cludes the whole space of the building including the court. The court will be roofed with glass. The walls and partitions above this story rest on iron columns, leaving the whole space on the lower floor open for light and free communication.

A broad corridor will extend about the lower floor on the southwest, reaching to and including the central pavilions; it will surround a box and delivery screen. This corridor will be only one half story high. Above it the remainder of the story will be formed into a gallery looking inward to the delivery rooms.

Corridors encircle the building in each of the upper stories, bounded on the exterior and interior by rooms lighted from the street and central court.

The rooms of the Postmaster, Deputy Postmaster, and Cashier will be over the principal entrance at the southwest. The Park front rooms will be occupied by the United States Courts. Three court rooms will be provided, two of which will be the hight of two stories. Adjoining these rooms will be special apartments for the judges. The remainder of the second and third stories will be occupied by offices for United States Marshals and other officers, United States attorneys, clerks, and other officers connected with the courts; and the jury rooms will be in the third story.

The work has proceeded slowly owing to various obstacles, some raised by the city authorities, but it has now reached to the second story.

As our readers will see, the lower part of the building is open to the criticism that its numerous angles will form most efficient dust traps. This will inevitably impart a dingy dirty appearance, which will greatly mar the effect designed. We regret that some other design for this story, in harmony with the rest of the design, yet not liable to the objection named, was not adopted.

Barring this defect, the edifice, when completed, will present a majestic and imposing appearance.

Stone, iron, and brick are the materials used; the exterior is of granite. One hundred and fifty-nine iron columns are placed in the basement, and one hundred and seventeen to support the partition walls and floors. The foundations are of granite and concrete, and are of the most substantial character. The floors will be of brick and iron, the stairs are to be of stone and iron, the roof of iron, covered with slate and copper. The building is to be heated by four large low eprssure steam boilers.

The roofs of the corridor pavilions rise 107 feet above the sidewalk. The foundation of concrete is laid 35 feet below the sidewalk: the cellar is a little more than 7 feet in the clear, the basement 16 feet, the public corridor 14 feet, and the *mezzanine*, or gallery above, nearly the same. The outer circuit of the building will be over one fifth of a mile.

The granite comes from an island off the coast of Maine, where 600 men are employed in quarrying and dressing it. No stone cutting is done at the building. When the blocks arrive, they are ready to hoist into the places prepared for them. Derricks, worked by steam engines, are arranged in such a way that it requires only one man to set all the stone which 600 men are cutting.

The north front of the building will be 290 feet in length, the Broadway front 340 feet, and the Park Row front 320 feet in the clear. On each of these two fronts, however, there is an angle, which, running back some distance and then projecting, forms the entrance looking down Broadway. The entire width of this front is 130 feet. These entering angles and projecting portico will give this front a very bold and striking appearance.

The Doctrine of Metempsychosis.

At the time of the death of Mr. Louis Bonard, an ingenious mechanic of this city, we called attention to his bequest, to the Society for the Prevention of Cruelty to Animals, of $100,000. The testator's relatives are disputing the validity of the will on the ground of insanity, and rely partly upon the alleged belief of the deceased in the transmigration of souls. Dr. Clymer was examined as a witness, and, on being asked if he considered such a belief to be a mental delusion, replied:

"I will tell you in my own way. It appears that opinion was at one time a very common doctrine. In modern times we know it more as the doctrine of Pythagoras, but he got it from the Egyptians. Now, it is told, they were the first who believed in the immortality of the soul, and that this was the first expression of such belief. They held that the soul, being immortal, when it leaves the body, enters another, and never ceases to be removed from one to another. Metempsychosis implies the passage of that soul into animals successively, and, according to some who held the doctrine, again returning, after certain purifications by its progress through these animals, to the human form; and this was one of the reasons why the Egyptians preserved their mummies. This doctrine was held by the Druids of France, Britain and Germany, and is held by the Brahmins, and, in more modern times, by Fourier, and his disciples in France. Origen, one of the Fathers of the Church, held it, and some theologians endeavored to prove it as held in the New Testament, from the 9th chapter of St. John, and others say the doctrine of purgatory originated in this way. Our own Christian doctrines are held variously. What one believes, another thinks a delusion, but a medical man, finding no evidence of delusion generally, would not be warranted in saying such a person labors under mental delusion. The transmigration of souls was held by some of the first minds in ancient and modern times, and I do not consider a belief in it necessarily implies that he was laboring under delusion."

YOU may glean knowledge by reading, but you must separate the chaff from the wheat by thinking.

Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

Fireproof Building.---How they Build in Berlin.

