

Scientific American

NEW-YORK, OCTOBER 23, 1852.

New York City.

From manifest indications we believe that the city of New York is destined to be the largest in the world. At present it contains more than one-sixth (520,000) as many inhabitants as there were in our middle country seventy years ago, and our whole country contains seven times more than there were in it at the same period. The City of New York has grown with the growth and strengthened with the strength of our united Commonwealths, and with the same mighty tramp of progressive population, which is now heard sounding from the Atlantic to the Pacific shores, so, from the ten thousand sources of our population, will there come those who will pitch their tents within our walls and take up their abode in modern Tyre. In the natural course of events, the City of New York will contain a population of 2,000,000 of inhabitants in sixty years from the present date. Nothing can prevent this but some overpowering calamity, which no one can foresee at present, and which no one anticipates. If such will be the mighty tide of population flowing through our streets in 1910, what will the City of New York be in A. D. 2,000? This is a question which no one can answer. Strictly speaking, New York is a commercial city, a mart of the sea—a port for tall ships and a caravansera for the merchants and merchandise of the world. On one side it is bounded by a narrow arm of the sea, and on the other by a broad and noble river; it is secure from all winds, and the most gigantic leviathans of the deep can ride safely and lightly close up to our wharfs and our warehouses. Every year it is becoming more and more like a whirlpool in drawing from afar those who want to sell and those who want to buy. Its centralizing influence is immense, and it no more can be checked than can the tides of the ocean. Here men come with what is new, and here men come to see what is new. "As iron sharpeneth iron, so doth the face of man his fellow;" and the natural result of men often meeting in masses together, is both to spread and elicit knowledge. Of this we have been more sensibly impressed during the past three weeks, than during any other period within our recollection. The streets of New York have been daily trod by forty thousand strangers in search of business and pleasure. Nowhere else have we had, or could we daily have, such opportunities of obtaining information from so many different sources, and of imparting it to so many different "lookers on in Venice." The Fair of the American Institute attracts many thousands to visit this city annually, and next year the World's Fair will attract far more than have ever visited New York before. The cities of the old world possess more interest to the traveller, because they are nearly all historical, and the association of places with events which have become famous in story, kindles up the feelings and excites the imagination; New York cannot boast of towers, castles, venerable cathedrals, &c.; neither can it boast of towering monuments, gorgeous palaces, splendid works of art, museums of renown, and galleries of paintings; no, she can boast of none of these; but every year adds something new and more imposing, and as certainly as time wings its flight, she certainly does New York grow on, and in grandeur and the acquisition of buildings and institutions, which will yet become renowned as those of London or Paris.

Important Patent Cases.

There have been two very important patent cases recently tried before two separate U. S. District Courts; we allude to the famous India Rubber Case, Goodyear versus Day, and the Revolving Fire-Arms case of Colt versus Allen. These trials have impressed us forcibly with the conviction that our U. S. Courts of Chancery are founded upon a wretched system. They are termed "Courts of Equity,"—the better name for them would be "Courts for the benefit of Lawyers." The case of Goodyear versus Day, for the infringement of a patent for the manufacture of vulcanized in-

dia rubber goods, has been before our U. S. Courts for some years, and it has only been brought to a conclusion within a few weeks. And yet, although an injunction has been granted against H. H. Day, we cannot strictly call it "a conclusion of the whole matter," for the defendant has published a card, stating that, under the advice of his counsel, he will appeal from the decision of the District Judges to the Supreme Court at Washington. This case may be banded from court to court, for some years to come, before it is finally concluded. The Supreme Court at Washington may reverse the decision of the District Court, and then, after that, a long trial by Jury will have to put the cap on the whole of the circumlocutions of the courts and the speeches of counsel. The first thing that is done by a patentee to get satisfaction for the infringement of a patent, is to apply to a U. S. Court for an injunction to restrain such and such a person or persons from infringing his patent. Notice is given to the alleged infringer of this application, and he at once employs counsel, and if the patent is an important one, "lawyers of the highest fees" are engaged, and on the plaintiff's side the most forcible arguments are adduced to prove the defendant to be a pirate, while, upon the defendant's side, as plausible logic is poured forth to prove the plaintiff a thief. For this india rubber case the great Daniel Webster was employed by Goodyear, and the renowned Rufus Choate by Day; other assistant and eminent counsel were also employed by both parties, and the speeches which they made to enlighten the Judges, occupied a number of days. After they were all made, these same judges took a most patient view of the whole subject, and came to the conclusion that they would make a short day's work of it, and hence they at once shut up Day from working any longer on his own account.

