than lead. Second—Zinc clear makes a hard and brittle enamel, which is subject to what painters call cracking and chipping. No matter how employed as a

paint, it must, for these reasons, be tempered. The prepared brands of zinc white are tempered in their manufacture to avoid these very objections.

Now as to errors in methods of applying paint. We once saw a contract for painting a railroad depot and passenger house, in which there were many elaborate and small architectural decorations, requiring to be picked in with several different colors. By the terms of the contract it was a three coat job, and it was required that the painter should "pick in" the colors in each coat. The colors were such that the picking in needed only to have been done on the last coat. As such painting requires great care and entails much labor, the consequence was that a large amount of labor was lost in the unnecessary work of two "pickings in." Besides, in spite of the care of the painter, the painting was rough and slovenly, much aggravated by the repeated work of matching lines and colors. We recollect also that the painter was greatly out of patience because the contractor would not listen to his suggestion that he could do the painting much better with a single coat of the "picked-in" colors. Many architects are expert in the selection and arrangement of colors and tints on an exterior, but it ought not to be expected that they can have the practical knowledge of paints and material, and the best methods of application, which are requisite to avoid mistakes such as those above alluded to.—N. C. Weiss, in Building.

Strengthening a Foundation.

AN interesting way of strengthening a weak foundation was recently tried on a new building that suddenly commenced to settle. The excavation for the walls had been carried down until a mixture of coarse sand and gravel was found, which was deemed suitable. During a heavy rain water found entrance to the cellar, when the sinking resulted. The building was braced, the cellar drained, and then the inside wall of the foundation was uncovered down to a little below the bottom. A A-shaped piece of masonry having a height of about twice the width of the base was then built, the bond between it and the wall being carefully looked to.

After this had been finished upon the inside, it was repeated upon the outside. The base of each of these pieces was equal in width to that of the wall, so that the operation practically trebled the bearing surface of the foundation. It may be well to add that the water will not again be permitted to enter that cellar, as every passage way has been securely closed.—Scientific American.

Prescott's Truss Hanger.

THESE Hangers are particularly adapted for use upon barn, stable, depot, and storehouse doors, or in any place where elegance of finish is not required. A child is able to move a door hung with this Hanger. Dunham, Carri- gan & Co., Agents.

Building Intelligence.

Owing to the immense lot of extra work caused by a complete change of type in our last issue, a few typographical errors crept in our columns. The buildings on cor. of McAllister and Filmore reported to cost \$2,100 should have been \$21,000. The alterations cor. Jessie and 18th streets, reported as \$1,000 should have been \$10,000.

SAN FRANCISCO.

Channel, nr. Sixth. Two-story frame, and one-story brick.
O.—A. Waldstein.
A.—Wolfe & Son.
C.—T. H. Day.
\$10,000.

Channel, nr. Sixth. Factory.
O.—Coos Bay Stave and Lumber Co.
A.—Wolfe & Son.
\$20,000.

Mission, east of Third. Four-story and basement brick.
O.—Warden & McClure.
A.—W. P. Moore.
C.—Richardson, brick work.
\$40,000.

Golden Gate Avenue, cor. Fillmore. Five two-story frame flats, brick foundation, and alterations to adjoining buildings.
O.—Lewis Levy.
A.—Schmidt & Havens.
C.—W. Plums.
\$30,000.

Block, bounded by Market, Waller, Octavia and Haight. Eighteen two-story frame, brick foundation. Thirty-six flats.
O.—M. A. DeLavaca.
A.—Schmidt & Havens.
C.—W. M. Fletcher.
\$55,000.

Mission, x. Eleventh and Twelfth. Two three-story frame. Flats.
O.—Mr. W. Menzel.
A.—Schmidt & Havens.
C.—J. N. & J. G. Day.
\$11,500.

Bush, cor. Fillmore. Two two-story frame. Brick foundation.
O.—Mrs. E. G. Butler.
A.—Schmidt & Havens.
C.—Robinson & Gillespie.
\$8,500.

Pine and Octavia. Five two-story, brick foundation.
O.—H. T. Jones.
A.—Schmidt & Havens.
C.—R. Smilie.
\$16,575.

Golden Gate Avenue, x. Laguna & Buchanan. Four two-story frame.
O.—Buckley.
A.—T. S. Welsh.
C.—J. W. Smith.
\$15,500.

O'Farrell, x. Polk and Larkin. Two-story frame.
O.—Dr. W. A. Douglass.
A.—T. J. Welsh.
C.—John Blake.
\$8,000.

Eddy, nr. Octavia. Three-story frame.
O.—W. Geist.
A.—H. Geilfuss.
C.—Kincaid & Baldwin.
\$8,000.

Jackson, nr. Davis. Two-story brick.
O.—Mrs. Wilson.
A.—P. J. O'Connor.
C.—B. Farrell.
\$5,000.

Hill, cor. Guerrero. Two-story frame.
O.—Mrs. Pomeroy.
C.—T. Maxwell.
\$6,000.

Dolores, cor. Liberty. Two-story frame.
O.—T. V. O'Brien.
A.—Swain & Cleveland.
C.—A. Flood.
\$—

Hyde, nr. Ellis. Two-story and basement frame.
O.—Mrs. A. Touhill.
A.—G. A. Voelkel.
C.—J. H. McKay.
\$6,000.

Guerrero, x. Twentieth and Twenty-first. Two-story and basement frame.
O.—A. P. Van Duzen.
A.—H. C. Macy.
C.—G. R. Lang.
\$6,500.

Scott, x. Geary and O'Farrell. Two-story and basement frame.
O.—Mrs. Meason.
A.—George E. Voelkel.
C.—W. Plums.
\$4,000.

Pacific, x. Pierce and Steiner. Two-story and basement frame.
O.—C. Page.
A.—W. F. Smith.
C.—J. Geary.
\$7,000.

Jackson, nr. Buchanan. Two-story and basement, frame.
O.—J. Gutte.
A.—Kenitzer & Raun.
C.—B. Brotherton.
\$11,500.

Hyde, nr. Clay. Two-story and basement frame.
O.—W. F. Jones.
A.—Percy & Hamilton.
C.—A. Jackson.
\$5,500.

Washington, cor. Larkin. Alterations.
O.—P. F. Fisher.
A.—H. D. Mitchell.
C.—R. McCann.
\$4,000.

Brannan Place, x. Clay and Washington. Four-story brick.
O.—Chinese Co.
A.—W. H. Bayless.
C.—J. Smith.
\$8,000.

Sixteenth and Dolores. Interior finish.
O.—St. Francis Church.
A.—Huerno & Everett.
C.—J. E. Massey.
\$5,200.

Twenty-second, nr. Fair Oaks. Two-story frame.
O.—R. Blair.
A.—H. T. Bestor.
C.—J. McCann.
\$6,000.

Franklin, cor. McAllister. Alterations to building. Three two-story frame.
O.—B. Windhaus.
A.—H. Geilfuss.
C.—B. Dryer.
\$13,200.

McAllister, x. Franklin and Gough. Three two-story brick buildings. Two-story stable.
O.—H. Nieman.
A.—H. Geilfuss.
C.—F. Weinschl.
\$12,400.

Sutter, x. Hyde and Larkin. Two-story frame.
O.—Schneider & Barton.
A.—Mooser.
C.—E. Klatt.
\$9,000.

Calvary Cemetery. Vault.
O.—Camere.
A.—Mooser.
C.—Paltenghi.
\$4,000.

Stockton, nr. Market. Alterations.
O.—P. Dorey.
A.—Curtlett & Cuthbertson.
C.—J. McCann.
\$2,000.

Sutter, x. Powell and Mason. Two-story frame.
O.—
A.—Felton.
C.—F. W. Kern.
\$5,000.

all parts of the lower section of the city, and from Oakland, Alameda, and by way of the numerous lines concentrating at the ferry slips—it appears to us that if the owners of the property in question would take a broader view of the possibilities surrounding their investments, they would forthwith proceed with the erection of first-class buildings, and enter into a vigorous competition for the trade advantages which are now distributing and establishing themselves in so many inferior localities.

No Decision Yet—Lien Law.

A DECISION by the Supreme Court, construing and defining the legal force and effect of the present Lien Law of this State, has been anxiously looked for by thousands of interested parties for six months or more. A degree of uncertainty surrounds all building interests, owing to the unsettled features of the law as it stands recorded upon the statute books. The new dress in which the law is clothed by the new Constitution, creates an uncertainty in the minds of the legal fraternity, and the opinions advanced by lawyers are entirely speculative. Some holding that the law as written is effective, while others maintain that no law which contravenes,—practically nullifies the agreements and obligations of contracts,—can be enforced. The issue involved in the case now before the supreme tribunal of the State, covers the whole ground, and the decision when rendered will be one of the most important that has been considered and decided since the adoption of the new organic laws of the State; as it will establish the responsibilities of owners of buildings and construction improvements generally, and lay the foundation upon which contracts, bonds, etc., must be constructed, and settle the vexed question whether owners can be held for deficiency amounts beyond the sum of contract. Hitherto the decisions upon the same issues under the old Constitution, have all held that the terms and agreements of contracts were conclusive, and that owners could not be held for any deficit that might occur from any cause. What the decision will be in the case now pending cannot be known until the decision now so anxiously waited for and desired is made known.

The Garland Trap.

MUCH has been said and written in regard to the efficacy of traps in preventing sewer gas from permeating our dwellings. But the climax of perfection was not reached until the time of the introduction of the Garland Trap. In fact his name is being used as a house word by many of our citizens; for after performing their necessary ablutions, they point under the washstand and say, "Old Garland is there," meaning that a perfect sewer gas protector by that name prevents the effluvia of the noxious gas from coming into the room. Safety and simplicity are the essential characteristics of the Garland Sewer Gas Trap.

The *S F Chronicle* of July 1st, in its article, "City Laws," "some figures concerning building operations for the past six months," etc., says: "The most reliable source as to the number of buildings now going to completion, is, perhaps the books of the Spring Valley Water Works"—which for the past six months gives 391 as the total of buildings with which the pipes of the company have been connected. Then follows "Another authority [meaning the CALIFORNIA ARCHITECT AND BUILDING NEWS] which claims to have taken much pains in compiling valuable statistics, gives the following figures:" this is followed by our semi-annual statement, showing the number, as reported in this journal, to be 424, or 33 more than the number given in Spring Valley's statements. It then adds, to qualify the discrepancy in the two totals, that the reports of this journal "include of course, many which are not supplied with Spring Valley water."

We refer to the article mentioned, because it is incorrect in some respects, and not editorially clever in others. First, it is not true that the "Spring Valley Water Works' books are the most reliable source," and the *Chronicle* so admits when it says the reports in this journal "includes many which are not supplied with water," which is a fact. A considerable number of buildings are reported by us, into which Spring Valley water never enters, and the books of that company cannot therefore ever be a "reliable source" in reference to the number of buildings erected in this city. The water company's books however serve to sustain the practically, unimpeachability of the reports of this journal, and it would have been no more nor less than fair and friendly, had the *Chronicle* acknowledged this fact, which must have been clearly evident to the writer of the article referred to.

Secondly, it was not kind nor generous on the part of our contemporary to say "Another authority which claims to have taken much pains" etc., when it would have been just as easy to have mentioned the name of this journal, as that of the Spring Valley Water Works, particularly as the figures given, and the admission made by the *Chronicle* show that our statements were more nearly correct than the "reliable source" credited.

Again, our contemporary has too often availed itself of the information contained in our monthly reports of building intelligence to render the language—"another authority which claims" etc.—justifiable. We claim nothing that is not ours by right of actual fact, and as far as our reports of building operations are concerned they are so far recognized and admitted to be correct and reliable, as to be found from time to time copied in the columns of the *Chronicle*, *Call*, *Alta*, *Bulletin*, *Post*, and other journals generally with due credit, but not always, and one thing is certain, that if those reports were not, or did not appear to be reliable, we should have heard from some of the "live journals" named, who are too keen in their pursuit of accurate information, to allow themselves to be misled by doubtful

statements from unreliable sources. The fact that our reports have included all that appears on the books of the Spring Valley Water Works, with thirty-three additional, certainly entitles us to preferred credit for correctness. But as we have heretofore stated in our yearly summaries, it is altogether likely that, with all the care exercised, we may miss some, as some owners very unwisely prosecute the erection of buildings without architectural supervision, and the fact of such erections are only ascertained by the system of personal canvass of the city made by our reporters each month. Admitting this to be so, and taking into account the possibilities in this connection, the result would increase the difference in totals, as mentioned in this article, to perhaps twice the figure named, still showing, however, the nearer accuracy of our reports.

Pay for It, If You Want to Read It.

WHILE we are reaping a pleasing reward for the time, labor, and money expended in the publication of this journal, there is room for a large increase in the number of subscribers. There should be not less than ten thousand in California and the Pacific States alone. It is the only journal published west of the Rocky Mountains, in the building, sanitary, plumbing, and other similar interests, and not a single owner of real estate, nor a carpenter, or mechanic of any class, but should subscribe. Each monthly issue contains information and matter worth more than a whole year's subscription, and the high standing reached places it among the very best of class journals published. The fact that its original matter is reproduced in scores of journals of all classes, attests the value of its monthly contents, and the innumerable complimentary notices received, adds testimony to the fact that it is a recognized, valuable journal; and, as such, it should receive universal support. Those who have noticed its progress must have discovered the advance made in its every department toward that excellence promised in its earlier numbers. It has required many thousands of dollars and an immense amount of hard labor and sacrifice to bring about present results, and we certainly feel that we have a claim upon those in whose interest it is published, for financial aid and support. The fact that hundreds obtain access to its columns through the kindness of those who pay for it, is by no means creditable to those who practice "sponging," rather than pay the small sum of two dollars per annum, and receive it honorably. The position of "dead head" is by no means a nice one, and we trust that all those who have relied upon seeing it in "somebody else's office," or borrow it from subscribers, and all others, will send in their names and subscription amounts. It is a costly publication and should be paid for by those who read it.

It is sagaciously hinted that to determine the value of building stone a ramble among the tombs is wise. In far fewer years than most people imagine, monuments decay.

New York Street Architecture.

A. CURTIS BOND.

THE COMPOSITE.

A RECENT writer in the *Pall Mall Gazette* claimed that brick when used in building exteriors was a subterfuge, a substitute for something more substantial and more in consonance with the weight of a house. Whether there is any force in this argument, or, as is more probable, whether it is merely one of the idiosyncrasies of an individual, brick has certainly taken an undeniable hold of the New York taste. Brown stone for a time, and a considerable time at that, was "the thing," and brick was considered too awfully ordinary; but people seemed to have tired of the once expressionless fronts of our aristocratic dwellings and have turned to brick as a relief, until finally it has become a fashion—the aim of every man and thing, for when it becomes fashionable its reputation and its fortune are secured, temporarily at least.

In most instances this adoption of brick has led to the construction of buildings suited to that sort of material, and the Queen Anne style has naturally been much in favor, for in this, probably of all others, the brick shows its decorative qualities to the very best advantage.

Red brick is warm in appearance, an excellent offset to our variable (and, alas, too often invariable) weather; it is domestic, inviting, home like; a house looks more cheerful, more social, cosier in brick than in anything else qualified for use in the city: it gives one the impression that the people who live behind it are nice, quiet, hospitable folks (this impression is often an erroneous one, of course, but it creates a pleasant feeling for the moment), people that can be approached and talked to and invited over to the house to supper. While the great staring, blank stone wall gives a chilling sort of an idea as to those whom it harbors, throws out the suggestion that they are of the "set" and don't care particularly about increasing their circle; at any rate, have no desire to take you into it and then you shrug your shoulders and stroll out to the park and have a smoke, and your thoughts run in an uncomfortable channel, and you make up your mind that "the more you see of men the more you like dogs," or something of that character. This is my exaggerated opinion of brown stone, and I imagine others are beginning to entertain the same thought, for, as I have said, it is being displaced.

Instead of being a substitute, as is claimed by the writer whom I have just referred to, it seems to me that brick may more rationally be considered the fundamental building substance, the constructive element proper alike of the primitive and the modern house. As it is used and colored now, it may take on the appearance of terra cotta, and the fronts of some of our new flats, for example, are really unique in effect and frequently so in detail; the terra cotta panels and the apparently terra

cotta ground work make the façade more than ordinarily showy, and, what is even better, permanent and lasting, for brick, among its other good qualities, possesses durability.

In some places, antique cities and ancient villages one finds in wandering over Europe,

they use tiles for the front of buildings; good, clear, shining tiles, tiles that are never dirty, for every shower washes them off and they look fresh and new as if they were just taken from the shop; no rust, no green deposit, no fading yellow, nothing to the end of time (for that particular building), but tiles, blue, yel-



PLATE I.—NEW YORK STREET ARCHITECTURE.

Prepared for this Journal by A. Curtis Bond.

low, red, anything you please, first and last the same color, the same shade, the same tile. What a contrast these semi-civilized structures show to our streets! Painted bricks with the point scaling off, veneered brown stone and the veneer failing to adhere to its foundation, scagliola that looks moth eaten, stucco in a demoralized condition, and freestone with arabesques and scrolls worked upon it in mold. Why won't some courageous builder free himself from these horrible materials and try the effect of a tile front? It would require courage, perhaps, but I have an idea it would reward the attempt to introduce it, and the result, if adopted, would certainly be to vastly improve the appearance of our streets and detract somewhat from the chronic melancholy of our architectural countenances.

As I urged the claims of brick and found in it all the apparent essential qualities of a constructive material, it would hardly do to desert it entirely in favor of tiles as my preceding paragraph would suggest; so I must own to a certain allegiance to glazed bricks whose history has had particular attractions for me ever since I saw the old market church in the city of Hanover, which is said to be the oldest example of glazed brick work in existence. It is said that prior to the fourteenth century the glazed brick was but little known, or at any rate was very little used; early in the fourteenth century, however, its employment became more general, and from that time to a comparatively recent day, it has been more or less an accessory in architecture. A number of spires built from glazed bricks are found through Germany, and one who has never seen the effect of these glistening, brilliant structures can hardly participate in my enthusiasm in advancing them.

"The durability of glazed bricks does not depend upon their color, but varies according to the composition of the glazing substance. Yet, as the composition of the glaze reacts upon the color, it has been noticed that the darker kinds are, as a rule, better preserved. In the composition of the glazing substance each producer varies the proportion of the component parts according to the quality of brick to which it is to be applied, and according to the method of burning which he employs." These words are quoted from the report of the Hanover Architects' Society.

I wish these few sentences of mine might be productive of some good, and tiles or glaze be adopted in the place of paint and stucco.

The composite or eclectic, or whatever name the modern architect chooses to give it, has attained, and appears likely to retain, an unmistakable position among builders. Originally it gave the architect an opportunity for displaying his diversity of knowledge among the many differing and various styles that it was allowed, might be combined under this one general title; but as it has increased in popularity there has been given it a form somewhat distinctive to itself, and it may ultimately be ranked among the "orders."

The illustration accompanying our letter is an example of what may be termed New York Composite, and belonging to the most recent improvement of that character we can very safely accept it as embracing the latest and newest phases of the style. The building shown is of brick, with terra cotta trimmings, and the large square space on the side between the towers is painted a steel-blue, making a most peculiar and unusual, though by no means unpleasant, effect. The large windows in the upper part of the towers admit a fine light to two floors of architects' offices; the oval topped panels between the fifth story windows help to give variety to the general appearance, and in that way are most effective; the slabs between the windows of the third floor bear brass plates inscribed with the name of the building, the date of laying the corner-stone, and the names of the architects.

The building is known as "The Hartshorne," having been erected by Stewart Hartshorne, who has made himself more or less famous, locally, by the invention of a mechanical shade roller, that has probably brought about his ears more law suits and more litigation than almost any other one invention of any importance in the city. But it falls to the good fortune of some men to have a boom in this sort of free advertising that is no small element in their success. Those persons who are fond of tracing everything to its origin, tell us that the composite made up or composed of numerous other styles, was brought into being by the Romans when they were either originating or destroying everything on earth. They devised the form in order to show their dominion over all nations, most of these nations making use of one or the other of the component "orders," and thus being represented through its distinctive phase of architecture. The Romans heaped one above another, Tuscan, Doric, Ionic, Corinthian, until they completed a magnificent structure, and the composite though in some respects a nondescript, was, in others, the most beautiful of exteriors. Le Clerc writing of this style says: "It may with singular propriety be used wherever elegance and magnificence are to be united, but more especially in buildings designed to commemorate great and signal events, or to celebrate the corubine achievements of conquerors and legislators, inasmuch as the capitals or other ornaments may be composed of emblems and of allegorical representations."

Modern architects diverge widely from this model and have given us something more in consonance with the times.

At a recent meeting of the Maryland State Board of Health, it was decided that hereafter sanitary conventions or meetings should be held at least once a year, under the auspices of the board, in different parts of the State, with a view to promote a general interest in sanitary science, the first meeting to be held in Baltimore on the fourth Tuesday in October, 1883.—*Sanitary Engineer.*

The Mechanics' Fair for 1883.

THE preparation now in progress by the managers gives assurance that the exhibition which will be opened in September next will equal if not surpass that of any preceding year. And we presume that the good judgment and business perception of all manufacturers, inventors, artists, farmers, merchants, producers and dealers in goods, wares, and merchandise of every class and kind, will lead them to see and appreciate the value and advantages of the opportunity thus offered to expose and popularize that which each may have for sale or public patronage; and this appreciation should stimulate a general emulation in display, and so render the exposition, as it deserves to be, a splendid success. And we hope that exhibitors will amend the rule heretofore practiced, and have their spaces filled and fully arranged upon the opening night. The neglects and tardiness which has heretofore prevailed, of quite a number holding back, and not completing their exhibits for several days after the opening, has materially lessened the interest of the public in visiting the fair during the first week. This should not be so, and as very many of our Eastern visitors are likely to remain among us until after the opening, we sincerely hope that the display upon the opening night will be essentially as grand in every particular as that of any other evening during the continuance of the fair.

San Francisco Chapter of Architects.

THE regular meeting of the Chapter will be held the first Friday in August, at which it is earnestly desired that every member shall be present, as the nomination of officers for the ensuing year will be the special business of the evening.

The beneficial influences of the Chapter upon the profession, in an individual and general sense, is an admitted fact, and this fact should stimulate to earnest effort on the part of every member, to assist in sustaining and increasing Chapter interests, and making it a power for good in the architectural profession. And the Chapter vacation season expiring with August 3d, it is hoped that every member will be present.

PRACTICAL CARPENTRY.

PRICE \$1.00.

A guide to the correct working and laying out of all kinds of Carpenters and Joiners' work. Solutions of the various problems in Hip roofs, Gothic work, Centering, Splayed work, Joists, Hinging, Dovetailing, Mitering, Timber Splicing, Hoppers, Skylights, Raking mouldings, etc. This work should be in the hands of every mechanic. One of the features to which this book will undoubtedly owe its success, is the absence of those numerous formulas which serve only to confuse the ideas of so many workmen. Everything is written in a clear, concise, and practical manner, and its utility is brought within the grasp of those workmen who have not had the benefit of a school education. We will send the above work to any address upon receipt of \$1.00.

Pacific Grove, Monterey, vs. Carmel River.

THE INTRODUCTION OF THE WATERS OF THE CARMEL RIVER THROUGH PACIFIC GROVE AND TO THE HOTEL DEL MONTE.

NESTLED at the foot of verdure-clad hills facing the beautiful bay of the same name, lies the quaint and ancient town of Monterey. Its old adobe ruins suggests to the pleasure-seeker, visions of scenes in the tales of the Alhambra. One is struck with awe as he mounts the deep-cut steps to the tower of the Old Mission church, and gazes on the work of those who lived more than a century ago. We linger but a moment to gaze on the ruins of the fast decaying Convent, and mentally wish that some philanthropist would enclose them for protection against the wear and waste of time, that future generations may look upon the work of the founders of this western country and note the progress of architecture from the rude adobe to the magnificent capitol of our State, and other more modern constructions.

Leaving the quiet, dreamy old town of Monterey, "where every person seems satisfied with himself, apparently believing the world is completed—living on in the dreamy self-satisfied consciousness that the spirit of progress is at an end," the pleasure-seeker presses onward to the beautiful Pacific Grove, passing numerous points and things of historic, and present interest,—among them the window in the old adobe at which Mrs. General Fremont sat while writing her descriptive letter of California; the first brick edifice erected in the State; the solitary and semi-sacred cross which marks the spot upon which the reverend pioneer fathers first planted their feet on the shore of the bay of Monterey, bearing the legend, "June 3rd, 1770"; the old fort with its one solitary gun keeping sentinel only over the dead silence of the crumbling bastions; the adobe in which the early Legislators first met in council to deliberate upon and frame the organic and legislative laws of the State; the little cove where the fishermen rest from their daily labors, and on to the beautifully wooded lane leading to the Grove where thousands yearly meet to enjoy the comforts of a delightful sea-shore resort; over and through which the pure ocean breezes spread themselves, while weary ones rest in the shade of a thousand trees, and countless songsters warble forth sweet music from the branches of the cypress, pine, fir, and other varieties.

