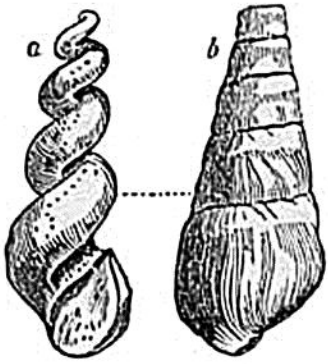
http://www.geology.19thcenturyscience.org/books/1859-Lyell-Elements/README.htm

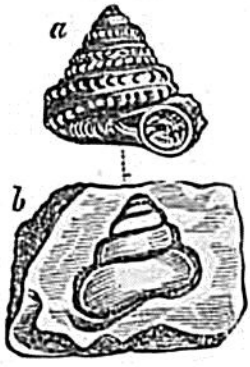
we have imagined at first sight that the shell *a* and the cast *b*, fig. 59, were different parts of the same fossil. The reader will observe, in the

Fig. 58.



Phasianella Heddingtonensis, and cast of the same. Coral Rag.

Fig. 59.



Pleurotomaria Anglica and cast. Lias.

last-mentioned figure (*b*, fig. 59), that an empty space shaded dark, which the *shell itself* once occupied, now intervenes between the enveloping stone and the cast of the smooth interior of the whorls. In such cases the shell has been dissolved and the component particles removed by water percolating the rock. If the nucleus were taken out a hollow mould would remain, on which the external form of the shell with its tubercles and striæ, as seen in *a*, fig. 59, would be seen embossed. Now if the space alluded to between the nucleus and the impression, instead of being left empty, has been filled up with calcareous spar, flint, pyrites, or other mineral, we then obtain from the mould an exact cast both of the external and internal form of the original shell. In this manner silicified casts of shells have been formed; and if the mud or sand of the nucleus happen to be incoherent, or soluble in acid, we can then procure in flint an empty shell, which in shape is the exact counterpart of the original. This cast may be compared to a bronze statue, representing merely the superficial form, and not the internal organization; but there is another description of petrifaction by no means uncommon, and of a much more wonderful kind, which may be compared to certain anatomical models in wax, where not only the outward forms and features, but the nerves, blood-vessels, and other internal organs are also shown. Thus we find corals, originally calcareous, in which not only the general shape, but also the minute and complicated internal organization are retained in flint.

Such a process of petrifaction is still more remarkably exhibited in fossil wood, in which we often perceive not only the rings of annual growth, but all the minute vessels and medullary rays. Many of the minute cells and fibres of plants, and even those spiral vessels which in the living vegetable can only be discovered by the microscope, are preserved. Among many instances, I may mention a fossil tree, 72 feet in length, found at Gosforth near Newcastle, in sandstone strata associated with coal. By cutting a transverse slice so thin as to transmit light, and magnifying it about fifty-five times, the texture seen in fig. 60 is ex-