We do not know, but it is our opinion, that this case must have cost each of the parties \$20,000, at least, for lawyers' fees alone. Now, is this all that our republican simplicity has wrought us, in obtaining justice for alleged violation of rights? Is it not possible to erect a system of United States Jurisprudence of a more economical, conclusive, and satisfactory character than this? We think it is. While we say this, we admit that it is far easier to pull down than build up, and we do not like to disturb existing systems for new ones, until good evidence is given that the evils will be remedied and beneficial results follow. It is our humble opinion that if our District Judges, in reference to patents, would at once, when any injunction is prayed for, order a trial by Jury, without hearing any long arguments in equity at all, the ends of justice would be more promptly and satisfactorily obtained than by holding Courts of Equity, for the benefit of enlightening the Judges as to their duty in the case. We will not, at present, enter into a further discussion of this subject, although we have much upon our mind to say; at some other time we will return to it; and merely say, in conclusion, that duty compels us to keep it before the people.

Poisonous Chloroform—Tests for its Purity.

On pages 3 and 16, of this volume of the Scientific American, we published the experiments of Dr. Jackson, of Boston, with chloroform and fusel oil, and stated, as we believed to be a fact, that he had made a most interesting discovery in finding out the cause of the deaths which had occurred by the use of chloroform. The chloroform which had been used was made out of whiskey, which contained this oil, instead of being made out of pure alcohol. We now have to state that this is not a new discovery. On pages 280 and 281, "Chambers' Edinburgh Journal," for 1850, there is a paper by Professor Gregory on this very subject, which speaks of the danger arising from making chloroform of the pyroxylic spirit of commerce. He states that this spirit of commerce contains impurities of oils, and the chloroform made of it "is extremely dangerous, because the oils mentioned are very deleterious when inspired, causing migraine, sickness, and vomiting. These effects may be produced by chloroform containing but a small portion of these oils, the vapor of which comes in contact with the internal surface of the lungs. A larger proportion of oils, such

as is sometimes found, may produce very serious results, hence the necessity of perfect purification." These quoted sentences embrace the very discovery asserted to have been made by Dr. Jackson.

It is essential that every medical man should be enabled to ascertain, readily, whether any given specimen of chloroform be pure. Dr. Gregory presents some very excellent tests for detecting impure and proving pure chloroform, which are so plain that no surgeon nor dentist in our country can be excused, after this, for using any that is impure. One is, pure chloroform has the density of 1.500, but as this test is troublesome, depending on temperature and delicate instruments, two other modes are given. The next is to shake the chloroform in a well stoppered (not corked) bottle, along with one-half of its bulk of the oil of vitriol (colorless) of the density of 1.840. If any trace of oils is present, the acid becomes more or less yellow, and when allowed to stand, a darker line appears at the junction of the liquids. When the yellow color appears, after being shaken and standing still for a short time, the chloroform is poured off into another vial, where it is shaken anew, with another and a smaller portion of vitriol. If, after a time, this appears colorless, the chloroform may be considered pure, and it only remains to remove the acid from the chloroform. This is easily done by pouring the chloroform into a third dry vial, and shaking it with a little peroxide of manganese till its smell is quite free from that of sulphurous acid, which is very soon the case; its specific gravity is then 1.500, and it is perfectly pure. Another test, but a very delicate one, is to allow a little chloroform to evaporate from the palm of the hand; when pure it leaves no smell, but if there be a trace of oils they, being less volatile, remain and present a disagreeable odor. It is very difficult to get chloroform so pure that it will leave no odor when thus tested; but no practitioner should use chloroform if it leaves a strong and distinct smell of noxious oils, or if it colors the acid. These tests are easy, and chemists cannot be offended if surgeons refuse to use their impure chloroform, when it is so easy of purification and so dangerous to use. Pure chloroform produces none of the persistent sensations which are caused by the impure. Dr. Gregory has seen a specimen labelled "pure chloroform," which scarcely contained a trace of that liquid, and Dr. Simpson, the discoverer of chloroform, once received a bottle of apparently pure stuff from a maker of good character, and there was not one of his patients but suffered from its use, until he suspected the cause, tried it and found it to be impure. In "Chambers Journal," for 1851, page 57, it is stated that it has been administered in Edinburgh 80,000 times without a single accident. We have now a true clue to the cause of death produced, in more than one instance in our country, on persons who had previously inhaled chloroform without the least evil effect.