There are but few prettier sights to be seen than the beautiful view presented in the approach to the Grove. The drive-way is grand, straight as an arrow, even the branches being trimmed that nothing may mar its symmetrical beauty, it presents a scene that at once engages the attention of even the phlegmatic observer. One can well say that nature is not at variance with art, nor art with nature, they both being servants of his Providence. Art is the perfection of nature, and in the beautiful drive before us, as we look

upward and see the blue sky beyond the gently swaying trees, we say "tis very sweet to one who has been long in city pent to look into the fair and open face of heaven—to breathe a prayer full in the smile of the blue firmament." Thus it was with us, and arriving at the entrance of the retreat—"far from the gay cities and the haunts of men," we involuntarily paused at the sight before us. Lanes of fantastic cottages, gayly trimmed tents, romping, galloping children, nurses toddling the little ones in their arms,—surely we are but dreaming, or else our imagination is dwelling on an old oft-told fairy tale.

We rambled around the grounds, keeping always in view the object of our journey, and admiring the almost perfect sanitary regulations and conveniences of this beautiful resort. We say ALMOST because there has been but one thing lacking to make this place resemble that described in the opening chapters of the Book of Holy Writ, and that essential is a lack of sufficient quantity of pure water.

But master minds had long been engaged planning a remedy for the only defect that nature had imposed upon this quiet resort. Twenty miles away flows the beautiful Carmel River. For ages past, it has poured its limped waters into the bosom of the grand old ocean; but to-day, its currents have been brought under subjection, and in the future the Grove, Monterey, and del Monte will be supplied by its pure water. This river has long been noted for the almost chemically pure properties of its water. It is fed by numerous living springs and flows nearly its whole length over rocky ground. It is our pleasant task to describe how this water is brought to the Grove as pure as when it leaves the Carmel River.

The point selected by the engineer for the construction of the mighty dam that is to hold in its embrace the element without which all animal and vegetable life would cease, is about twenty-five miles from Monterey. To the uninitiated, a more uninviting place could hardly have been selected. Great credit is due to the intuitive ability of the engineer, by which at a glance he could see how each and every obstacle was to be met and overcome. Engineering difficulties that would have discouraged any one with less energy and skill, were so studied and handled that the work in contemplation seemed to be directed as were the pyramids of old.

From the dam in the river to the reservoir near the Grove, the water is conveyed in iron pipes. The first six miles, eighteen-inch wrought iron pipes are used. In places the bluffs are so steep that holes are drilled in the solid rock, into which are placed heavy iron brackets, and upon these are placed the large pipe above mentioned. A covering has been securely fastened over the pipes to protect them from falling rocks.

At the end of the distance named the pipes are changed in size to fifteen-inch boiler iron. This is maintained for a few miles, when it is again changed to a twelve-inch cast iron pipe,

* L. D. Norton, Esq.

three-fourths of an inch thick, and for the rest of the way the pipes are of this size and thickness. Much of the ground passed over is very rocky and full of clefts, as if some great force of nature had exerted itself to sectionize the ground by a system of deep cavities or gorges, many of which are bridged over; and in passing some of these clefts the pipe assumes the shape almost of the letter V. In such cases, at the bottom of each a cock is placed that the pipes in case of necessity may be cleaned of sediment, a cock is also placed at the apex, for the purpose of affording escape to pent up air.

That the cast iron pipe may be free as possible from danger, a trench about three feet deep is first dug in which the pipes are placed. After the latter has been tested the trench will be filled and the dirt thoroughly tamped. Trees near the route of the pipe line that show evidences of decay, have or soon will be cut down. A tree falling across the pipes will not be apt to break them on account of the depth they are placed in the ground. The more serious difficulty lies in the fact that the roots of a tree in falling may be under the pipe and thus lift it out of its bed, perhaps breaking one or more joints. As far as human ingenuity can do so, this has been guarded against.

Our engraving shows the point where the pipe reaches the reservoir. This is situated about one-half a mile above the main entrance to the grove. Plate No. 2 shows the character of the work done before the reservoir was constructed. The ground was covered with trees, and it was no small task to cut them all down, grub out their roots, and clear the ground of rubbish. It is and has been the main purpose of those having this work in charge, to preserve the purity of the water, and in order to do this, every particle of vegetable matter, roots, etc., have been removed from the ground covered by the water within the reservoir. All the top soil has also been removed, and our engraving shows a body of men shoveling this top soil into a large pile to be moved to the outer edge of the dam.

It will also be noticed that a deep trench runs across the site of the dam. This idea and its fulfillment is one of the engineering triumphs of the master in charge. This trench is from twelve to sixteen feet in depth, and extends down to hard pan the whole length of the ground covered by the water when the reservoir is full. It is about six feet in width. This is to be filled with a solid wall of clay well tamped down. While excavating the pipe line, a large mass of clay was met with, and it almost seemed as if Providence intended it for the use to which it is applied. The clay is first puddled and then the ditch is filled with it, while hundreds of rammers are making it an impenetrable wall against the encroachment of the water. As this wall is gradually built up, the soft dirt on the inside is taken off and placed on the outer edge of the dam.

When finished the dam will be one hundred



PLATE 2.—This engraving represents the construction of the new dam for the reservoir of the Pacific Grove water supply. The ditch shown is to run across the full length of the dam, and is to be filled with a solid wall of clay, as described on page 109.

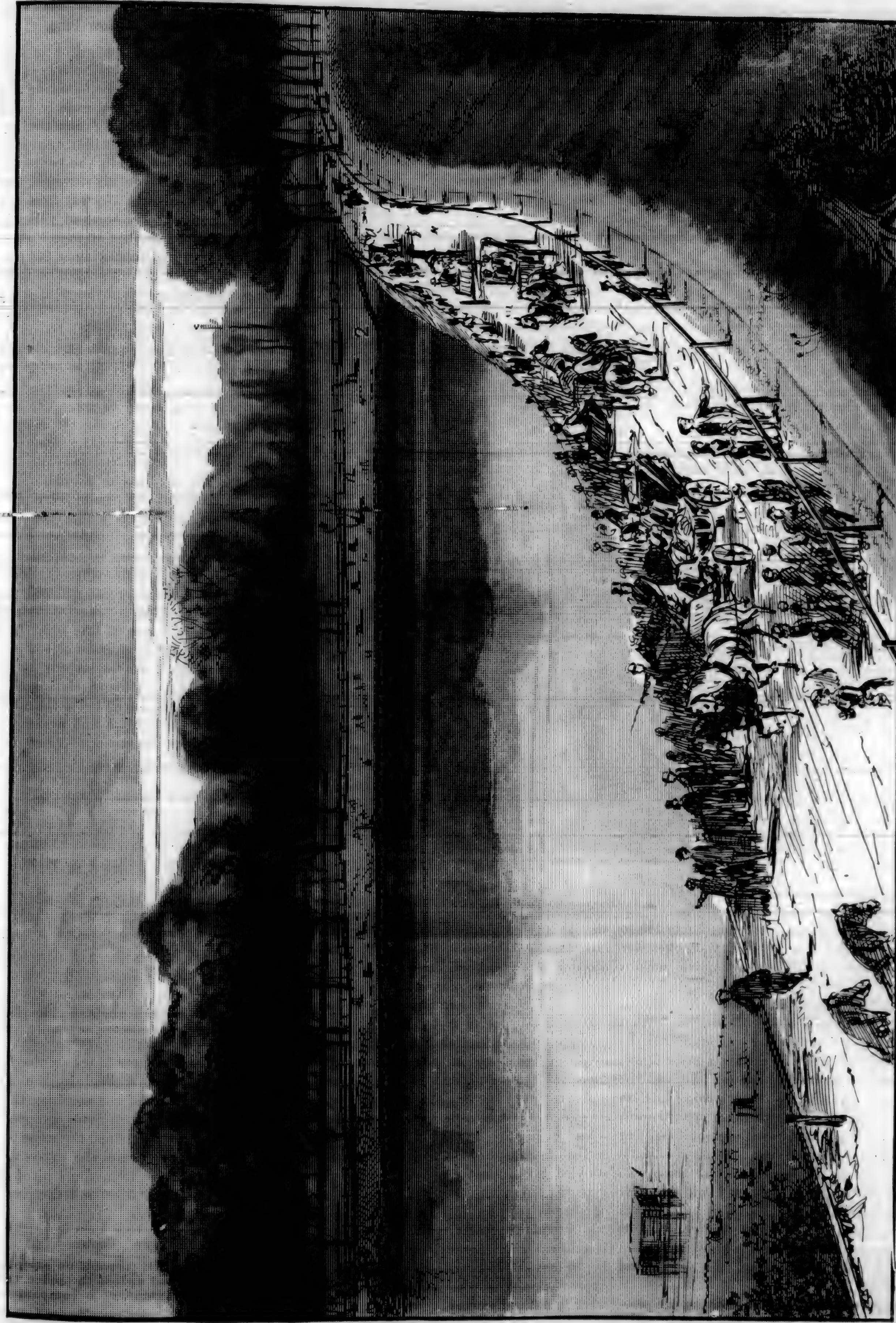


PLATE 3.—This engraving represents the dam when finished. It will be one of the prettiest drives of the many around and about Pacific Grove. See page 109.

and eighty feet wide on bottom, and thirty feet on top. Its height will be about thirty-five feet at the greatest point. The capacity of the reservoir will be about fifteen million gallons. The supply pipe will furnish one million three hundred thousand gallons daily, and should the supply pipe at any time be so damaged that it can not be used for a week or more, the water in the reservoir will be abundantly sufficient to supply all the country over which the pipes pass, for at least thirty days, and with reasonable use will last sixty days or more.

Much care has been exercised to prevent the formation of little shallow pools around the edge of the reservoir. Usually these are regular breeding places for mosquitoes and other insects. The whole outer edge of the ground encircled by the inclosed water will be sloped at an angle of about forty-five degrees, thus preventing the formation of stagnant water in shallow places.



From the reservoir the water is taken through a four-inch pipe over every portion of the Pacific Grove Retreat. It is the intention to change this size to a six-inch pipe whenever the demands of the grove require such a change.

From the description of the work now in process of completion, it will be seen that an abundance of pure water is guaranteed to those who seek the quiet precincts of the Grove for either health or pleasure. It will be greatly appreciated by those owning lots, as they can beautify their premises with flowers, trees, and shrubs, and have the great life-giving element at their very door. Another advantage greatly to be appreciated by those who love to drive over a fine road, will be, that the roads can be kept well watered. Tanks can be erected at a few different points, thus enabling sprinkling carts to keep the road in splendid condition between the Grove and Monterey.

We append a little sketch showing the pres-

ent facilities for supplying the Hotel del Monte, which although it is but a small engine inclosed by a rude shed, is a source of much attraction to the many little ones who are amused at the click chuck music of the pump as it is worked by the engine; and the pleasure thus afforded to innocent prattlers, furnishes the subject of numerous childlike stories for mammas and papas.

Now that pure water is to be supplied in quantities abundant and sufficient for all purposes, to those who seek the pleasant retreats of Pacific Grove, Monterey and Del Monte—while the waters of the broad Pacific Ocean lash the craggy shores, and the far stretching, crystal sand beaches of the bay of Monterey, it is reasonably to be anticipated that the portion of Monterey County encompassed in this article will at once, or at a very early day, become the leading and principal resort in the State; not only of the resident population, but of the thousands who now,

and the tens of thousands from all parts of our own and foreign countries, who will yearly visit this coast in search of the picturesque, instructive and pleasant things that so richly abound in all parts of California, and in the section of country under notice in a special manner. While grandeur of scenery and spots delightful for resting places during the summer months may be found in numerous other localities, we know of none which affords superior if equal advantages over the region under notice, with its land and ocean views, its splendid and numerous macadamized roads—unequaled by any other pleasure resort region—leading and winding through thickly studded wood, quiet groves and valleys; now exposing the smooth or ruffled bosom of broad ocean, now opening up extended views of hill and mountain scenery, and again closing in beautiful fertile glens and valleys, all combining to furnish food for the contemplative and appreciative mind with Nature's most perfect work in natural scenery.

Strength of Yellow Pine.

It is reported that a comparison of the relative strength of yellow and Norway pine was made at Dayton, O., with the following results: The specimens were dressed exactly one inch square, and these were broken in a testing machine by placing them on bearings, one foot apart, with the weight in the center. The southern pine had been air seasoned for two years and upwards, the Norway from a year to fifteen months. The weakest yellow pine broke at 736 pounds, the strongest at 1,102 pounds; average of eight specimens, 904 pounds. The weakest Norway broke at 501 pounds, the strongest at 790 pounds; average of ten specimens, 702 pounds, showing the yellow pine to be 28.7 per cent. stronger than Norway, and that a yellow pine sill 4x8 inches dimensions is equivalent to a Norway sill of 5½x8 inches, with the further advantage in favor of the yellow pine that it can be got much freer of knots and consequently stronger in comparison than these figures show, which are based on clear timber. Another test was made at a meeting of the Master Car Builder's Association, with the following results: Five pieces of each variety, one inch square and eleven inches between bearing points, were experimented upon, the pressure being applied in the center. The outcome showed strength of yellow pine at 500, 510, 500, 490, and 530 pounds breakage strain, or an average of 506; while Norway stood a strain of 620, 645, 730, 650, and 630 pounds, or an average of 635 pounds. These experiments do not appear to throw much light on the question of relative strength, and unless it can be attributed to the difference in seasoning, it is hard to find a satisfactory reason for such a discrepancy—*Northwestern Lumberman*.

Wheeler's Patent Wood Filler.

This is by far the best article of its kind that has as yet been brought to our notice. One coat prevents any further absorption, hence the oil in subsequent coats of paint will stay with the pigments. It gives the wood a surface as smooth as ivory. We are pleased to announce that the Bridgeport Wood Co., manufacturers of the above Filler, have established an agency in this city, where any quantity can be had. Architects will do well to call for this Filler in their specifications.

It is said that from 95 to 98 per cent. of all the railroad locomotives in use in the British colonies were manufactured in the United States, and that all of the continental European countries have their roads equipped to a greater or less extent from the same source. Within the last ten years the exportation of railroad locomotives from the United States has aggregated \$12,000,000 and the passenger coaches \$40,000,000.

Sample Copies.

Hereafter we will forward no sample copies of this Journal unless the price, twenty cents for each number, accompanies the order.

Supplement No. 2.

Special Notice to Advertisers

We are now preparing our Mammoth Edition of
FIFTY THOUSAND COPIES
Of a Supplement of this Journal.
It will be 8 pages, each page 16x23 inches in size.

Pacific Coast Architecture.

Each page will be beautifully illustrated with designs exemplifying different classes of building in the styles of Architecture now prevalent on the Pacific Coast. Suburban and Country dwellings, City Residences, Cottages, with plans and explanations of the same, in fact all kinds of buildings will be shown.

Mechanics' Department.

Special care will be taken to present to Mechanics all the new ideas in regard to framing buildings, rules by which all the various cuts in Carpentry are made, and items of information generally in regard to the Building Trade.

Distributing the Mammoth Edition.

Special arrangements are being made for the distribution of this Supplement. In order that a copy may reach all the bona fide residents of this State, we have divided it into several routes. First-class men have been engaged, selected especially for their ability to further the interests of the projectors of this enterprise.

To show how the distribution is to be made we will describe one of the routes. One man will leave this city in a buggy, taking a

Tour Around the Bay.

He will stop at every town and leave every resident, as far as practicable, a copy. Whenever convenient along the route, he will leave some amongst the farmers. By this means the towns of San Mateo, Redwood City, Menlo Park, Mayfield, Santa Clara, San Jose, Alviso, Newark, Centerville, Mission San Jose, Niles, Hayward, Eden, Alvarado, San Leandro, San Lorenzo, Alameda, and Oakland will be thoroughly supplied.

Another employee will proceed by rail to Modesto; after supplying that town, he will in succession stop at the towns of Ceres, Turlock, Merced, Athlone, Berenda, Madera, Borden, Fresno, and in fact every town as far south as Los Angeles. We will send by express the number we desire to have distributed in each town, so when our Agent arrives in that place he can proceed at once to deliver the number sent. In this way his time will be used to advantage.

Of course the main design is to
Increase the Circulation
of this Journal; and advertisers will please remember that all steps taken in this direction is so much to their advantage.

A Limited Space Only

will be given to advertisements. The columns will be about 3½ inches wide. A square will be the width of one column, by a depth of one inch.

A Uniform Rate

of \$2.50 per square will be charged. No deduction for a space less than five squares. Special contracts made for larger spaces.

One Hundred and Six Reams

of paper, 480 sheets to the ream, of good paper have been secured, and we guarantee an actual edition of

Fifty Thousand Copies.

This is allowing 880 for wastage, but of course it will be much less than that number.

Oregon, Washington, Hawaiian Islands, and in fact this mammoth edition will be distributed all over the Pacific Coast and adjoining islands.

Particular Notice to our Eastern Advertisers.

We will not have time to carry on a lengthy correspondence in regard to the insertion of advertisements. The facts are just as we state. An edition of 50,000. A uniform rate of \$2.50 per square. There will be no choice place as all pages will be equally interesting. The perfect system by which we distribute this Supplement will ensure the notice of your wares being seen by more than

One Hundred Thousand

residents on the Pacific Coast. The fact that this Supplement will be under the superintendence of the Business Manager of this Journal, is a sufficient guarantee that all the designs contemplated will be faithfully carried out.

Please Notify the Manager

of the California Architect and Building News immediately the space you will require. Eastern advertisers not personally known to us, must send either a post-office order for the amount of their ad, or else send us references to parties in this City.

Address GEO. H. WOLFE,

Business Manager California Architect,
240 Montgomery Street, San Francisco.

Solid and Hollow Iron Columns.

A CONFUSION of ideas is sometimes found among practical men respecting the comparative strength of solid and hollow pillars. One hears it often said, for instance, that a hollow pillar is stronger than a solid one. Now this is, as one able authority has pointed out, not absolutely the case; it is perfectly true that comparing the strength of two pillars of the same height and diameter, one solid and the other hollow, that the latter has the advantage of being economically stronger. The fact is, the solid column is stronger than the hollow of the same external diameter; but the lesser area is more effective than the greater, because the central portions of the solid pillar are less useful in resisting the bending force than the metal in the circumference of the hollow pillar. But if the quantity of material in both the solid and hollow pillar of equal height is the same, the hollow pillar is by far the stronger. A simple geometrical construction will enable any one to understand this fact, by enabling us to proportion a hollow column of the same area as that of a solid one, by one of the diameters being given. It is shown, in fact, that hollow columns of the same area of metal as a solid one, may be made to any larger diameter, their strengths increasing proportionally till a limit is reached by the shell of the metal becoming too thin to insure a sound casting. Taking an example from Downing's work, a hollow pillar 9 inches in external diameter, having an internal diameter of 8.062 inches, and a thickness of 4.7 inches, or about one-half inch, is five and one-half times stronger than a solid pillar with the same quantity of metal. A thickness of one-half inch may be regarded as a practical limit in manufacture.—*Building News*.

PREVENTION OF FADING IN SHOP WINDOWS.—The Swiss *Gewerbe Blatt* recommends a remedy for an evil which drapers and many other shopkeepers have long experienced, namely, the fading or bleaching of many kinds of colored articles when exposed in the shop windows. The authority quoted says that this fading or bleaching is brought about only by the white rays of the sun's light, and, where it occurs, it shows that the glass is more or less perfectly colorless. It is found that if, instead of such colorless glass, the window panes consist of glass which is slightly yellow, the bleaching or fading process is prevented. Where the glass is colorless and cannot be replaced by slightly yellowish tinted glass, the desired effect may, it is said, be produced by simply giving the panes a coating of copal varnish.

New Catalogue.

We will mail a copy of our new catalogue of designs for Crestings, Fences, Finials, Posts, and wrought-iron work of every description, upon receipt of a letter from parties desiring them.

BIGELOW, SIMS & MORRIS,
Western Iron Works.



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.

EDS. ARCHITECT:—In your really good article on the Pyramids, you failed to mention one very important fact, which is this:—It has been proven beyond a doubt that the GREAT PYRAMID was covered from top to bottom—over the “steps” with polished granite. Now to say nothing of the difficulty of putting this on up to the apex, the question presents itself, “How did they get that, the crown, the key of the whole structure, in its place.” This is a very difficult problem to solve. Of course I do not pretend that the above is an original question, but it may meet the eye of some one who has given the subject much study, and I for one would like to know the latest truths that the researches of science have made. Yours truly, J. B.

CLEANING SCREWS FROM RUST.—Rust can be removed from small screws, etc., that are too small for holding against an emery-wheel, by attrition. Take, say, one pound of screws, and place them in a box; a cigar-box will do. Put a small quantity of oil on them, and shake for another minute or so, and then sift the sawdust from the screws in a fine sieve, when the screws will be found to be as good as new.

STAINED glass windows can now be made at home by attaching to the plain window, in artistic combinations, the clippings and waste from the bench of the glass-cutter. There is a little wheel sold for something less than a dollar which will cut the glass, and with this the amateur can shape the pieces to suit himself.

A decided revival in the demand for mahogany is reported in the English markets. The wood is increasing in favor generally, and is much desired in cabinet work. Mahogany furniture is largely in stock. Figured logs are less desired, but the wood of rich color is greatly sought after.

IMITATION of ground glass can be easily produced by dissolving about two table-spoonfuls of Epsom salts in a pint of lager beer, and painting the glass with the mixture. When it is dry the glass will appear as if frosted, and the effect is very satisfactory.

“MODERN HOUSE CARPENTER'S COMPANION.” Price \$1.00.

Chimneys.

AMONGST the lost arts we must, it is feared, include the art of building chimneys which will fulfill their proper function; and the smoke nuisance not only poisons the air we breathe, and undermines our health, but it defaces our architecture into the bargain.

It is very much to be suspected that the building of chimneys is left in a great measure to chance, or they would not be so bad as they are. The conditions which should be observed to secure success are well known and are easily obeyed. First the chimney-stack should discharge at as high a level as convenient so as to ensure that the outer column of cold air shall have a marked preponderance over the equal column of warmer and therefore lighter air in the flue. The modern custom is to cut off the chimney-stack as soon as it shows itself above the roof. The additional height is quickly made up by the substitution of a zinc tube, and shows that the original error lay in robbing the stack of its due altitude. Secondly, the area of the flue is almost always in excess of the requirements. The traditional 14 in. by 9 in. was, as has often been pointed out, determined by the fact that the climbing boys who swept the flues could not ascend safely in less space. But with the disuse of boys for this service the reason for the old dimension of the flue vanishes. The late Mr. Cubitt found, as the results of experiment, that a better size was 9x9 inches, and that this was enough for all ordinary purposes. For many years the writer has adopted this form of flue and his experience of its efficacy exactly agrees with Mr. Cubitt's.

Thirdly, the outer casing of chimney-stacks is generally too thin. A half brick is the usual allowance, not "of the best material and workmanship." Now, we know that this is no protection against cold and wet, and that if the upper part of the chimney is cooled the ascending current is checked in consequence. The writer never on any account employs less than nine inches in such a situation, and he is confident that nothing less should ever be allowed if the draught of the flues is to be satisfactory.

And fourthly, the fire is too often quite unprovided with air from the outside, so that the heavier column spoken of above is not brought to bear on the base of the lighter one in the flue, and a sluggish action at the best is the result. The builder who is anxious that his flues should "draw," should be careful to provide a copious supply of fresh air in the region of the fire, and this can be done without draught by a modification of the expedient which, though a very old one, is usually associated with the name of Mr. Tobin.

With the above precautions it is not probable that any trouble will arise from smoky chimneys, but it must be owned that sometimes the evil is met with in spite of every precaution. The "best laid schemes o' mice and men gang aft agley," and the action of smoke from an open fire is now and then, to

say the least, capricious, and often baffles all our best endeavors.

This is a difficulty which should be resolutely faced, and if some form of cowl is inevitable it is the architect's duty to take up its design. If there is one characteristic which more than any other distinguishes the builders of past time from their modern confreres, it is the frankness with which they accepted, and the skill with which they turned to artistic account, the necessities of their time one by one as they arose. Evasion and subterfuge were alike undreamed of in their philosophy. They set themselves without hesitation and without reserve to their task of rendering comely whatever was found to be necessary or useful. There is not a beauty in the old work but is the result of the judicious treatment of what was at first a difficulty, and features which we copy long after the original necessity to which we owe them has ceased to exist, survive simply as evidence of this special and peculiar gift of our ancestors. The faculty was so complete and universal that its exercise seems almost like the result of instinct, and thus to lose its merit as art.

Amongst the many instances of the directness and certainty with which the early builders developed to the utmost the artistic possibilities of every new problem as it presented itself, we may cite the domestic chimney itself. The hall *louvre* was always a picturesque feature, and we should regret its abandonment in favor of the fireplace, but for the various and picturesque forms which the architects devised for the chimney-stack which replaced it. If we trace the history of this feature from its first appearance as a single shaft with side piercings at its summit until its glorification under the Tudors, one cannot fail to be struck with the ingenuity, the perseverance, and the versatility of its designers.

Hitherto the modern architect,—in face of the enormous probability that as soon as his building leaves his hands it will be disfigured by some sort of smoke-extracting apparatus,—has been quite careless as to what shape such apparatus shall assume; and there is something almost comic in the *san/ froid* with which, after taking infinite pains about the design and details of every other part of his work, he leaves to those who care nothing about it the task of crowning it with an array of cowls.

