formance, which is really the work done, will be had by dividing the value now obtained by the number b, which expresses the sum of the resistance overcome by the working-point and the friction of the machine.

What has been now delivered contains, we imagine, the chief principles of the theory of machines, and points out the way in which we must proceed in applying them to every case. The reader, we hope, sees clearly the imperfection of a consideration of machines which proceeds no farther than the statement of the proportions of the simultaneous pressures which are excited in all the parts of the machine by the application of the external forces, which we are accustomed to call the *power* and the *weight*. Unless we take also into consideration, the immediate effect of mechanical force applied to body, and combine this with all the pressures which statical principles have enabled us to ascertain, and by this combination be able to say what portion of unbalanced force there is acting at one and all of the pressing points of the machine, and what will be the motion of *every part* of it in consequence of this overplus, we have acquired no knowledge that can be of service to us. We have been contemplating, not a working machine, but a sort of balance. But, by reasoning about these unbalanced forces in the same simple manner as about the fall of heavy bodies, we were able to discover the momentary accelerations of every part, and the sensible motion which it would acquire in any assigned time, if all the circumstances remain the same. We found that the results, although deduced from unquestionable principles, were quite unlike the observed motions of most working machines. Proceeding still on the same principles, we considered this deviation as the indication, and the precise measure, of something which we had not yet attended to, but which the deviation brought into view, and enabled us to ascertain with accuracy. These are the changes which happen in the exertions of our actuating powers by the velocity with which we find it con-