

in the first place, to expose ourselves to illusions of sense which may lead to the grossest errors. Thus, in alpine countries, we are constantly deceived in heights and distances; and when we have overcome the first impression which leads us to under-estimate them, we are then hardly less apt to run into the opposite extreme. But it is not merely in preserving us from exaggerated impressions that numerical precision is desirable. It is the very soul of science; and its attainment affords the only criterion, or at least the best, of the truth of theories, and the correctness of experiments. Thus it was entirely to the omission of exact numerical determinations of quantity that the mistakes and confusion of the Stahlian chemistry were attributable,—a confusion which dissipated like a morning mist as soon as precision, in this respect, came to be regarded as essential. Chemistry is in the most preëminent degree a science of quantity; and to enumerate the discoveries which have arisen in it, from the mere determination of weights and measures, would be nearly to give a synopsis of this branch of knowledge. We need only mention the law of definite proportions, which fixes the composition of every body in nature in determinate proportional weights of its ingredients.

(116.) Indeed, it is a character of all the higher laws of nature to assume the form of precise *quantitative* statement. Thus, the law of gravitation, the most universal truth at which human reason has yet arrived, expresses not merely the general fact of the mutual attraction of all matter; not merely the vague statement that its influence decreases as the distance increases, but the exact numerical rate at which that decrease takes place; so that when its amount is known at any one distance, it may be calculated exactly for any other. Thus, too, the laws of crystallography, which limit the forms assumed by natural substances, when left to their own inherent powers of aggregation, to precise geometrical figures, with fixed angles and proportions, have the same essential character of strict mathematical expression, without which no