The conclusion at which we are compelled to arrive is that although by care we may very considerably diminish the necessity for cowls or some cognate contrivance, cases will arise in which they are indispensable, and therefore they should form the subject of the architect's attention. Here is a new field for the exercise of whatever skill in the art of design is left amongst us, and we would suggest the matter as a fit one for the Institute prizes. In making a serious attempt to devise a suitable form for a necessary adjunct of our buildings we should be following the steps of the architects of old who never shirked an opportunity of

the kind. Whether our endeavor should be attended with the success which invariably waited upon the efforts of our predecessors it would perhaps be rash to predict,—but at any rate the attempt should be made.—*The Builder*.

High Buildings and Fires.

THE increasing tendency of land owners and builders in large cities to utilize the ground area as much as possible by erecting lofty buildings, requires some commensurate means to prevent fires and to stay their progress. Our best steam fire engines are wonderful improvements on the old time hand engines, and they can force an unbroken stream of water in round, solid column for a considerable distance from the nozzle, unless exposed to a high wind or the direct heat of a raging fire. But these adverse conditions often exist and turn the water column into diffused spray, or dissipate it into mist or vapor, when most of its effective force is lost.

Recent experiments, however, suggest that if the force of the engine could be exerted on a confined column of water rising vertically to the roof, sufficient power would remain in the impulse from the engine to deliver streams of solid water over the area of any ordinary city building. A steam fire engine was recently tested which threw water 156 feet horizontally from a one-inch nozzle attached to a 2½ inch hose running 2,700 feet on a level and 200 feet above the engine. In this instance a very large column of water was made to deliver a moderately small column at a great height above the engine; but by the employment of two or more engines on the same hose, by means of the two-way or the four-way butt, a result may be reached which will place the roofs of the highest buildings under the control of the firemen.

This can be effected by a fixed stand pipe attached to the building so as to be easily reached by the firemen from the street. This stand pipe is, in effect, a prolongation of the ordinary engine hose, and the nozzle, with a convenient length of handling hose, may be attached to the top of the pipe, or to an opening on any floor.—*Scientific American*.

BRASS work that is so dirty by smoke and heat as not to be cleaned with oxalic acid, should be thoroughly washed or scrubbed with soda, or potash water, or lye. Then dip in a mixture of equal parts of nitric acid, sulphuric acid and water; or, if it cannot be conveniently dipped, make a swab of a small piece of woolen cloth upon the end of a stick and rub the solution over the dirty or smoky parts; leave the acid on for a minute and then wash clean and polish.

Important to those Receiving this Journal.

Should this Journal be received by any subscriber who does not want it, or beyond the time they intend to pay for it, let them not fail to write us direct to stop it. We will not knowingly send the paper to any one who does not wish it, but if it is continued through the failure of the subscriber to notify us to discontinue it, we shall positively demand payment for the time it is sent.

Paint for Floors.

A PAINT for floors, which economizes the use of oil colors and varnish, is described in the German technical press as having been composed by Herr Mareck. It is remarked that this paint can also be used on wood, stone, etc. For flooring, the following mixture has been found applicable: 2½ ounces of good, clear joiner's glue is soaked over night in cold water. It is dissolved, and then is added (being constantly stirred) to thickish milk or lime heated to boiling point, and prepared from one pound quicklime. Into boiling lime is poured (the stirring being continued) as much linseed oil as becomes united by means of saponification with the lime, and when the oil no longer mixes there is no more poured in.

If there happens to be too much oil added, it must be combined by the addition of some fresh lime paste. For the quantity of lime previously indicated, about half a pound of oil is required. After this white, thickish foundation paint has cooled, a color is added which is not affected by lime, and in case of need the paint is diluted with water, or by the addition of a mixture of lime water with some linseed oil. For yellowish-brown or brownish-red shades about a fourth part of the entire bulk is added of a brown solution obtained by boiling shellac and borax with water. This mixture is specially adapted for painting floors. The paint should be applied uniformly, and is described as covering the floor most effectually, and uniting with it in a durable manner. But it is remarked that it is not suitable for being used in cases where a room is in constant use, as under such circumstances it would probably have to be renewed in some places every three months. The most durable floor paint is said to be that composed of linseed oil varnish, which only requires to be renewed every six or twelve months. It penetrates into the wood and makes it water resisting; its properties being thus of a nature to compensate for its higher cost in proportion to other compositions used for a similar purpose. Its use is particularly recommended in schools and work rooms, as it lessens dust and facilitates the cleaning of the boards.—*The Builder*.

Scarfed Joint.

WHAT is meant by the term "scarfing," applied to wood or metal in making a joint? *Ans.*—It is often required to unite two pieces of metal or of wood, in such a manner that the joint shall not be thicker than the rest of the piece when joined. To make a secure joint, however, it is necessary that the ends of the pieces should lap somewhat, and to avoid the extra thickness, the edges that are to be joined are beveled off, or "scarfed," so that when the edges so beveled are laid together by overlapping, the two pieces have the same thickness. Such a joint is called a "scarfed" joint, or lap joint; and the operation is called "scarfing." The manufacture of lap-welded boiler tubes

affords a good illustration of forming a scarfed joint with metal, both edges of the "skelp," or plate, that is to form the tube being beveled preparatory to passing it through the forming die. In carpentry it is not necessary that the edges of the pieces of wood to be joined should be beveled; but any method of joining together two pieces of timber, by bolting or nailing them together transversely, so that the two appear as one, is called "scarfing," and the joint is called a "scarf."—*Wood Worker and American Lumberman*.

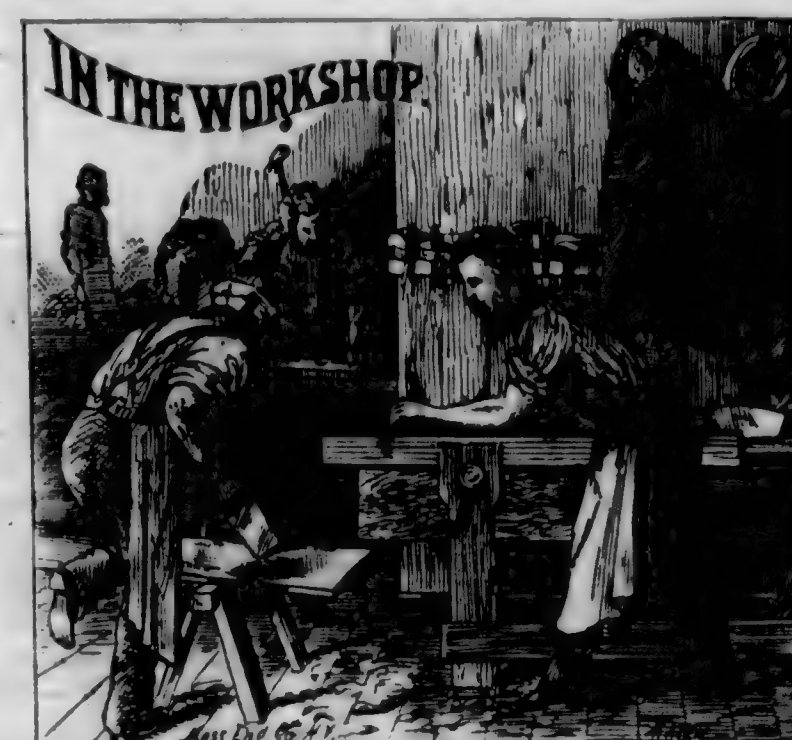
PITCH PINE.—Pitch pine is increasingly used all along the west coast of France, not only for parqueting, but in building. The American pitch pine flooring has been ascertained to have an advantage over that from the north of Europe—both costing nearly the same—which consists in its great durability and freedom from knots, giving it a much finer appearance. The French demand, it is expected, will grow large, while there is considerable consumption in Spain.

A WRITER says: Wood-workers are well known to be peculiarly liable to accident in the pursuit of their trade. Of course the keen edges and the swift-running machinery with which they have to deal, render their occupation a dangerous one, but I think it is safe to say that nine-tenths of the accidents can be fairly attributed to carelessness pure and simple. One proof of this is found in the fact that the larger part of the sufferers are not young and inexperienced hands, but those in whom familiarity has bred contempt.

SEVERAL kinds of hardwood lumber are gradually coming into use, which, a few years ago, were unnoticed. Beech is one of them. It is cheap and abundant, while the more popular hardwoods are becoming comparatively scarce and consequently high-priced. Beech has a fine grain, is quite durable, and is used in the manufacture of school and church furniture, chairs, and to a certain extent in furniture. The red variety has a handsome appearance, and can be made to imitate cherry.

THE *Art Amateur* for July contains an admirable and copiously illustrated article on "The Theory and Practice of Pen Drawing," and is alone worth the price of the number to the many who are interested in this humble but useful art. No one interested in art should fail to examine the July issue of this excellent magazine.

In the Olympia District, W. T., a yoke of oxen for logging purposes costs as much as a span of horses—\$350, and the demand exceeds the supply. Hay costs \$30 a ton, chopped feed \$35, and wages of men \$68 to \$100 a month.



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.

EDS. ARCHITECT: In your September issue, 1882, you illustrated the various scarfs or joints used in splicing timbers. You fail, however, to give one that can be used when the timber is only a little long and a short splice is required. The following cut which I send you will explain itself. It is much used in the East when the timber, in length, will not justify the use of the long joints shown in your article of the date mentioned.



You also say that "in every splice, no matter what the shape may be, there should be bolts through the joints securely fastening them together." In the accompanying illustration you will notice that a very strong splice can be made and no bolts whatever are needed. Yours, etc., E. B. R. Portland.



We thank our correspondent for the above suggestions. We do not agree with him however, that the splice referred to is just as strong without a bolt. It is a very difficult one to make and have the parts fit perfectly, and unless a perfect fit was made, the joint would be a very poor one without being held together by bolts.

EDS. ARCHITECT: Please give me a rule by which I can find the number of studs required around the outside of a building, placed sixteen inches from center. S. R. T.

FIRST get the exact measurement of the outside of the building in feet. Take three-quarters of this amount and add one stud for each corner and angle, and one for each opening. Plates and gable studding are to be added extra. A rough and ready rule is to allow one stud for every foot of the outside measurement of the building.

"COTTAGES AND VILLAS." Price, \$6.00.

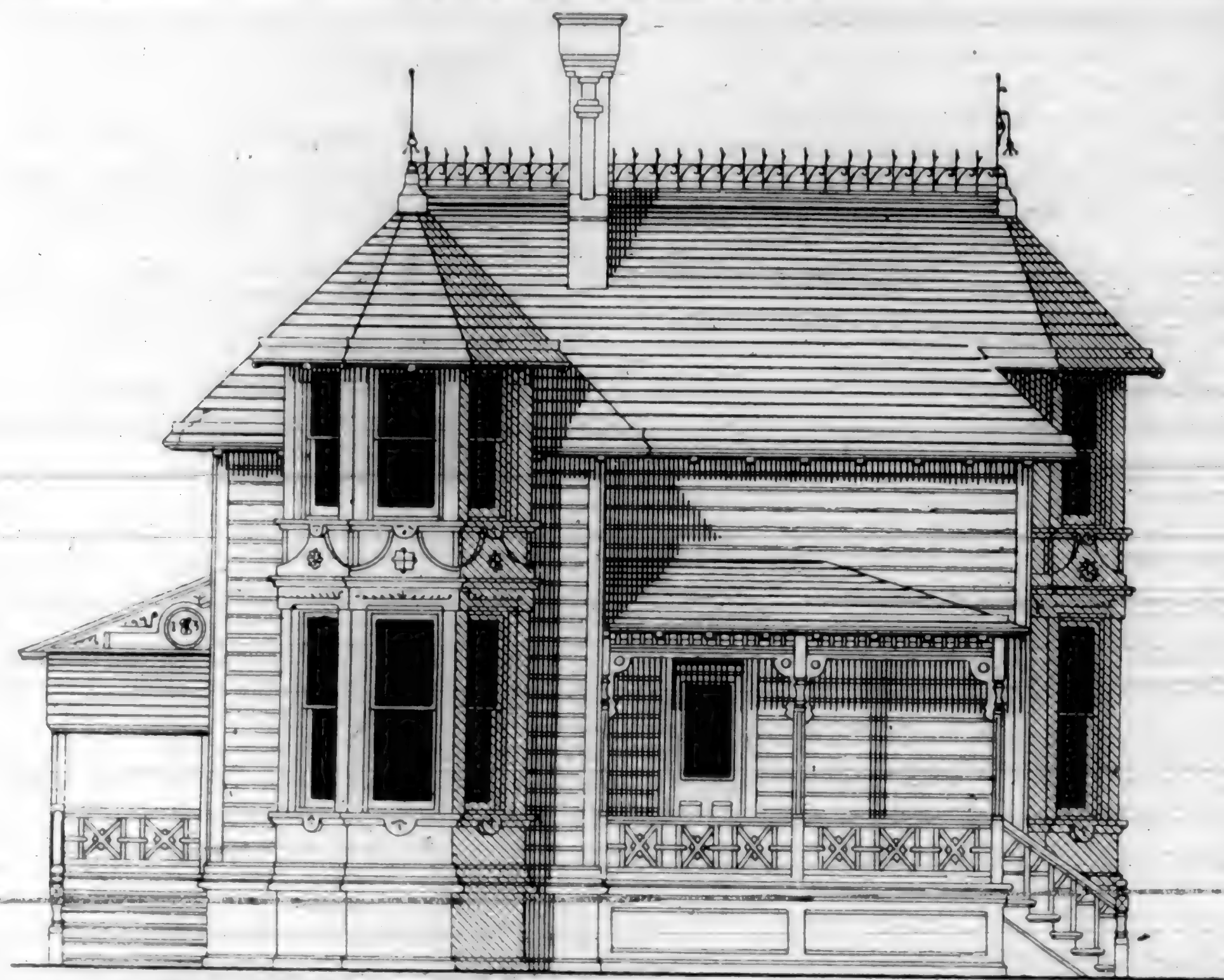


PLATE 4.—A SUBURBAN DWELLING COSTING ABOUT \$3,000.

The Other Side.

[We admit the following communication to our columns for the single purpose—as far as its references and inferences go—of showing in what manner, and to what extent skilled and unskilled labor has been and is affected by the acts and successes of the railroad companies. We leave the vexed question of regulating freights and fares—direct commissions, &c., to the tender mercies of the general press.]

STRANGE as the announcement may be to the average man, yet the fact remains that there are two sides to every question; the one idea, and one-sided creatures who foam over and fill the daily press with froth when discussing the railroad question in this State, seem to have forgotten, if in fact they ever knew this general proposition. Judging from their wild statements we are living under a tyranny worse than that of the Czar of all the Russias,—our State lying prostrate under its iron heel, and all enterprise heavily handicapped by its remorseless grasp, etc., etc., *ad infinitum*—while strange again is this fact, that the men who raise this howl of anguish, and thousands who join in it, never pay one dollar for freight or passage over this terrible road, but feeding daily at this miserable mess of prejudice, ignorance, and brainless nonsense, they gradually come to believe that they are the most down-trodden people on the earth's surface, and raising their hands in holy horror they cry, Down with the magnates (*magnates* by the way is remarkably effective), and howl all the louder in hopes that the noise may become so obnoxious to the railroad people, that they may be induced to offer them a little coin to stop their miserable wail.

Now we wish to state a few facts and ask

fair-minded men and women to give them their full weight in making up their minds on this important question. First—The large number of gentlemen employed by the great Railroad Corporation (hirelings, see daily press) include some of our most active and useful citizens, who take as much pride in the prosperity of this State as any portion of its inhabitants. And being as a rule well paid for the services they render, in return are faithful in the performance of their duties; at the same time obliging and courteous to those who transact business with the road, comparing most favorably in this respect with the working force of any Eastern corporation.

Second—The immense sums of money expended in this city and State, giving employment to thousands, encouraging home manufactures, and quietly but surely adding to the substantial prosperity of the Pacific Coast.

To call attention in detail to part of this constant outlay of money, we would cite the millions spent on the palaces on California Street Hill, the construction of which employed for several years hundreds of our best mechanics at the highest rate of wages, and whose beauty and splendor are the pride of every true citizen.

The very large expense incurred in building the California Street Cable Road, the efficient manner of its equipment and daily management; also the large amount of property enhanced in value by its construction.

The millions now being expended on the Market Street Cable system, sparing no expense to secure a roadway that shall last, run

smoothly, and be a continual source of pleasure to those who patronize it. This first-class road with all its branches will be one of the chief features of our city, its equipment and management the very best, while property all along its far-reaching lines has advanced, and will still more advance in value, giving promise of the erection of hundreds or new buildings as soon as it is completed.

The million and over spent upon the mole and new depot on the Oakland side, which is unsurpassed by any ferry company in the United States, and giving security and convenience to the thousands who use it daily.

The extensive improvements at Benicia and Port Costa, including the construction of the mammoth ferry boat *Solano*, with the slips, wharves, and landings, all of which involved a large outlay of money which also found its way into the hands of our best mechanics and laborers.

The purchase of seven thousand acres of land at Monterey, building the Hotel del Monte, laying out and beautifying the surrounding grounds, macadamizing twenty-five miles of

roads through the most picturesque portion of the county, so that all the principal points of interest can be reached by tourists with pleasure and comfort; buying the great Los Laureles Rancho with its superior water privileges from the Carmel River, constructing substantial reservoirs and conveying the water some twenty miles in iron pipes twelve, fifteen, and eighteen inches in diameter, so as to afford an abundant supply of pure water for the Hotel del Monte, the surrounding country and the well-known summer resort by the sea, Pacific Grove. Enlarging the grove, erecting new buildings, and sparing no expense to make both places the most attractive resorts on the coast; advertising them in the most thorough manner throughout the Eastern States and Europe, so that the Hotel del Monte, with its many attractions is as well known as any similar resort in the world, bringing hundreds of wealthy and enterprising men to California, thereby calling attention to the resources of this State, where such golden opportunities await all who have either capital, brains or perseverance.

In the matter of advertising alone the railroad people have done more to make the advantages of this State known than anything that has been done for years.

The great faith, good judgment, and indomitable pluck that induced the managers of this corporation to project a line across the wilds of Arizona, New Mexico, and Texas, reaching to the Mississippi and New Orleans on the Gulf, spending millions of hard coin in an investment that was open for all the capital in the

land to enter, but which lay dormant until the magic touch of our California railroad managers made it spring into life, thus making the far distant mines of silver, gold, copper and other minerals accessible to our people, and adding untold wealth to our Nation and State, making an outlet for the many products of this great commonwealth, and looking to direct communication with Europe at an early day. All this and much more being the result of the far seeing policy inaugurated by these terrible despots!!!

Thus in part only have we glanced at the great enterprises carried on so successfully during the past few years, and we leave it to all fair minded persons to consider if it is not time to give credit where it is due, and to stop this daily abuse of men who have shown such great ability to make money, and who have spent it lavishly for the improvement of the city and State where they reside.

Much more might be said, as the subject is far from being exhausted, but believing that the time is coming when the intelligent people of this State will refuse to be led any longer by a press that only cries "down with the railroad and its management," so that it can foist some favorite into power or fill its own pockets, we leave the subject, hoping that we may have said something that may hasten on the reign of justice and harmony.

Home Courtesies.

SINCE we presented the readers of this journal with its new dress, and in an enlarged form, we are more than pleased with the evidences of good-will shown to us by the editors of our California exchanges. And for the first time since we have published this journal we print a few kindly notices that have appeared in various papers, in regard to the evidences shown by us of increasing prosperity on our part. Many notices have appeared from time to time in papers published all over the Pacific Coast, but we have refrained heretofore from quoting them in our columns, and those found below are now given to show our Eastern readers the opinion entertained of us by our own co-workers in the journalistic vineyard.

The *California Architect and Building News* has become one of the handsomest periodicals on the Pacific Coast in its new make-up, and is worthy of the support of every person connected with building operations in any manner whatever. We are pleased to see it giving such unmistakable signs of success.—*Commercial Herald*.

The *California Architect and Building News* is decidedly the best publication of the kind in the West, and should be in the hands of every architect, contractor or carpenter in the country. Each number contains all the latest building news, and intelligent discussions of matters of interest to builders, besides from four to six pages of designs for buildings suitable for both city and country residences, together with ground plans and details. We have watched the progress of this excellent periodical and find that it is steadily increasing in interest and usefulness. The subscription price is but \$2.00. The publication office is 240 Montgomery Street, San Francisco.—*Fresno Republican*.

The June number of the *California Architect and Building News* is far ahead of any previous issue. It is printed upon better paper; contains some eight pages more matter; is more extensively illustrated than ever before; and in letter press is up to the highest standard of works of this class. The ARCHITECT, as it is familiarly known, is found in all its departments. It is carefully and judiciously edited; always truthful, clear, and unbiased in its statements. Aside from its merit as an Architectural Journal, it is also emphatically the "mechanics own paper," and richly merits the standing it has attained.—*Alameda Enquirer*.

We have received the *California Architect and Building News* for June, and we feel that it is nothing more than justice

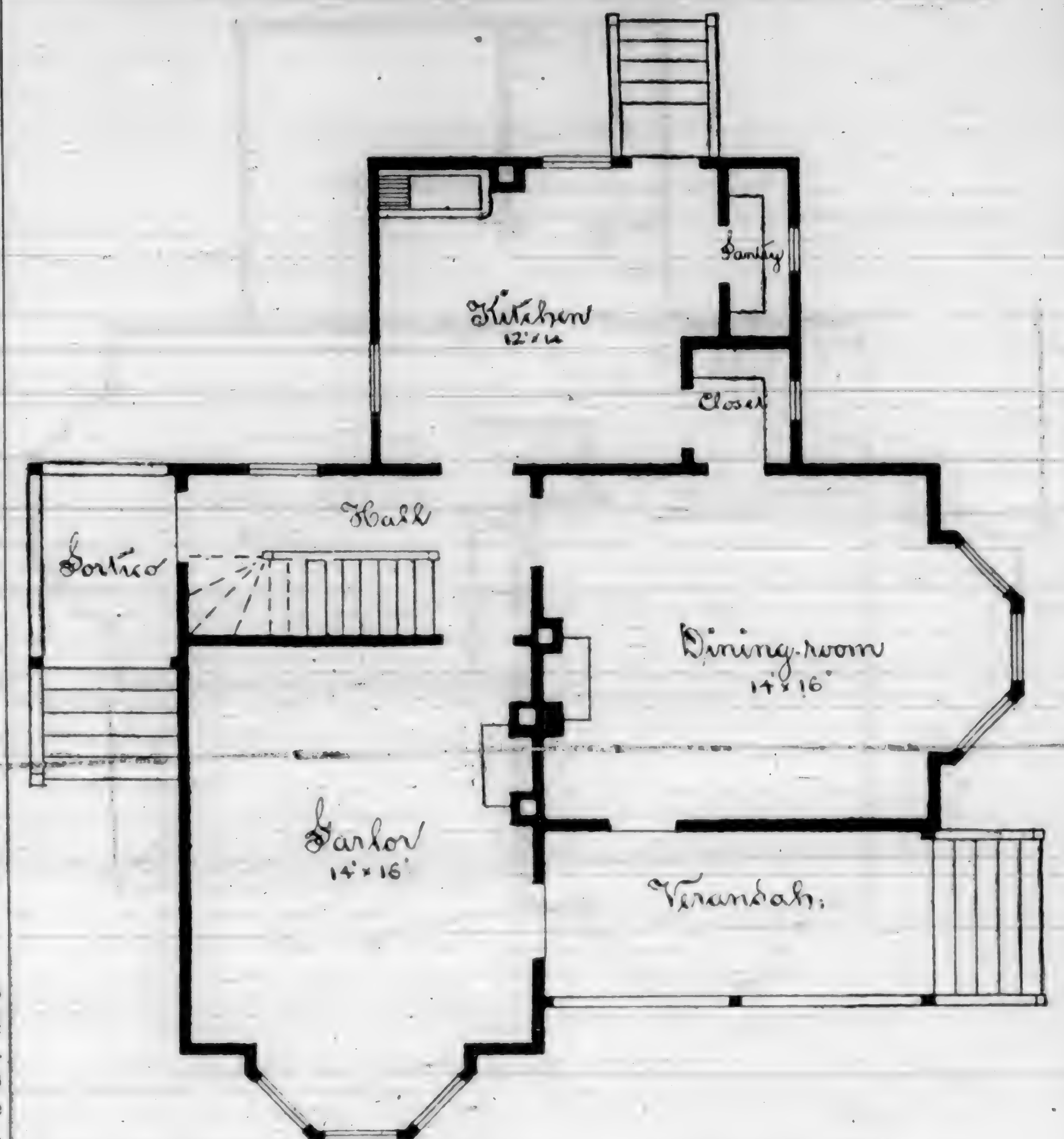


PLATE 5.—PLAN OF FIRST FLOOR, SUBURBAN DWELLING COSTING ABOUT \$3,000.

that we should call attention to the merits of the publication, and recommend it, especially to all engaged in any of the building trades, or in the supply of building materials. The *Architect* is very neatly printed and the contents such as must be of interest and value to all who build, own, or live in houses, and that includes pretty much everybody with sense enough to go in when it rains.—*Hayes Valley Advertiser*.

