stringer of a flight of stairs, a spring is placed under the top of each, and on this lies the stair top, being divided and hinged on the sides, so that when a person ascends the stairs he has the force of the spring to aid him in rising to the next, and in descending, the elasticity of the spring prevents the whole weight of the body from coming forcibly on the one foot, thus rendering "gitting up stairs" not such a fatiguing affair as in the ordinary solid stairs.

H. Getty, of Brooklyn, exhibits an Adjustable Hammock Berth. This invention consists in a convenient and comfortable mode of arranging the berths of ships. In the day time, it folds away and gives more room in the cabin; and at night, as it swings from two pivots, one at either end, however much the ship may roll, the occupier is perfectly quiet.

On a table in the south transept there are four models, each intended as an improvement on the usual form of ships' paddle-wheels; but we are sorry to say they are not of much practical use, as the nautical public do not seem to have sufficient confidence in them to ever adopt such contrivances. The first is composed of six floats, which, by means of an eccentric, feather themselves when leaving the water; and so large are the floats that they nearly form a perfect drum. The second is on the same general principle, having a greater number of smaller floats and a larger wheel. The third is a large wheel, having a number of small solid floats; their section is triangular, with slightly concave faces, and they are placed on an axis, so that each can rotate by itself when in the water. It is practically of no use; the friction is not so great, trnly, but the floats would simply revolve through the water, and exert very little propelling action on a ship. The last is a model of a method of arranging paddles without employing a wheel, and although the model is very small, it is almost as much as one person can do to turn it; what power it would take to turn a large one capable of propelling a vessel, it is beyond our arithmetical capacity to calculate. On the axle are fixed three eccentrics, arranged the same as a three-throw crank; round these are coupling joints, in the lower half of which are four paddles, radially placed, and the top of the couplings are fixed by means of levers. When the axle is turned, these paddles describe an elliptical arc, one-half in the water, the other out, and as four are always moving through the water, the inventor evidently thinks the ship would be propelled. It might be; but we should not like to pay the coal bills which an engine would naturally consume in its laborious efforts to drive the boat.

Every succeeding Fair of the Institute brings out a greater or less variety of devices which have not the merit of novelty, to say nothing of utility, to recommend them; and what is the more strange is that nearly all these old traps originate in, or very near to, New York city, the supposed centre of information. The four wheels above mentioned appear to have been born in this city within the past year. Arguing from this fact, and from our observations in the past, we believe that, in general, the mechanics and inventors of the country are better acquainted with the progress of invention than the same class in the city. We have reference to those who toil in the shop and at the lathe. Our city mechanics usually read story papers, and do not pay sufficient attention to the current progress of mechanical science.

Strychnine.

This poison, which has of late become so notorious in its abuse, (we cannot say use,) is the most uncertain in its action on the human frame; in some producing instant death; the same dose in others only bringing on tetanic convulsions, and in a lucky few no effect at all; and this does not appear to have any relation to the physical strength of the patient. It is a whitish crystalline substance, and is extracted from the nut of a tree called strychnine *nux vomica*. This tree grows in Ceylon, is of a moderate size, and has thick shining leaves, with a short, crooked stem. In the fruit season, it is readily recognized by its rich, orange-colored berries, about as large as golden pippins. The rind is smooth and hard, and contains a white pulp, of which many varieties of birds are very fond; within this are flat, round seeds, not an inch in diameter, covered with very beautiful silky hairs, and of an ash-grey color. The nut is the deadly poison which was well known and its medicinal properties well understood by Oriental doctors long before Europe or America had heard its name. "Dog-killer" and "fish-scale" are translations of two of its Arabic names. The natives of Hindostan often eat it for months, and it becomes a habit, like opium-eating, with the same disastrous results. They commence with taking the eighth of a nut a day, and gradually increase their allowance to an entire nut, which would be about twenty grains. If they eat directly before or after food, no unpleasant effects are produced; but if they neglect this precaution spasms result. The chemical tests for it are numerous, but only one or two can be relied upon as thoroughly accurate.

The British and American Patent Offices.

