(For the Scientific American.)

Motions of the Planets.

The article on page 200 this volume SCIENTIFIC AMERICAN, headed "Centrifugal Action among the Stars," deserves a few remarks.

A planet moving in its orbit is constantly attracted by gravity towards the sun; and were it not for inertia, would soon reach it. But the planet is in motion, and the resistance it opposes to having the direction of the motion changed, exactly balances the force of gravity, and it moves in a curve around the sun. And all the force of gravity acting on it from its first being projected in space, has been consumed in overcoming its inertia, and causing it to describe a curve around the sun. It has moved just as fast and as far as if it had moved in a direct line, and if loosed from gravity, would move on in a right line through space. The rotary motion of planets, fly-wheels, and all machinery moving around fixed centers, are governed by the same laws; each individual part in circular motion representing the planet in its orbit, and whatever connects it with the center of motion, represeni-ing gravity.

If a wheel or globe have a rapid rotary motion, it will resist a change in the direction of its axis; and as the resistance at its nodes—or where the lines of circular motion of its parts cross the lines of its former motion—is in different directions, it will have a tendency to revolve on a new axis. Hence, the cause of the axis of the globe of the toy having a tendency to remain in a horizontal position, and revolve around the center of support, is the combined action of the support upwards, gravity downwards and inertia. When it rests on the support, the force of gravity will incline the globe to sink and let the other end of its axis lower; but the least iaclination of its axis will change the direction of the motion of the rotaticg parts, and by the principles of inertia, will resist this change. The parts at each side of the globe, where the direction of rotation is changed, (the nodes,) make an effort to move perpendicularly, down and up, and incline the globe to revolve horizontally. But so soon as the revolving commences, the situation of its axis is changed horizontally, and the matter moving at the top of the globe will tend inwards towards the support, and that at the bottom outward, which two actions will tend to raise it, and keep it moving round the support horizontally.

But I had taken up my pen only for the purpose of noticing the conclusion, "that the double motion" of the toy, "explains the compound motion of our planet around the sun," or that it presents an argument at all in favor of the nebular hypothesis. There is no such movement in tha heavens. neither can they be, as those of the toy. The globe has a fixed axis extending over some distance at each pole; one of them is confined by the support, while gravity attracts the whole machine towards the earth; and these two forces—the support and gravity—balance each other, and, combined with the rotary motion of the globe, cause it to rotate horizontally.

But to suppose that the laws of nature could form out of nebulous matter a sphere, with a fixed axis extending past the poles, and apply a force at one end at right angles to the axis, that shall not act on the globe, and another equal force acting in a contrary direction, on each particle of matter of the globe, is preposterous. And yet, under no other conditions can such a movement be accomplished in the heavens. J. B. CONGER.

Jackson, Tenn.

Cotton Seed.

MESSRS. EDITORS—Perhaps you recollect that I inquired of you last year if there were any patentable novelty in the process of singeing off the short cotton on the cotton seed. A patent has recently been taken out by A. A. Hayes, of Boston, Mass., for "maturing the cotton seed after it has been separated from the cotton by heat artificially applied, so as to render the husk brittle and easily separable from the kernel." This is just what I did in the oven of a stove, and then I singed off the short cotton from a small quantity, which made the husk very brittle. In a late number of the SCIENTIFIC AMERICAN, E. Conkling, of Cincinnati, suggested the invention of machinery to remove the short cotton or fiber from the seed, and the using of this fiber for making paper. In the winter of 1855, Wm. Coleman, Esq., of Euclid, wrote me from New Orleans, La., stating that if my hulling machine could hull cotton seed, he did not know of a better business to engage in than making cotton seed oil. In May, 1855, I received a barrel of the seed from him, and after trying the experiments referred to, I tried to hull it, without any more preparations excepting screening. The hulling machine removed the short cotton without breaking the husk, and by giving it a higher velocity, the husks were opened, and the clear kernels came out. I got 6 per cent of short cotton, and I showed a sample to Mr. Younglove, paper manufacturer in this place. The sample had some of the husks mixed with the cotton, but these could have been screened and separated. I made an estimate of the cotton seed crop of 1853, and allowing one half the short fiber to be applied with seed for manure, 65,257 bales could be obtained for making paper. If it is desirable to remore the short cotton from the seed, or if it is desirable to open the shuck at once, to let out the kernels for oil, the machine is already invented that can do this.

OLIVER P. STEVENS.

Cleveland, Ohio, May, 1856.

