only that in this case the motion is continuous. The inventor employs these circular, band, or reciprocating knives in substitution of saws, to cut timber and other substances; and the cutting is effected with the production of a smooth surface, and without waste; and he also uses such knives or knife edges, moving not merely like a chopper against the substance to be cut endways, but like a saw, to cut tobacco and all kinds of fibrous or other similar substances requiring to be cut cleanly and without jagging.

HYDRO ELECTRIC CABLE.

This is the invention of F. Tomasi, of Paris, France. The cable is composed of one or several pipes of copper or other convenient material, equal in number to that of the despatches it may be desired to transmit simultaneously. Each pipe leads respectively and separately at one end into a little cylinder provided with a piston, and at the other end into a bent glass tube which contains some mercury. A platinum wire, isolated everywhere except at its extremity, which is always immersed in the mercury contained in the tube, is in communication with a terminus or screw nut. Another wire, also of platinum, which can be immersed more or less deeply into the mercury in the glass tube at will, is connected to another similar terminus, and a third wire, also of platinum, isolated everywhere except at its end, is in contact with a third terminus. The last wire is immersed in the glass tube, so that its uncovered end can only come in contact with the mercury at its upper level, The second mentioned terminus is put in contact with the receiving apparatus, and the latter with the pile, which in its turn is connected with the first mentioned terminus.

LUBRICATING OILS.

A Scotch inventor combines caoutchouc with mineral lubricating oils. In preparing the improved mineral lubricating oils, the oil obtained from the destructive distillation of shale at a low red heat, and refined by redistillation and treatment with acids and alkalies, is employed; and it is so far freed from paraffin as to be liquid at, say, 30° to 40° Fah., then refined to the extent which produces an oil of a permanent light yellow color, practically free from pungent odor. In this mineral oil about one per cent of caoutchouc, preferably in the form of sheet india-rubber, is dissolved, and the solution is effected by first allowing the caoutchouc to remain immersed in the oil for a few hours, the oil being, during that time, maintained at a temperature of about 100° Fah.; and, second, by violently agitating the caoutchouc and oil together for about twenty-four hours by means of a mechanically driven dasher or agitator. However, heat alone, or mechanical agitation alone may be used for effecting the solution of the caoutchouc in the oil; a more perfect solution is obtained by employing the methods together. After the solution or combination of the caoutchouc with the oil has been effected, the prepared oil is allowed to settle until it has become clear.

THE PRESENT AND THE PAST.

NUMBER V.

The incredulous reader, who has lived a lifetime by the banks of some swift running and powerful stream, on reading our last contribution, says at once: "Our stream has not sunk its bed, within our recollection, at the utmost more than a few inches, if that; it has not altered its channel more than a few yards; and what it has removed from one place it seems to have redeposited in another; and yet you would have us believe, that these rivers of the West have eaten into the bowels of the earth six thousand feet; have given rise to a series of elevated plains, traversed by endless water-courses; and have carried away rocks not to be estimated by tuns, but thousands upon thousands of cubic miles! It is too incredible; just think for a moment of the time required in such an operation; millions of years will scarce meet the demand! Can you not explain all this by the aid of fractures and dislocations of the strata and by the more energetic and rapid action of the breakers of the sea, while the land was gradually emerging from the ocean?"

No! good reader, we cannot relieve you; the facts of the case forbid a doubt, for Nature, in this instance, has recorded her own method of procedure in unmistakable characters. In the first place, the idea of these water courses being on the line of fissures or dislocations is utterly untenable. The rocks on either side of them are undisturbed, and the very sinuous course of these numberless streams forbids of their being on the line of faults. But the evidence against any action of the sea is, if possible, even still stronger.

Everywhere throughout this region Nature has left monuments to record the progress of her destroying hand. Here and there, harder portions of the rocks eroded have resisted the action of the atmosphere, and stand in fantastic shapes, resembling, as Dr. Newbery remarks, "the forms of churches, castles, gates, and monuments of various kinds." In one locality, a number of such monuments give the idea of a vast cemetery of gigantic tombstones. Had it been the violent action of breakers that had eaten away this land, these monuments had not been left. Do you doubt this statement? Then let us descend with our guide, into the gloomy depths of the cañons, and hear what Dr. Newbery says of these monuments in the early stages of their formation: "Near the mouth of the Diamond River, by the intersections of the numerous cañons which cut the plateau, portions of it have been left in a series of pinnacles and pyramids, frequently standing entirely isolated, forming some of the most striking and remarkable objects seen on our expedition. Many of these buttes exhibit a singular resemblance to the spires and pyramids, which form the architectural ornaments of the cities of civilized nations, except that the scale of magnitude of all these imitative forms is such as to render the grandest monuments of human art insignificant in comparison with them. Oh, man! what becomes of your old churches and castles, your colosseums, and triumphal arches, your ruined cities of the desert, your pyramids, and of the Cyclopean masonry of your lost races, by the side of these, the ruins of an ancient continent?"

