

the accomplishment of our purposes, and which it is the province of practical mechanics to teach us to combine and apply in the most advantageous manner; without which the mere command of power would amount to nothing. Practical mechanics is, in the most preëminent sense, a *scientific art*; and it may be truly asserted, that almost all the great combinations of modern mechanism, and many of its refinements and nicer improvements, are creations of pure intellect, grounding its exertion upon a moderate number of very elementary propositions in theoretical mechanics and geometry. On this head we might dwell long, and find ample matter, both for reflection and wonder; but it would require not volumes merely, but libraries, to enumerate and describe the prodigies of ingenuity which have been lavished on every thing connected with machinery and engineering. By these it is that we are enabled to diffuse over the whole earth the productions of any part of it; to fill every corner of it with miracles of art and labor, in exchange for its peculiar commodities; and to concentrate around us, in our dwellings, apparel and utensils, the skill and workmanship, not of a few expert individuals, but of all who, in the present and past generations, have contributed their improvements to the processes of our manufactures.

(59.) The transformations of chemistry, by which we are enabled to convert the most apparently useless materials into important objects in the arts, are opening up to us every day sources of wealth and convenience of which former ages had no idea, and which have been pure gifts of science to man. Every department of art has felt their influence, and new instances are continually starting forth of the unlimited resources which this wonderful science develops in the most sterile parts of nature. Not to mention the impulse which its progress has given to a host of other sciences, which will come more particularly under consideration in another part of this discourse, what strange and unexpected results has it not brought to light in its application to some of the most common objects! Who, for instance, would have