	Specific gravity
Original marble—1st specimen.	
Specific gravity after the rock had been placed in water under a vacuum of 28½ inches of mercury for 24 hours	2·722
Original marble—2d specimen.	
After treatment in a similar manner	2·722
Average	2·722
Deformed marble—specimen "A," 1st fragment.	
After having been placed in water under a vacuum of 28 inches of mercury until no further air was given off	2·712
Deformed marble— specimen "A," 2d fragment.	
Treated in vacuo in the same manner for 24 hours, no further air bubbles being given off	2·717
Deformed marble—Specimen "B."	
After having been placed under water in vacuo for 24 hours, until no further air was given off	2·713
Average	2·714
The comparison thus stands:	
Original marble	2·722
Marble after deformation	2·714
Difference	·008

This may be taken to mean that the marble remains unchanged in specific gravity by deformation, but that in the deformed marble some of the little cracks or crevices developed in the rock on relief of pressure still remain, into which the water can not penetrate, and which give rise to the slightly lower specific gravity of the deformed rock. In this connection it is to be noted that specimen "A" could not be tested for strength on account of the minute fissures by which it was traversed and which were developed upon the relief of pressure incident to the removal of the steel tube in which it was enclosed during deformation, while specimen "B," which gave off comparatively few air bubbles, had the appearance of being much more solid.

In connection with these results it is interesting to note the results of the investigations carried out by Spring* on the specific gravity of the sharply folded limestones in the Alps. In these he found that the specific gravity of the limestone on the concave side of a sharp fold, where the pressure of course is greatest, was slightly higher (·003 to ·023) than on the convex side of the same fold. This he at first interpreted as

* Note sur la véritable origine de la différence des densités d'une couche de calcaire dans les parties concaves et les parties convexes d'un meme pli: Ann. Soc. Géol. de Belgique, xl, p. 4, 1883-4.

meaning that there had actually been a permanent condensation of the calcite by the greater pressure to which it had been subjected in folding. Further investigation, however, showed that the slightly lower specific gravity of the rock on the outer side of the fold was due to the presence in it of minute rifts or pores which were wanting in the rock on the more highly compressed inner side, the limestone itself really being of the same specific gravity throughout.

Conclusions.

1. Marble when deformed at ordinary temperatures will flow readily by distortion of the original calcite grains, accompanied, if the differential resistance be low, with the development of a certain amount of cataclastic structure.
2. The marble when deformed at ordinary temperatures will increase in strength if allowed to rest.
3. The marble, if deformed at ordinary temperatures, will be much stronger if the deformation be carried on slowly than if the deformation be rapid. There is every reason to believe that with the extreme slowness of deformation to which the rock is subjected in nature, and the long rest which it subsequently undergoes, the change in shape would be accomplished without any loss of strength.
4. If the deformation be carried on at a higher temperature, the calcite develops freer movement on its gliding planes, and the deformed rock will be relatively stronger than if deformed at the ordinary temperature.
5. Under the conditions to which the rock is subjected in these experiments,—although not under all conditions,—the presence of water has no recognizable influence on the character of the deformation.
6. The specific gravity of the rock is not increased by the pressure to which it is subjected during deformation.

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EXPLANATION OF PLATES.

Plate II.

a. Wrought iron tube enclosing marble column after compression.
b. Column of marble, before and after compression, under a load of 296,725 pounds per square inch (20,875 kilos. per square centimeter). The finer lines of the scale are 1 millimeter apart.

Plate III.

a. Carrara marble, original. ×60.
b. Carrara marble, caused to flow under pressure of 296,725 pounds per square inch. ×40.

Plate IV.

Tube with its enclosed column of Carrara marble, cut open after deformation. The finer lines of the scale are 1 millimeter apart.