

we consider the inexhaustible resources, which science itself furnishes, in rendering the quantities actually to be determined by measure great multiples of the elements required for the purposes of theory, so as to diminish in the same proportion the influence of any errors which may be committed on the final results.

(389.) Great, indeed, as have been of late the improvements in the construction of instruments, both as to what regards convenience and accuracy, it is to the discovery of improved *methods* of observation that the chief progress of those parts of science which depend on exact determinations is owing. The balance of torsion, the ingenious invention of Cavendish and Coulomb, may be cited as an example of what we mean. By its aid we are enabled not merely to render sensible, but to subject to precise measurement and subdivision, degrees of force infinitely too feeble to affect the nicest balance of the usual construction, even were it possible to bring them to act on it. The galvanometer, too, affords another example of the same kind, in an instrument whose range of utility lies among electric forces which we have no other means of rendering sensible, much less of estimating with exactness. In determinations of quantities less minute in themselves, the methods devised by Messrs. Arago and Fresnel, for the measurement of the refractive powers of transparent media by means of the phenomenon of diffraction, may be cited as affording a degree of precision limited only by the wishes of the observer, and the time and patience he is willing to devote to his observation. And in respect of the direction of observations to points from which real information is to be obtained, and positive conclusions drawn, the hygrometer of Daniell may be cited as an elegant example of the introduction into general use of an instrument substituting an indication founded on strict principles for one perfectly arbitrary.

(390.) In speculating on the future prospects of physical science, we should not be justified in leaving out of consideration the probability or rather certainty, of the