sult of experiment the laws regulating their composition and decomposition. Though the science of chemistry is daily becoming more and more perfect, yet many arts attained, when chemical science was in its infancy, great excellence—an excellence which, in some arts cannot be surpassed in the present day by the most experienced manufacturers—and in some cases processes have been entirely lost and cannot be recovered by our most skilful chemists. That many chemical phenomena should have been discovered in ancient times, and afterwards lost, is not to be wondered at, for in the early periods of chemical science, many of these phenomena were the result of chance experiments, the chemical laws governing the various changes being unknown, and consequently were lost as time lapsed.

To every seat of the arts chemistry descends, where it changes the forms and the qualities of the productions of nature, enabling them to be appropriated in a thousand different ways to our wants. The dyer, tanner, distiller, bleacher, the soap and candle-maker, the manufacturer of glass, porcelain, and sugar, the brewer, gas-factor, photographer, the etcher upon copper and steel, the lithographer, and many others, are all more or less beholden to this science for the perfection to which their several arts have arisen. By its aid we learn how to extract the metals from the combinations with which they are found in nature—how to fuse, purify and alloy them. It gives to waste materials new and increased value, for the chemist, by research and experiment, points out the application of matters supposed to be effete and useless, to some beneficial purpose. In the present day the manufacturer must possess a certain amount of chemical and scientific knowledge, so vastly are the arts indebted to chemistry for all improvements in their various processes, and especially if he would compete successfully with others in his productions. The manufacturer, by pointing out new processes, and discovering new materials, which cheapen the products of his art, is enabled to bring within the reach of the many the comforts and luxuries which otherwise would have been confined to the few. How necessary it is for the manufacturer of soap, if he would successfully and economically carry on his manipulations, that he should understand the affinities existing between the various oils and alkalies; to the candle-maker, that he should understand the decomposition of fats and oils into their acids and bases—he must learn the nature of fatty bodies, and know how to separate the superfluous matters of fats and oils from those parts which he requires in his art. The extraordinary improvements that chemistry has effected in this one manufacture is surprising. Before 1811, the candle manufacturer had only tallow, wax, and spermaceti at his disposal, and the great desideratum was to obtain substances possessing a certain amount of hardness and compatibility; the great objection to tallow, besides its disagreeable odour, is its want of uniformity in consistence—tallow being formed of two fatty bodies, one oily and soft, the other firm and hard: consequently, when burning the soft portion melts first, and we have what is known as guttering. In 1811, a French chemist, M. Chevreul, by his researches, explained the true nature of fats, their composition, &c., which up to this period had been veiled in obscurity; he separated fat into solid and liquid constituents, and placed at the disposal of the manufacturer the solid ingredients of fat, stearine, and margarine, possessing the required properties, and as the result, we see in the present day the tallow candle almost entirely superseded by a variety of candles called palm, composite, Belmont sperm, stearic acid, and many others, which almost equal wax and spermaceti in appearance and illuminating power, and from the cheap rate at which they can be manufactured the best varieties are open to all.

In very few cases has chemistry been more successful in its application than in those of dyeing and calico printing. Dyeing is strictly a chemical art. The great object of the dyer is to be enabled to impart to fabrics of various materials, whether of silk, cotton or wool, certain colouring matters, the colours being derived either from the animal, vegetable, or mineral kingdom, and so imparting these colours that they cannot be removed by washing. This art being so dependant upon chemical science, we shall expect to find that its development has taken place of late years only, and that amongst the nations of antiquity it existed in a very imperfect state. Amongst the Greeks and Romans indigo was known, but was used only as a pigment, not as a dye, the nations being ignorant of its proper solvent, it being insoluble in water, though in Egypt and in India this dye was known and used. Madder was also used as a dye, and the kermes insect, for the production of a crimson colour, by these nations; but it is well known the most renowned dye in ancient times was the imperial Tyrian purple, a most costly colour, and worsted dyed with this in the time of Augustus, sold for £36 the pound weight; it was used in dyeing the imperial robes, and exclusively employed for that purpose. It was procured from two shell fish, *buccinum* and *purpura;* a puncture was made in the neck of the animal, and when squeezed two or three drops exuded; or the entire shell-fish was pounded in a mortar, and the fluid thus obtained, collected, mixed with water, and used. The fluid thus extracted was at first colourless, but by exposure to air and light, became yellow, then green, afterwards red, and in twenty-four hours, of a beautiful purple colour. By adding to this dye various alkalies, &c., the Tyrians managed to get shades of this colour. The process for obtaining the Tyrian purple was kept secret and lost, but of late years some French chemists have obtained from these shell-fish, the beautiful purple of ancient days. When America was discovered, several dyeing materials were added to the list, such as logwood, arnatto, cochineil, Brazilwood and quercitron. But the great improvement in modern times in dyeing, (and this improvement owing to the rapid strides of chemistry) is the addition of colours derived from the mineral kingdom. Thus, about the end of the 17th century, Prussian blue, chrome yellow, chrome orange, manganese brown, prussiate of copper, green, &c., &c., were added to the list, and the use of Mordants became general. We do not, as would naturally be supposed, derive our dyes from the brilliant, and varied colours of plants, for it is found that in those parts of the plant exposed to