The London *Engineer* has the following article, comparing the English and American Patent Offices:—

"We had no idea of the cribbed, cabined, and confined nature of our own little nest, in comparison with the vast aviary in which we have been accustomed to be fleeced by our Transatlantic friends, before we had the plans drawn out on the same scale, or we think we should have hesitated to make such an *exposé* of our deficiencies; but the plans being prepared and promised to our readers, we feel bound to bring them to the light, let the consequences be damaging as they may. We had read of the sizes of the various rooms of the American office, as stated in the published description of it, and we had seen the plan; and, further, we knew well the ins and outs of our own Patent Office, but never, until the plans were placed side by side, did the comparison appear so ridiculous. We do not say that some of the closets of the American office are as large as our patent library, but really the space occupied by the entire building is so vastly greater than our own little jewel in Chancery lane, that we are at a loss to know what use can possibly be made of it. It is true that the plan of the American office, as we have given it, is not yet completed—one portion having to be built, and other portions being occupied by different departments of state; yet for all this, the building was designed for the Patent Office alone, and to the purposes of this office alone will it very shortly be devoted, so that we may justly conclude, from the size of the entire building, what views the Americans entertain of the importance of the patent business of their country. In one of *our* departments the space is so confined that we have recommended the attendants to wear spring shoes, so that they would, after a little practice, be able to jump over each other's heads; there being no room to pass between the shelves and the backs of the chairs of those sitting at the central table. With respect to the store department, there is only sufficient room in the corrugated iron out-house to contain a few copies of each of the printed specifications, which space will be wholly inadequate when the specifications of the patents granted under the old law are all printed. As to a museum of models, it does not exist, except in one of the boilers at Kensington; and as recent events, to which we referred last week, give signs of an explosion in that quarter, no safety-valve having as yet been discovered—it is not impossible that the models may again have to be placed in their respective cases, and consigned to the cellars from which they were taken. Now, this is all too bad, especially when we consider that the patent fund, notwithstanding the excessive fees of the law officers, has accumulated to the extent of about £100,000. Patentees will never, as was at one time suggested, have any part of this fund returned to them, and why, we want to know, would it not be as well employed in building a respectable office as in remaining in the Treasury? The business done in our Patent Office is not less important than that of the United States office; then what makes the difference in the views entertained as to the amount of space required for the proper transaction of that business? The real fact, we suspect, is that no difference of opinion exists as to the space required, but there are some undefined uses to which it is supposed the accumulated fund may be hereafter applied, and which time has not yet revealed. We beg to suggest that this expected revelation, when it is made, should be nothing more than that the whole fund, if necessary, should be expended in building a new Patent Office, containing ample space for every department, including a museum for models; and we venture to hope, further, that the revelation will show that a situation near Chancery lane is in every respect the best for such a building."

Carbon.

Carbon is surely a kind of sylph, or sprite, and that, too, of no ordinary sort. The caterpillar changes its coat, and becomes the gorgeous butterfly, and this astonishing transformation is the theme of the fabulists. Far more wonderful, however, is the change which takes place in a piece of charcoal. From a black, opaque, and almost worthless material, it changes to a brilliant gem—the diamond, which even the stars are likened to. It certainly appears incredible that the diamond, so transcendently beautiful, sparkling with more brilliancy than the dew-drop at sunrise, should be nothing else than a bit of charcoal, but so it is. Not here, however, does the chameleon power of carbon rest, for by another change it becomes invisible. In such a state it exists in the brightest, purest air. By another change it becomes the thick, heavy flakes of smoke which we see roll out of ill-constructed flues—the "blacks" of London and Birmingham. Coal is but impure carbon, hence it is often spoken of as the "black diamond," signifying, however, as much the intrinsic value of coal to man as its chemical relationship to the sparkling gem. How the world would fare without carbon it would be difficult to say, for it forms the major part of the vegetable and animal creation. Tallow is white, but it is composed of nearly all charcoal (that is, carbon,) and the elements of water. So also with starch, sugar, spirit, gas, chalk, shells, bones—all contain carbon; they would, in fact, cease to exist without it. If we make a mixture of sulphuric acid and sugar, a volcanic commotion ensues. When all is over, and the black residue washed, it is found to consist of nearly pure charcoal (or charbon, as the chemists in France call it,) or carbon, as the English write it—having a dislike to the *h*. The purest carbon or charcoal with which the chemists are acquainted is the diamond; but even this valuable stone, when burned, shows by its ashes that it is of vegetable origin. Looking at carbon, therefore, either in its black or white condition, and knowing that it exists in the atmosphere around us in an invisible state, we need not any knowledge of chemistry or physics to enable us to come to the conclusion that few substances exhibit the infinite power of the Creator more than carbon.