"The Niagara Mail," vs. "Scientific American."

"The Scientific forgets to relate how, that Hobbs' own lock was picked in two hours, by a London locksmith; and that the reaper was invented in Scotland, twenty years ago, and re-invented by Mr. McCormick, a Scotchman in the United States, who introduced it to the World's Fair, and lastly, that the 'glorious Yacht America,' has been beaten twice in England. The Scientific American, not only denies the least modicum of praise to foreign ingenuity, but not satisfied with that, there is never an invention or improvement announced in Britain but that journal makes it its particular business to decry either it or its author. The Scientific American is no true lover of science, else such illiberality and vulgar depreciation of talent out of the United States, would not be permitted to fill its columns."—[The Niagara Mail.]

[There is not a sentence in the above which we cannot, with reason, contradict as an untruth. Hobbs' lock has not been picked in England; and if the reaper was invented in Scotland 20 years ago, an assertion which we do not deny, Mr. McCormick, although bearing a Scotch name, is a native of Virginia; and if he re-invented the reaper, it was original with him, and does not militate against the remark of ours, that called forth the above,

viz., "McCormick's reaper gained a triumph at the World's Fair." If Patrick Bell invented a good reaper 20 years ago, Englishmen and Scotchmen ought to take shame to themselves for allowing it to cut silently a few acres only, on the Carse of Gowrie every year. Americans ought to be thanked for bringing this useful invention into notice at the World's Fair. The "Yacht America" has not yet been beaten. No candid Englishman will contradict this assertion; there is a great difference between losing a race and being beaten.

The Scientific American, instead of denying praise to foreign inventors and inventions, has always been forward to praise them when they deserved it. When speaking of American triumphs, we never employ opprobrious epithets against others. We speak as strongly against poor or humbugging home inventions as we do against foreign ones. We endeavor to be impartial and generous, and it is very singular that while our foreign scientific exchanges have given us credit for this course of conduct, a provincial journal should see fit to speak in different terms. No paper in our country, we believe, endeavors to be so impartial when speaking of foreign inventions and inventors. Our rule is truth, and our motto is, "honor to whom honor is due." If the Mail had been as candid as it is captious, it would not have used the language we have quoted.

To All Whom it may Concern.

GATESVILLE, Oct. 4th.

MESSRS. MUNN & Co.—Please continue the Scientific American to my former address. Enclosed find \$2 in payment. Yours,

SAML. IVES."

We publish the above letter for the purpose of directing attention to one of the most serious annoyances experienced by newspaper publishers, viz., the want of proper directions for mailing papers. Sam'l Ives has no doubt been a subscriber, but not at Gatesville, and as no such place appears on any of our books, therefore the conclusion is inevitable that Mr. Ives has never received his paper at that office,—indeed we never before heard of such a place, and could never find it by the aid of Mr. Ives' letter. Gatesville may be in Maine, North Carolina, Missouri, Texas, or any other of the thirty-one States, and, for aught we know to the contrary, a ville bearing this name may be found in every State in the Union. We spent an hour in looking for Mr. Ives' name in hopes of discovering his whereabouts, and, after finding three of the same name, we are obliged to wait another letter from him, in which he may slightly hint at our rascality, because we take his money without sending the paper in return.

We have many times been so confronted by correspondents, where the fault was entirely their own. Whenever any person sends for a newspaper, great care should be taken to specify the address to which the paper is to be mailed. Write your names, with town, county, and State, in a clear legible hand. If you cannot write plainly, print the address in Roman letters, with a pen; this will always give satisfaction, and insure correctness in mailing. Sometimes we can decypher the address from the postmark, but this is not always to be regarded because we have had many letters mailed from offices at a distance from the writer's residence. We remember one from a gentleman who, we have since learned, resided in South Carolina. This letter was dated at one place, mailed at another, and contained a postscript requesting his paper to be sent to another place, and in neither instance was the State indicated. This, we repeat, is a great annoyance, not only to the publisher but also to the correspondent.