The *California Architect and Building News* for June comes to us with a new dress and enlarged form, an indication of its popularity and merited patronage. We wish it continued success.—*Petaluma Argus*.

EVERY carpenter and builder should subscribe for that excellent journal, the *California Architect and Building News*. The article on the pyramids in the June number was alone worth the price of subscription. The illustrations of plans for dwellings are excellent, and no carpenter can afford to miss the useful information given in each article.—*Closterdale Sentinel*.

The *California Architect and Building News* for June lies on our table. It has come out in a new dress and in an enlarged form. This monthly journal is becoming a very potent factor among our architects and those who intend to build. It is well conducted and filled with articles that are of great importance to all who are interested in the building progress of our city and State. The number before us is especially complete and interesting.—*Mission Local*.

The *California Architect and Building News* for June is on our table. It is one of the best publications of its kind in the United States, and we are glad to learn that it is meeting with success. Every architect, carpenter, and builder should subscribe for it.—*Riverside Press*.

The June number of that splendid publication, the *California Architect and Building News* has been received. Its monthly plans alone are worth more to builders than the price of subscription, while its sanitary suggestions are of value to every one.—*Watsonville Pajaronian*.

It is with pleasure that we note the great evidences of thrift and prosperity possessed by the editors of the *California Architect and Building News*, as shown by their enlarging their journal, and at the same time donning a complete new dress. The June number is especially interesting. The article on the Pyramids should be read by every one; and there

is not a mechanic in the State that should fail to subscribe, now that Part Two of the "Steel Square and its Uses" has been commenced. It is emphatically the representative of the building interests of this coast. We are especially pleased with the progress of this journal, as one of its editors for a number of years resided in this town, and we want to lay claim to our share of literary personages, whose minds have been partly trained in our beautiful village. Success and long continued prosperity to the *California Architect and Building News*.—*Healdsburg Flag*.

The June number of the *California Architect and Building News* contains the most beautiful elevations and plans we have yet seen in that journal. This journal is improving in its engravings as well as its reading matter. No live mechanic or head of family should be without a copy.—*Santa Rosa Republican*.

The *California Architect and Building News* is a monthly publication published by the S. F. Architectural Publishing Co. It is a useful publication to carpenters and builders generally, and contains well executed drawings of cottages and country residences, with plans of the different floors, besides a great deal of information to the architect, builder, and farmer. In its new dress and enlarged form it presents an appearance not excelled by any journal of its class in the United States.—*Mariposa Gazette*.

The *California Architect and Building News* is getting to be a valuable and very interesting publication and is cordially recommended to our building trades. It has lately donned a new dress, and in its typographical appearance and the ability displayed by the editors, it takes rank amongst the best of our scientific journals.—*St. Helena Star*.

Modern House Painting.

A NEW lot of this celebrated work has been received, which will be forwarded to any address upon receipt of the publisher's price, \$5.00.

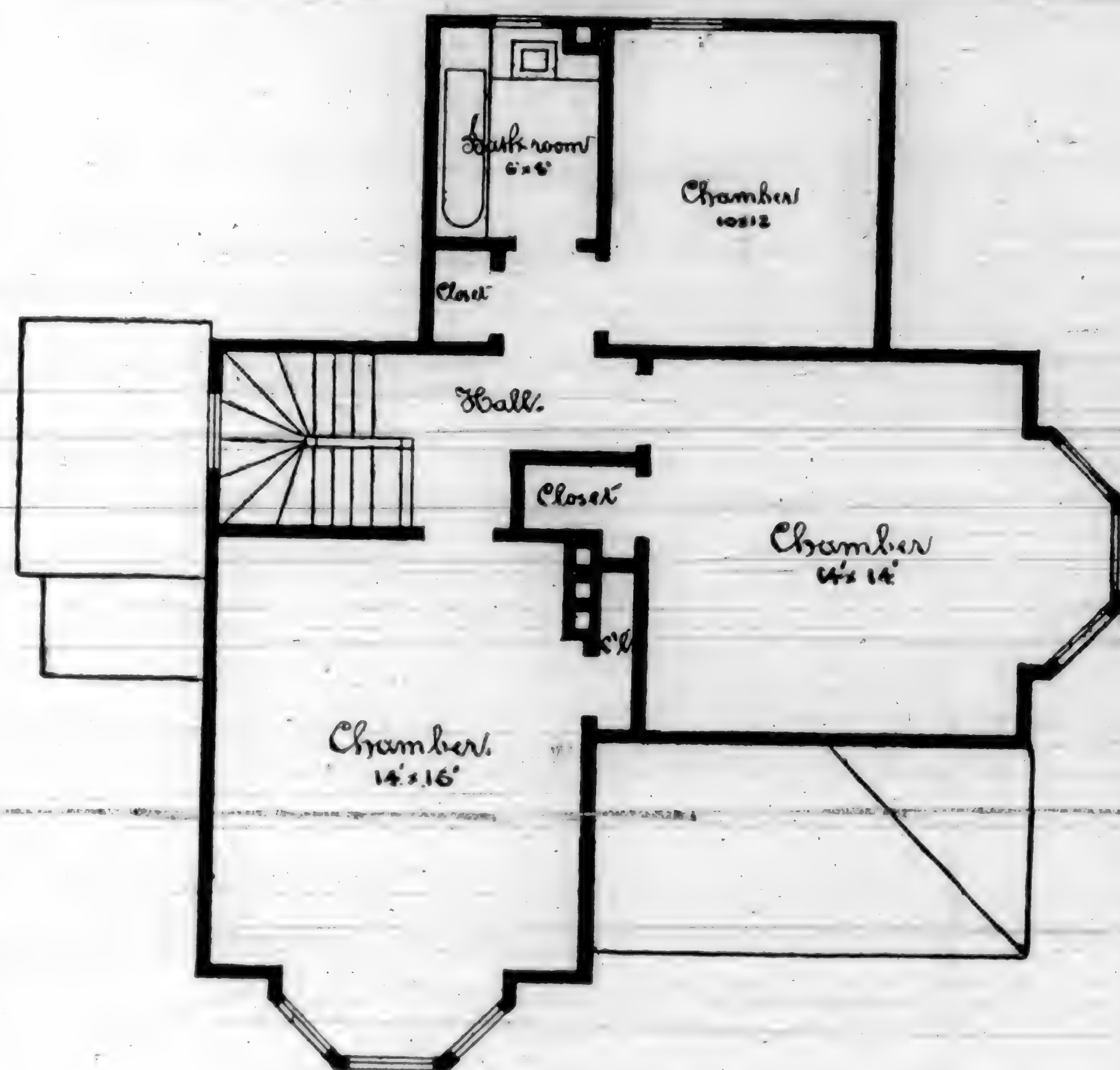


PLATE 6.—PLAN OF SECOND FLOOR, SUBURBAN DWELLING COSTING ABOUT \$3,000.

Our Illustrations.

PLATE 1 represents a design for a new building in the latest style of New York Street architecture. It was prepared expressly for this journal and is the second of a series by A. Curtis Bond.

Plates 2 & 3 represent the construction of the dam and reservoir for the new water-works to supply the Pacific Grove, Monterey, and the Hotel del Monte. The engraving marked Plate 2 was prepared by our artist from sketches taken on the ground during the progress of the work, and is very realistic of the scene at the time the view was taken.

Plates 4, 5, 6, are the plans and elevation of a neat suburban residence, the cost of which will be in the neighborhood of \$3,000.

SEWAGE PERILS.—Speaking of these, the *Popular Science News* has some very sensible remarks. It says: "The vast number of traps, valves, automatic plays, bent tubes, etc., used in houses have resulted from efforts among plumbers and inventors to meet the difficulties of the situation by the first method. It may be said that some degree of success has crowned the efforts of the mechanics to obviate sewage perils, but the success has been by no means what the gravity of the situation

demands. At present there does not appear to be a single mechanical appliance known which effectually, under all circumstances, affords immunity from the return of deleterious gases and disease germs into dwellings." But it goes on to say that a Mr. Mallett, a well-known chemist, has invented a device called a *germicide*, "which most admirably meets an important end. This device is very simple, and consists in placing behind the lid of water-closets a black-walnut box, within which is a metallic case holding a mass of crystalline chloride of zinc. This zinc is open to a gentle flow of water, which gradually dissolves it, and it flows into the bowl constantly, night and day, sterilizing the water so that no living germs can pass." This looks very much as if it met and overcame the difficulty.

THE QUEEN ANNE STYLE OVERDONE.—The Queen Anne style of architecture, which soon after it came in vogue here was exaggerated and distorted by builders of cheap houses, is naturally passing out of fashion now that it has been overdone. One of the largest structures now building is in the Italian Renaissance style, and even the architects who introduced the Queen Anne are returning to severer schools.—*N. Y. Sun*.

"FOUNDATIONS." Price, \$1.50.

Practical Manuals.

Handrailing and Staircase. A Complete Set of Lines for Handrails by "Square-cut System," and Full Practical Instructions for making and fixing Geometrical Staircases. By FRANK O. CRESWELL, of the Liverpool School of Science, Medalist for Geometry. With upwards of One Hundred Working Drawings. Cloth, \$1.50.

Drawing for Carpenters and Joiners. With Elementary Lessons in Freehand and Object Drawing. Containing 250 Illustrations and Drawing Copies. Cloth, \$1.75.

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Drawing for Cabinet-Makers. With Lessons in Ornamental and Object Drawing; Elementary Instruction in Water-Colored Drawing. Containing Twenty-four Single and Five Double-page Plates. Cloth, \$1.50.

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Cutting Tools Worked by Hand and Machine. By R. H. SMITH, Professor of Mechanical Engineering, Sir Joseph Mason's College Birmingham. Price, \$1.50.

These are a few of the new series of manuals published by Cassell. They are written in a plain, practical manner, and are profusely illustrated. We will send a copy of either or all of them upon receipt of the price.

Bending Wood.

THE primitive idea of wood bending was to conquer a stick when green and hold it in position, as illustrated in the making of bows. New applications of the underlying principle, and discoveries incident thereto, are constantly being made, and bending for all purposes is readily done by the aid of usually simple appliances and steaming processes.

Where it is desired to have the pieces stay in place, the heart is kept outward, the tendency of wood being to bend outward. But where a corner piece or other difficult stuff is being bent, the heart is kept inside, because admitting of more end pressure or upsetting without giving way or wrinkling. A bent piece increases in weight for its bulk according to the extent it is compressed, being much stiffer, also, than when in its natural and undisturbed state, which makes it especially desirable for carriage work. Tests that have been made with bent and sawed stuff under similar conditions have shown the former to be the stronger. By steaming wood its stiffness is increased, without reference to the bending, and it is also rendered brittle, which is sometimes enough of a characteristic to be detrimental to its quality. One kind of hickory is better for spokes or whiffletrees after it has been steamed, while another kind becomes very stiff when air-dried. Kiln-dry-

ing and steaming both cook the gum in resinous woods, and hence have a similar effect. Stiffness is the desirable quality in a spoke, felloe or whiffletree, and in hickory it is always increased by steaming. It is difficult to splinter or tear a piece of bent wood. Its fibres have become interwoven, and, without being particularly indicated on the outside, the interior becomes materially changed.

The steaming is usually done in boxes. Two or three hours is enough steaming for many ordinary purposes. Corner pieces require a whole day, and timber that is hard and tough should be steamed from 24 to 36 hours. For light panels 10 or 15 minutes steaming is sufficient, and most hard woods need only a half hour. A nice discrimination as to time is highly essential to success. By over-cooking timber the virtue can be made to depart from the toughest wood, rendering it punky and without elasticity. Live steam is not indispensable, exhaust steam being frequently used to advantage. Neither is a great quantity of steam required, partially condensed or damp steam being considered the best. A tight box with enough steam fed into it to make the wood swelter and cook is sufficient. After being bent the twisted fibre sticks as stubbornly to its new course as it did to the directions of nature. Bending is chiefly done on wheels and forms. A strap is used in numerous cases, and is indispensable in such bending as shafting, to keep the wood from slivering.—*Northwestern Lumberman*.

Incombustible Paints.

WATER-GLASS is being extensively used in the production of a paint which in addition to its durability is also a protection against fire, and as a floor paint it is especially recommended.

The surface of the floor having been well cleaned, any crevices or cracks between the boards are next luted with a thick mixture of water-glass and pulverized chalk or gypsum; then, by means of a stiff brush, a coating of water-glass, of sirup like consistency, is spread over the floor, and to this succeeds a second coating of the same, mixed with the desired color—the latter a mineral color, as the alkalies of the water-glass commonly decompose vegetable colors. This coating having become dry, other layers of the water-glass are given until the floor acquires a fine lustrous appearance. In order to insure a polished brightness, the surface is ground off a little, oiled, and thoroughly dried. A number of patents have been granted for incombustible paints in this country, and among the foreigners who have experimented with different ingredients for accomplishing this end, M. M. Vilde and Schambeck propose the following mixture for rendering wood-work incombustible:—

Pulverized glass.....	20
Pulverized porcelain.....	20
Pulverized stone.....	20
Calcined lime.....	10
Silicate of soda.....	30
	100

The solid elements must be reduced to as fine a state as possible and sifted, and then

mixed intimately with the soluble glass, thus forming a glutinous mass which may be employed as it is for painting, or may be mixed with various colors.

The addition of the lime gives a certain unctuousity to the mass for painting, while the combining of this lime with a portion of the silicic acid of the soluble glass promotes the intimate mixture of the other substances.

Although the mixture given above is recommended as being the best, the proportions of the various elements may be changed according to circumstances, except that of the soluble glass, which must remain constant. Some of the substances may also be replaced by others; but it is advisable to retain the lime. Instead of silicate of soda, the soluble glass of potash may be employed, but the former is cheaper.

The paint is laid on with a brush, in the ordinary manner and as evenly as possible, on the surface to be protected. The first coat sets immediately, and the second may be applied from six to twelve hours afterward—two coats being sufficient. This composition may also be employed with advantage for protecting iron bridges, sleepers, etc., from oxidation.—*Scientific American*.

Australian Trees.

THE giant trees of California, which have been one of the wonders of the world ever since their discovery, some twenty-five or thirty years ago, are now found to be far surpassed by certain specimens of the eucalyptus found in the mountains of southeastern Australia. The highest tree at present standing in the groves of Mariposa County is three hundred and twenty-five feet high, and this is only the largest out of a small number of specimens of a tree found nowhere else, while the Australian forests contain many thousands of greater height than this, one of them, the tallest yet measured, being four hundred and seventy-one feet from the ground to the summit. The diameter at the base of this enormous plant is eighty-one feet, so that, if it should ever be cut down, a squadron of cavalry might go through its evolutions on the stump, in place of the modest quadrille which it has given so much pleasure to the Californians to dance upon the truncated fragment of one of their great sequoias. As in California, the largest of the Australian trees are no longer standing, and a prostrate trunk has been found which measured four hundred and thirty-five feet from the roots to the place where the upper portion had been broken off by the fall. The broken tip had disappeared, but as the diameter of the trunk at the point of fracture was three feet, it is estimated, with great probability, that this indicates an additional length, for the perfect tree, of at least seventy feet, making the whole height of the plant more than five hundred feet. Concerning the time required for developing from a very minute seed a tree which would overlook the Great Pyramid, no inquiry has been made, and as the evidence of the so-called annual

rings is now known to be worthless for determining this point, we may never be able to form even an approximate estimate of the age of these giants, but the common eucalyptus has been observed to grow from seed to a height of sixty feet in ten years, and it is quite probable that a few centuries have sufficed to bring specimens planted in a favorable soil to their full development.—*American Architect and Building News*.

HAND SAWS

How to Select and How to File Them.

PRICE \$1.00.

This work is intended more particularly for operative Carpenters, Joiners, Cabinet Makers, Carriage Builders, and wood-workers generally, amateurs or professionals.

It is a complete guide for selecting, using, and filing all kinds of Hand Saws, Back Saws, Compass and Key Hole Saws, Hack and Butcher Saws; showing the Shapes, Forms, Angles, Pitches, and Sizes of saw Teeth suitable for all kinds of saws, and for all kinds of Wood, Bone, Ivory, and Metal; together with Hints and Suggestions on the choice of Files, Saw Sets, Filing Clamps, and other Matters pertaining to the Care and Management of all Classes of Hand and other Small Saws.

Illustrated by over Seventy-Five engravings. This work is edited by the author of the "Steel Square and its Uses," "Builder's Guide and Estimator's Price Book," "Practical Carpentry" etc. Being sole agents on the Pacific Coast for all the above mentioned works, we are prepared to furnish dealers and agents at publisher's prices. Single copiest post-paid upon receipt of price.

Book Notices.

LIFE OF SIR WILLIAM E. LOGAN, K. T., LL.D., F. R. S., F. G. S. First Director of the Geological Survey of Canada. By BERNARD J. HARRINGTON, B. A., Ph. D. With steel portrait and numerous woodcuts. New York: John Wiley & Sons, 15 Astor Place. 1888. Price \$2.50. 432 pages, octavo.

The principle work of Sir William Logan's life was the Geological Survey of Canada. His ability, energy, and genial qualities gained for him the esteem and affection of many of the best and most eminent men of science. Canadians especially cannot afford to forget the name of one who labored so long and so earnestly to promote the interests of their country, but others too will be grateful to the author for the compilation, which sets forth the admirable character and work of the greatest geologist. The style of the book is excellent, the account is entertaining and pleasant reading throughout, and the make-up is all that could be desired. Most of the illustrations scattered throughout the volume are copies of pen-and-ink sketches from the note-books of Sir William Logan.

THE MATERIALS OF ENGINEERING, by R. H. THURSTON, A. M., C. E., published by Wiley & Sons, New York.

This standard work is issued in three parts. Part one has already been noticed. Part two, IRON AND STEEL, has just been received. The chapters on the properties of iron and steel, and the strength of the same, are the most comprehensive to be found in any work that has, as yet, been brought to our notice. The result of the numerous tests in regard to the strength of each metal, are given in a tabulated form, and will be found much more interesting than other works of a similar character. It is beautifully illustrated, and contains 675 pages. Price of Part two, \$5.00.

Stairs.

THERE are a few people who do not "mind" running up and down two or three flights of stairs several times a day. They "get used to it" they say, but to the majority of people stairs are a positive labor and weariness without any sufficient compensation. If one could enter a fifth-story room with the same ease as he can enter the first and second story rooms, the most of us, other things being equal, would prefer a room of that altitude. The air is purer, the quiet deeper, and interruptions less frequent. In hotels and other large buildings, where there are elevators, there is comparatively slight difference in the charge for rooms of the same grade on different floors and with reason—a minute more or less in reaching one's room does not count. A flat in the upper floor of a four or five story building, containing an elevator, is often rented when the other floors are vacant, not only on account of its moderate price, but because it is high and quiet and isolated.

Of late years the minds of inventors have been turned toward the invention of an elevator which could be moved by some other power than steam, and patents have been applied for, but such has been the depression of all trade, and especially of the building interests, that there has been little encouragement for efforts in this direction. But it is certainly to be greatly desired that some cheap and facile method be devised for bringing all floors substantially to a common level, and abolishing the fatigue of climbing stairs and the evils that flow from it. This is very desirable in schools and colleges for women. There are more girls and young women disabled for life by climbing stairs while they are going to school than by any hard study they are guilty of. If their clothing was suspended from the shoulders, and not from the waist, the evil would be lessened, but even in that case it would not cease to be formidable. In many schools and colleges for girls, the pupils regularly several times a day, go up and down three or four flights of stairs to their rooms, up and down as many more to attendance in the laboratory, the art gallery, and the recitation rooms, until they are as much, if not more, exhausted by this labor as by all their other toils put together. There is certainly no objection to elevators in male colleges, but there is every reason why they should be in institutions for the other sex.

In our private houses the aim should be to have the work of the family as far as possible on one floor, and to abolish every step up and down that can in any way be dispensed with. Cellar kitchens are a nuisance and an abomination to be tolerated only in case of dire necessity. Sub-basements are a convenience if dining-room and kitchen can be on the same floor, and in our cities, where land is bought by the foot and the inch, they are a necessity. But in the country, where land is cheap, there is no economy in piling story upon story, and enforcing the continual running over flights of stairs by house-keepers and

servants in their performance of the household. A great deal of labor can be saved, and is saved, by having our houses heated by steam, and by having water in and out on every floor; but these are luxuries not within the reach of the masses of country people, who can, however, because land is less valuable in the country than the city, so build as to dispense with them with slight inconvenience.—*The Builder and Wood-worker.*

A Main Chance.

THERE never was a time more opportune than the present for the general introduction of yellow pine lumber. The dealers who desire to push its sales have a splendid opportunity to do so. A doubt regarding the value of such lumber for building purposes does not find a place in the mind of any man who understands its durability, and the difference in cost between it and white pine. It is evident, however, that there is something in the way of its general use. When the two kinds of pine come in competition, nothing is more rational than to suppose that the public would buy the cheaper, providing it will answer every purpose of the dealer. The average man has an inherent desire to buy as cheaply as possible. One objection against the general use of yellow pine arises from the builder. He is not, voluntarily, going to make a contract for working a certain kind of wood, when he can handle another with more ease. This applies more particularly to inside finishing. For bridge timber, building dimension, and other grades which are not necessary to be worked to a smooth surface, he is less particular. White pine is easily sawed and planed, and the carpenter courts the ease with which it is done. For the same reason, somewhat intensified, the wood-worker gives hemlock a wide berth. He has no affinity for its slivers. He has a kind and natural regard for his hands and tools, and he is not willing to overcome this regard for the sake of cheapening a building a few dollars.

There has been a current belief in the Northern States that yellow pine will not hold paint satisfactorily. It has been thought that any exudation of pitch would stain the paint, and to a certain extent force it off. This idea, however, has been greatly magnified. In sections of the Southern States, where little besides yellow pine is used for building purposes, there is usually heard but little complaint. Occasionally, a builder will put a coat of alcohol over the outside work, which cuts any pitch there may be on the surface, but oftener no special process is employed.

There is still another objection to yellow pine for inside work, finished in the natural color, that has sometimes arisen, that is simply the result of taste. To the eyes of some the effect is too glaring. The ones who take this exception assert that they tire of it more quickly than of a more somber-colored wood. The color is too vivid. The effect at first sight is cheering, but it is short-lived. As we remarked, this is simply a matter of taste, and

one that every man should decide for himself. Yellow pine does not stand alone in this respect, for exceptions are taken to the color of other woods. Walnut, for some, is too dark, and for others cherry is too red. If the brightness of yellow pine is a serious objection, it is one that time in part overcomes, for it will grow dark with age.

The opportunity that the yellow pine handlers have of pushing their lumber, arises from the feeling that exists between the yard dealers in white pine, and the manufacturers of it. The former are crying for cheaper lumber, and the latter are strenuously endeavoring to sustain prices. If there is a cheaper lumber than white pine that can now step in and satisfy the minds of the dealers as to price and satisfy them otherwise, its advent would be hailed with shouts.—*Northwestern Lumberman.*

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Vol. XVII.—History of New Mexico and Arizona.
Vols. XVIII-XXIV.—History of California.
Vol. XXV.—History of Nevada.
Vol. XXVI.—History of Utah.
Vols. XXVII, XXVIII.—History of the Northwest Coast.
Vols. XXIX, XXX.—History of Oregon.
Vol. XXXI.—History of Washington, Idaho, and Montana.
Vol. XXXII.—History of British Columbia.
Vol. XXXIII.—History of Alaska.
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Vols. XXXVI, XXXVII.—Popular Tribulations.
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THE HISTORY OF THE PACIFIC STATES is the central figure of this literary undertaking, the *Native Races* being preliminary, and the works following the History supplementary thereto. The territory covered is the western half of North America, from Panama to Alaska, including all of Central America and Mexico, and is equivalent in area to one-twelfth of the earth's surface.

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Our Prosperity.

WE return hearty thanks to one and all for the very many extremely flattering and favorable notices. Commendations and congratulations received—personal and editorial—in reference to the handsome improvements in the appearance, and in the illustrations and matter contained—more especially in the recent number of this journal. Without detracting from previous issues, its June number placed it upon equal footing with the best and most meritorious class journals published in the English language; and it has been so recognized. And while its managers have great reasons to feel proud of the success achieved, the people of the entire Pacific Coast—particularly those of San Francisco—have also reasonable ground for pleasure at seeing produced and established, without peradventure or question of failure, a publication in the building interests, alike creditable to its proprietors and the city in which it is issued.

But it should not be forgotten that the results obtained have been reached only by indomitable effort and perseverance, for in its infancy even those who wished it well feared and doubted its success. Kind expressions were not wanting; but the doleful accents of doubt were often coupled with the wish that it might succeed; and for a time its demise was a matter of monthly anticipation by many. But, as stated in its early numbers, when discouraging shadows hung about us, we entered not blindly into the undertaking, but had counted the cost and measured the strength of our arms, and to-day we enjoy the proud satisfaction of having risen above all contingencies, admired and approved by thousands, and the words of approval which now come to us from all quarters, have the clearing ring of well-wishing and unqualified confidence.