To the Editor of the Scientific American:

The late Chicago fire has called public attention to the subject of fireproof building; and within the last few weeks a number of articles about this matter have already appeared in the columns of your paper. It seems to me that all endeavors to find constructions which will be really fireproof—for instance, so as to stand a fire like the one in Chicago—are useless, at least as far as the majority of our buildings are concerned, for the simple reason that even if such constructions were found, they would be too expensive for our ordinary dwellings, stores, etc. If stones, bricks, and iron are considered insufficiently fireproof, we may give up the idea of building our cities of fireproof houses. The proper remedy to prevent large conflagrations is to build all houses in a city as fireproof as can be done at a reasonable cost. If only all frame buildings, as well as the unnecessary use of wood for inside work, roofs, etc., were absolutely prohibited, and no lumber yards and the like were allowed inside of our cities, the houses need only be built substantially of stone brick, and iron, and we should have no more conflagrations of any extent. In most of our cities, however, the building laws are, or at least have been up to a recent date, of such a deplorable nature, and a mode of building has accordingly been in use, that a fire can hardly be expected to remain confined to the house in which it originates. As long as party walls are allowed, and chimneys are built without any foundation, but supported only by a couple of joists, etc., etc., our houses will always be apt to communicate a fire from one to the other, as, as soon as a whole row of houses is in flames, the heat is sufficiently intense to set fire to adjoining buildings, even if they are built independent of the former.

An example that it is not necessary to build a city of fireproof buildings only, to prevent any large fires, is the city of Berlin. There has been no fire of any extent during the last ten years, the mere reason of which is an excellent building law and a strict enforcement of the same, in combination with an effective fire department.

In this country, however, even where more money is spent on a house than is necessary to construct it fireproof to a certain extent, we often find that a great deal of money is expended in such a manner as to make the building as unsafe as possible against fire. We will only allude to the "lumber piles" which are put on many houses, in the form of "French roofs." Our stores and offices are lined with neatly dressed lumber, which, to make it the more dangerous, is oiled or varnished. Is it a wonder if a safe in such an office proves insufficient to preserve its contents in case the building takes fire? Such unreasonable use of wood for the inner outfit of our houses should not be tolerated, in the same way as, in most of our cities, shingle roofs are now prohibited by law. For the majority of our buildings, lumber cannot be entirely excluded as building material, as for floors, joists, rafters, etc.; but its use should be diminished as much as possible; wooden partitions should be abandoned, and the stairways should be made either of iron or stone, and self supporting, so as to require no casing, a construction which cannot be too highly recommended.

I have been in Berlin for four years, from 1862 to 1866, and I do not recollect ever to have seen a fire there. I have often seen the engines in position, ready to go to work, but in almost all cases the fire was suppressed without bringing them into use. How does this compare with the fires in our American cities, where in one half of the cases the damage done by water is greater than that by fire?

Baltimore, Md. H. DUEBERG.

An Appeal to Dr. Vander Weyde.

To the Editor of the Scientific American:

Professor P. H. Vander Weyde, in one of his very interesting articles upon psychic force, speaks of the Davenport brothers, and how that he had performed the same wonderful feats as those jugglers. Now, as they have astonished and excited the wonder of large audiences in nearly every city in the United States, the Professor would confer a favor upon thousands, perhaps hundreds of thousands, of his fellow citizens, if he would give a clear and full *exposé* of the wonderful performances of those men while in their cabinet; such as the taking off of the coat of one of them, while securely tied, and the knots sealed with sealing wax; also the putting on of another gentleman's coat while he (the Davenport) was tied fast to a chair. Of course the light was extinguished during the performance, but not longer than it would have taken a man, not tied, to put on or take off his coat. And will the Doctor also explain the passing of the musical instruments around the hall, with phosphorus on them to enable the audience to see their movements?

Americus, Ga. J. FRICKER.

Squeaking Boots Again.

To the Editor of the Scientific American:

I have two pair of calfskin boots, both inveterate squeakers, which I have worn for a year. I tried all the known remedies, as greasing the soles, driving in pegs and nails, soaking them in water and wearing them till dry, but without success. At length a happy thought struck me. With a rag, I saturated the insoles with kerosene oil; and *Eureka et* glory! O hallelujah! the thinnest pair gave in at once, and the other pair after the second application.

Sextons and ushers will please make a note of this, and ever cherish, with grateful remembrance, the name of the discoverer, JONES.

[For the Scientific American.]

ABSORPTION OF MOISTURE BY BRICK AND STONE.