SEPTIMUS PIESSE.

The Action of the Sea.

That ever restless mass of water, called the sea, or ocean, is the great agent in producing the physical changes of the globe. It is the only workman who never rests—always working, always toiling, for the good of man. It is continually wearing away the rocks and beaches of portions of our coasts, and carrying the matter onward in its currents, to form islands or to add to continents in other places. The motion of the waves produces a sifting action, and only the heavy matter falls to the bottom, while light alluvial soil and small sand is held suspended in the upper strata of the water. We can realize the force of the waves in wearing a coast by remembering that in a hurricane the force of the waves are equal to a pressure of forty tuns to the square foot of coast surface. What can withstand this? We feel that all our breakwaters and stone walls must give way in time, however long that time may be. The buildings of man must fall before the forces of Nature.

Mathematics.

Mathematics is the most noble and elevated science the human mind can investigate or study. Each question that the student undertakes to solve, when accomplished, but leads to another and a higher, and thus leads the intellect to consider and grapple with the grandest realizations of truth in our universe. All other sciences (except those relating to living beings) are based upon it. Astronomy, its eldest child, and Mechanics, its most useful servant, are but practical mathematics. How grand and noble to calculate the distances of stars, the motions of the planets, and to prophecy the appearance of a meteor! and how useful and glorious, as advancing true civilization to calculate the horse-power of a steam engine, to estimate the extent of a bed of coal, or to determine the practical strength of iron! All these are done by the aid of this science, and the world teems with objects for its investigation.

Loss of the Central America.

This steamship left Havana for New York on the 8th inst., having on board about six hundred passengers, chiefly returning Californians, and $1,600,000 in specie, which was lost beyond recovery. Up to Saturday, the 12th, they had a storm, which increased in violence, and on that night the ship foundered, when five hundred passengers, it is supposed, were lost; the remainder were saved by various vessels sailing in the vicinity. No more particulars had been received up to the hour of our going to press. This calamity will sadden the circle round many a household fire, and in place of the look of pleasure and cry of joy which would accompany the welcome home of every one who had been toiling for years in the land of gold, we shall only see the look of anguish and hear the wail of grief.

The Great Eastern.

At a late meeting of the Eastern Steamship Company, it was announced that the vessel may be launched in September, but that the trial trip to Portland, Maine, will be deferred to the April following. Her total cost will amount, including all contingencies, to about three millions of dollars, of which nearly one remains to be met. Of this, $160,000 will be provided by calls at present in arrear, and to supply the balance of $490,000 the directors are empowered to borrow $500,000 upon debentures.

Ventilation of Cars.

In traveling by railroad, the unfortunate individual who chances to be in the cars all night must either catch a severe cold, by having one or more windows open, and in dry weather nearly choked with dust, or else poisoned with the malaria arising from the burning of lamps and breathing of passengers. Surely this can be remedied. It would cost the railway companies but little to adopt some of the known systems of ventilation which would answer all the purposes required, and they would be amply repaid by the increased comfort of their patrons.

The Parisian newspaper, *Galignani*, says:—"M. Babinet, the astronomer, has just announced to the Institute that, in consequence of a favorable change in the currents of the ocean, a series of years of heat has been entered on, of which the present is the commencement." We can only say that, if this is the first year of M. Babinet's series of years of warmth, it is the coldest that has been known in the United States for a long time. However true this fact may be as regards Paris, it certainly has not affected New York.