But pardon me, reader; you ask, why could not these buttes that our guide describes, have been carved out by the action of breakers? Simply because in the depths of these cañons, even if the sea ever had had access to them, no breaker action could be possible. Visit the fjords of Norway, smaller cañons actually partially submerged, and see the land-locked waters lying these, but harmlessly ruffled by the wildest gale, and you will realize that neither Scandinavian fjords nor Colorado cañons were ever formed by breaker action. And if the buttes below, now forming, do not owe their shapes to any such cause, may we not reasonably infer that the same statement applies to the buttes on the plateau above, long since weathered out, and more completely isolated by longer exposure to atmospheric influences?

But yet another proof. The extensive plateau, marked, in the section we gave in our last, as "the Sage Plains," has been eroded in thick strata of cretaceous shales. These shales represent muddy portions of the Cretaceous sea, which were thickly tenanted by a peculiarly formed characteristic oyster, known to geologists under the name of *gryphæa*. Like other oyster-shells, these are massive and heavy; and Dr. Newbery tells us that, on the Sage plains, these shells occur, strewn over the ground in such numbers that thousands of large ships might be filled with them; these have undoubtedly all fallen from the hundreds of feet of shale that have been removed, the heavy shells resting on the surface, while the lighter particles of earthy matter have been swept away. Now, had breaker action destroyed these beds, these shells would have been ground and reground, and their fragments would have been scattered far and wide; and they thus, in their present disposition, indubitably attest the more gentle nature of the agent that has accomplished this great work of eating away these 1,600 feet of shales.

It is worth our while to cast another glance at the total amount of this erosion. Invert the section we gave in our last, and the empty space between the dotted line and the line describing the present surface will represent the mass of material that has been removed, as a section of a mountain range; a range 6,000 feet in hight, and varying in width from 1 to 180 miles, and with a length of several hundred miles Nor, in reality, does this do full justice to the case; for, to give at all an approximate idea of all this denudation, we ought to have drawn the dotted line from peak to peak, and then continued it over the valleys east and west of the Rocky Mountains and the Wasatch range, but we feared to confuse the reader. And all this work has been accomplished since the close of the cretaceous epoch!

Whither has all this material, thus removed, gone? To form the more recent strata around the Gulf of California, and to furnish material for new strips of land, to be sooner or later upheaved and added to the western edge of our continent; and this appropriately, brings us to the consideration in our next, of the mode in which such materials are re-arranged into new strata.

But we would draw attention to one more question, to which Dr. Newbery gives prominence, and which is well worth remembering, when some tell you that, in our oldest rocks, we see the commencement of geological history.

The materials eroded, as herein described, vast as they are, are as nothing to the vast total of deposits of which they once formed a part. In the Colorado region, we have sections of upwards of 6,000 feet of strata, from some of the oldest, as the silurian, up to the last of the secondary; and these deposits extend between the Colorado and the Mississippi, in a belt 1,200 miles in width, and of "great, though yet unmeasured, extension north and south."

It would have required, according to our guide, all of an island 300 miles in diameter, and at least 6,000 feet high; or, what is more probable, a continent of six times that area, and 1,000 feet high, "to furnish all the sediment that forms the stratified rocks of only that portion of this great central plateau that immediately borders the Colorado."

Where, then, was the continent whose ruin furnished the materials for the whole of the great belt? Do you tell me that fragments of it remain in the north, in Canada, and the Adirondack Mountains? Granted! but these themselves are sediments, altered, it is true, by the vicissitudes of their vast history; and whence came they? Dr. Newbery infers the existence "of broad and rapid rivers, which flowed from the mountains and through the fertile valleys of a primeval Atlantis," bearing down the sediments of our Paleozoic rocks; but what shall we call that utterly lost land, whose destruction must have accompanied the formation of the very oldest ruins, the foundations of this same Atlantis that attest the age of the world? Verily, geology might be termed "man's nescience of creation," wherein he best learns how little he can know.

Paper Wheels.

The Pullman Car Company is running a car, on the Chicago and North-western road, with what are called "paper wheels." The wheels have steel tires and cast-iron hubs, and the paper is introduced in the way of filling under the tires, for the purpose of deadening sound and diminishing the force of concussion. According to the *National Car Builder* the wheels have been running since July last under this particular car, and had been in use some four months previously.

The paper device is said to be superior to wood for the purpose designed, being stronger and lighter, and free from knots, grain, or sap. It does not expand or contract, but remains in the condition in which it is put in the wheels without liability of change. It is cheaper than wood, and can be molded into any form by pressure, and is made fire and waterproof by asbestos. It is, as a substitute for wood, adapted to a variety of uses, especially in the way of ornamentation.

SCIENTIFIC INTELLIGENCE.

A NEW PREPARATION OF THE SULPHOCYANIDE OF AMMONIUM.

A Dutch chemist, Van Zouteveen, has made the important discovery that by passing dry ammoniacal gas through the bisulphide of carbon, a brick-red precipitate forms, which upon solution in water and boiling down to half its original volume, yields sulphocyanide of ammonium. The reaction is a valuable one, as it points out a possible way of making the sulphocyanides in an economical manner. Our readers will recall the uses of this class of salts in testing for iron also in photography, and more recently in the artificial production of cold.

RECOVERY OF IODINE FROM RESIDUES.