[A patent has lately been taken out in England for destroying the short fiber on cotton seed by steeping it in sulphuric acid.—[ED.

Steam Engines for Circular Saw Mills.

MESSRS. EDITORS—Most circular saw mills are designed to be portable, therefore the engine should be portable also. Such an engine should be as compact as possible. The employment of two pumps—one for cold and another for hot water—are almost universal attachments with our western engine builders, whereas eastern engineers almost as universally repudiate more than one pump. There can be no advantage obtained in the use of two pumps; one is sufficient. The water can be heated in its passage from the pump to the boiler, by passing the pipe through a heater box set in the exhaust steam pipe. The supply can be regulated by a stop cock. The barrel of the pump should be as small as the plunger will allow, otherwise the air will prevent the necessary vacuum

It is better to place the steam chest on the side instead of on the top of the cylinder, as the rock shaft and standards can thereby be dispensed with. The piston should have a high speed, otherwise it will be necessary to get up the speed by a counter-shaft, or a very large fly wheel, both of which are objectionable. With a long stroke a high speed is almost unattainable, therefore the stroke should be as short as possible, and the necessary capacity of the cylinder should be obtained by an increase of its diameter. This plan possesses the advantage of shortening the bed plate and bringing the entire engine within a small compass. Such an engine should be fitted to work the steam expansively, and with a variable cut-off to allow for different kinds of sawing harder and lighter work, such as the variable depth of line cut, and hardness of the timber. The entire power of the engine is sometimes required, while at other times one half of its power will be sufficient. Hence the benefits of a variable cut-off in the sawing of timber are self-evident.

These remarks apply to reciprocating engines. If oscillating engines are not liable to springing their piston rods and flattening their pistons, they certainly are to be preferred, because they can dispense with the steam chest, the eccentric and rod, and many other adjuncts required for the working of reciprocating engines; and besides, they occupy less space. They are more portable, because more simple.

It is desirable to have an engine of unlimited and uniform speed attached directly to the saw shaft; such qualities, however, do not belong to the reciprocating engine. The rotaryengine, did it not contain many objections not yet removed, would be the best of all. It is to be hoped that a perfect rotary steam engine for steam saw mills will yet be invented.

J. W. GAREY.

Grenada, Miss., 1856.

(Our Foreign Correspondence.)

Italian Fishing Nets, Dredging Machines, and Sawing Apparatus.

ROME, April, 1856.

MESSRS. EDITORS—The fishing arrangements employed here, on the Tiber, consist of scows moored near the center of the stream, having a revolving shaft, to which are attached long wooden arms. Two of these arms had oblong iron frames, to which were fastened a couple of nets, bagging towards the shaft, and about three by six feet in size. The two other arms had boards about two feet long by one in width attached to them. The force of the current caused this machine to revolve, ensnaring all the small fishes unlucky enough to swim within reach of the nets. I watched one of these concerns for a long time before I could persuade myself that it was actually intended for fishing purposes; but when I saw one small fish struggling in the meshes of the net, and observed an attendant stretch out a scoop and secure it, I no longer doubted the evidence of my senses, and felt very much inclined to send you drawings "by express." I felt somewhat anxious to have you speedily lay before your readers the particulars of this improvement, that some of them might profit by the novelty, at least, which it possesses.

The modern Romans are more remarkable for their religion than they are for ingenuity. The turning lathes that I observed consisted of a hickory pole, one end planted in the ground and the other fastened by a rope to the spindles, which, being made to revolve by a treddle under the workman's foot, coiled up the rope on one spindle, the rebound of the hickory stick turning the wood, first one way and then the other, until the article required had been "turned" out in the desired shape. When I was a youngster I have often seen a more improved article of the same kind in use among our farmers; but that was so long ago I did not expect to find any approach to it in establishments celebrated here for being the largest manufactories of cabinet furniture.

In Rome, also, it is refreshing to see carpenters planing boards, by hauling the plane towards them; or sawing veneers singly, with a saw placed between two rope-secured handles. Even the sawers of fire-wood had an improved method of doing their business, by placing one end of the saw blade upon the ground, bearing upon the other end with their bodies, and then cutting the stick of wood in two by rubbing it backwards and forwards over the edge of the saw.

