it has not recovered for the space of twelve centuries.

The ravages of the Visgoths, in the fifth century, destroyed all the most beautiful monuments of antiquity; and Architecture thenceforward became so coarse and artless, that their professed architects understood nothing at all of just designing, wherein its whole beauty consists, and hence a new manner of building took its rise which is called the *Gothic.*

Charlemagne did his utmost to restore Architecture, and the French applied themselves to it with success under the encouragement of H. Capet, his son Robert succeeded him in his design, till by degrees the modern Architecture was run into as great an excess of delicacy as the Gothic had before done into passiveness. To these may be added, the Aresbek, and Morisk or Moorish Architecture, which were much of a piece with the Gothic, only brought in from the south by the Moors and Saracens, as the former from the north by the Goths and Vandals.

The architects of the 13th, 14th, and 15th centuries, who had some knowledge of sculpture, seemed to make perfection consist altogether in delicacy and multitude of ornaments, which they bestow upon their buildings with a world of care and solicitude, though frequently without judgement or taste.

In the last two centuries, the architects of Italy and France were wholly bent upon retrieving the primitive simplicity and beauty of Architecture; in which they did not fail of success; insomuch, that our churches, palaces, &c. are built after the antique. Civil Architecture may be distinguished with regard to the several periods or states of it, into the antique, ancient, gothic and modern, etc. Another division of Civil Architecture arises from the different proportions which the different kinds of buildings rendered necessary, that we might have some suitable for the purpose according to the bulk, strength, delicacy, richness, or simplicity required.

Hence arose the five orders, all invented by the ancients at different times, and on different occasions, viz: Tuscan, Doric, Ionic, Corinthian, and Composite. The Gothic Architecture may also be mentioned here, for it is perfectly distinct both from the Grecian and Roman style, although derived from the latter.

LAWS OF PROJECTION.

In explaining the theory of projections, no allowance will be made for atmospheric resistance. In most cases the projection of liquids is subject to, and governed by the same laws as that of solids. If a body—a ball for instance—is projected vertically upwards, it will require the same time to return that is occupied in ascending; and the time required in ascending and descending may be readily ascertained; also the extent of its projection, by having the given quantity of power applied. By a similar rule, the height of projection, and the power applied, may be ascertained by the time occupied—the weight of the ball being known; or the power and time may be ascertained by the height to which the ball is projected. A body in falling will descend one foot in one fourth of a second of time, and will quadruple the distance as often as the thing is doubled; thus, four feet in half a second, sixteen feet in one second, &c. Now, if a ball ascends by projection 16 feet, it will require one second, to ascend, and another to descend, making two seconds. If the weight of the ball is one pound the power required to produce the projection will be equal to raising one pound 16 feet—16 pounds 1 foot—or 64 pounds three inches: therefore, if the force applied is continued but three inches, the pressure must be 64 lbs. If four times the power is applied, the ball will be projected 64 feet high, and the time occupied in ascending and descending will be four seconds. The velocity at the time of starting and at the termination of its descent will be at the rate of 64 feet per second. To ascertain the height to which a projected ball has ascended, by the time of its absence, multiply one half of the time of the absence in fourths of seconds by itself: the product will be the height of its ascent in feet. For example, if the ball is absent four seconds, one half of the time is two seconds, which is 8 fourths of a second, then 8 times 8 are 64, which is the height of its ascent in feet. To ascertain what force is required to project a ball to a specified height, multiply the given height by the distance which the force is continued, and that product by the weight of the ball. For example, if a ball weighing 4 lbs. is to be projected to the height of 64 feet and the force is to be applied for the space of three inches being multiplied by 4 to make one foot; and 4 being multiplied by 64 makes 256; this product being multiplied by 4—the weight of the ball—gives 1024 as the required force. When a ball is projected obliquely so as to form a curve, the velocity of the ball will be retarded by gravity during the first half of its journey, and accelerated by the same force, and in the same proportion, during the other half. If it be projected at an inclination of 45 degrees with the horizon, and with sufficient force to elevate it 16 feet at its highest altitude, it will have performed its journey in two seconds, and at every point of its progress will be directly under the point at which it would have been if it had kept on a direct course without having been affected by the force of gravity. In other words its horizontal progress will be uniform; and at every point of time, during its progress, it will be just as far below the line of direct inclination as it would have fallen in the same time perpendicularly. Therefore, knowing the velocity with which a ball is projected, the time required for its arrival at any point in its progress may be readily calculated, also its vertical elevation at any point in its horizontal progress.