But, however gratifying and appreciable kind words may be, they are not available in the payment of the necessary cost and expense of publication, nor negotiable with grocers, butchers, bakers, clothiers and others who furnish the food and raiment, eaten and worn by those who perform the labors incident to the production of this journal monthly. Consequently, while our list of subscribers is daily increasing with pleasing rapidity, there is room for greater, and we urge our claim to universal support upon all classes of citizens, as not only those who plan and build, but those who own their residences, and those who occupy rented houses, are alike interested in the matter and subjects contained in its columns; and none should refuse or fail to lend the helping hand. San Francisco alone should give us ten thousand paying subscribers.

How Spools Are Made.

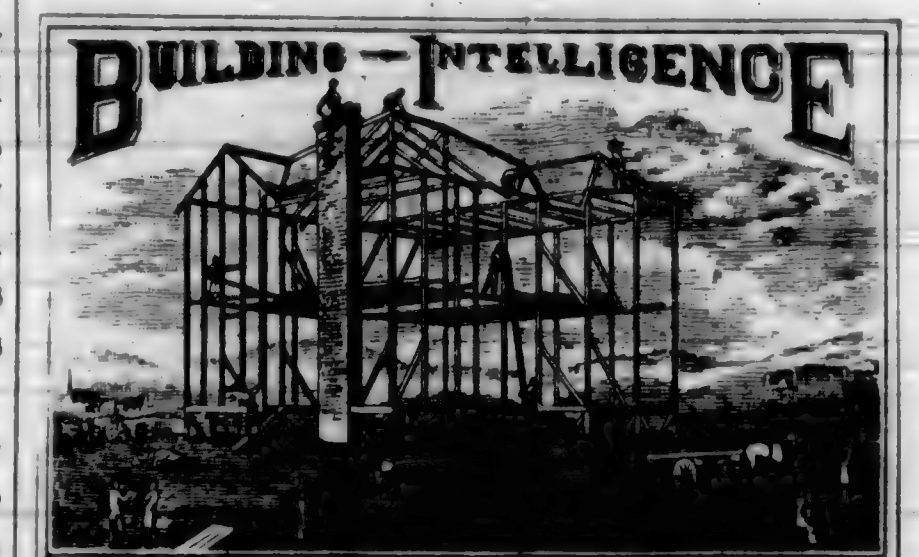
BEARING in mind an inquiry made of us some time since, we present the following interesting description of the *modus operandi* of making spools, as carried on in the extensive factory of the Searsport Spool and Block Manufacturing Company, in Searsport Village,

Maine: This company own large tracts of land in northern Maine, from which the lumber for spool-making is cut, white birch being used exclusively. The wood is first sawed into pieces four feet in length, and of nine sizes, varying by sixteenths, from an inch to an inch and a half square. It is then dried as thoroughly as it can be out of doors. Inside the factory it first goes to the "rougher," where the strips are cut into cylinders of the length of a spool, and the hole bored, the turning and boring being performed at one operation, and the cutting off, with a small circular saw, at another, all on one machine. These little cylinders drop from the rougher into a barrel, from whence they are removed to the "rollers," or revolving slat cylinders, in which the fine dirt and fuzz left by the saw and bits are removed. The pieces are then picked over by hand and all imperfect ones are sorted out to feed the ever hungry fires under the boiler.

The next process is a more thorough seasoning of the blocks in a loft, and then they go to the "reamer," where the center holes are made to the exact size required, which cannot be done by the rougher on account of the shrinking of the wood after leaving that machine. Until lately the reaming has been done by an ordinary reaming tool working in a lathe, the work being fed by hand, but a new machine has been recently put in, which will ream the spools as fast as two boys can feed them into the spouts. This reamer was made by the company's machinist, Mr. John F. Rogers, at the machine shop in the factory, from patterns made by him, he having seen a similar machine working in McGregor's factory in Lincoln, Me. The machine in use in the Searsport shop has some features which the builders claim are improvements over the original, which was imported from Scotland, it having lately been invented in that country and not yet patented in the United States. It consists of a short revolving shaft, with a reaming tool at each end, working endwise backward and forward about four inches. At each end spouts are arranged with feeding apparatus which forces the spools into the proper position to be bored, and then allows them to be dropped out into a barrel below. At each oscillation of the shaft two spools are reamed, one at each end, the machine turning out about 240 per minute.

The next machine is the "finisher," which is an attachment to an ordinary lathe, by which the spools are turned into shape at one operation, at the rate of from 1,000 to 1,500 per hour. There are eight cutting knives on this machine; one at each end, standing up perpendicular to the length of the spool, for trimming the end; one at each end, horizontally, for turning the outside of the flange; between these, two others, standing diagonally, for the inside of the flange; another, horizontally, for turning out the space between the two flanges; and a small circular chisel for cutting the finish on the top of the spool. The spools have now received their shape, and

need only the finishing touches. These are given, first by the "polishers," which are the same as the rollers described above, the friction of the spools against each other giving them the required polish. After remaining in this from four to five hours, they are again sorted by hand, and all imperfect ones removed, after which they go to the "embosser," a sort of printing machine, which stamps the number of the thread and some ornamental devices upon the head of each spool. They are then packed in stout sacks, holding from thirteen to thirty-six gross each, according to the size of the spools.—*The Manufacturer and Builder.*



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\$8,700.	
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O. Gallagher.	
A. J. Marquis.	
C. Kincaid & Baldwin.	
\$7,000.	

Clay, cor. Polk. Three-story frame. O.—Prof. Wilkinson. A.—Wright & Sanders. C.—H. Lukes. \$10,000.	Twenty-second, corner Guerrero. Two-story frame. O.—Clancy. C.—R. M. Grant. \$3,000.	WOODLAND. Main, cor. Second. Two-story brick. O.—Mrs. R. L. Beamer. C.—Samuel Caldwell. \$10,000.	B.—Gilbert & Son. Days' work. \$800.	J. x Seventh and Eighth. Repairs to brick building. O.—T. McMorry. A.—N. D. Goodell. C.—Carle & Croly. \$5,000.	MISCELLANEOUS. Guerneville. Two-story frame. O.—Odd Fellows. C.—F. J. Ryus. \$2,250.
Post, nr. Buchanan. Three two-story frame. O.—G. W. Hinkle. \$10,000.	Hardie, nr. Sixteenth. One-story and basement frame. O.—J. McIntyre. C.—J. J. Welsh. \$800.	Main, nr. Second. Alterations. O.—Mrs. R. L. Beamer. Days' work. \$800.	Oak Avenue, cor. First. Additions. O.—C. D. Bevelson. C.—Gilbert & Son. \$1,000.	J. x Seventh and Eighth. Fitting up store. O.—C. H. Gilman. A.—N. D. Goodell. C.—J. White. \$1,000.	Florence. School House. A.—Kysor & Morgan. C.—W. Jeans. \$2,400.
Sutter, cor. Lyon. Two two-story frame. Days' work. \$8,500.	Seventeenth, x Church and Sanchez. One-story and basement frame. O.—C. F. Duhm. C.—H. Mayne. \$2,500.	Near Town. Two-story frame. O.—S. P. Pond. Days' work. \$1,600.	Court, Armory of Company F, First Artillery Regiment. Improvements. O.—Armory Hall Association. Days' work. \$1,300.	One-story and basement brick. O.—W. Kerth. A.—N. D. Goodell. C.—B. F. Bell. \$2,007.	Pomona. Two-story brick. A.—Kysor & Morgan. C.—J. C. Cord. \$1,000.
Geary, cor. Pierce. Two-story and basement frame. O.—Dr. J. W. Blake. C.—Randall. \$7,000.	Jones, near Washington. Two-story frame. O.—Mrs. Overend. C.—Hanna & Cornell. \$5,000.	First, cor. Court. Additions and improvements. O.—John M. Rhodes. B.—Gilbert & Son. Days' work. \$1,000.	COURT, Armory of Company F, First Artillery Regiment. Improvements. O.—Armory Hall Association. Days' work. \$1,300.	San Jose. Alviso Road, near town. Two-story frame. O.—J. H. Oyler. A.—Theo. Lenzen. C.—Thos. Livingstone. \$9,000.	Berkeley. Two-story frame. O.—Mrs. R. Clark. C.—C. G. Beadell. \$1,000.
Bush, x Hyde and Larkin. Additions. O.—A. Grant. A.—Kensler & Rain. C.—Mahoney Bros. \$4,500.	Taylor, x Jackson and Pacific. Two-story frame. O.—Mrs. S. C. Harding. C.—A. R. Denke. \$4,000.	Court, cor. Second. Two-story frame. O.—Dr. L. Welges. Days' work. \$750.	ALAMEDA. Central Avenue, nr. Benton. Two-story and basement frame. O.—Wasson & Pattiani. B.—Wasson & Pattiani. \$5,000.	Storey Road, near town. Two-story frame. O.—A. H. Albers. A.—Theo. Lenzen. C.—E. A. Van Dolsen. \$6,000.	Livermore. Two-story frame. O.—J. Johnson. Days' work. \$3,000.
Sacramento, near Baker. One-story frame. O.—M. H. Landers. C.—C. Kerns. \$1,500.	Hyde, x Broadway and Vallejo. Two-story frame. O.—C. Harrigan. A.—Townsend & Co. Days' work. \$5,000.	Fourth, cor. Cross. Finishing off basement rooms. O.—A. J. Gilbert. B.—Gilbert & Son. \$500.	Foot of Webber. Two-story and basement frame. O.—Mrs. J. Duvalle. A.—Townsend & Co. C.—W. P. Clark. \$5,000.	Seventh, x San Antonio and San Carlos. O.—D. Hatman. A.—Theo. Lenzen. C.—W. S. Boyles. \$1,500.	One and one-half story frame. O.—C. W. Bradshaw. C.—C. W. Bradshaw. \$800.
Jackson, nr. Baker. One-story and basement frame. O.—R. J. Mercer. C.—F. Gauterau. \$2,250.	Vallejo, nr. Mason. Three-story and basement frame. O.—R. Da Meur. C.—E. Castagnino. \$1,800.	Second, One-story frame. O.—John Freeman. B.—W. H. Winne. \$1,800.	Willow, x Railroad and Santa Clara ayes. Two-story frame. O.—I. Air. C.—N. McComas. \$3,600.	Two-story frame. O.—Sperry & Co. A.—Percy & Hamilton. C.—W. Saunders. \$6,948.	Martinez. Two-story frame. O.—D. Bush. A.—W. H. Wharff. C.—Bulger Bros. \$5,000.
Fillmore, nr. Pacific. Two-story and basement frame. O.—J. P. Shepard. Days' work. \$6,000.	Vallejo, x Mason and Powell. Two-story and basement frame. O.—A. Kaufman. A.—G. E. Voelkel. C.—J. Doherty. \$4,000.	South Woodland. Additions and improvements. O.—E. McConugal. B.—Gilbert & Son. Days' work. \$500.	Pacific Avenue, nr. Bay. One-story and basement frame. O.—P. J. Cassin. A.—T. J. Walsh. Days' work. \$1,000.	Three-story frame. O.—W. P. Miller. A.—Percy & Hamilton. C.—Seymour & Stevens. \$12,000.	Riverside. Two-story frame. Presbyterian parsonage. C.—A. W. Boggs. \$2,800.
Washington, near Hyde. Three-story frame. O.—Mrs. Domaney. A.—W. O. Banks. C.—J. Treadwell. \$3,000.	Waller, x Webster and Fillmore. Two-story and basement frame. O.—N. C. Taft. A.—Warren. Days' work. \$2,500.	Capay Canon. One and one-half-story frame. O.—F. S. Freeman & Co. C.—W. H. Winne. \$1,000.	OAKLAND. Sixteenth, corner Filbert. Two-story and basement frame. O.—S. T. Alexander. A.—Clinton & Day. C.—E. Child. \$18,000.	Two-story brick. O.—Sperry & Co. A.—Percy & Hamilton. \$8,000.	Two-story frame. C.—Porter & Davis. \$2,000.
Sixth, cor. Howard. Additions. O.—A. Wolf. A.—W. C. Hoagland. C.—R. McAnan. \$8,000.	Clay, x Broderick and Devisadero. Two-story frame. O.—George Chaitin. A.—Townsend & Co. C.—Moore Bros. \$4,000.	Main, cor. Second. Fitting up office. O.—W. M. Coward. C.—W. Wilson. Days' work. \$1,400.	Webster, near Seventh. One-story frame. O.—South Pacific Coast Railroad Co. C.—B. McManus. \$1,700.	Refuse Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Ninth, nr. Mission. Three-story and basement frame. O.—Ziner. C.—Burs. \$5,800.	Page, x Gough and Franklin. Bankhead and foundations. O.—George Strasser. A.—G. H. Miller. C.—J. Garrity. \$1,000.	Second, nr. Lincoln Ave. Improvements. O.—M. H. Torrence. C.—Gilbert & Son. Days' work.	Eighteenth, near Market. One-story and basement frame. O.—J. McCully. C.—A. Hughes. \$2,000.	Common Rough, up to 40 feet, per M feet \$22 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Fourteenth, cor. Shotwell. Four two-story frames. O.—J. Gleason. A.—Townsend & Co. C.—C. Kelley. \$14,000.	Valencia, cor. Fourteenth. Seven two-story frame. O.—P. Ashe. A.—Curtlett & Cuthbertson. C.—A. Flood. \$21,000.	Main, cor. Second. Fitting up office. O.—W. M. Coward. C.—W. Wilson. Days' work. \$1,400.	Market, nr. Twenty-fourth. One-story frame. O.—L. G. Lindgren. B.—L. G. Lindgren. \$800.	Refuse Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Twentieth, cor. Shotwell. Two-story frame. O.—Rice. A.—Curtis & Bennet. C.—Sanchez. \$4,000.	California Avenue. Two-story frame. O.—E. J. Mize. Days' work. \$2,000.	College Avenue. One-story frame. O.—Mrs. M. C. Briggs. C.—G. K. Glenn. \$2,500.	Telegraph Avenue, cor. Twentieth. Two-story frame. O.—W. A. Griffith. B.—W. A. Griffith. \$2,000.	Common Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Howard, nr. Twenty-first. Additions. O.—C. Mengels. A.—H. Gelfuss. C.—Conrad & Miller. \$5,500.	Valencia, x Twenty-third and Twenty-fourth. Two-story frame. O.—Davis. C.—Kincaid & Baldwin. \$13,000.	Main, nr. Fourth. Improvements. O.—Clark & Culver. O.—Gilbert & Son. Days' work.	Third, nr. Harrison. One-story frame. O.—Dr. Simonton. C.—D. Markel. \$1,100.	Common Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Valencia Junction. One-story frame. O.—Chamberlain & Sprague. \$1,600.	First Baptist Church. A.—Kysor & Morgan. C.—W. O. Burr. \$19,000.	East Main. One and one-half-story frame. O.—Mr. Brunner. B.—Mr. Jackson. \$1,000.	Ninth, x Madison and Jackson. Additions. O.—Gilman. C.—Haskell & White. \$1,800.	Common Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Church, cor. Twenty-ninth. One-story frame. O.—R. Bergfeld. \$1,400.	Two-story dwelling. O.—Mrs. Scott. A.—Kysor & Morgan. C.—R. B. Young. \$5,300.	Court, skating rink. O.—Dinsler & Flaks. C.—Fern & Nickelson. Days' work. \$1,300.	J. x Seventh and Eighth. One-story and basement brick. O.—A. Coolat. A.—N. D. Goodell. C.—E. A. Boyer. \$2,000.	Common Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.
Fair Oaks, cor. Twenty-fourth. Two two-story frames. O.—Mrs. McDaniels. A.—Huerno & Everett. C.—W. B. Krager. \$4,000.	Two-story dwelling. O.—Mrs. McDougall. A.—Kysor & Morgan. C.—Hargitt. \$11,000.	East Main. One and one-half-story frame. O.—H. Davis & Co. B.—A. Stamp. Days' work. \$2,200.	K. x Fifth and Sixth. Reconstruction. O.—P. Newman. A.—N. D. Goodell. C.—Carle & Croly. \$2,000.	Common Rough, sized with planer \$2 additional on above rates, per M feet. No. 1 Flooring, 6 inches and over, " 4 " and under, and 1 1/4 x 6 " 33 50 " 41 to 50 " " " 23 50 " 51 to 60 " " " 24 50 " 61 to 70 " " " 26 50 " 71 to 80 " " " 28 50	Two-story frame. C.—Porter & Davis. \$2,000.

The California Architect and Building News.

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NUMBER 8.

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All Impediments to Building Improvements Removed.

THERE has hitherto—since 1880—been two matters of law which have discouraged many owners from improving their property by the erection of buildings: First, the Mechanics' Lien Law, as it appears on the statute book, and during the past three years generally accepted as the law governing the matter, made owners liable for all bills contracted in the erection of buildings, for labor, materials, etc., without regard to the sum of contract. This feature has been set aside by the recent decision of the Supreme Court, as elsewhere stated in this issue, and the declaration made by the court of last resort, that owners can be held only for the amount expressed in the contract. Consequently the lien law is now as it should be, harmless against owners, beyond the sum of contract. Second, the ruling of the Supreme Court in the case of Zeile vs. Hood, as elsewhere herein stated, supported the doctrine that owners excavating for the purposes of building were obliged to sustain and underpin structures on the adjoining premises. The effect of this ruling was to discourage many from making improvements, they preferring to allow their property to remain unimproved rather than be forced to bear the expense of sustaining their neighbors' buildings. But the Supreme Court has, by a late decision, removed this obstacle, by virtually affirming that every owner of real estate shall have the right to excavate to the depth of four feet below the curb level, with the simple restriction that proper written notice of intention to excavate shall be served upon adjoining property owners, who must, upon the service of such notice, take care of and underpin such buildings, etc., as may be affected by such excavations, at their own cost and expense.

Mechanics' Lien Law.

DECISION BY THE SUPREME COURT.

THE Supreme Court of this State, in a decision rendered in the case of Latson vs. Nelson, filed July 24, 1883, has defined and fixed the legal force and effect of the Mechanics' Lien Law of California, thereby setting at rest all questions as to the rights of owners, contractors, material men, and others, whose interests may in any manner, now or hereafter, be affected by the operation of the law.

The construction placed upon the Lien Law by the court of last resort fixes the fact that owners of real estate and others entering into contract obligations are bound by the conditions and agreements, and for the specific sum

expressed in the contract entered into, but not for any sum greater than the contract amount, all other things being regular. The Legislature convened next following the adoption of the new Constitution, amended the Lien Law passed April 11, 1872, by striking out the illogical and absurd section which had been adopted with the passage of the law as a whole, which made all parties—architects, mechanics, material men, artisans, and even common laborers—performing labor, rendering services, or furnishing material for or in connection with the erection of buildings, etc., at the instance and request of the contractor, without the owner's assent or approval, "the agent of the owner for the purposes of this act." A proposition so adverse to all principles of law and common rights, was, as a matter of course, doomed to repudiation whenever submitted to the judgment of an impartial, competent tribunal. Consequently, when the law of 1872 was appealed to the Supreme Court, the—everybody—an agent of the owner feature, was virtually stricken from the statute, leaving the rightful protection which the law provided, of liens against property and improvements for the full amount of contract and no more.

In place of the section stricken out, however, another was substituted by the Legislature of 1880, of similar import and character, and equally as inequitable, being no more nor less in effect than a re-enactment of the rejected section in a new wording, the material clause of the new section (1) reading as follows: "This lien shall not be affected by the fact that no money is due or to become due on any contract made by the owner with any other party." Thus placing owners at the mercy of those to whom they might intrust their interests by contract, without any security whatever in or under the written agreements. True, owners by requiring bonds and securities outside of the contract—by drawing in and involving innocent parties as bondsmen—might, at the end of a lawsuit, save themselves by recovery upon the bond, less the costs, vexations, and annoyances ever attending suits at law. Upon this point the Supreme Court, in its late decision, remarks: "It is said that the owner has full security in the right to require a bond of the contractor that no liens shall be created. So far as that is any argument, it may with equal force be said that the material man may require payment or security of the contractor before parting with his goods!"

But while this decision settles the Lien Law question and places the responsibilities and securities just where they should rest, there are some who will insist that the Supreme Court has erred in its judgment and should be reversed.

As a matter of course, those whose interests are secured and protected by the decision will approve; while those who have hitherto felt themselves safe against the defaults of contractors, by enforcing their claims against owners without regard to contract considerations, will disapprove. This is a natural sequence, as the justice and equities of all laws, as a rule, are weighed and valued by individuals in the light of personal interests; consequently there will ever be uncertain diversities of opinion; for the law approved and advocated under one set of circumstances, will, by the same parties, be rejected and opposed at other times, because of reversal of issues. Every good man claims to be a law-abiding citizen, and is so in fact when there is no sacrifice required in occupying that position; but when law and individual interest come in conflict, no man living will yield personal interests to law, if by any means it is possible to secure those interests, even though all the laws upon the statute books of the land should be sacrificed.

This, however, is certain for the present: The Supreme Court has, by its late decision, ended all speculation and controversy in reference to the Lien Law, and those who desire to make improvements can do so without fear of being called upon to pay more than the contract price.

Epidemics—Sewerage South of Market Street.

WE clip the following from the *Examiner*: "Health officer Mears is of opinion that there are no grounds for fearing an immediate introduction of cholera, yellow fever, or small-pox into San Francisco, but thinks that the city should be placed in proper sanitary condition, especially as regards the sewerage south of Market Street."

All of which may be true. We have repeatedly referred to the condition of the sewerage south of Market Street, and urged the necessity of its improvement, not only as a safeguard against epidemics, but for the general health of the people residing and doing business south of Mission Street. But how is this to be done, with the general grade of the streets as they are, taking the line of Sixth Street as a guide, with the last five blocks in from the outlets of the sewer as base, a total distance of over 2,000 feet, without any fall whatever, the established grades being: Mission Street, thirty feet; Howard Street, ten feet; Folsom Street, five feet; Harrison Street, two feet, and Bryant, Brannan, Townsend, King, Berry, and Channel Streets at zero, the greater number of the blocks being 550 feet, beside the width of crossing streets. The only apparent remedy under the circumstances is the filling in and raising of the whole district so affected to a uniform grade from the higher point—Mission Street—and making a uniform grade of thirty feet from Mission Street to the mouth of the sewers, instead of twenty feet from Mission to Howard, five feet from Howard to Folsom, three feet from Folsom to Harrison, two feet from Harrison to Bryant, and a dead

level of 2,000 feet and over from Bryant to the sewer outlet, the other corresponding streets being at the same disadvantage. To do this will now cost a considerable sum of money, which, however, would be more than compensated by the increased value of the property affected, as it is a certain thing that the property of the entire section would double in value were the filling-in done. At present, and for years past, a cloud has rested upon the whole district mentioned, and it has been in continued disfavor, owing to the state of facts recited. There is no good reason why the property south of Mission Street should not be very much more desirable than it is, the only drawback being its flatness and want of good sewerage, and consequent dampness generally; all of which can be remedied, and would have been twenty years ago had the order then passed by the city council been carried out, which order placed the grade of Folsom Street, at Sixth, seven feet higher than its present depression. But the importance and necessities for this change of grade was not so forcibly apparent then, although the cost at that time would not have been more than one-tenth what it would be at present, and the property owners in that section, failing to anticipate present conditions, they succeeded in nullifying the order, and property south of Market Street has been injured millions of dollars in depression of values and income.

If this filling-in was determined upon and put into practical execution now, even at its greater cost—owing to the number of buildings that would have to be raised, etc.—it would pay, as it would require the hills and banks of materials now occupying numerous valuable lots and whole blocks in various parts of the city, which remain from year to year ungraded because of the cost involved, grading being expensive work, owing to the great lack of convenient dumps. There is no other one project that would be more beneficial to the city of San Francisco than that suggested in this connection, as it would give employment to thousands of men and hundreds of teams, and add millions to the assessable value of property, both south of Market and that which would be increased in value by being graded off to furnish the filling-in material. Sacramento furnishes an example in the filling-in of the entire city ten feet more or less, by which the healthfulness and importance of the city was greatly improved; and there is no good reason why that part of San Francisco which might be made very desirable for both business and residence purposes should be held at its present low standard, owing to its shamefully insufficient sewerage, and the lack of enterprise on the part of those most interested to reclaim it, and make it what it is capable of being made.

MR. THEO. A. EISEN has resumed the active practice of his profession as architect, and can be found at 218 Post Street, San Francisco.

Old Homes Made New. Price \$1.50.

Sensible Letter from a Lumber Dealer.

EDITOR CALIFORNIA ARCHITECT—*Dear Sir:* Much has been said from time to time by interested parties in reference to the "Mechanics' Lien Law," as to the protection it affords citizens and material men. A good deal of law and legislation has been had to try and make it what it was and is intended it should be, to wit, absolute protection. But all the brains, time, trouble, and expense heretofore bestowed upon it seems, under the late decision of the supreme authority of the State, to have gone for naught; and now, practically, the "lien law" is in the same condition it was before the adoption of the new constitution, which was at best a "trap and a snare," except as between principals. Now I think a great deal of trouble, anxiety, and not a little coin can be saved if the parties who first contribute to the "start" of a building, to wit, the lumber dealers, of which I am one, would refuse absolutely to furnish lumber to any party who they would not consider worthy of credit, independent of a possible security through the "lien law." This would have the effect of shutting off all those who now, and for many years have disgraced an honorable calling, the "contractor and builder," and reduce the number of "figurers" to those who have a respectable standing in the community and whose credit is beyond question, thus enabling them to obtain a fair price for their work, leaving them a legitimate profit, and in turn to pay a fair price to all those who in any way contribute material, brain, or muscle to the structure. In this way owners would get better work and better value for their money, because all sub-contractors would, without doubt, work with a better grace and feeling and at a lower price, knowing that their pay was absolutely safe, and removing that uncertainty that at present, to a great extent, exists; and I claim also that owners would reap many other benefits that I may point out at some future time. How many owners are there who heretofore have had to defend their property as against "liens," through no fault of their own, but through the incompetency if not the dishonesty and unreliability of their builder. And how many architects have been annoyed beyond description from the same cause. Hence I repeat that the whole fault lies with the lumber dealer; for if the contractor, or the party who sets himself up as such, could not get lumber he could not "start" his job, and would be forced to withdraw in favor of some more responsible person.