BY JOHN C. DRAPER, PROFESSOR OF CHEMISTRY UNIVERSITY MEDICAL COLLEGE, NEW YORK.

In the construction of buildings in a climate like ours, it is of tho utmost importance that the materials employed should absorb and retain as little water as possible, otherwise the buildings will be damp, and the presence of quantities of moisture in their walls will favor the formation of vegetable growths upon their surfaces, which will, together with the action of frost, aid materially in the process of disintegration.

In a recent experimental investigation of this subject, I selected the following materials, namely, brown stone and Nova Scotia stone of the best quality, fine red Philadelphia brick, and a very compact, hard burned, white brick, stamped A. Hall & Sons, Perth Amboy, N. J. Masses of equal size of each were placed in water for twenty hours to allow them to imbibe as much of the fluid as they could take up. They were then turned about on blotting paper as long as they dampened it. The external moisture being thus removed, the masses were weighed and placed in an air bath at 212° for three hours. On being removed from the bath, they were put under a glass bell jar, and, being again weighed when cool, were found to have lost the following quantities of moisture.

TABLE I.

Brown stone	10,000	parts, lost	260 of moisture.
Nova Scotia stone	"	"	426 "
Red brick	"	"	1,179 "
White brick	"	"	525 "

The masses were then placed in the warm air bath again, and kept at 212° for four hours. On being cooled with the same precautions as before they showed the following losses:

TABLE II.

Brown stone	10,000	parts, lost	8	parts of moisture.
Nova Scotia stone	"	"	8	" "
Red brick	"	"	0	" "
White brick	"	"	0	" "

The masses were then placed on an iron plate, which was heated to a dull red heat and covered with a hood of tin to cut off currents of air. They were consequently exposed to a uniform temperature, which was sufficiently high to scorch paper when it was laid on their upper surfaces. The last traces of water were thus expelled, the quantities being as follows:

TABLE III.

Brown stone	10,000	parts, lost	17	parts of moisture.
Nova Scotia stone	"	"	35	" "
Red brick	"	"	a trace	
White brick	"	"	a trace	

The conditions, to which the substances were submitted at the commencement of these experiments on drying, may be regarded as representing their state after a prolonged storm of rain in which they had been drenched and soaked with water for many hours, and Table I. demonstrates that while the brick absorbed more moisture than the stone, the white brick imbibed less than half that taken up by the red, and the brown stone a little more than half that taken up by the Nova Scotia stone.

Table II. in its turn shows that stone is far more retentive of its moisture than brick, for, while the former lost eight parts, the latter lost none. In Table III. the same fact is still more conclusively demonstrated, for against an almost imperceptible loss on the part of the brick, the brown stone lost seventeen parts, and the Nova Scotia stone, thirty five. We are therefore justified in concluding that though brick absorbs a larger quantity of moisture than stone, it is to be preferred as a building material, since it parts with the imbibed water with greater facility; and, comparing the two kinds of brick together, the white hard burned brick is superior to the red, since it absorbs only half as much water.

Passing from the consideration of the power of retention to that of absorption, I found that, on submitting the thoroughly dried masses of the last detailed experiment to the action of an atmosphere saturated with moisture at 70° Fahr. for six days, the following results were obtained:

TABLE IV.

Brown stone,	10,000	parts, absorb	at 70°,	52	of moisture.
Nova Scotia stone,	"	"	"	45	"
Red brick,	"	"	"	3	"
White brick,	"	"	"	3	"

The conditions prevailing in this experiment may be regarded as being similar to those existing on an ordinary midsummer day when the dew point stands at 70°; and on inspecting the table we find that, while the brick absorbs but little moisture, the stone is very hygroscopic, the brown stone possessing this property in a more marked degree than the Nova Scotia. Since warmth and moisture, taken together, are peculiarly favorable to the production of vegetable growths, it follows that brown stone is, by virtue of the larger amount of water it absorbs, more liable to disintegration from this cause than the other substances submitted to experiment. In the case of the bricks the absorptive power is, as the table shows, equal, and very slight or slow in its action. They are therefore superior to stone in this respect.

To determine the absorptive power when exposed to conditions similar to those prevailing during a fog, I caused steam from a free opening to play upon them for three hours. After cooling for twenty hours, they were weighed with the following result:

TABLE V.

Brown stone,	10,000	parts, absorbed	147	parts of moisture.
Nova Scotia stone.	"	"	110	" "
Red brick	"	"	127	" "
White brick	"	"	106	" "

Which demonstrates that under such circumstances brown stone is more hygroscopic than Nova Scotia stone, and there