

former usage, but is constantly led onwards to contemplate objects which, in a previous stage of his progress, he would have regarded as unattainable and visionary, had he even thought of them at all. It is here that the investigation of the hidden powers of nature becomes a mine, every vein of which is pregnant with inexhaustible wealth, and whose ramifications appear to extend in all directions wherever human wants or curiosity may lead us to explore.

(43.) Between the physical sciences and the arts of life there subsists a constant mutual interchange of good offices, and no considerable progress can be made in the one without of necessity giving rise to corresponding steps in the other. On the one hand, every art is in some measure, and many entirely, dependent on those very powers and qualities of the material world which it is the object of physical inquiry to investigate and explain; and, accordingly, abundant examples might be cited of cases where the remarks of experienced artists, or even ordinary workmen, have led to the discovery of natural qualities, elements, or combinations which have proved of the highest importance in physics. Thus (to give an instance) a soap-manufacturer remarks that the residuum of this ley, when exhausted of the alkali for which he employs it, produces a corrosion of his copper boiler for which he cannot account. He puts it into the hands of a scientific chemist for analysis, and the result is the discovery of one of the most singular and important chemical elements—iodine. The properties of this, being studied, are found to occur most appositely in illustration and support of a variety of new, curious and instructive views then gaining ground in chemistry, and thus exercise a marked influence over the whole body of that science. Curiosity is excited: the origin of the new substance is traced to the sea-plants from whose ashes the principal ingredient of soap is obtained, and ultimately to the sea-water itself. It is thence hunted through nature, discovered in salt mines and springs, and pursued into all bodies which have a marine origin; among the rest, into sponge. A medical prac-