stone, a bit of iron pyrites, a shell or a crystal of carbonate of lime. Negative evidence, however, is strong. I think it safe to say, that many concretions have no nucleus of foreign matter. If one exist, it is in the form of such a minute grain of calcium carbonate, it cannot be detected with the eye.

Under the direction of Prof. W. O. Crosby, a concretion was sawed in two and polished. Lines of stratification were distinctly seen, but with this exception the mass was perfectly homogeneous. There was not the slightest evidence of a nucleus or of concentric structure. One half was sawed in two again, giving a sharp angle, which proved the extreme fineness of the material. A quarter was etched in chlorhydric acid, and while this rendered evident a concentric structure, it did not reveal a nucleus. Little spherical cavities were seen, as if the tendency to concretionary structure was so great that the concreting material was not satisfied with forming one large concretion, and so made smaller ones within the larger. I also dissolved one claystone in acid, and examined the insoluble residue upon a filter. It was impalpably fine clay, and no foreign particle of any appreciable size was visible.

Prof. Hitchcock says: "In no case in Massachusetts have I seen an organic relic as a nucleus." In 1859 Mr. Charles Stodder exhibited, at a meeting of the Boston Society of Natural History, two specimens cut open, one showing a nucleus less than 1-16 of an inch in diameter, the other not. At the same meeting ex-President Bouvé remarked while showing some concretions: "These bodies do not always have a nucleus; on the contrary, those from many localities very seldom have any. These seem by no means necessary for their production." I have looked through the Proceedings of the Society since 1859, but find nothing that throws additional light upon the subject.

The third question involves the history of a claystone. We first have the clay arranged in layers by the mechanical action of water. That the formation of the concretions is subsequent to the deposition of the clay is proved by the