Magnetic Balloon Ascent.

Applications have, it is said, been made to the proprietors of the different places of entertainment in London, from whence balloon ascents take place, by an individual who wishes to make an ascent suspended 30 feet below the car, by magnetic attraction. The method by which he proposes to accomplish the feat is this: he possesses a magnet, the attractive power of which will sustain a weight of 150 lbs.; this is to be hung by a line 30 feet below the car; round his body is fixed an iron zone, which on being brought near the magnet firmly attaches itself thereto,



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.
FOR THE WEEK ENDING OCTOBER 12, 1852.

APPARATUS FOR HEATING FEED WATER OF STEAM BOILERS—By M. W. Baldwin, of Philadelphia, Pa., and David Clark, of Schuylkill Haven, Pa.: We claim the arrangement of a heater for the feed water of steam boilers, with respect to the chimney, smoke box, and the blast pipes of the escape steam, substantially as described, so that the heated smoke and gases from the smoke-box, and the exhaust steam from the cylinder, shall pass separately through the heater, in distinct tubes or channels, in such a manner that they cannot mix, until both have passed the heater, as set forth.

MILL STONES—By Thos. Barnett, of Beverly, England. Patented in England Jan. 8, 1852: I am aware that holes or apertures in upper and under millstones, have been sometime in use, and I do not claim simply the making of holes or apertures, in millstones, as my invention.

I claim the making, in under mill stones, of holes or apertures, covered with wire gauze cloth, perforated metal plates, or any other substance that will allow part of the meal to pass through, after it is sufficiently ground, in combination with holes or apertures, in upper mill stones, containing sweepers, brushes, or rubbers, for the purpose of sweeping, rubbing, or brushing the meal over, or through the wire gauze cloth, perforated metal plates, or other substances, without confining myself to the exact detail described.

GANG PLOWS—By Chas. Bishop, of Norwalk, O.: I claim the manner described of constructing the mould boards, and combining them with the blade, in the manner substantially as specified.

SUGAR BOILING APPARATUS—By Wm. H. Clement, of Philadelphia, Pa.: I claim, first, the arrangement and combination of the simmering vessel, with the ball cock and the scumming trough, substantially as described; and I claim this arrangement and combination, whether alone or in further combination with a partial covering of the bottom of the simmering vessel, or the introduction of the steam worm, as described.

Second, the agitator arranged and operating in the manner and for the purpose described.

SCUMMING APPARATUS FOR SUGAR APPARATUS—By Wm. H. Clement, of Philadelphia, Pa. Patented in England July 23, 1846: I claim the application in the manufacture of sugar, of rotating paddles, or leaves, for skimming or taking off the scum and gummy matters from the surface of the liquor.

DISTILLING APPARATUS—By Chas. Delecluze, of New York City: I claim, first, the combination and arrangement of the boiler connected by the pipes with the column, which enables me to work continually, and without interruption by distilling the contents of one boiler, while the other boiler is being filled, and thus distilling the contents of one boiler immediately after the other, as seen in the description of the work.

Second, the combination and arrangement of the worm, situated between the two boilers, and of the pipes which connect the boilers with the worm, enabling me to test and ascertain the nature of the liquid contained in the boiler under operation, and to ascertain when the contents of that boiler are distilled.

ILLUMINATING GAS APPARATUS—By Robt. Foulis, of St. Johns, N. B.: I claim the return pipe, in combination with the retort, as set forth.

Second, I claim, in combination with said pipe, the false bottom and lining, as described.

Third, I claim the arrangement of the decomposing chamber, in combination with the return pipe in the vertical retort.

Fourth, I claim the employment of the series of decomposing trays, under the arrangement in the vertical retort, substantially as described, in combination with the central pipe.

Fifth, I claim refrigerating the gas by air, substantially as described.