In Ancona I saw contrivances for raising mud from the bottom of the harbor, which goes a little behind anything of the kind I have ever seen elsewhere. One of these concerns consisted of a large scow, on which two drum-like wheels had been erected—a large and small one. The larger wheel was about fifteen feet in diameter, having stepping boards fastened on the inner circumference. A troop of men trotted over these stepping boards, tread-mill fashion, causing the wheel to revolve and coil up a rope upon the smallest drum wheel—some six feet in diameter. This rope acted upon a very long and heavy pole, one end of which was plunged into the water, and brought up about a wheelbarrow full of mud—when its lower extremity finally emerged from the water, and exhibited an oyster-rake-looking implement attached there for that purpose.

The other mud machine resembled the walking beam of an engine, built of wood, ten times the usual size of the iron engine. To one end of this concern was attached the mud rake, the other end being raised or lowered by means of a wooden screw, about a foot in diameter, sticking up some twenty feet into the air, from one end of the scow on which this machinery was located.

I believe I could fill several columns with descriptions of various articles, as far behind our times as the people are who use them; and might continue to illustrate the very slow progress Italians generally have made in the use of machinery. J. P. B.

April, 1856.

The new suspension bridge over the falls of Montmorency river, Canada, fell last week with a terrible crash while a cart was passing over it.

The Hights to which Balloons have Ascended.

MESSRS. EDITORS—Your worthy correspondent Wm. Partridge should adopt the motto of 'First see that you are right then go ahead" before he makes such a sweeping assertion as "the lightest gas used in filling balloons is sub-carburetted hydrogen, whose specific gravity is as 5 1-2 to 10 to the density of the atmosphere on the planes of the earth." From this he concludes that "aerial voyagers are apt to imagine they rise higher than they really do." And "much doubts if any balloon ever rose two miles in perpendicular hight."

Your correspondent seems to know nothing about the ascent of Biot and Gay Lussac with Napoleon's war balloon *Intrepede*, after its return from Egypt. Lussac ascended with it a second time, purely for purposes of science and truth, and being assisted by such men as Berthollet, Laplace, and the celebrated chemist Chaptal, there is hardly any room to "doubt" the accuracy of the experiments, as the very best instruments had been provided by the Academy of Arts and Sciences." Lussac rose to a hight of 23,912 feet above Paris, and 23,040 feet (being more than four miles and a quarter) above the level of the sea. The barometer sunk to 12·95 inches. I have myself ascended until the barometer sunk to 15·14 inches.

Gas generated with zinc and sulphuric acid is not more than one-thirteenth the weight of atmosphere, and when iron is used, it is, with ordinary precaution, not more than one-eleventh the weight of atmosphere. Your correspondent is also in error as regards the attainable hight with a balloon filled with carburetted hydrogen of five-tenths the weight of common air. It does not follow that it will rise *only* to the hight of 7 1-2 pounds of atmospheric pressure. The hight attainable is governed by the ascensive power of the balloon when leaving the earth, and room in the balloon for the expansion of the gas. Thus, a balloon may be charged with carburetted hydrogen and ascend to a hight of four to five miles, which has been done by the great Vauxhall balloon in England.

I agree with Mr. Partridge that "It is necessary, in reasoning on any subject, to take special care that our theory is based on some provable facts, or our reasoning will produce confusion."

The carburetted hydrogen used for lighting purposes in this country is rarely five-tenths the weight of air. In the city of New York I found it to be nearly five-tenths, and in all other American cities I seldom found it to be four-tenths the weight of common air. When cannel coal is used for its production it is five-tenths, and sometimes heavier; but with the commonly used bituminous coal it rarely reaches four-tenths. The gas companies find it more profitable to make poor gas and good coke than to make good gas and poor coke. Hence they should be called "Coke Manufacturing Companies, and supplyers of gas incidentally," rather than Gas Manufacturing Companies. JOHN WISE.

Lancaster, Pa., May, 1856.

Progress of Astronomical Science.

Seventy-five years since the only planets known to men of science were the same which were known to the Chaldean shepherds thousands of years ago. Between the orbit of Mars and that of Jupiter there occurs an interval of no less than three hundred and fifty millions of miles, in which no planet was known to exist before the commencement of the present century. Nearly three centuries ago, the immortal Kepler had pointed out something like a regular progression in the distance of the planets as far as Mars was broken in the case of Jupiter. Being unable to reconcile the actual state of the planetary system with any theory he could form respecting it, he hazarded the conjecture that a planet really existed between the orbits of Mars and Jupiter, and that its smallness alone prevented it from being visible to astronomers. But Kepler soon rejected this idea as improbable. In this space no less than thirty-three small planets—the Asteroids—are now known to revolve, and perhaps double this number may yet be discovered. These small planets are believed by Dr. Alexander and others to have once formed a single thin planet.