Cheap Railroads.—All, or most of those who have seen railroads, have also seen occasionally running on them, cheap and light-made cars which are propelled by means of a crank which is turned by one of the passengers. These hand-power cars are furnished for the convenience of laborers on the roads, and are by them used for conveying themselves from their residence, to such places on the road as require repairs or other business. These cars are usually propelled at a speed of ten or twelve miles per hour. It has been suggested that there are many places where light railways might be constructed at a cheap rate—at an expense not exceeding $2 per rod—which should be useful for the conveyance of passengers between villages, or from one point to another in the same town or city, by this light kind of cars to be thus propelled by hand. It is argued that the business of working them would be no more laborious than rowing a ferry-boat by hand, which is extensively practised in places where the business will not support steam ferry boats. Two men are able to propel a light car ten miles per hour with twenty passengers; and a road for this purpose merely, might in many places admit of an elevation on posts in a cheap manner, which would not be safe for a road of ordinary service. There may undoubtedly be found many places where a cheap road for the purpose would prove a profitable concern.

The Springfield Bridge.—The new Railroad Bridge over the Connecticut river at Springfield, is constructed on a novel plan, exhibiting much rational science and calculation, which in connection with its extraordinary length and height, renders it conspicuous among the many artificial curiosities which the progress of science and enterprise has recently brought into view. The length of this bridge is 1300 feet, its height from the surface of the river to the top of the bridge, is near 50 feet. It is built on the strait, cross-brace principle, and rests on six well finished stone piers. One striking peculiarity of this bridge is, that in its entire construction, it has neither mortise nor tenon; the braces are simply abutted against certain cross-chucks which are *gained* into the caps and sills, and the latter are firmly secured by stout iron bolts which extend vertically from the sills to the caps, passing through both, and terminate in huge screws and nuts to match: thus effectually securing the bridge against the possibility of looseness in its joints. This bridge was projected and constructed by Mr. Howe of Warren, Mass., at an expense of $115,000, including stone work. We shall probably furnish a full length view of this bridge as soon as we can conveniently procure the engraving.—*Mechanic.*

Velvet Carpet.—Most people have seen a beautiful article of paper hangings, usually termed 'velvet paper,' the figures on which resemble fine casemere of brilliant colors. The velvet carpet is made on a similar principle. The base is of cheap and strong cotton sheeting. The figures are formed of old woolen cloths of various colors ground up fine, and secured to the base by a strong copal cement. The rich and elegant figures are rapidly formed by a peculiar process and operation of machinery. This carpet is calculated to be very durable, and will come into market cheaper than any other kind for handsome floors.

Preserving Ice.—Much has been said of late on the efficacy of saw-dust for preserving ice, from which it might be inferred that there is some peculiar *anti thaw* principle or property in saw dust, which is not found in other materials. The fact is, that the excellence of saw dust for this purpose, consists not in the substance of which it is composed, but in the peculiar form of its grains, which admits of a large proportion of intervening air, which is a bad conductor of heat when confined, and the only use of the saw dust, is to prevent its circulation. It may be kept a long time enclosed in a box made of thick pine plank; but the solid wood will not so throughly exclude the caloric of the surrounding atmosphere, as an equal quantity of confined air between two thin partitions of wood. Let a box be made of very fine pine boards, arranged in a succession of four or five partitions half an inch apart extending round and over the entire cube, and ice may be kept in it through the summer season, without sawdust or any other material.

Mowing Machine.—Many attempts have been made to construct a machine that might be worked by horse power for cutting grass; but none have succeeded. Some experiments have been recently made on a mowing machine to be managed by hand, which appears likely to supersede the use of the scythe on clear fields, and if it succeeds will save more than half of the labor of mowing. It is calculated to take a swarth or course, five or six feet wide and cut smooth and close as fast as a man can walk over the ground. Of course a man will mow an acre in less than an hour. Another advantage that will attend this machine is that it will leave the cut grass all lying one way, and of a uniform thickness, thus saving the labor of spreading the swarths. The cost of the machine will not exceed two dollars.

The Double-hand Rake.—This machine being nearly allied to that for mowing we give it a notice in this place. It has been introduced, thoroughly proved and several of them are in use. It consists of a very light arrangement of frame work about ten feet long, with handles at each end by which two take hold of the machine and walk abreast allowing a part of the rake to slide on the ground, which gathers the hay very clean, and readily deposits the same in *winrows* at the option of the managers. This rake is much more economical than the horse where the hay is light, and ordinary men can with one of these rakes gather the hay from an acre of land in twenty minutes.