In my opinion all artisans and material men would be better off if there was no "lien law" at all, except as between principals, for, as I have hereinbefore stated, the present "lien law" is nothing more or less than a "trap and a snare" to catch unsuspecting victims.

Not desiring to impose upon your good nature by taking up too much of your valuable space in presenting my humble views, I will close. Yours respectfully,

A LUMBER DEALER.

New York Street Architecture.

A. CURTIS BOND.

THE ROMANESQUE.

THE Romanesque, corrupted from the Roman, has invaded all other styles and left them marked with its name and its peculiarities; those familiar to us to-day, the Byzantine, the Moresque, the Gothic, have all appropriated its suggestions and its patterns, until we have almost sunken the individuality of the Romanesque proper and transformed the title into an adjective descriptive of a place of the orders named.

In the early Christian styles the tendency of the Romanesque influence was toward creating tall towers, square capped and without any appreciable variation in measurement at the extreme top or bottom; in columns the greatest latitude was permitted, for not only were they frequently unlike in proportions, but the material and workmanship presented contrasts that cannot be said to have always been either picturesque or harmonious. The disposition was to have all things one-sided, unequal, illy-balanced, towering to an awkward height and then ending abruptly in a flat-looking cap.

In another instance of the Christianized Romanesque the form of the bath was adopted, a circular structure with a center dome, all of the building being embraced within the limits of the circular walls, no wings nor other projections being usual.

With the progress of events and the advance of architectural skill, the Byzantine came into existence and the Romanesque took another form as it entered into this new acquisition to the orders. The prominent features of this new form of buildings were heavy piers and spreading arches supporting a dome that rose over the center and had vaulted side spaces connecting with it. Columns were used more as ornamental and decorative features than as entering into the necessities of construction; cornices and capitals were discouraged, and in many instances they were almost entirely ignored. The church of St. Sophia at Constantinople is generally selected as being the most brilliant and authentic example of this style. It is certainly one of the most wonderful in point of extent and elaboration that has ever been constructed. It rises gradually from comparatively low arch-supported side structures, to the rotund roof of an inner row of vaults, and from these latter swells gracefully and magnificently into a dome that is nearly 200 feet above the pavement, and looks down upon an interior decoration and display of niches that made it, even in those extravagant times, an object of admiration and brilliant example for other humble but ambitious designs.

As the Byzantine made itself known and spread through Europe, its Romanesque ingredient became more and more evident, and in Armenia, for example, the Byzantine character was preserved only in the ornamentation; the shape, lines, peaked roof and towers, sur-

mounted by a shapely slanting cap, were eminently Romanesque, uninfluenced by any other styles.

In Russia, on the other hand, there was made up such a conglomerate species of architecture that almost every possible style was made a part, sharp roofs, pinnacle-like in their height and slender proportions, their outlines jagged with protruding ornaments and the apex crowned by a small ball. Towers rose in the same building, octagonal and having balconies at irregular intervals, and supporting an immense globe, shaped like a gigantic inverted bubble, with the stem pointing toward the sky and adorned with numberless chains and gilt ornaments that sparkle and

glisten to the intense delight of the superstitious crowds thronging the plaza below, and who, between the shouts of long life for their Pope and father, the Czar, paid their devotions to the painting of their saints, protected beneath these hybrid roofs and pictured by the local artists in high-top boots and attired in the costumes that we can only associate with modern civilization. The domes are painted in brilliant colors, silvered, gilded, yellow, red, or white, green or blue, with bright stars sprinkled over all, and the colors laid on in stripes, squares, circles, as the architect felt was the more effective. Such an architecture as this, while it is unquestionably unique and peculiar, lacks the tasteful attrac-



PLATE I.—DRY DOCK SAVINGS BANK.

tions of other forms of the Romanesque, and becomes almost absurd in its mass of detail and useless accessories.

From the Byzantine to the Mahometan is but a step, but the difference is noticeable. We leave a style marked by fanaticism, an ornamentation burdened by symbols, lavish in its extent and religious in its character, oppressive with its reminiscences of assumed martyrdom, or with its monograms and trade marks of saintly individuals; and yet, withal, a style that is original and becomes with closer study interesting.

The Mahometan, on the contrary, aside from its occasional introduction of passages

from the Koran—the letters of the language combining so well with the ornamentation as to appear as a part of it—with this exception, there was nothing to remind one of what is considered by many the serious affairs of life, and everything to create in the brain a lively imagination and an exaggerated sense of enjoyment.

The Mahometan Romanesque in Spain became the Moresque, whose gradual filiation through the requirements of the different countries to the restriction of street architecture in this city we showed the result of in our June number. In Turkey it displays a barren wall pierced by small windows, prompted

to this cloister-like aspect by jealous pashas and exuberant odalisques; in Egypt variety is given to the outward appearance by latticed bow windows clinging to the house side, and at which an occasional glimpse is had of a peeping face partly concealed by a veil, the female herself being rigidly guarded from the sight of the Caucasian race, though why it is difficult to understand, for the few samples of this particular kind of household appurtenances that I saw, in a recent visit to that country, had very few charms of features, and

their corpulency was of that pronounced type vulgarly associated by us with those Cuicuinations recently ruled out of Germany by Bismarck. In Spain the forbidding exterior was replaced by one of great beauty.

It is perhaps unnecessary to follow the thread of the Romanesque through the various stages of its modern development. It would be an interesting study, though a lengthy one, and we may some day return to the subject with illustrations of the prominent peculiarities of each stage. It has found its way into

Germany, Italy, France, and England; there is a Venetian Romanesque, an Italian, French, and Spanish, with minor branches such as the Provençal, Angiovine, Aquitanian, the Apulian, and the Pisan. The Oriental spirit is inherent in the Apulian form, and it is rich in sculptured animal figures; a Gothic tendency is found in French and Spanish.

By the time it reaches our country it becomes what we see it in our accompanying illustrations. Figure 1 is a representation of the Dry Dock Savings Bank and is as near an



PLATE 2.—DWELLING IN AMERICAN ROMANESQUE STYLE OF ARCHITECTURE.

approach to the true Romanesque as modern New York architects will tolerate. The building is of light stone with tile caps over the windows and doors; the entrance is richly sculptured, and the Gothic balcony has its roof supported by polished marble pillars. The sloping roofs are slate. The style is what is strictly known as the English Romanesque, the arches and balconies tending toward the German Byzantine; an application of the form very far from its original purpose.

Figure 2 is a more modernized American

Romanesque of really good lines and embracing English Gothic windows with Byzantine details. The building is of brick with light stone trimmings and gray slate roof. It stands at the corner of Fifty-seventh Street and Fifth Avenue, and is the residence of Mr. F. W. Stevens. The exterior is so inviting in appearance that we have intruded upon the privacy that should protect one's home and reproduce from our New York contemporary, *The Decorator and Furnisher*, an excellent view of the parlor, in which the ceilings are

heavily paneled and the walls are hung with tapestry. The mantel is a wonderful combination of embossed velvet, and the columns rising from it are of highly polished wood. With our reader's permission I will digress for a moment to show them the dining-room of this house, and my only excuse must be that it is one of the most noticeable and written about of any similar room in the city. The walls are decorated in Pompeian red and portieres of Japanese silks are suspended at the doors; stained glass windows representing the

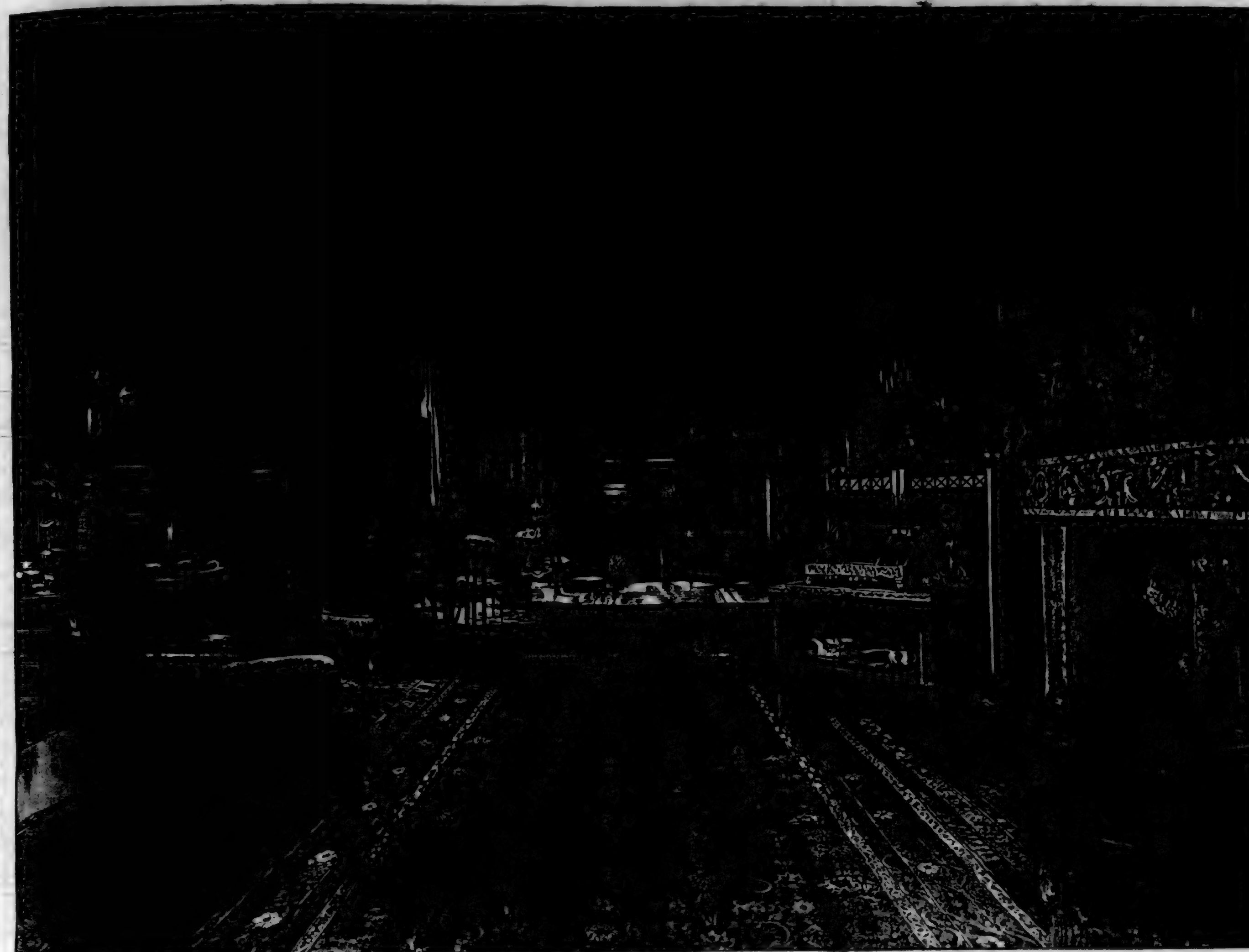


PLATE 3.—INTERIOR VIEW OF THE PARLOR IN AMERICAN ROMANESQUE DWELLING.

(From the New York Correspondent of the CALIFORNIA ARCHITECT AND BUILDING NEWS.)

seasons, and others bearing the ever-hungry goddesses, Pomona and Ceres, are six in number; mottoes suggestive of the pleasures of the table are upon the walls, and they are so arranged as to enter into the ornamental figures and form a part of them. Light is provided at night by means of candles, thus avoiding the destructive qualities of gas. I might lengthen this brief description, but feeling that I have transgressed now beyond the scope of our paper, I must put a brake to my inclinations.

As a matter of news I might call attention to the new building of the Mutual Life Insurance Company that is being put upon the ground formerly occupied by the old post-office, a miserable excuse for a Government office that will be familiar to our readers who were acquainted with New York ten years ago. The location is on Nassau Street, extending from Cedar to Liberty Streets. The old place served at various times during its career as church, riding school, dog pit, and post-

office, ending its career as a broken-down auction room and a succession of dilapidated private offices, mostly devoted to beer, billiards, and young lady type writers. The wretched structure was torn down, and as if to complete the diversity of its experiences several bodies were discovered amid its foundations. This is the site of the New Mutual Life Company's building, and the situation is in a measure worthy the labor they are putting upon it. Nassau Street is one of the busiest thoroughfares in the city and one of the narrowest streets in the country, shut in by large houses rising seven or eight or ten stories toward the sky. The Mutual can only hope to shine and be distinguished by piling story upon story until it towers above all others. And this is the idea. It is to be 190 feet tall, overloom everything about it, and hopes to fly from its lofty towers the signal flags of the weather bureau's survey, now monopolized by the Equitable Insurance Company by virtue of their extreme height, but their laurels

seem now to be endangered and bid fair to rest upon other brows. The new building is up only one story and gives but little idea of its architectural character excepting that it will be substantial rather than ornamental and less decorative than massive. The material is granite, and already there is a profusion of polished columns that is really perplexing, and the round corners of the building, if carried up its entire extent, will give a finish that will be novel and agreeable.

Dio Lewis' Monthly.

A NEW aspirant for the favors of the public appears upon our desk under the above title. The author is so well known that we have no doubt but that he will gather in many of his admirers on his subscription list. Terms, \$2.50 per year.

Wooden and Brick Buildings, 2 vols. Price \$18.00.
Street, Store and Bank Fronts. Price \$4.00.

Labor Strikes.

DURING the past three months the "striking" spirit seems to have taken possession of the laboring classes in almost all lines of labor operations. The prosperities of the last three years, which have gladdened all hearts and furnished employment to all classes of skilled and unskilled labor throughout the country, has awakened and stimulated in those who plod along from year to year under the yoke of labor, enforced by necessities in the obtaining of daily bread, the determination to seek relief in fewer hours of labor, in increased compensation, and the right to regulate the methods, rules, and equities of labor, so as to relieve it of all unnecessary hardships, and secure to those obliged from force of circumstances to walk within its restricted limits, all the reliefs and comforts possible; all of which are but the natural results of a prosperous condition of affairs generally, in which the masses of mankind feel that they have common rights, and should enjoy proportionately the benefits flowing and maturing from such general prosperities.

There is in every right-minded man that lives, the desire and ambition to better his condition. This is one of the greatest incentives to human action, and the beacon light that encourages those who would otherwise settle down in the gloom of "nothing beyond." But some are more successful than others in this universal reaching after and grasping the gifts of fortune—some gathering in and securing millions, while the greater number accomplish but little more than the securement of daily bread; yet the right to possess and enjoy an equal share of this world's goods is co-equal in all, although the qualifications to this end are vastly disproportionate. Still, with the enlightenments of the present age, the daily plodding, toiling multitudes will not quietly submit to some of their own blood and race being enthroned upon altars of gold, and clothed in habiliments of luxury and wealth, while they remain dependent upon and bound down to the slavery of labor, requiring all the working hours of day and the full strength of manhood, yet yielding no more than a mere subsistence. Hence the numerous disquietudes and uprisings which vitalize into strikes, and which as a rule inflict as great injury as benefit; but the battles will be renewed from time to time, both the workers and employers utilizing the advantages of circumstances and conditions as they present and repeat themselves, under the ever-changing degrees of prosperity which surround all business activities upon land or sea.

The Inspector of Plumbing.

MR. JAMES E. SWEENEY, plumbing inspector appointed by the Board of Health under the plumbing law of this State, called at this office on the 4th inst. and expressed an earnest desire that the most cordial and friendly relationships may exist between himself, architects, owners, and contractors generally, with

whom he may be brought in contact in the course of his official duties. He unquestionably enters upon his work with an honest purpose to carry out the provisions of the law creating his appointment, and being himself a thoroughly competent and practical plumber, as we and many others in the profession can testify, it is fair to anticipate that under his watchful care plumbing frauds will be matters of the past. But it will require resolute mechanical and executive abilities and energies on his part to hold in check and prevent the numberless "nigerisms" which have hitherto prevailed, until, with a certain class, good workmanship and honest dealings have become almost obsolete considerations, bringing upon the plumbing art reproaches and mistrust. But if the gentleman named will exercise qualifications as inspector in degree and force equal to his mechanical abilities there need be no fear as to the result.

THE rules and regulations require that drawings and sketches sufficient to represent correctly the run of sewers, and sections illustrating the arrangement of the soil and waste pipes, etc., through the building, are to be filed in the office of the Board of Health; and, if found not to be correct in any particular, Mr. Sweeney will promptly correspond with or interview the architect, and suggest the necessary changes.

THE matter of payment for this extra service will rest between the architect and owner, and may be made a direct and separate charge against the owner, or the expense thereof may be stated in the plumber's specifications, and the plumber be required to pay the cost thereof to the architect. If the latter course shall be pursued, the payment may be reached without calling the special attention of the owner to the matter. It is a common thing to include, "the plumber is to pay the cost and expense of making the water service connection," and to make the charge for the extra plans a like matter of specification will serve all purposes, insure the payment thereof to the architect, and do no injustice to the owner. And it becoming a fixed item under the law, owners cannot object to the method suggested, unless he prefers to pay the amount direct, in addition to the fee agreed upon.

The Chapter Improperly Reported.

THE *Bulletin*, in its report of the meeting of San Francisco Chapter, held the 3d inst., says: "The law relating to the inspector of plumbing was discussed, and it was apparent that it did not meet with approval of the majority." This statement is misleading and erroneous, as the fair inference to be drawn from the language used is that the plumbing law passed by the last Legislature of this State, which authorizes the appointment of an inspector of plumbing, was the subject matter of debate; while in fact said law cut but an incidental figure in the discussion, which ran exclusively upon the rules and regulations adopted by the Board of Health, which was freely discussed

and criticised, all present agreeing that they were and are imperfect, inexplicit, and defective in several materially important respects. We should not notice this did it not misstate facts and misrepresent the views of members of the chapter. Whether such was the intent or not, it assumes the appearance of the *Bulletin* seeking to sustain and strengthen its repeatedly expressed opposition to the plumbing law, by making it appear that the architectural association of this city virtually endorsed our contemporary's views of the case—a something that has not been done, and will not be until experience shall demonstrate the impracticability and insufficiency of the law to regulate and correct the evils, for the correction of which the law was passed.

San Francisco Chapter, American Institute of Architects.

THE regular monthly meeting of the above chapter was held in the rooms of the Art Association on Friday evening, August 3, President John Wright presiding.

Minutes of preceding meeting were read and approved.

Mr. Pissis reported that his class was getting along finely. The regular place and time of meeting was Thursday evening, at the office of Wright & Sanders, between 8 and 9.

The several committees on incorporation of the chapter, room for the use of the class in carving, etc., reported progress and were continued.

A communication was read from the Rhode Island Chapter, A. I. A., informing this chapter that it was desirable that drawings, sketches, etc., should be received from the members of S. F. Chapter for exhibition at the National Convention of A. I. A.

The Secretary was instructed to notify the R. I. Chapter that the notice of time in which to prepare plans or sketches was too short to allow of members doing themselves justice.

N. L. Mayo was proposed for membership as student. The rules and regulations adopted by the Board of Health in regard to the new Plumbing Law were discussed. No action was taken.

Nominations of officers for ensuing term being in order, it was moved and seconded that the various officers now holding the different chairs be renominated. Amended so as to substitute H. C. Macy for Treasurer in place of the present incumbent, on account of the latter having removed his residence to Oakland. Also the Recording and Corresponding Secretary were united in one office, and G. H. Wolfe nominated for the dual place.

On motion, it was resolved that this chapter offer a premium of \$30.00, in three prizes of \$15.00, \$10.00, and \$5.00, for the best three designs for a seal for the use of this chapter, the competition to be confined strictly to the students in the profession.

CURLETT & CUTHBERTSON have removed their office to the Phelan Block, junction of Market and O'Farrell.

The Importance of Learning to Draw.

TRAINING in art is a means of education, of calling out faculties of the body and mind which would otherwise lie dormant, of opening sources of pleasure in an intelligent appreciation of works of art—people who do not understand art practically almost always admire bad things—and of giving, by means of the power of drawing, a more accurate perception of the forms of objects, and a capacity for representing and describing them in a manner far more direct and more universally intelligible than any written description can be. This practical value of drawing has been borne witness to by not a few employers of labor, who have given it as their experience that a workman who could draw and could properly understand a drawing was always more capable, more useful, and better able to carry out his instructions than one who could not. The practical value of drawing may be recognized, even apart from its operation on the understanding, in its power of promoting greater delicacy of manipulation in operations quite apart from that of drawing in itself. One of the best amateur artists of the day, as is well known, is an eminent surgeon who has declared that he first took up etching because it was a recreation which would have the effect of rendering his hand more delicate for his important professional work. One of the best remarks in regard to this result of training in drawing was given by a lady who was a candidate for a school board election, and was asked, somewhat indignantly, by one of her working-class constituents, what was the use of teaching drawing in the board schools to girls who were going into service, for instance; and why their education was not confined to things that would be useful to them in their future life? The reply given was that there was no more common complaint against female servants than about their clumsiness in handling fragile things, such as glass and china, and their continual breakage of such articles in consequence; and that a training like drawing would probably do more to render the hands more safe, careful, and sensitive to touch than any other influence that could be named. Of course, it might have been said in addition that a knowledge of drawing would give a domestic servant even greater advantages than that, in providing her with a more interesting and sensible occupation for her leisure time than reading "Penny Dreadfuls."

Probably the reform would be accelerated not a little if it were once fairly recognized that there is a practical value in the power of drawing for men who are in trade and commerce, and that it is not a mere accomplishment for ladies and gentlemen. In many schools the mistake is that drawing is only voluntary. Few school-boys are likely to do anything voluntarily in the way of work; and as drawing taught on the scientific method really is work, and not mere trifling with brush or pencil, it may be surmised that only a very strong turn for drawing on the part of the pupil, or the direct orders from home on the part of the

parents, lead to the filling up of the drawing-class. Among university men of the present day, from which class most or all of the professors at our large schools are recruited, there still linger the remains of the old superstition, that drawing should be an "extra," somewhat like dancing; an elegant accomplishment, not to be put on a level with classics and history and other serious studies. The next generation of school-masters will probably know better themselves; to those of the present generation it may be urged that drawing is a most important element in mental and bodily training, and that up to a certain point—that is to say, as far as concerns the practical handling of the pencil and the power of copying an object when seen, and of drawing in correct perspective anything which it is desired to represent—so far as this, drawing can be almost as certainly taught generally as writing, and ought to be so, as a part of every man's education. The question of artistic feeling in the higher sense is a different one. It only exists at all in a portion, perhaps, a minority, of boys; though a preliminary training in practical drawing might not infrequently bring out evidences of latent artistic taste, where it would never have shown itself or been suspected had not the capability for the expression of it first been imparted. The true solution of the problem for general schools would be a compulsory class, supplemented by a voluntary one. The elements of drawing, scientifically taught, should be as much a compulsory subject as grammar or writing; and when once this is established, we should not have the curious spectacle, which we have sometimes seen, of great publishing firms which would on no account publish bad and ungrammatically-written books, being quite willing, nevertheless, to publish books containing illustrations violating the first rudiments of the grammar of drawing and perspective, and seeing nothing to be ashamed of in this; and after the course of a few generations of compulsory teaching of drawing, people will read about the people who could not draw in the present day as we do now about barons and knights who could not write their own names.

—*Art Interchange.*

The Mound Builders.

