percolating the earth's crust, is rarely free from a slight admixture either of iron, carbonate of lime, sulphur, silica, potash, or some other earthy, alkaline, or metallic ingredient. Hot springs in particular are copiously charged with one or more of these elements; and it is only in their waters that silex is found in abundance. In certain cases, therefore, especially in volcanic regions, we may imagine the flint of silicified wood and corals to have been supplied by the waters of thermal springs. In other instances, as in tripoli, it may have been derived in great part, if not wholly, from the decomposition of *diatomaceæ*, sponges, and other bodies. But even if this be granted, we have still to inquire whence a lake or the ocean can be constantly replenished with the calcareous and siliceous matter so abundantly withdrawn from it by the secretions of living beings.

In regard to carbonate of lime there is no difficulty, because not only are calcareous springs very numerous, but even rain-water, when it falls on ground where vegetable matter is decomposing, may become so charged with carbonic acid as to acquire a power of dissolving a minute portion of the calcareous rocks over which it flows. Hence marine corals and mollusca may be provided by rivers with the materials of their shells and solid supports. But pure silex, even when reduced to the finest powder and boiled, is insoluble in water, except at very high temperatures. Nevertheless Dr. Turner has well explained, in an essay on the chemistry of geology,* how the decomposition of felspar may be a source of silex in solution. He has remarked that the siliceous earth, which constitutes more than half the bulk of felspar, is intimately combined with alumine, potash, and some other elements. The alkaline matter of the felspar has a chemical affinity for water, as also for the carbonic acid which is more or less contained in the waters of most springs. The water therefore carries away alkaline matter, and leaves behind a clay consisting of alumine and silica. But this residue of the decomposed mineral, which in its purest state is called porcelain clay, is found to contain a part only of the silica which existed in the original felspar. The other part, therefore, must have been dissolved and removed; and this can be accounted for in two ways; first, because silica when combined with an alkali is soluble in water; secondly, because silica in what is technically called its nascent state is also soluble in water. Hence an endless supply of silica is afforded to rivers and the waters of the sea. For the felspathic rocks are universally distributed, constituting, as they do, so large a proportion of the volcanic, plutonic, and metamorphic formations. Even where they chance to be absent in mass, they rarely fail to occur in the superficial gravel or alluvial deposits of the basin of every large river.

The disintegration of mica also, another mineral which enters largely into the composition of granite and various sandstones, may yield silica which may be dissolved in water, for nearly half of this mineral consists of silica, combined with alumine, potash, and about a tenth part of iron. The oxidation of this iron in the air is the principal cause of the waste of mica.

* Jam. Ed. New Phil. Journ. No. 30, p. 246.