INDIA RUBBER BAT CLOTH—By Chas. Goodyear, of New Haven, Conn.: I claim passing the bat, or fleece of cotton, flax, silk, or other fibrous substance, together with dissolved or softened caoutchouc, gutta percha, or other vulcanized gums, or the compounds or preparations thereof, between callendering rollers, with an elastic substance interposed between the bat or fleece, and one of the rollers, as described, or between the glazed apron and one of the rollers, as described.

ELECTRO MAGNETIC ENGINES—By J. S. Gustin, of Trenton, N. J.: I claim supporting the principal part of the weight of the armatures of the electro magnets, mounted upon sliding guides, or their equivalents, upon the reciprocating frame, as described, by means of springs, or their equivalents attached to said frame, so as to preserve the balance of weight in the moving parts, as set forth.

SAFETY VALVES—By Alfred Guthrie, of Chicago, Ill.: I claim the construction of the cock in the connecting pipe, by which the resistance to the pressure is taken off, and at which the steam will be allowed to escape.

DOUBLE SEAMING MACHINES—By Walter Hamilton, of Elmira, N. Y.: I claim the mandrel with heads removable at pleasure, in combination with two or more pressure rollers, operating with the same, and with a mallet acting simultaneously with said mandrel and pressure rollers.

I also claim the adjustable steadying rollers, or their equivalents, arranged with reference to the mandrel, and acting substantially in the manner and for the purpose set forth.

HOMINY MILLS—By James Hughes, of Cambridge City, Ind.: I claim the combination of the beating cylinder arranged and constructed as set forth, with the adjustable discharging apertures, by means of which the hulls and eyes are separated from the grain, and the latter is retained within the range of the beaters, for a shorter or longer period, according to the grade or size of hominy or samp, which is desired.

PRESSES FOR BUNDLING FLOCCULATED AND OTHER SUBSTANCES—By Danl Kellogg, of Pittsfield, Mich.: I claim the combination of the pressing box made with openings in its sides, with the platen and bed turning on swivels, and formed with channels, so arranged as to admit of the passage of the needles and cord through the pressing box, for the purpose of singly and doubly binding fleeces of wool, or other substances, while under pressure.

GAS REGULATORS—By Walter Kidder, of Lowell, Mass.: I claim producing a uniform pressure of gas in the branch pipe, which supplies the burners by means of the inverted cap, the vibratory lever, and the induction valve, arranged and operating within the chamber, of the branch pipe, substantially as described.

GAS REGULATORS—By Walter Kidder, of Lowell, Mass.: I claim producing a uniform pressure of gas in the branch pipe, which supplies the burners, which may not be varied by the number of burners supplied, nor by the variations of pressure in the main, by means of the counterpoising double inverted cups, the vibratory lever, and the inductor valve so combined and arranged with reference to the main and the branch pipe, that one of the said inverted cups will be acted upon by the gas in the main, and the other by the gas in the branch pipe, as represented.

GAS REGULATORS—By Walter Kidder, of Lowell, Mass.: I claim the producing, at all times, a proper and uniform pressure of gas in the branch pipe, which supplies the burners, which will not be essentially varied by the number of burners supplied, nor by the variations of pressure in the main, by means of the induction valve, the vibratory lever, and the counterpoising inverted cup combined and arranged and operating within the chamber of the main, substantially as described.

HARNESS SADDLE TREES—By Thos. Mardock & Wm. C. Keller, of Cincinnati, Ohio: We claim the crupper loop, having a shank, which, being inserted through the cantle into the pommel, is secured to the latter by the pad-hook, in the manner described.

APPARATUS FOR TRANSPORTING TRAINS ON INCLINED PLANES OF RAILROADS—By Saml. McElfatrick, of Dauphin, Pa.: I claim making the axles of the safety car in two parts, the inner end of each part being provided with an independent journal constructed and operated as described, when this is combined with the auxiliary wheels and auxiliary converging track and hub, substantially in the manner specified.

GRINDING MILLS—By Oldin Nichols, of Lowell, Mass.: I claim the pointed projections on the front edges of the teeth of the cylinder, when used in combination with the teeth in the concave formed with concavities in their front edges, substantially in the manner set forth.

EXPANDING WINDOW SASHES—By Mighill Nutting, of Portland, Me.: I claim the method of varying the pressure of the edges of the expanding sash against the jambs of the window frame, by means of the combination of the adjusting screws and springs with the set screws, or the equivalent thereof, for limiting the extent of the expansion of the sash, as set forth.