AT the annual meeting of the Boston Society of natural History, a highly interesting statement was made by Prof. F. W. Putnam, Curator of the Peabody Museum of Harvard University, concerning his recent explorations of certain mounds in the Ohio Valley. The subject was illustrated by drawings hung upon the wall, and by photographs. These explorations, in which he was assisted by Dr. C. L. Metz, of Madisonville, Ohio, were made last year, and were restricted to one particular mound field or tract upon the borders of the Little Miami River, in Madisonville, about twenty miles from Cincinnati. It is to be regarded as one of the felicities of the event—for the work and its results constitute an event in the full significance of the

word—that, being situated so near to one of the great cities of the land, it has happened that no persons impelled by mere idle curiosity have hitherto dug into these mounds in a random way, and thus practically destroyed them in respect to their special value to the archaeologist. The excavations now made were conducted on the most approved methods of science. Nothing worthy of notice has escaped observation and record, and every relic has been carefully preserved for scientific purposes. In the brief discussion which followed the Professor's statement, one of the members of the society declared the results thus reached to be the most important discovery yet made in American archaeology. Several of these mounds were what are called "altar mounds," and in these the valuable and instructive relics were found. These, in number and variety, were sufficient in themselves, if none others had ever found, to give a very distinct—it might almost be said comprehensive—idea of the civilization of the social state of the ancient mound builders. Among other things found were articles of personal adornment, such as ear-rings of pearl and bracelets of metal. The precise advance of the art of working metals is thus disclosed. The metals had been wrought by hammering the ore. Molten work was beyond the skill, or rather the knowledge, of the artificer. The metals were iron, copper, silver, and gold. This is the first time gold has been found in the mounds. The gold, and in some instances the silver, was used for plating an inferior metal, being hammered thin and clinched at the edges. Most significant of all, perhaps, was a little statuette, which not only presented the human form in a shapely—it might almost be said artistic—contour, but showed also the ear-rings and the drapery of the waist which were fashionable in the American prehistoric times. Some of these relics must originally have come from the Florida coast, from Lake Superior and from the Rocky Mountains, indicating thus either extensive migration or intercommunication. The indications are that cremation of the dead was practiced by these natives, and that an altar mound is significant of some great sacrificial ceremony, and that these trinkets and relics, some of which pertained to the useful arts, represented an offering on the part of these people, equivalent, in comparison with our scale of values, to hundreds of thousands of dollars.—*The Mechanical News.*

THE greatest obstacle in the way of forming definite conclusions from experiments is the fact that, generally, more than one experiment is tried at the same time. Hundreds of experiments that count for nothing would have been valuable in advancing both general and specific knowledge, if between them and others with which they are compared some addition or alteration had not been made, the presumed influence upon the result leaving the latter problematical.—*American Machinist.*

Plasterer's Manual, enlarged. Price 75c.



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.

O. T. C.—A two (2) inch hole is bored in a green or unseasoned plank. When the plank becomes seasoned, will it affect the diameter of the hole, or will it still remain two inches?

Yes. The diameter of the hole will be less than two inches, and will be found to be somewhat elliptical in form, the contraction being greater across than on the lines parallel with the fiber of the wood.—W. C. S., in the *Artisan*.

Method of Obtaining Length of Rafters.

For some months past there has been quite a discussion of various plans for obtaining the length of rafters. Many of the methods presented are not desirable, for the want of accuracy. Some years ago the subject came up for discussion where I was at work, and I then prepared the following table, which is very simple and mathematically correct. Any mechanic can copy it on the back of a business card and tack it to the lid of his tool-chest, where it will always be handy for reference. The word "pitch" means such a fractional part of the width of the building. The further north you go the steeper the pitch, on account of the snow; also certain localities have pitches peculiar to that section of the country:

Pitch.	Square.	Rafter.	Brace.
1-6	4 and 12	0.527046	1.054092
5-24	5 and 12	0.541666%	1.083333
1-4	6 and 12	0.559017	1.118034
7-24	7 and 12	0.578852	1.157704
1-3	8 and 12	0.600925	1.201850
3-8	9 and 12	0.625	1.25
5-12	10 and 12	0.6508541	1.3017082
11-24	11 and 12	0.6782843	1.3565686
1-2	12 and 12	0.7071068	1.4142136

The first column indicates the pitch of the roof; the second gives the figures on the square that will cut the various pitches; the third gives the length of a rafter for a building one foot wide, and the fourth gives the length of braces for runs of the same proportion as the figures in the second column.

The manner of using the table is as follows: For any given pitch multiply the tabular number by the whole width of the building, and the product will be the length of the rafter in feet and decimals of a foot.

Example.—What is the length of a rafter of a building 18 feet wide at $\frac{1}{2}$ pitch?

Solution.— $0.600925 \times 18 = 10.81665$ feet, or 10 feet 9 13-16 inches.

Example.—What is the length of a brace having 40 x 48 inch run?

Solution.—40 x 48 inches is the same proportion as 10 x 12; hence, $1.3017082 \times 48 = 62.482$ inches, or $62\frac{1}{2}$ inches, always using the longest run for multiplier.

Example.—What is the length of a brace having 35 x 35 inch run?

Solution.— $1.4142136 \times 35 = 49.7474$ inches, or 49 $\frac{1}{2}$ inches.—S. R. K., in *Carpentry and Building*.

Modern House Painting. Price \$5.00.

A Handsome Illustrated Catalogue.

We have received from the Robert Mitchell Furniture Company of Cincinnati a very elaborate illustrated catalogue, containing 307 pages, of parlor and chamber sets and house and office furniture and fixtures of endless variety and in every conceivable style and design. Expense has manifestly not been spared in producing the catalogue, and those desiring elegant things in the furniture manufacturing art will do well to consult its pages, as any and everything of the character necessary to the comforts of home life, and to furnish beautiful surroundings and equipments, will be found fully illustrated.

Lessons on Hand Railing. Price \$5.00.

Workshop Virtues.

OBSERVATION is the first lesson the apprentice learns. When fresh from school he is introduced into the new world (the workshop), and he sees about him a number of men and of tools, and of the names of the latter, or their uses, he knows practically nothing. Machines, wheels and shafts, some in motion and others at rest, stare him in the face until he is somewhat bewildered and he is apt to exclaim, like the "heathen Chinese," who was viewing a marine engine for the first time, "Too muchee wheellee; make man think too muchee." After a day or two this feeling of bewilderment fades away—use becomes second nature to him. Now is the time to improve himself and awaken his faculties, if he has the will. Let him observe the various machines and processes, try to understand why one machine runs at one speed and another at a different one, and why one process is dependent upon another—in fact, make use of his powers of observation, try to remember what he sees, and consider whether he can suggest an improvement. If he can make notes at home of an evening, so much the better; he will find the habit exceeding useful. By observation, errors may be detected in work about to be executed before the blunder is actually committed, thereby saving both time and money.

In some measure all workmen are obliged to be punctual in their going to and leaving work. The bell rings or the whistle blows at fixed hours, and the workmen must be governed by these signals; but over and above these fixed

times, the habit of punctuality is a valuable one. Some factories are famous for being faithful in the fulfillment of their promises as regards time of delivery; they will work night and day to complete an order by the specified time. Others, again, are noted for their utter disregard of time.

Every foreman or manager knows how pleasant it is to deal with a workman ready at taking a new idea, or willing to try a new method of doing work. These are the men who distinguish themselves, and obtain better position than those who cannot move out of their rut of habit. So, also, a firm becomes noted for adapting itself and its resources to new trades or methods of doing work, while a firm which will not try an experiment will be pushed out in the cold in the struggle for existence. The man who knows the reason for what he does is a better man than he who only does a thing because he is told to do it a certain way. Every mechanic should understand, for example, why his drill should run faster for a small hole than for a large one, why one speed of tool is suitable for one metal and not for another.

If he is a smith, he should know why steel is worked at a lower heat than iron; what conduces to a sound weld, and why a piece of steel broken haphazard off a bar cannot be drawn to a sharp point without certain precautions. There are principles underlying every trade which is to the interest of the artisan to study, to ponder over, aye, and even to discover, for it is well known that there are principles yet undiscovered which the cultivator of the various workshop virtues may be lucky enough to fathom, with honor to himself and benefit to mankind at large.—*Mechanics*.

Stables, Fences, Out Buildings, etc. Price \$2.50.

THE KIND OF NAILS.—At first the extra cost of steel nails was one and one-half cents per pound, or \$1.50 per keg, but it has now been reduced to \$1.00. The great advantage of the steel nails is that they can be driven into hard wood as easily as an iron nail will go into a pine board. Steel nails have been driven into a white oak knot without bending. Nothing else is now used in laying hardwood floors, as they require no boring, but are driven readily. For all kinds of finish they are especially adapted, and as so much hard finish is now employed, their use must be on the increase. They are also used largely by builders, and box-makers are increasing their demand for them. Box-makers have been using the better grades of iron nails, as they desire those that can be drawn and redriven.—*Northwestern Lumberman*.

School House and Church Architecture. Price \$4.00.

Sample Copies.

Hereafter we will forward no sample copies of this Journal unless the price, twenty cents for each number, accompanies the order.

Warping of Drafting Boards.

I HAVE taken many valuable hints from *Carpentry and Building*, and I wish to contribute my mite to the general information presented. Those who have used drafting boards appreciate their liability to warp under various conditions of atmosphere. It is also pretty well known that almost fabulous prices are demanded for good drafting boards at the hands of dealers. I have discovered a method by which an ordinary drafting board can be constructed that will remain in good condition. I had some large detail drawings to make in California many years ago, and, being a carpenter, I made a board for the purpose in the quickest manner I could. I glued the joints, and, as battings suggested themselves, I employed them in its construction. The board measured about 40x80 inches in size. I dressed one side and cut three beveled-edged battings and fitted them to one-half the thickness of the board—in other words, I dovetailed them in such a manner as would allow them to slide and not interfere with the shrinkage of the board, and then went to work with my drawings. In a few days I was compelled to stop, as my board had warped three-quarters of an inch, taking the battings with it. I then grooved the under side one-half the thickness of the board at distances of two inches. The grooves run in the opposite direction to the battings, or with the grain of the board. When this was done I found that I had the most perfect drawing board I had ever used. I think others will find the suggestion advantageous.—*Palmetto, in Carpentry and Building*.

A Good Hint to Workmen.

THE old saying that "a man is taken by the coat that he wears," applies to journeyman plumbers. Show us a man that loses his self-pride as to his appearance, as a general rule he also becomes careless in the work he performs. On the other hand, a man that has a good appearing tool-bag, containing tools requisite and necessary to perform a good job of plumbing, also keeps himself clean and tidy, it is a sure indication that he can perform a good job of work. How often do we have the question put to us by our customers when ordering work done, "Will you send me that last man that done our work?" Why? "O, because he attends to his business; don't fool with the girls; goes about his work in a workmanlike manner, and don't mess and dirty the entire house up, and tear the wood-work of the whole house apart. If you can't send him I would prefer waiting a day or two until you can." Ain't this satisfactory proof to a boss? Yes; and these are the men that study their own interest as well as the bosses', and an ornament to any trade or profession.—*Plumber's Trade Journal*.

THE daily cut of the mills on Columbia River, Oregon, is 650,000 feet. About \$1,000 worth of logs are daily floated out of John Day's River. The mills of Astoria and vicinity daily cut \$150,000 worth of lumber.

A List of Registered Plumbers up to Date of This Issue.

IN accordance with the requirements of the new Plumbing Law, the following parties have been registered. It is imperative that every plumber, be he master or journeyman, shall have his name and standing registered at the office of the Inspector of Plumbing. The office is on O'Farrell Street, west of Dupont, in the same building and in connection with the Health Office. In our next issue we probably will be able to give nearly a complete list.

M stands for Master Plumber. They are required to file a bond for \$500. J stands for Journeyman:

Adams, John L., 9 Clara Street. J.
Ayers, Chas., 909 Larkin. J.
Byrne, Jas., 119 Welsh. J.
Berwick, David, 937 Mission. J.
Broad, J. F., 1222 Bush. J.
Cardiff, R. J., 319 Tehama. J.
Cusick, Jas. E., 937 Mission. J.
Connor, J. H., 528 Third. M.
Dixon, J. J., 1222 Bush. J.
Doyle, J. P., 214 $\frac{1}{2}$ Sixth. J.
Doggett, B., 116 $\frac{1}{2}$ Langton. J.
Duffy, G. F., 2096 Market. J.
Daniel, W. L., 234 Post. M.
Dunn, W. J., 37 Louisa. J.
Enright, Wm., 1115 Devisadero. M.
Ellis, T. P., 668 Mission. J.
Ford, Thos. J., 404 McAllister. J.
Flood, Jos., 753 Harrison. J.
Fritz & Kean, 130 Geary. M.
Firmin, J. E., 240 O'Farrell. M.
Gray, W. J., 1 Webster. J.
Gray, J. T., 230 Sutter. M.
Holden, C. S., 824 Green. J.
Hammond, W. T., 1027 Sutter. J.
Heath, J. F., 236 Minna. J.
Hufschmidt, H. L., 637 Clay. M.
Hildebrand, C., 181 Sixteenth. M.
Hobro, W. D., 728 Washington. M.
Johnston, Pat. J., 2008 Larkin. J.
Kelly, Frank, 1208 Green. J.
Kearns, Thos., 1813 Jessie. J.
Kerrison, R. J., 1030 Alabama. J.
Linehan, Jas., 119 Powell. J.
Lawton, J. J., 418 Fulton. J.
Layton, John, 25 Lily Ave. J.
Mitchell, M. J., 410 Waller. J.
Murray, John, 1 Hampton Place. J.
McFadden, J. J., 133 Langton. J.
McNally & Hawkins, 419 Montgomery. M.
McCormick, J. F., 313 $\frac{1}{2}$ Sutter. M.
Milne, Geo., 1209 Golden Gate Ave. M.
Powers, E. J., 213 Prospect Place. J.
Pendergast, John, San Miguel. J.
Rice, R., 107 Geary. M.
Reiley, C. J., 214 Montgomery Ave. M.
Rohr, J., 222 Minna. J.
Snook, Edgar N., 726 California. J.
Wilson, W. F., 25 Stockton. M.
Waters, Chas., 30 O'Farrell. M.

It is imperative that all plumbers should be registered, as they are not allowed to work on buildings without a permit, and the sooner the matter is attended to the better, as permits will not be granted unless the parties are registered.

The above list includes all that are registered up to the time of our going to print.

Discoloration of Brick Walls.

WITHIN late years the great popularity of brick as a building material and the great increase in the number of brick edifices which have been erected have brought into prominence a matter which could not have escaped the notice of the most casual observer, namely, the disfigurement of brick walls from a coating of white powder resembling in appearance hoar frost or mildew.

These deposits are usually formed in rainy weather, and for a long time it has been a mooted question how this substance comes to be collected, what it is, and what can be done to remove it or prevent its formation. The rains of this spring seem to have been especially favorable to the forming of these deposits, and old buildings even, which hitherto have never been defaced by this substance, have this year given up their ruddy appearance for a paler and less attractive complexion. Dr. Joseph Leidy, President of the Academy of Natural Sciences, in speaking of this subject recently said:—

"The efflorescence is simply ordinary Epsom salts or sulphate of magnesia. The sulphurous acid, which results from the burning of coal, combines in the presence of moisture with the magnesia in the mortar or from the clay in the bricks. It was decided that it emanated from the former source. The sulphate of magnesia dissolves in the water, which runs over the bricks, and, evaporating, leaves the deposit. Some walls are covered with a black substance which seems at a distance to be smoke. This is a fungus, which flourishes in damp places, and is materially different from the white sulphate." Dr. Charles M. Cresson explains in a similar way the method by which the substance is deposited on the walls, but expresses the belief that it is sulphate of potash. Edwin F. Durang, the architect, said that sulphurous acid acting on the mortar decomposes it to such an extent that chimneys had often to be rebuilt on account of it. He thought the efflorescence was sulphate of lime.—*Scientific American*.

STRAW lumber has been very much exaggerated, though it may be reckoned considerable of an invention. An Eastern enthusiast recently stated to a newspaper interviewer that there were "scores of mills in the country where paper, straw, prairie grass, and other fibrous substances are converted into straw boards, which are sold all over the country as substitutes for wood." This may be taken either as deplorable ignorance, or an ingenious statement. There is but one factory at present where straw lumber is being manufactured so as to cut any figure. Paper boards—building paper—are made all over the country, and are used to some extent in place of wood, but they are only paper, pure and simple, and lay no claim to being a substitute for lumber, and are more a substitute for plastering.—*N. W. Lumberman*.

Public Buildings. Price \$4.00.



PLATE 4.—FRONT ELEVATION OF WORKINGMAN'S COTTAGE, COSTING \$1,500.

The Board of Health and the Plumbing Law.

THE Plumbing Law, passed by the last Legislature of this State, went into practical effect on the 1st inst., under the rules and regulations adopted by the Board of Health of this city and county. Said law being the first enacted in California for the purpose of regulating and controlling the customs, methods, and execution of a special branch of mechanical works, it was to be hoped that those empowered to give it shape and vitality would have exercised all the care and practical, mechanical, and scientific intelligence necessary to its complete efficiency. And we regret that the rules and regulations adopted by the board in this case do not warrant us in stating that they are *fairly* perfect. It may be that to the learned gentlemen composing the board the whole matter contemplated by the statute was so plain and simple that they deemed it unnecessary to spend much time in framing a set of rules and regulations, and therefore paid no attention to the ambiguities, inexplicitness, and imperfectness of those adopted.

There are many reasons why this should not have been, and why an exceptionally perfect set of rules should have been provided: *First*. Plumbing laws exist in several of the Eastern States and are in practical operation, and the rules and regulations by which they have been rendered operative and efficient were available to the San Francisco board and might have been consulted. If this has been done, the result developed in the rules adopted by our Board of Health are not calculated to reflect any great amount of credit upon the rules in practice in Eastern cities.

Secondly and mainly. If, from imperfect rules and regulations, or any other cause, the

plumbing law of this State shall prove a failure, it will discourage all future legislation upon matters looking to the relief or protection of other mechanical operations. In this view of the case, all branches of mechanism are interested in the success of the law under notice; for if an effective law cannot be passed regulating plumbing and sewer works, then it is doubtful whether Legislative protection

can be thrown around any other of the mechanical arts.

We will not, however, enumerate further, nor refer in detail to the errors and deficiencies in the rules, knowing that the board, together with the gentlemen most in interest, the plumbers, are fully competent to discover and correct such mistakes as may have been made.

Artistic Homes. Price \$3.50.

Coterminous Ownership—Rights to Excavate.

PRIOR to July, 1880, the city ordinance relative to and defining the rights of owners in the excavation of their lots for the purpose of building, was generally observed in practice. Said ordinance provides (sec. 5, chap. vi, order 1281, as amended May 16, 1876) that owners about to erect buildings, etc., shall have the right to excavate to a depth of fourteen (14) feet below the curb level, without incurring any risks or responsibilities in reference to adjoining property or structures, except to serve the proper written notices. This understanding of the matter was so general that adjoining owners seldom refused to take care of and underpin the structures upon their premises. But in the July, 1880, number of this journal, we published the decision of the Supreme Court in the case of Zeile vs. Hood, which virtually set aside the city ordinance, and by, as we think, an irrational and illogical construction of sec. 832, civil code, sustained the decision of the Fourth District Court, Judge Morrison then presiding, which decision imposed upon the party excavating (Hood) the responsibility and cost of under-

pinning the adjoining owner's (Zeile's) building. The decision of the higher court becoming generally known through the columns of this journal, owners of improved property have since acted upon the defensive by refusing to be put to any expense in underpinning their buildings, and those making new improvements have been compelled to bear the cost of sustaining the adjoining property, or suspend building operations. But the present Supreme Court, in the case of Aston respondent, vs. Nolar, appellant, has reversed the decision in the case of Zeile vs. Hood, and virtually restores the city ordinance, which gives to all owners the rights and privileges hereinbefore stated. This result is in exact harmony with the views expressed by us at the time of presenting the Zeile and Hood case, in which we held that "the vital point in issue had not been finally settled and determined" by the decision then referred to; and so it has proven; for the section of the code quoted is without shadow of reference to the party excavating sustaining the structures erected upon the adjoining property. (For full report of the case of Zeile vs. Hood, see this journal of July, 1880).

In plain words the case now stands thus: Every owner of real estate has the right to excavate his premises to a depth of fourteen

(14) feet below the curb level, without regard to adjoining structures, provided he shall first serve a written notice upon the owner or owners of the adjacent property, notifying him or them of the intention to, and extent of, the intended excavations. And the owners of adjoining property or buildings are required, under the decision of the Supreme Court, to take care of and underpin at their own cost



PLATE 5.—SIDE ELEVATION OF WORKINGMAN'S COTTAGE.



PLATE 6.—FIRST FLOOR PLAN OF \$1,500 COTTAGE.

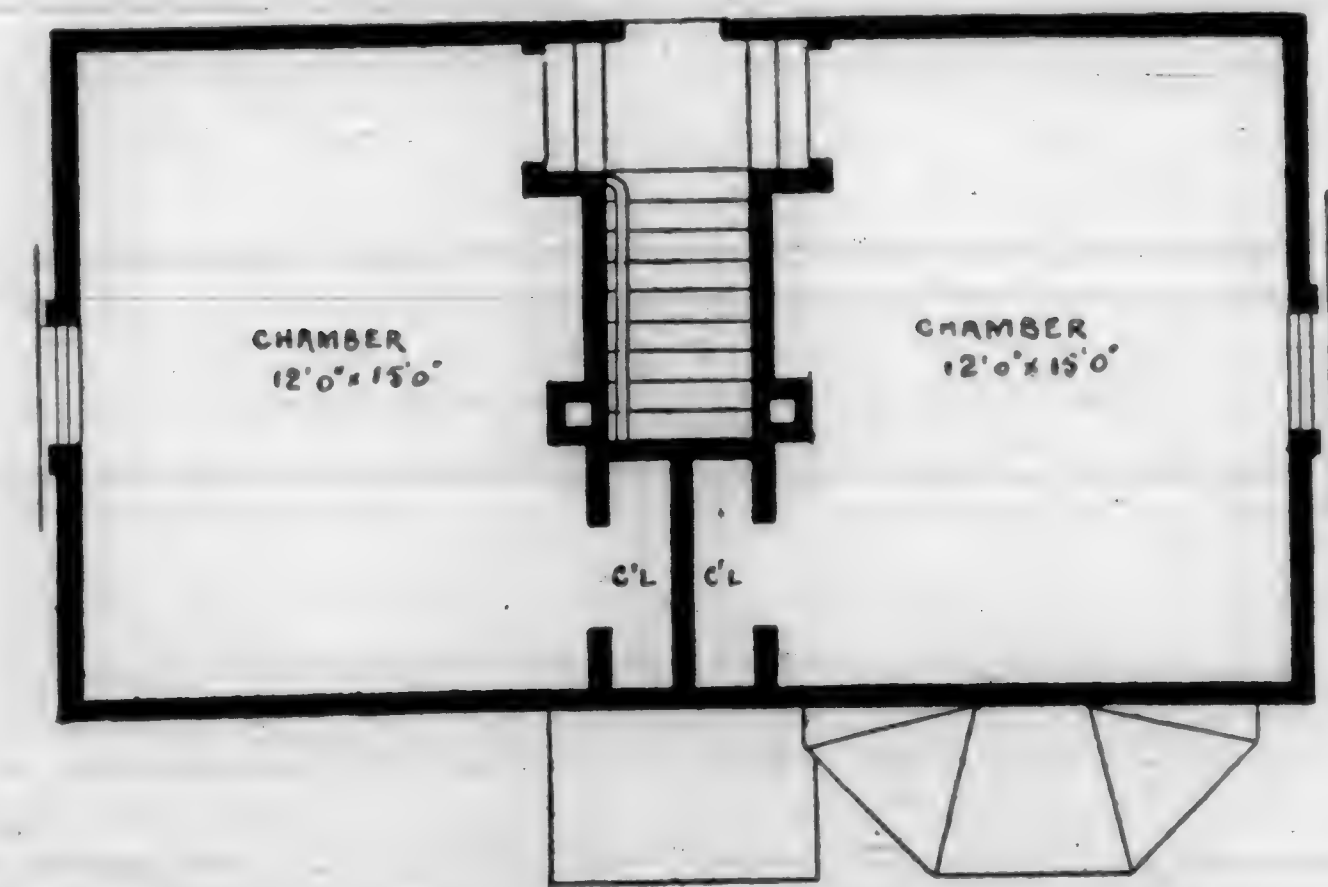


PLATE 7.—SECOND FLOOR PLAN OF \$1,500 COTTAGE.

and expense. Any doubt that may exist in the mind of any one can be set at rest by calling at the office of this journal, and examining the law and decisions bearing upon the case.

Swiss Gothic Cottage.

WE have received a supply of the above from Palliser, Palliser & Co. It is a large sheet on which are given elevation and plans of a Swiss Gothic Cottage. By an easy modification it can be built either as an eight or six room cottage. Full details are given. Price, postpaid, \$2.50.

WHAT CAUSES THE TIMBER LINE?—A writer in the New York *Independent*, says: The cause of what is known as the timber line on high mountains continues to be discussed in scientific periodicals, and the attempt continued to connect the line in some degree with mean annual temperatures. The writer of this paragraph has had the matter in mind when on these high elevations, and the explanation seemed very simple. On all these high peaks there is a continuous, though in some cases slow, descent of the soil from the summit to the base of the hill. He has never seen a case, where there was soil enough to grow a tree, that trees were not growing. As the wash from rain or melting snow will be nearly uniform in a given range, there will be of necessity some uniformity in the timber line. On Mount Washington and other high places, little plots of dark vegetable earth can often be found far above the present timber line, the remains of trees which existed before the earth was washed away. What is called the timber line seldom shows graduated sizes, as a mere matter of temperature would call for. Generally the line is formed of very small trees, and immediately scrubby plants, from the absence of deep soil, begin.

THE California Redwood Company has been formed by English lumbermen, with a capital of \$4,500,000. The object is to purchase redwood timber lands in California, and ship the product across the water.

Exterior Stains.

[From the American Architect and Building News.]