When bromine and chlorine are present with the iodine in residues, it is difficult to separate them and to recover the latter; and various methods have been resorted to for the purpose. Beilstein recommends the following: The solution containing the iodine is rendered acid by sulphuric acid; and nitrous acid gas, made from one part starch and six parts crude nitric acid, is passed through it, and the iodine thus precipitated is separated by means of a Bunsen filter. It is then thoroughly washed by cold water, and dried over sulphuric acid. If bromine be in the filtrate, warm the liquid to expel any iodine that may have been dissolved in it, and distil with black oxide of manganese and sulphuric acid. If chlorine be present, it will go off with the bromine. It is said that a considerable portion of the nitrous acid can be reclaimed, after it has served its purpose.

A NEW OPIUM MEDICINE.

We mentioned, some time ago, the discovery of a powerful emetic called apomorphine; we now have to record the preparation of a somewhat analagous base, to which it is proposed to give the name of *apocodein*. When chloride of codein is heated for 15 minutes to 338°—348° Fah., with an excess of a concentrated solution of chloride of zinc, water is eliminated, and apocodein is formed. It cannot be obtained in a crystalline form, but in other respects closely resembles apomorphine, and is more permanent and more easily made than the morphine compound. It is likely to prove a valuable emetic.

NARROW ESCAPE FROM SUFFOCATION BY CHLORINE.

The steamship *England*, which cleared from Queenstown on January 12th, with 200 passengers on board, was obliged to put back to harbor in consequence of the breaking, during a heavy storm, of a number of barrels of bleaching powder in the hold. The heavy sea washed into the ship, and thus liberated the chlorine gas in such quantities as to nearly suffocate all on board. Attempts were made to remove the powder, but it was soon found to be impossible for any one to live in the hold long enough to put on the grappling hooks, and the captain decided to put back to port as fast as he could sail. There are few gases so suffocating as chlorine, and in case of accident to a large quantity of the bleaching powder, the lives of all on board ship would be greatly imperiled. We have frequently observed the fumes of chlorine, while passing through some of the lower business streets of the city, and have been surprised at the endurance of persons employed in certain localities. There is too much carelessness in handling an article that is capable of so much mischief.

RECENT DECISIONS AT THE PATENT OFFICE.

The Examiners-in-Chief at the Patent Office make the following report to the Acting Commissioner of Patents, in relation to the application for an extension of a patent to John Worsley, granted December 23, 1856, on the use of corn husks in manufacturing rolls for calenders, washing machines, etc.

"The invention at most was but the substitution of one known material for another, or others. It is admitted that cotton, paper, wood, rags, or cloth, etc., had formerly been used for precisely the same purpose, and probably a list might be made out, of a hundred other materials, embracing grasses, leaves, mosses, barks, etc., etc., which would be the full equivalents of husks for the purpose named. It is true that when one discovers some quality in a particular material, peculiarly adapting it to some important use not thought of before, whereby art is improved, and the public benefited, he should be rewarded with the monopoly of its use for a proper time. But this class of discovery is generally among the least meritorious.

"Artisans and manufacturers should not be improperly trammeled, but left as far as possible, consistent with the clear rights of inventors, free in the choice of material wherewith to ply their trades and carry on their occupations. To allow patents for each supposed step of improvement, where it consisted in the mere use of skill and good judgment in the selection of material, would embarrass rather than promote manufactures and arts.

"But in the case before us, the Hon. Commissioner of Patents, Judge Mason, for whose opinion we have great respect, decided the matter to be patentable; but added, as a sort of solace to his own conscience, 'If it be a valueless invention, a patent can harm no one; if it be valuable, it is patentable. The applicant has had an opportunity of testing its value by going with it before the public for fourteen years, and though he swears that he has used extraordinary diligence in introducing it, yet a less number of his 'superior and cheaper' rolls were demanded in the last than in the second and fourth years of his patent.

"He states that he has made a profit of $5,975 in manufacturing his rolls, from which he deducts $3,500 as about the amount expended in 'traveling expenses, advertising, circulars, and incidental expenses in introducing the invention.'

"This is too indefinite to be admitted as a set-off, and we must conclude that he has been sufficiently rewarded for having discovered that husks are suitable for the purposes claimed.

"The claim that the invention is of any value to the public is only supported by two general affidavits of persons using the rolls, and think them superior to any in use, though what knowledge they possess in regard to other rolls does not appear.

"There is no proper detailed statement, or any other proper showing of the value of the patent, and we think the extension should be refused.

"R. L. B. CLARKE,
"S. H. HODGES } Examiners-in-Chief.
"J. M. THACHER,

DECISION.

The reasons assigned by the examiners-in-chief for the adverse report upon the merits of the present application are deemed good, and the extension is accordingly refused.

DUNCAN, Acting Commissioner.

The Acting Commissioner makes the following report, in relation to an application for the extension of letters patent, of John B. Read, for an improved projectile for ordnance, granted October 28, 1856.

The invention to which this application relates is an expanding wrought-iron sabot for elongated shot and shell Various modes are suggested by which the hollow cylinder constituting the sabot may be attached to the projectile, but the preferred mode is by imbedding it more or less in the cas.