FLOW FASTENING DEVICES—By James Robb, of Lewistown, Pa.: I claim holding the share to its place by a tightening wedge, having a lip for lap or bite on the share, in combination with the headed or lipped studs for further securing the same.

SEED PLANTERS—By James Robb, of Lewistown, Pa.: I claim, first, causing the point of the drill tooth, when raised out of the ground, to slope backwards by the arrangement of the drag-bar attachment, the friction pulley and the curve of the upper part of the drill tooth, to avoid breaking the teeth, as described.

Second, I claim the combined device of endless screw and curved neck and pinion for producing the result specified.

BURNERS FOR SPIRIT GAS LAMP—By R. W. Sargent, of Philadelphia, Pa.: I claim the combination of the lower chamber or chambers, with the upper chamber, for the purpose specified, viz. the lower chamber or chambers answering the purpose of a heater, volatilize or turn into gas the fluid in the upper chamber, the flame being regulated as described, and the whole arrangement being substantially as set forth, without restricting myself, by this claim, to the precise form of the burner described.

PACKING WATER WHEELS—By Erasmus Smith, of Norwich, N. Y.: I claim the arrangement of the packing between the edges of the chamber or case and the wheels, in such manner that the packing on the lower portion of the chamber is adjustable from the interior, while the packing round the upper portion of the chamber is set up from the outside of the said chamber, substantially as specified, so that the whole of the packing is on the upper side, and none of it under the case, and all capable of being set up or adjusted without the necessity of getting under the case.

GOVERNORS—By John Tromper, of Buffalo, N. Y.: I claim the combination of the winding cords or chains, retarders or discs, hub, and spindle, arranged and operating in the manner set forth.

I also claim operating the governor valve of steam and other engines, by the twisting and untwisting of a flexible cord or chain, or equivalent thereto, attached to revolving retarders, and to the driving pulley placed above it, and detached from the spindle.

I likewise claim constructing the clasp with shoulders upon each part, which fit against corresponding shoulders upon its opposite part, and prevent the opening of the clasp, when they are united by the screw, substantially as set forth.

GLASS BUTTONS—By A. W. Walton, of Cheshire, Ct.: I claim the inserting of figures of uniform or variegated colors upon the inside of glass centered buttons, substantially in the mode described.

SEEDING APPARATUS OF SEED PLANTERS—By L. Moore, of Bari, Pa. Patented originally July 2nd, 1850: I claim the employment of a reciprocating gauge plate, when provided with feeding apertures, in combination with corresponding apertures in the hopper bottom, which have their sides oblique to the sides of the apertures in the said reciprocating plate, and when combined with a device for giving it a variable reciprocating motion, for the purpose of sowing the seeds constantly and uniformly, and varying the amount at pleasure, while the machine is moving by simply varying the extent of its reciprocating motion, as described.

I also claim the pivoted rod and the vibratory lever, which is provided with apertures arranged in the arc of a circle, whose centre is at the pivoted end of the rod, in combination with the curved or undulating discs and the gauge plate, substantially as described, for the purpose of imparting to the gauge plate a reciprocating motion, which may be varied at pleasure by the operator, by inserting the rod in one or another of the apertures in the lever at different distances from its fulcrum.

GRATE FRAME—By Jas. L. Jackson, of New York City.

PARLOR STOVE—By N. S. Vedder, of Troy, N. Y.

[For the Scientific American.]
Colored Daguerreotypes.

I have long been a reader of your valuable journal, and have been much interested in many of the communications on Electricity and Chemical Science, which have appeared from time to time in its columns. I have been experimenting on Heliography during my leisure hours for a few weeks past, and am induced to give you the results of my experiments, in the hope that others may be led to prosecute them more successfully.

