

moulds. After the glass is rolled into straight panes, they are, while yet soft, placed on these moulds, where they take the shape in which they are allowed to cool.

These convex panes give to the windows to which they are applied a most agreeable appearance, as they disperse the light in all directions, and it may be said that these curved glass panes are rather an improvement in architecture than of the art of manufacturing window glass.

Elasticity of Vulcanized Caoutchouc.

M. P. Boileau has made a series of experiments upon the elasticity of vulcanized caoutchouc, which he reported to the Academy of Sciences, of Paris. The material was used in the form of a pile of disks separated by other disks of metal, as it is used for springs for railroad cars, &c.

The disks were eight in number, and were compressed progressively by a lever loaded gradually with different weights; then the lever was gradually unloaded. The compression corresponding to different loads, from 166 kil. to 806 kil. for the eight disks, that is, about from 2967 to 14,401 kil. per square centimetre, were observed and recorded in a table. In order to determine the law of the variation of compressibility, these results were projected on a large scale in the form of a curve, having the load per sq. centimetre for abscissas, and the corresponding compressions for ordinates; then from this sum were taken the depressions due to the increase of $\frac{1}{2}$ kil. per sq. centimetre. The results of this operation compose the following table.

Pressures on square centimetre.	Increase of compression.	Pressures on square centimetre.	Increase of compression.
kil.	mm.	kil.	mm.
2.0	0.60	8.5	0.63
2.5	0.64	9.0	0.60
3.0	0.70	9.5	0.57
3.5	0.85	10.0	0.49
4.0	0.99	10.5	0.32
4.5	1.05	11.0	0.20
5.0	1.04	11.5	0.15
5.5	0.98	12.0	0.14
6.0	0.90	12.5	0.13
6.5	0.80	13.0	0.12
7.0	0.73	13.5	0.11
7.5	0.70	14.0	0.10
8.0	0.66		

The curve shows at first sight that the law is not simple nor even constant. The principal fact is a maximum of compressibility which is produced by a load of 4.7 kil. per sq. centimetre; near this point of maximum the compressibilities increase and decrease rapidly. From the load of 11.5 kil. up to that at which the material undergoes permanent change of form, the decrease of compressibility is very small, but this period is preceded by one in which the contrary takes place to that within the limit of the experiments, and probably from the lightest loads up to those which crush the material, the compressibility of disks of caoutchouc passes through a succession of periods of alternate slow and rapid compressions.

The author thinks that this complication of phenomena must be due in part to the molecular constitution of the substance considered, and that the caloric developed by the compression is concerned in it.

In regard to reducing the pressure, when starting from 806 kil., the elastic column is slowly and progressively discharged; it did not take exactly the weights corresponding to the same pressures during the period of compression, but it returned to its original height when all the weights were removed. This latter circumstance proves that the elasticity of the caoutchouc had undergone no change.

In using springs, it is important to limit the pressures so as not to change their elasticity. In regard to this condition, the preceding results show that the pressure 14.404 kil. per sq. centimetre was not too great, but in another series of experiments the load being increased to 18.12 kil., the permanent change of the disks became very sensible, not only by their diminution in thickness, but also by the upper and lower edges changing to oblique and slightly curved surfaces. When the changes are sudden, or by blows frequently reiterated, the mean effect of the blow should not exceed 10 kil. per sq. centimetre.—(*L'Institut*, 28th May, 1856, p. 190.)

A new—old Invention.

In *Poggendorff's Annalen*, Tome xcv. p., 607, M. Du Bois Reymond proposes to enable the galvanometer needle to be read more easily and accurately by mounting a mirror upon its axis, and measuring the deflection of a ray of light, upon a screen at any distance. This is the principle used by Saxton in his pyrometer fully twenty years ago; and since applied by Gauss & Weber, and others, for reading the deflection of magnetometers. It is quite fashionable for European scientific men to ignore American inventions, but they should know, at least, what their own eminent men have done.

Ed.

New modification of the Galvanometer Coil.

M. Bonelli proposes a modification of the galvanometer coil, by which he hopes to obtain greater delicacy by bringing the conductors closer together, and greater economy by the cheapness of the material used, and the simplicity of the construction. His proposition is to rule a number of parallel metallic lines upon paper, as close together as possible. Then, if the band be so wrapped that all the left-hand ends of the lines shall be connected together and with one pole of the battery, while all the right-hand ends be likewise connected, and with the other pole, the coil will be equivalent to the one made of the ordinary wires, whose section is equal to the sum of the sections of the lines, and whose length is equal to the length of any one line: but if the band be so wrapped that the right-hand end of the first line is in connexion with the left-hand end of the second and so on; the poles of the battery being connected respectively with the left-hand end of the first, and the right-hand end of the last; then the arrangement will be equivalent to a coil of wire whose cross-section is equal to that of one of the lines, and whose length is