Experiments in New York with Toughened Glass.

The ancient admonition to occupants of glass houses is in danger of losing its force. M. A. de la Bastie, a Frenchman, has already succeeded in making the demolition of that hitherto fragile substance a matter of no small difficulty. When saucers, plates and glass dishes of every description, not to mention watch crystals and large plates of window-glass, are thrown about a room in a miscellaneous manner, with greater damage to the floor than to the missiles, the inquiry, Cannot glass be made practically unbreakable? becomes one of interest.

A l this and much more was done by Prof. Egleston, of the School of Mines, yesterday, at Cooper Institute, with the La Bastie glass. Before beginning his experiments the Professor assured his audience that although he had been engaged in experimenting on the substance, at the request of Messrs. Paturle and De la Chapelle, agents for M. de la Bastie, during the past two months, he was not yet prepared to state all the properties of the wonderful glass. The discovery, or it might be called the invention, of M. de la Bastie, was only made last autumn, but for the last ten years he has devoted his time and attention to the matter, having during that time tried over 2,000 different baths, the peculiar properties of his glass being obtained by plunging ordinary glass, when at a great heat, into a bath composed mainly of fatty substances. The "peculiar properties" are toughness to an almost incredible degree, and non-conduction of heat to an absolute degree. Further than the heating and bathing in fatty substance (the composition of which bath is of course a secret) there appears no difference in its manufacture from that of ordinary glass, and yet its whole molecular construction is different. When broken, as it can of course be by sufficient force, it rivals the traditional "one-horse shay" in the totalness of its destruction, a piece three inches square furnishing several hundred fragments, each fragment paradoxically being an entire piece by itself, with smooth edges so that one might safely thrust his hand into a barrel of this broken glass and withdraw it uninjured. The glass exhibited yesterday was hardly as smooth and clear as might be necessary for some purposes, but Prof. Egleston stated that this defect was owing entirely to the crude means at present provided for the process, and not to any fault in the process itself. The experiments yesterday were conducted in the presence of a large number of spectators.

EXPERIMENTS WITH THE GLASS.

As a preliminary, the Professor threw a few pieces of red glass, of considerable thickness, about the room, which only excited a smile from the many glass dealers present; next saucers and various other glass dishes of more fragile dimensions bounded unbroken from the hard floor, the smiles perceptibly dwindled; and when in handsful, watch crystals and long thin pieces of glass fell on the floor and remained whole, a round of applause broke from all present The next experiment consisted of testing the strength of ordinary and this patent glass beneath a steel weight, cartridge-shape and tempered, dropping from different heights. Best English plate glass broke beneath a two-ounce ball falling 15 inches, while the La Bastie glass of an equal thickness was only broken by the same ball falling 4 feet 8 inches. Ordinary plate glass was broken by a four-ounce ball dropped from a height of one foot, while the tempered glass resisted the blows of the weight until it had been raised to 3 feet 9 inches. A one-pound weight required to be raised 3 feet to break a piece of this wonderful glass ¼ of an inch thick. To demonstrate the advantage of using this substance in roofs of hothouses, a plate was placed in a slanting position and a two-ounce ball allowed to fall upon it perpendicularly, as hailstones strike upon slanting roofs, and it was not until the ball fell from a height of 9 feet and had struck the same spot thirty six times that it was broken, while common glass of twice the thickness was demolished at 4 feet. Another experiment consisted in allowing a strip of the glass 3 inches wide and 3-16 of an inch thick to project from a vise 6 inches and placing weights upon the projecting end. In this position it supported forty six pounds, while ordinary glass of the same dimensions sustained but 16½ pounds. The next experiment failed. A strip of the patent glass 10 inches in length, 3 inches wide and 3-16 of an inch thick, was bridged upon two uprights, and weights suspended from it in the center. One hundred and eighty pounds were thus suspended, when the glass, still remaining unbroken, with no signs of its giving way, and there being no more weights on hand, the experiment had to be abandoned. Many similar experiments were tried, all with great success. Glass dishes were heated and cooled without injury, and one plate was exhibited which Professor Egleston said had remained upon the range in his house, subject to every change of temperature, for over a week. The Professor also vouched for having heated a large plate of the material in the centre of 2,000° and still held it comfortably by the edges in his bare hands. A photograph taken upon a piece of the glass was likewise exhibited, and the immense value of the article to photographers in enabling them to preserve their negatives was shown. Specimens were also produced, colored, stained and engraved, so that there appears nothing for which ordinary glass is used that cannot be improved and benefitted by this discovery. A diamond will not cut it, but means for doing so are thought to be of easy discovery. The process of manufacturing the article is also said to be within the scope of any ordinary workman, while the cost is said to be but five per cent. additional in its manufacture.—*N. Y. World, June* 8.

The process which removes the brittleness of ordinary glass consists in immersing it at red heat in a bath of fatty substances, which the inventor keeps secret, and in slowly cooling the glass therein. The lecturer threw three pieces of prepared colored glass on the floor, as well as some watch crystals, neither of which broke, although thrown vigorously ten or twelve feet. Various glass plates similarly projected remained entire; but the Professor showed the only way of breaking them, by spinning one fourteen feet high in the air, and allowing it to impinge horizontally and with its whole surface, when it shivered into thousands of pieces. In the experiments recited by the lecturer it required thirty six shocks of a pointed steel cylinder falling from ten to twelve feet high on the same point of a prepared glass two ounce ball to break it. On prepared glass placed at angles in hothouses the falling cylinders had no effect.

In resistance to direct pressure the prepared glass far surpasses the best ordinary, strips of the latter on knife edges bearing at the utmost a weight of twenty seven pounds, while narrower strips of the new did not break under sixty pounds weight, but often required much higher pressure. With ordinary supports a half inch tempered glass three inches long broke only at 210 pounds. The resistance of the new material to fire is remarkable. A plate on which a heat of 3,000 degrees was brought to bear only began to bulge after 3½ minutes of such intense heat, while ordinary glass broke within five seconds. Its applicability to optical purposes has as yet not been fully tested, but although extremely elastic, La Bastie's glass is so hard that it resists the diamond.—*N. Y. Sun, June* 8.

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