preſſing that rest which is the test of this kind of equi­librium. The ſecond has been called Dynamics or Universal Mechanics, becauſe the different kinds of motion are characteristic of the powers or forces which produce them. A knowledge of both is indiſpensably necessary for acquiring any uſeful practical knowledge of machines : and it was ignorance of the doctrines of accelerated and retarded motions which made the progreſs of practical mechanical knowledge ſo very slow and imperfect. The mechanics, even of the moderns, before Galileo, went no further than to ſtate the proportion of the power and reſiſtance which would be balanced by the intervention of a given machine, or the proportion of the parts of a machine by which two known forces may balance each other, This view of the matter introduced a principle, which even Galileo conſidered as a mechanical axiom, viz. that *what is gained in force by means of a machine is exactly ccmpenſated by the additional time which it obliges us to employ.* This is falſe in every instance, and not only prevents improvement in the conſtruction of ma­chines, but leads us into erroneous maxims of conſtruction. The true principles of dynamics teach us, that there is a certain proportion of the machine, dependent on the kind and proportion of the power and reſiſtance, which enables the machine to perform the greatest poſ­ſible work.

It is highly proper therefore to keep ſeparate theſe two ways of conſidering machines, that both may be improved to the utmost, and then to blend them toge­ther in every practical diſcuſſion.

Statics therefore is preparatory to the proper study of mechanics ; but it does not hence derive all its im­portance. It is the ſole foundation of many uſeful parts of knowledge. This will be best ſeen by a brief enumeration.

1. It comprehends all the doctrines of the excitement and propagation of preſſure through the parts of ſolid bodies, by which the energies of machines are produced. A preſſure is exerted on the impelled point of a machine, ſuch as the float-boards or buckets of a mill-wheel. This *excites* a preſſure at the pivots of its axle, which act on the points of ſupport. This must be understood, both as to direction and intenſity, that it may be effectu­ally refilled. A preſſure is alſo excited at the acting tooth of the cog-wheel on the ſame axle, by which it urges round another wheel, exciting ſimilar preſſures on its pivots and on the acting tooth perhaps of a third wheel.—Thus a preſſure is ultimately excited in the working point of the machine, perhaps a wiper, which lifts a heavy stamper, to let it fall again on ſome matter to be pounded. Now ſtatics teaches us the intensities and direction of all thoſe preſſures, and therefore how much remains at the working point of the machine unbalanced by reſiſtance.

2. It comprehends every circumſtance which influ­ences the liability of heavy bodies; the inveſtigation and properties of the centre of gravity ; the theory of the conſtruction of arches, vaults, and domes ; the attitudes of animals.

3. The ſtrength of materials, and the principles of conſtruction, ſo as to make the proper adjuſtment of ſtrength and ſtrain in every part of a machine, edifice, or structure of any kind. Statics therefore furniſhes us with what may be called *a theory of carpentry,* and gives us proper instructions for framing floors, roofs, centres, &c.

4. Statics comprehends the whole doctrine of the preſſure of fluids, whether liquid or aeriform, whether ariſing from their weight or from any external action. Hence therefore we derive our knowledge of the stabi­lity of ſhips, or their power of maintaining themſelves in a poſition nearly upright, in oppoſition to the action of the wind on their sails. We learn on what circumſtances of figure and ſtowage this quality depends, and what will augment or diminiſh it.

Very complete examples will be given in the remain­ing part of this work of the advantages of this ſeparate consideration of the condition of a machine at rest and in working motion ; and in what yet remains to be delivered of the hydraulic doctrines in our account of WATER-Works in general, will be perceived the propriety of ſtating apart the equilibrium which is indicated by the uniform motion of the fluid. The obſervations too which we have to make on the ſtrength of the materi­als employed in our edifices or mechanical ſtructures, will be examples of the inveſtigation of thoſe powers, preſſures, or ſtrains, which are excited in all their parts.

STATISTICS, a word lately introduced to express a view or ſurvey of any kingdom, county, or parish.

A Statiſtical view of Germany was publiſhed in 1790 by Mr B. Clarke; giving an account of the imperial and territorial constitutions, forms of government, legiſlation, adminiſtration of justice, and of the eccleliaſtical ſtate ; with a sketch of the character and genius of the Germans ; a ſhort inquiry into the ſtate of their trade and commerce; and giving a distinct view of the domi­nions, extent, number of inhabitants to a ſquare mile ; chief towns, with their ſize and population; revenues, expences, debts, and military ſtrength oſ each ſtate. In Pruſſia, in Saxony, Sardinia, and Tuſcany, attempts have alſo been made to draw up ſtatiſtical accounts; but they were done rather with a view of ascertaining the preſent ſtate of theſe countries, than as the means of future im­provement.

A grand and extensive work of this kind, founded on a judicious plan, conducted by the moſt patrio­tic and enlightened motives, and drawn up from the communications of the whole body of the clergy, was undertaken in Scotland in the year 1790 by Sir John Sinclair of Ulbſter, one of the moſt uſeful members of his country. Many praiſes are heaped upon genius and learning; but to genius and learning no applauſe is due, except when exerted for the benefit of mankind: but gratitude and praiſe is due to him whoſe talents ſhine only in great undertakings, whoſe happineſs ſeems to conſiſt in patriotic exertions, and whoſe judgment is uniformly approved by his ſuccess. A work of this kind, ſo important in its object, io comprehensive in its range, ſo judicious in its plan, and drawn up by more than 900 men of literary education, many of them men of great genius and learning, muſt be of immenſe value. Sixteen volumes octavo are already publiſhed ; and it is ſuppoſed that the work will be completed in two or three additional volumes.

The great object of this work is to give an accurate view of the ſtate of the country, its agriculture, its manufactures, and its commerce; the means of improve­ment, of which they are reſpectively capable; the amount of the population of a ſtate, and the cauſes of its increase