I hope that you will not think the following experiments superfluous. They were tried with great care, and without any wish to support any particular theory or opinion.

Experiments on Cylindrical and Conical Wheels.

Having on a former occasion (vol. 2, Trans. of R. I. Academy, 1788) tried experiments on carriages in a manner similar to that which Mr. Cumming has employed, namely, by measuring the vis inertiæ remaining in a carriage after a given force had been applied to it, and after it had overcome a given resistance; I had reason to think, that doubts might occur as to the conclusions formed from such experiments, and I therefore preferred the direct application of weight as the measure of resistance.

At the same time, I observed, that all the experiments tried by Camus, and those that I had seen in public lectures, and particularly in a set of experiments tried before the society for the encouragement of arts and manufactures, the times of the descents of the weights employed were not taken into consideration. So that if it were required to ascertain which was superior of two models of carriages, to be drawn at the rate of ten miles an hour upon a table 16 feet long, it would be found that no weight that could be applied would draw either of them at that rate; because the weight, even without any incumbrance, could descend only sixteen feet in a second, and not so much if it were counterbalanced by the smallest weight or resistance. And seeing that a similar consideration should be attended to, where velocity was made the standard of comparison, I constructed an apparatus in which the velocity was regulated by a vane impinging against the air, so that after a few turns of a circulating axis, the motion of the descending weight acquired no fresh velocity. By these means, when experiments were to be tried upon the resistance afforded to any body, the motion could be measured directly by the weight required to continue the velocity of the body in question uniformly the same, notwithstanding the resistance to which it was exposed.

I have now applied such an apparatus, to determine the resistance occasioned upon given roads by the different construction of wheels.

The descending weight was made to move uniformly by a vane striking against the air. It required a weight of four pounds to give this vane a velocity that would permit the scale that held the weights to descend at the rate of thirty feet in ten seconds, which is nearly the rate at which a common waggon travels. The road on which the carriages moved, was made to represent as nearly as might be a common road, the parts of which should be in proportion to the size of the wheels of the model. The carriage was double the size of that used by Mr. Cumming. Wheels $8\frac{1}{2}$ inches diameter, four inches in breadth, and $10\frac{5}{8}$ asunder; the axle-trees were turned in a lathe, and were fitted in brass boxes. The arms of the axle-trees quite straight, and nearly of the same diameter at the shoulder and at the linch-pin.

The weight of the carriage and the load together was sixty pound, double the weight employed by Mr. Cumming. The rims of the conical wheels were made to deviate from cylinders in the same proportion as those mentioned by Mr. Cumming, so as to preserve an analogy between his experiments and mine.

TABLE OF EXPERIMENTS ON WHEEL CARRIAGES.

Ex.	Time.	Space or Length of the Road.	Description of the Roads all of which were carefully made horizontal, both in Length and Breadth.	Weight of the Carriage and Load.	With Conical Wheels: 8¼ inches Diameter inside. 6¾ do. . . . . outside. 4 inches Breadth of Sole. Weight employed.	With Cylindrical Wheels. 8½ inches Diameter. 4 inches Breadth of Sole. Weight employed.
No. 1.	- -	- - -	A Road of smooth deal boards. - - - - -	- - -	3 Pounds.	2 Pounds.
2.	- -	- - -	A gravel Road slightly rolled, similar to the Road in Hyde Park during Summer.	- - -	6½	6
	10 Seconds	30 Feet		60 lb.		
3.	- -	- - -	The same Road newly raked up like a newly made gravel Road. - - - - - -	- - -	8	7
4.	- -	- - -	The same with gravel Stones scattered over it like a newly made *coarse* Road - - - -	- - -	9	9
Thirty feet in ten seconds is equal to two miles an hour.						

It may be observed upon these experiments.

First, That the advantages of cylindrical, over conical wheels moving on smooth hard roads, appear in these to be the same as in Mr. Cumming's experiments, namely as three to two.

Secondly, That on gravel roads the difference between conical and cylindrical wheels is not nearly so great as upon smooth roads.

Thirdly, That on rougher roads, where the stones do not give way, there is scarcely any difference between the cylinder and the cone.

The causes of these different results are obvious; on sandy and gravelly roads the materials give way, and recede from the smaller part of the conical wheels as Mr. Cumming's bars recede: and on stony roads only, cylindrical sections of the conical wheels touch the stone, the rest of the cone does not bear upon the road.

Upon the whole, I return to my former proposition, and do give it decidedly as my opinion, that nothing but an experiment in large, upon a real road with real waggons drawn by horses, can ever determine the relative advantages of cylindrical, conical, or narrow wheels, to the satisfaction either of philosophical enquirers or the public.

BIOGRAPHICAL SKETCHES OF DISTINGUISHED PERSONS.

The following character of Doctor Haliday appeared in the Belfast News Letter, immediately after his death. To those who were acquainted with the worth of the man, no apology is necessary for inserting this well merited eulogium and tribute to his memory. It appears with much propriety in a Magazine published in a town, which he so long adorned by the urbanity of his manners, his high professional skill, and the soundness of his political principles.

It would be very acceptable to us, if any of his relatives, or others, would furnish us with further particulars of his life. We have heard he left in manuscript a tragedy, founded on the story of Lucius Junius Brutus. We should gladly publish it in our pages, if we had permission.

DIED on the——day of——1801, aged 72, Alexander Henry Haliday, M.D A gentleman, who, for the space of half a century, illustrated his native town of Belfast, by a character distinguished for private worth, consistent public spirit, much elegant accomplishment, and high professional reputation.

Of all the liberal professions, that of medicine is perhaps the most liberal. No one which, in a more eminent degree, combines the useful and the amiable qualities, the solid talents which dignify, and the sweet courtesies which decorate character. No one which supplies more ample opportunity of forming a true estimate of human life, of appreciating the weakness and the worth of human nature. No one, which, in a political point of view, has maintained, amidst the selfishness of sects, and the intrigues of factions, a more virtuous independence and dignified impartiality. The general remark has never had a truer application, than in the life, conduct, and conversation of Doctor Haliday.

Of his professional merits, the profession itself must supply the most adequate judges, but the public at large, may perhaps form as true an estimate, from the long popularity, which, as a practitioner of physic, he possessed, not merely in his native town, but throughout the whole province of Ulster; a popularity, neither made, nor maintained by any sinister arts, by the patronage of the higher ranks, nor by the puffing of the lower, but the well earned fruit of an excellent education, engrafted on an excellent understanding. His successful and extensive practice was the natural and necessary result of a shrewd and sagacious intellect, always kept in a state of the highest cultivation by the habit of reading and