STAINS for exterior use may be divided into two classes: first, those in which the coloring material is actually dissolved in the vehicle; and second, those which are colored with a very finely divided insoluble pigment, mixed with sufficient fixative to make it adhere firmly. Stains of the latter class are therefore merely very finely divided paints. The first class where applicable, is, in the writer's opinion, superior to the latter, as the grain of the wood in the clapboards or shingles is rather more distinctly and vividly brought out. On the other hand the number of colors is very limited which admit of this application. A few of the colors of this description which have been thoroughly tried by the writer may here be enumerated.

American Asphalt.....	Brown
Trinidad Asphalt.....	Brown
Resin Asphalt.....	Reddish Brown
Aloes Gum.....	Greenish Yellow
Yellow Gum.....	Light Yellow
Alizarine.....	Red
Annotto.....	Red
Eosin.....	Red
Dragon's-Blood.....	Red
Azo Yellow.....	Yellow
Amth Yellow.....	Yellow
Methyl Green.....	Green
Malachite Green.....	Green
Nigrosin.....	Blue Black

It is useless to extend this list farther, for the writer has tried almost all the known colors that can be brought into solution in oil. Unfortunately, of this list only the first six are upon careful trial sufficiently fast to be used for exteriors, and of these alizarine is too expensive at present to admit of use except for some special occasion where price is not considered. The remaining ones would many of them answer for interiors, but the combination of rain and sunlight disposes of them outside too easily. We are therefore limited to a very narrow range of colors of this character, and must turn to the second class of colors, viz., those consisting of insoluble pigments with a fixative to hold them on to the fiber of the wood. With these we can obtain almost any desired shade, and if properly ground pigments and suitable vehicles are used, effects can be obtained almost equal to the colors of the first class in respect to showing the grain of the wood. The writer has found the best pigments to be pure oxides of iron (exceedingly finely ground) for the reds, yellows, and browns; pure chromate of lead for lemon yellow; mixtures of these with black and blue pigments for greens and olives. The greatest care should be used in selection of pure and very fine pigments. For a vehicle the best seems to be a purified creosote oil, which practically renders the wood imperishable and is moreover comparatively inexpensive. Linseed oil may of course be used, but it has one difficulty which every one must remember who has seen a lot of old painted shingles taken down. Just behind the butt of the shingle or clapboard is seen a deeply corroded or decayed spot upon the under side, where the

water has been held in between that shingle and the next by the paint, which forms a *cul-de-sac* in which the moisture collects and causes the decay; this is due to the "skin" formed by the drying of the linseed oil, and is not to be found if creosote oil be used in place of linseed. In conclusion the writer would say that he thinks the best way of treating either a clapboard or shingle is to dip about two-thirds of it in the stain, which should be kept well stirred. It should then be allowed to drain back into the pan or barrel by being put into a wooden trough tipping backward, and then should be thrown out on to the grass or clean ground to dry for three or four days. Many houses are built in which the shingles are stained and the clapboards painted. The result would be much finer if both were stained, for stain has the effect of making the whole side of a house look as if it were treated in detail, so great is the beauty and variety of the grain of the wood, while paint reduces the whole to a monotony in which the color *en masse* is the only effect. Any inquiries which the writer can answer will receive the attention of

Yours sincerely,

CHEMIST.

Builders Guide. Price \$2.00.

The Practical Advantages of Trade Journals.

WHAT commerce does to stimulate the industries of the world, the trade journal does for the trade it represents. It would be difficult to name a trade of any importance which is not represented by its journal. The reason of this is clear enough to those who know how much absorbed good workmen are in their calling, and how anxious they are to know what is going on in their own immediate world—what improvements and developments are taking place; what is new, and what becoming obsolete. As the daily paper presents to the general public reports of notable events in the social, political, and commercial world, so the trade journal culls all facts bearing on the interests it represents, and furnishes them to its readers.

The importance of trade journals is indicated by the fact that they are wholly supported by the trades that each represents, and cannot be said, to any appreciable degree, to be read by the outside public. And this condition of things is quite natural, because every one takes the greatest interest in what most intimately concerns himself, and the journal of greatest value to the tradesman is that which has something instructive and encouraging to say about what he is doing, and about what others in the same trade are doing. Some shrewd observers of human nature maintain that the nature and quality of a person's reading, and the departments of a paper to which he turns with greatest eagerness, are sure indexes to his avocation.

Notwithstanding the cordial support given to trade journalism in this country, it may be said that it is not wholly understood or appreciated by those most interested. Much more

could be made of it if its readers were only to consider themselves as contributors and correspondents. There is probably no member of a trade or profession who does not wish to know something or have some doubt removed. There are probably few, whether employers or employed, who have not discovered something in their special calling which, if known, would be of practical value to those of his own trade. Many of the best workmen hesitate to take up the pen to enlighten others, though they are willing to do so, and know that they have ideas which would be helpful to their fellows, simply because they cannot turn out their sentences in a style which they consider proper for a widely-read paper. This is largely due to false modesty, and perhaps through indulging in many a brilliant idea, and often a valuable invention or suggestion of real practical utility is buried in a man's bosom, and dies with him. It is the idea, and not the language which clothes it, that is important. It is the diamond, with its bright sparkle, and not the setting, however rich, that attracts the eye. So the tradesman who has developed anything new in thought or in actual experiment, is in duty bound to give currency to it for the benefit of his fellow workmen, where this can be done without too great pecuniary sacrifice. The gospel parable reproves him most severely who wrapped his talent in a napkin and buried it.

If all artisans and mechanics were to consider their own trade journals as the storehouse for their ideas, and a free exchange for all communications affecting their calling and interest, every journal of this class would grow in importance and general interest. It would be a means of improving their condition, enhancing their skill, stimulating original thought, awakening a more friendly feeling among mechanics, and possibly effecting a better understanding between employers and employed.—*British and Colonial Printer and Stationer.*

"First Class."

A LARGESHARE of the misunderstanding and consequent confusion and trouble in the world seems to come from the lack of an absolute standard of excellence. This is especially the case in matters connected with building. It is a never-ceasing source of amazement to tyros that the estimates, made by thoroughly good, responsible, and intelligent builders upon any given piece of work, for which plans and specifications have been prepared by equally intelligent and experienced architects, should vary so widely. It is by no means an uncommon thing for the estimates of different contractors to vary from ten to thirty per cent., and instances are not wanting where one builder has offered to do work for half the price proposed by another. But a short time ago estimates were made upon a dwelling house in this vicinity, the plans for which had been prepared by one of the best firms of architects in the country, and the lowest figures were \$22,000, the high-

est \$37,000. A still greater variation occurred in estimates for finishing certain departments of a public building whose history is familiar to many people, the highest being between \$42,000 and \$43,000, the lowest between \$18,000 and \$19,000; these estimates were based upon the same plans, the same specifications, and there is no reason to doubt that the men who made them understood the same thing. It certainly is difficult, even for professional skill, to account for these differences, yet it is a part of the experience of every one who has to do with building or with preparing plans for the same. To a large extent this is owing to the lack of thorough training, that is, to this want of an absolute standard of excellence.

"First-class" work does not mean the same thing to men who are differently educated, and, although the phrase is constantly occurring in the written description of work, it is indefinite in its practical application. To one who has had the advantage of a thorough training and practice upon the best kind of cotemporary work, it has a distinct meaning with reference to what he has already done; but to one who has had no such experience, and whose best work would seem to the other entirely unworthy and inexcusable in a given case, it means something entirely different; i. e., although both read the same words, yet judged by the same standard one agrees to perform that which is many times greater in value than the other. Referring to the details of work it is impossible to estimate the value of the labor required to execute anything which depends upon the skill and intelligence of the workman. A spindle, revolving a fixed number of thousand times a minute, may be depended upon to turn out a fixed amount of yarn in a given time. It is not possible to measure the capacity of a workman in the same way. He may drive a nail with two blows or three; he may smooth a board or straighten a joint with five strokes of the plane or ten; he may cover a square yard of lath with plastering or of clapboards with paint in five minutes, or it may take him ten; and this variation carried out through all the details makes the difference between the \$5,000 or the \$10,000 of the aggregate estimate. Hence it follows that the greatest uncertainty usually appears in those structures or parts of a building in which manual labor is the chief item of cost, and the buildings in which this occurs are not alone those of elaborate and expensive workmanship, but those which deviate in their style and manner of construction from conventional and familiar modes. This latter fact accounts for another peculiarity that is often referred to as one of the unaccountable points in building; that is the difference between ready-made houses and those which are built from special plans. It is easy to duplicate the cheap, every-day styles of building—those with which every mechanic is familiar in every part, from the thickness of the cellar wall to the pattern of the scroll-sawed

bracket—but a house of precisely the same size, precisely the same amount of material, and requiring actually the same amount of labor, will be found more difficult to estimate in proportion as it appears to contain more unknown quantities—not necessarily larger or more complex quantities, but they are unfamiliar, and neither contractor nor workman undertake them with as much confidence and expedition. The practical remedy, as far as it appears at present, for this unsatisfactory state of affairs,—for it is unsatisfactory, begetting distrust and disappointment continually,—is the more thorough training of workmen, the dissemination of such technical skill as will give to mechanics and builders not only better facility in doing work, but a more reliable standard of excellence,—in brief, technical, industrial education. It follows, without the need of saying it, that when contracts must be made the only safety lies in keeping clear of all but thoroughly competent and reliable contractors.—*The Builder.*

Village Builder. Price \$10.00.

Rights of Owners of Buildings.

IN referring to the right of owners of buildings, we have not in view such covenants as they may make with tenants, and in which they are secured, but those which exist for compensation for damages inflicted at the instance of neighboring owners. The most unquestioned claim exists where the latter so carry out excavations as permanently to weaken foundations or cause subsidence of adjoining building, thus affecting the value or rentable value of the property, and possibly endangering its maintenance. We may state at the outset that owners of buildings in this country have fewer rights than those generally possessed by their class abroad. The laws in England and on the continent are singularly minute and exacting as to what constitutes special damage, and builders are proportionately embarrassed. In England, the erection of a building can be prevented, so far as it will obstruct the light or interfere with the view from the windows, should such windows have existed for the term of twenty years. These "ancient lights" are jealously protected by the courts, even though pertaining to premises old and dilapidated. Such a legal provision would never consort with our city improvements. On the other hand, as respects the effect of the erection of one building on another, the Supreme Court has held that no compensation can be obtained for indirect damage. It is not even clear that the damage occasioned to houses by the vibration caused by the running of trains on the elevated railways, constitutes a claim for compensation on the part of aggrieved parties, the cases in which they have taken action being yet unsettled among the appeals to higher courts. An instance of a clear case, allowing of compensation, is when the preparation of the foundations of a building causes damage to the neighboring property under different owner-

ship, by subsidence, owing to excavations being carried too low down; or carrying these on beneath such property without proper underpinning, or neglect sufficiently to shore the side wall; or, furthermore, when by injudicious or overcharged blasts detriment of various natures result. But where a building is entirely removed, so as to take away the support which the adjoining building, owned by another party, has enjoyed, the question as to whether a suit for damages can be sustained becomes complicated, for a reason set forth by the *Building News* in treating of damage to buildings, English rulings on this point being followed.

"In theory, the law supposes, for the purpose of a claim, the owner of the servient house to have been acquainted with the fact that his own building was necessary for the support of the adjoining premises—a kind of knowledge that cannot always be brought home with any direct evidence."

This is evidently a point difficult to establish. Houses in streets have very often been built together (afterwards falling under different ownership), and each most probably requires to some extent the mutual support of another, and in such a case the owner of a house has a right to look for support to his neighbor, as the possessors have in law a presumed reservation and grant, even although the original owner parts with some of the houses. The frequent need for taking down internal cross-walls, which perform the office of struts, and for excavating to a greater depth for drains and other purposes than the foundation of adjoining premises, underpinning operations and the like, call for special consideration on the part of architects, that they do not weight builders with undue responsibilities. We can hardly take an extended walk in portions of New York where excavations are being made, or foundations laid, without meeting with instances of sheer recklessness. We must allow that house owners of New York, and it is true probably of those of other cities, are not very forward to assert their rights. They take quietly cracks, and possibly serious settlements, have their doors thrown out of square, and windows fixed without protest, though decisions at law have shown that the building owner is liable. If the latter excavates below a neighboring foundation, he is bound to underpin it, for the first to build and take up his lease is entitled to the support of the adjoining land.

Many buildings are erected depending on lateral pressure, and the law provides a remedy if such support is withdrawn. It is the business of the architect to find out the position of adjoining parties. A landlord owner is responsible for damages to adjoining parties in taking down buildings and walls, the neighboring building being entitled to the amount of support that previously existed, if this support be essential to solidity. There are a great many ways in which property may be interfered with, and the cases in which these have been made the subjects of lawsuits are widely

scattered. The circumstances cited, however, so greatly vary, that it would answer no purpose to specialize them. It may be remarked, generally, that owners of buildings have more rights than, as a general rule, they have chosen to avail themselves of; but this forbearance, viewed from a moral standpoint, should constitute an additional incentive to architects to avoid negligence, and to builders to make the necessary provision against the consequences likely to arise from want of precautionary works.—*Building.*

Our Mammoth Supplement.

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Wood Finish.

THE patented preparations known as wood fillers are prepared in different colors for the purpose of preparing the surface of wood previous to the varnishing. They fill up the pores of the wood, rendering the surface hard and smooth. For polishing mahogany, walnut, etc., the following is recommended: Dissolve beeswax by heat in spirits of turpentine until the mixture becomes viscid; then apply by a clean cloth, and rub thoroughly with a flannel or cloth. A common mode of polishing mahogany is by rubbing it first with linseed oil, and then holding trimmings or shavings of the same material against the work in the lathe. Glass paper followed by rubbing also gives a good luster. There are various means of toning or darkening woods for decorative effect. Logwood, lime, brown soft soap, dyed oil, sulphate of iron, nitrate of silver exposed to the sun's rays, carbonate of soda, bichromate and permanganate of potash, and other alkaline preparations are used for darkening the wood; the last three are specially recommended. The solution is applied by dissolving one ounce of the alkali in two gills of boiling water, diluted to the required tone. The surface is saturated with a sponge or flannel, and immediately dried with soft rags. The carbonate is used for dark woods. Oil tinged with rose madder may be applied to hard woods like birch, and a red oil is prepared from soaked alkanet root in linseed oil. The grain of yellow pine can be brought out by two or three coats of Japan much diluted with turpentine, and afterward oiled and rubbed. To

give mahogany the appearance of age, lime water used before oiling is a good plan. In staining wood, the best and most transparent effect is obtained by repeated light coats of the same. For oak stain a strong solution of oxalic acid is employed; for mahogany, dilute nitrous acid. A primary coat or a coat of wood fillers is advantageous. For mahogany stains the following are given: Two oz. of dragon's blood dissolved in one quart of rectified spirits of wine, well shaken; or raw sienna in beer, with burnt sienna to give the required tone; for darker stains boil half a pound of madder and two oz. of logwood chips in one gallon of water, and brush the decoction while hot over the wood. When dry, paint with a solution of 2 oz. of potash in one quart of water. A solution of permanganate of potash forms a rapid and excellent brown stain.—*Mechanics.*

What Shall We Stand Upon?

A FEW years ago the architect, in writing specifications for his houses, had very little difficulty in describing the floors. Any good, smooth lumber that was well seasoned, would lie still, and which would admit of tacks being driven in and pulled out twice a year was all that was required. Now the description of the parquetry, borders, and inlays, the matching, the woods, the grain, the texture, the provision for rugs and hearths and registers, make the planning and description of the floors an important and sometimes a complicated affair. The demand for carpets still continues, but there is undoubtedly an increased use for floors that are intended to be used wholly or partly uncovered. This is partly owing to the caprice of fashion, which at present inclines towards rugs, and partly to a conviction that bare, clean floors are preferable on sanitary grounds. Of the woods that are most available for such floors probably none is used more than southern pine, and if this is of the best quality it is very satisfactory and not expensive. The poorer kinds are liable to splinter, which is a serious fault. Maple, birch, and cherry are admirable for this purpose on account of their fine, smooth, firm grain, and the readiness with which they take on a hard polished surface. Quartered white oak is irreproachable. It is needless to say that for a perfect floor—that is a smooth, hard, and unbroken surface—it is indispensable that the material should be perfectly seasoned and also that the narrower the separate pieces are the less it will be affected by atmospheric changes; the less liable will it be to develop cracks and wrinkles as it grows old. It is also very important that the lining floor to which it is nailed should be of well-seasoned and reliable stock. A poor foundation ruins whatever is laid upon it, and the finest hard wood floor in the world fastened to an unseasoned layer of coarse spruce or hemlock boards will no more keep in place permanently than a brick wall would stand upon a foundation of logs. Even if the lining floor is seasoned when laid it is liable, especially if the boards are wide, to be swollen by the damp weather in

summer and shrunk by the steam heat in winter, and each board will carry the separate pieces of the finished floor lying upon it. It is a very common thing to see these wide cracks in the upper floor occurring at regular intervals and indicating the width of the boards below. When the upper floor consists of narrow widths running parallel to the lining, that is at right angles to the joists, the trouble arising from the shrinking and swelling of the under floor can be obviated by laying them diagonally. As it is so common to cover the central part of the floor with a rug of some sort there is no reason why this should be made ornamental; plain, narrow strips of any smooth hard wood being all that is required. Around the edges, where the floor is supposed to be seen, a more or less ornamental border is appropriate, but as a rule the less ornament the better, or rather the less elaborate. The manufactured fancy wood floors are, as a rule, too complicated to be agreeable. They suggest puzzles and a sort of intricate but inartistic mosaic that is, to say the least, misapplied in such a position and of such materials. Wood floors are sometimes made by sawing the blocks of wood in very short pieces, and setting them endwise with the grain. Such must be laid with the utmost care, and, unless perfectly seasoned, show to the fullest extent the shrinkage. They are not liable to splinter and would be exceedingly durable, although for ordinary use in a dwelling house a well-finished wooden floor of any of the harder woods, especially covered with rugs, would probably stand the wear of fifteen or twenty generations without essential injury. There are many advantages in laying a border of finished wood around the outside of the room a quarter of an inch thicker than the center part, which is to be fitted with a carpet nailed down in the regular way; and this is likely to be preferred by those who find it inconvenient to use rugs without kicking up the corners, and who are unwilling to give up the familiar and well-established custom of regular carpets.

Among those who devote themselves to discovering sanitary faults in buildings the ordinary construction of floors comes in for a share of their disapproval. It is claimed that the cracks that are sure to appear sooner or later are constantly gathering dust and dirt from sweeping and washing, which falls between the joists, upon the lathing and plastering, and becomes a constantly increasing source of uncleanness and therefore of danger. Whoever has helped to tear down an old house or to cut holes in the floors of those that are of recent date, especially if rats and mice have inhabited the inner chambers, will not need to be told that there is an abundance of uncleanness concealed from sight. Much of this is due to the carelessness of builders who leave rubbish under the floors.—*The Builder.*

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How It Works in New York.

WHEN the plumbing law went into effect in this city and Brooklyn nearly two years ago, it was everywhere regarded as a most important departure in a novel direction in city administration. The law has now been in effect long enough to indicate its benefits. While it has not been possible to obtain exact statements of the particulars in which to-day plumbing has been improved over what it was three years ago, there is not the least doubt that a great improvement exists. It is now impossible to repeat the gross blunders which were common a few years ago. Plumbers, builders, and architects have all been forced to recognize what is essential to the planning of proper work, and it is probably true, as stated by the Health Department, that the law has gradually raised and is still raising the standard of workmanship in the great mass of houses of moderate cost.

Before this law the Health Department had practically no supervision of new work. As a result, in consequence of the fact that the great majority of houses were then, as now, built for speculation by unscrupulous men, serious sanitary defects were very common. Soil and waste pipes were not usually extended above the highest fixture; fixture traps were unventilated; joints were frequently made with putty or cement and very defective; water-closets were flushed directly from the mains; house drains were generally of earthenware, laid under the cellar floor, and often very defective; and many other practices, fraught with danger to the health of the occupants, were common.

The work of enforcing the law was at first attended with great difficulty; owners failed to submit plans and specifications, and builders failed to comply with them after they had been approved by the Board of Health. It was hard to change the prejudices of plumbers, and to make many of them see the necessity for the regulations of the Board of Health. For a time the character of the work continued nearly as bad as before the law, and it was not until the Board resorted to legal measures, and the builders began to see that the law was to be rigorously enforced, that the work showed much improvement. The successful suit of the Board in the case of the Weiher houses at Fourth Avenue and 120th Street did more perhaps to bring about a decided change for the better than any other. This was an unusually persistent and serious case of violation, in which the Board ordered the plumbing taken out and reconstructed and were sustained by the courts.

At last builders have come to see that it is for their interest to have their buildings plumbed well; they have found that it is difficult to sell or rent a building in which the plumbing had not been approved by the Board of Health. It is now a common thing for intending purchasers and money-lenders to go to the Health Department to inquire if the

plumbing of the houses they think of buying or lending money on has been approved by the Board.

Notwithstanding the great improvement in the character of the work, the number and occasionally very serious nature of the violations show the necessity for constant vigilance. During the first half of this year violations were reported in 535 houses. This by no means represents all the actual violations, for in very many cases it is only necessary for the inspector to call the attention of the plumber to the fault to have it promptly removed. On the 9th inst. there were reported in progress of construction 2,243 buildings, of which 1,023 contained plumbing on that date. The seven inspectors visit all of the latter at least once a week to inspect the work done since their last visit, and keep watch of the remainder to learn when the plumbing begins.

In justice to the plumbers of this city, it should be said that the great majority of violations are by a few men (not more than ten or twelve), who are outcasts from the trade, not members of the Master Plumbers' Society, or if members not attendants at the meetings. To the co-operation of all respectable plumbers is the success of the law very largely due.—*The Sanitary Engineer.*

How Screws Are Threaded.

SCREW threads are "originated" in the lathe usually. All lathe turning, with regular—constant—feed of the turning tool, is screw cutting, or threading; the tool cuts a spiral around a revolving cylinder.

It is evident, therefore, that by increasing the speed of the feed relative to that of the revolving cylinder, and having the point of the cutter properly shaped, a screw thread would result, instead of a paring off of the entire surface of the cylinder. All important actuating or working screws, as those for feeding on machine tools, are formed in this way, and large numbers, also, of ordinary machine screws, which when once seated are expected to remain *in situ* until the machine or implement of which they form a part is worn out.

Wood screws, as screws for fastening wood to wood, metal to wood, etc., are threaded in a similar manner, the thread being cut from the solid by a single cutter removing the material between the threads.

Large numbers of screws are threaded by dies, which may be called hollow screws, or nuts with cutting edges. These, by rotating, form the feed as well as the cutting device for threading the smooth cylindrical rod or bar. Some of these dies are worked by hand, others by power, but in either case the cut, by the modern and improved dies, is clean, and the thread is formed from the solid. The old-fashioned dies were adjustable so as to be "set up," and could be made to cut several sizes of diameters. Much of their work was done by pressure, or squeezing, and a part of the thread was "raised" instead of being cut from the solid material. There are adjustable dies

made now, but they are so formed as to do solid cutting.

There is another method of cutting threads direct from the solid, and that is by milling. It is the invention of the late Eli Horton, the chuck man of Windsor Locks, Conn. The machine is entirely automatic, the blank to be cut being rotated as in a lathe, and a rotary milling tool rotating against it at an angle adapted to the pitch of the thread desired. As the blank revolves slowly toward the cutter, the cutter revolving more rapidly forms the thread by being fed along over the blank as is the cutting tool in a lathe. The milling tool is so formed in cross section as to produce any shape of thread desired. This method is still in use by the successors of Mr. Horton to thread the steel screws of their chucks.

Threads on large cast iron screws are sometimes formed simply by being cast, and formerly there was much cheap small work of that sort in the market.

Threads may be raised by forging in dies, and some good work by this is produced. In both these cases, however, an after finish in the lathe is desirable.

For some peculiar purposes threads are formed by twisting a square or a flat bar, a common form of hand drill that has superseded the bow drill being a case in point. The stock of this drill is a bar, square in cross section, twisted, and which is rotated by sliding a loosely fitting nut rapidly back and forth over its length. A familiar instance of a screw thread of this description is the ordinary auger or bit, the cross section of which is a flattened parallelogram like a flat bar.

One peculiar method of forming screw threads remains to be mentioned. It is that of raising a thread by rolling between dies under pressure. There is a great deal of what is known as "bright wire goods" in the market, which are threaded. In many cases these threads are formed by simply rolling—one revolution, or a little more—the wire between two hardened steel plates that are corrugated spirally to form, when combined, a continuous thread. Sufficient pressure is applied during the rolling—which, however, is very rapid—to raise the metal enough from the annealed wire to make a thread. In this case the threaded portion is considerably larger than the stock or wire, at least half the depth of the thread on each side.

The threads in nuts are produced either by the "originating" method, cutting them in a lathe, by being tapped, or sometimes by being cast of soft metal, as brass, on a threaded core of hard metal, as iron or steel. But nuts are mostly threaded by tapping, running one, two, or three successive taps through them either by hand or in a power machine. Nuts of very thin material, as sheet brass for lamp tops, jar covers, etc., are formed simply by rolling between spirally corrugated rolls, a work analogous to "beading" on tin ware.—*Scientific American.*

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