our workshops, our manufactories, our steamships, and our locomotive engines, for the purpose of *turning round* certain axles or wheels with a continuous whirling or revolving motion, it has appeared to many the simplest, the most elementary, and the most appropriate manner of applying the moving power, that the steam should itself follow the wheel which it turns, round the circumference of its circle of gyration, and so it is supposed, by acting immediately and directly on the wheel to be turned round, produce the most powerful effect. In this way the action of the steam would be made to resemble the turning of a millwheel by the action of the water on the buckets of its rim ; and the arrangements by which such an elementary mode of action might be brought about, form what is called a Rotatory Steam-Engine.

That simplicity of form and of outline are essential to simplicity of action, and excellence of mechanical action, is a fallacy ; that simplicity of figure and fewness of parts are objects of higher importance in machinery than dura­bility, precision, and economy of operation, is a fallacy ; that such an elementary machine, if constructed, could give forth any more of that power than is now rendered effective by the common steam-engine in everyday use, is a fallacy, arising in ignorance, ending in disappointment.

We have to state with regret, that very injurious consequences have arisen from this popular error. Many men of high talent and inventive genius have sacri­ficed their talents, their industry, their lives, to this deIusion. The patent-offices of England, Scotland, Ire land, and France and America, the mechanical periodicals of them all, the transactions of societies for promoting the arts, the “ machines approuvées par l'Académie,’’ the journal of the Franklin Institution, all teem with inven­tions of rotatory engines, and substitutes for the crank of the common steam-engine, by which power and simplicity are to be united in the highest degree. And yet, when we look around us, we nowhere find that a phalanx of talent thus concentrated with a single­ness of purpose, and an indomitable perseverance worthy a more hopeful object, has ever been successful in producing one form of mechanism to stand in competition with the common everyday reciprocating engine, with its crank and its flywheel and all its much con­demned appendages. In this country alone a crowd of inventors have not only proceeded so far as to expend their ingenuity, labour, and money, in inventing and constructing machines of this class, and making them the subject of experiment, but more than a hundred of them have actually laid out in succession four or five hundred pounds apiece in procuring the royal grant of monopoly for their valuable contrivances. We feel it, therefore, to be our duty to give a full and uncompromising exposure of the fallacies of the rotatory engine. We regard such a fallacy as a grievous obstruction to the advancement of the arts and the industry of Great Britain. It is to the prevalence of ignorance on this subject, that much of the misdirection of mechanical talent, in so far as it has been applied to the improvement of our prime movers, is to be attributed. Again and again, year after year, do we find the same machine invented and reinvented, and the same experi­ments repeated and the identical failures encountered. Of these failures, however, there is only a small number comparatively which comes before the public. Those alone which obtain patents are dragged into light ; and of these we are only left to infer the subsequent failure, from the circumstance of discovering that their existence is recognised nowhere except in the parch­ments of the Patent-Office. It is indeed a matter of general regret, not limited to the subject of rotatory engines, that false pride should prevent m n from pub­lishing the results of such experiments as may not be

perfectly successful in accomplishing the objects originally intended, lt should be recollected, that, as evi­dence of the truth or falsehood of some great principle, no experiment is valueless, if simply and faithfully described; and that, if it do not serve as a signal-post to point the way to truth, it may at least prove useful as a beacon to warn from the path of error. It is to unsuccessful experiments that we owe many of our most valuable scientific discoveries. The failure of an attempt to make a sucking pump more than 33 feet long led to an acquaintance with the doctrine of atmospheric pressure, and open ed a new field of research to the genius of Galilei, Torricelli, and Boyle ; and Sir Humphrey Davy is reported, on an occasion where he was shown a dexterously manipulated experiment, to have exclaimed, “ I thank God I was not made a dexterous manipulator, for the most important of my discoveries have been suggested to me by failures.” Thus we find that the record of error may often prove a contribution to truth ; and the man who is sufficiently unselfish to impart to others the benefit of such experience, is the disinterested friend of science. Had all the failures of the rotatory engine been publicly recorded, that avenue of misdirected effort would long ago have been closed.

Our present object is to bring together, and place under the eye of the reader, all that has been done upon this subject, the attempts that have been made, and the failures of those attempts. We shall thus show that the attempts at a successful rotatory steam-engine which are every day produced, are mere repetitions of experiments which have long ago been tried in circumstances precisely the same, and have long ago hopelessly failed and been abandoned ; that these attempts were made in circumstances that were well suited to ensure their success, had success been possible. Let it be recollected that the only office performed by machinery, is the transmission of power from an animal or element, and never the creation of power. It can modify motion in direction, velocity, and force, so as to expend itself in one manner rather than another, but it can never create motion or generate power. This is true, or all the experience of the laws of matter which has been obtained since the use of inductive philosophy is false. Solid matter may obey force and modify it, but can never create power. The only enquiry to be made, therefore, in regard to any engine is this : when force is applied to the machine, whether the force of steam or any other, does it turn all the force of the agent to a useful purpose, without further diminution than is occasioned by necessary friction and resistance of the air, and the least possible loss of power by transmission ? When steam bursts a boiler, or water overturns the embankment of a reservoir, the power of heat and of gravity produces its full effect; hut it is not a useful effect. The object of a machine is to expend it parsimoniously in rendering the greatest portion of its effect useful. The only question entertained is, which form of engine is best calculated for converting the power of steam to a useful purpose, so as to do so with the smallest diminution in its quantity?

The common, or reciprocating steam-engine, is distinguished from the rotatory steam-engine by the nature of certain parts of its mechanism, which convey the motion of the steam to the machinery which is to be moved : these are a piston-rod and crank. Now, it is owing to a radical misconception of the nature of this elementary machine, the crank, that innumerable schemes have been devised for the production of circular motion, without the intervention of the crank, either by giving to the steam itself an immediate circular action, or by the substitution of some other less elementary mechanism between the reciprocating piston and the revolving axis, as the means