The discoveries of M. Niepce Victor, in Heliography have been announced to the public for some time; I first saw them on page 3, Vol. 7, Scientific American, but I have heard of none repeating them. An outline of M. Niepce's process may be found in the "Annual of Scientific Discovery" for the year 1852; it is substantially the following:—Make a solution of the chlorides of copper and iron, about one part of the mixed chloride with three or four of water. The plate to be prepared is to be attached to the positive pole of a galvanic battery, the negative pole of which (a platinum plate) is immersed in the solution, and is then itself immersed for a short time, depending on the strength of the battery. The color of the plate rapidly changes from the chlorine of the mixed chlorides attacking its surface, to a red, lilac, brown, and even nearly black. It should be taken out when the plate has acquired a lilac or brownish tint, if sufficiently coated to hide the silvered surface completely, if not, let it remain a little longer. With a battery of two of the ordinary Grove cups, changed to a Smees, by removing the porous cups, and charging it with dilute sulphuric acid, so that hydrogen is not evolved too rapidly from the platinum plates, it will take from one to two minutes to coat the plates sufficiently. The plate should now be well washed in rain or distilled water and dried carefully over a spirit lamp. The color changes as the plate is heated through various shades of brown and red, and is at its most sensitive state when it takes a cherry red. It should not, however, be heated much over 212° Fahr., or the surface will scale off. All these operations may be performed in open daylight (avoiding, of course, the direct rays of the sun); indeed, a certain amount of light seems to be necessary, in the preparation of the plate. The plate, if well prepared, will now present a beautiful red enamelled-like surface, partly translucent, but still showing no part of the silvered surface beneath, and is ready for the camera.

The object to be copied, a colored lithograph will answer, is placed in the clear light of the sun, and the prepared plate exposed to it for a time, varying with the brightness of the light, and the prevalence of the active rays in the atmosphere. It takes from two to three hours to produce an impression on the plate, and from five to six to obtain a good picture. If the process be successful, a perfect copy of the original, in form and color, will now be presented on the plate (and it will resemble a miniature painting) but be much finer in detail.

If the plate be dipped, before placing it in the camera, in a weak solution of the fluoride of sodium, the process will be much accelerated and the colors preserved. I have tried various other accelerators—the chlorides of sodium and bromine, the compound bromine and hydrofluoric acid, chlorochromic acid, and perfluoride of chrome. They all accelerate the process very much, but diminish the brilliancy of the colors; the hydrofluoric and chlorochromic acids are the best. The hydrofluoric acid acts very well with red and blue colors, but is apt to change the brown and black lines to a dark red. The other is better, but the plate should be exposed to it only for a few seconds.

I have taken very good pictures in an hour and a half, but it generally takes three or four. The most annoying failures sometimes occur from miscalculating the time, and making out the plate a fine picture in form and color is found, but not sufficiently developed. In such cases the surface can sometimes be removed by an alkaline solution, and the picture developed. A camera with an aperture in it for viewing the picture, would be a good arrangement.

The pictures resist most of the ordinary che-

mical agents and heat very well, but are rapidly dissolved by the hyposulphite of soda. In one instance, I brought out a picture which was invisible when the plate was taken from the camera, by using the sulphate of iron and bichromate of potash, but the colors were fainter than the original. In this case chlorochromic acid was the accelerator.

I have not been able to produce colors on the mercurialized plate, though I have not experimented much on it. This presents a difficult but perhaps not impossible problem. It seems to me, though I have not tried it, that one or more colors might be produced in the ordinary picture by exposing the mercurialized image to chemical agents before gilding. The colors in this case would be owing rather to chemistry than to Heliography.

M. Niepce says that no bodies but chlorine or chlorides are capable of producing colored images. I am inclined, however, to suspect that when the problem of instantaneous photographic images is solved, that fluorine will be found as one of the principal, if not the principal, agent in their production.

I shall be happy to hear from other experimenters, and shall be much pleased if any of them should make the discovery of instantaneous colored images. Great credit is due to M. Becquerel and Niepce for their discoveries, and also for the readiness with which they have made them public. I intend to devote a part of the little leisure time I have to the prosecuting of this interesting subject.

JAS. CAMPBELL.

Dayton, Ohio.

P. S.—I omitted to mention that the plates sometimes become solarized by long exposure. When this is only partial the picture may sometimes be restored by alkaline solutions. A thin coating of some colorless varnish is also very advantageous to the picture. The pictures accelerated with the fluoride of sodium or the chlorochromic acid seem to be quite permanent in ordinary diffused light.

Submarine Telegraph.

By our latest European exchanges we learn that in a few weeks will be completed a second line of electric communication, in connection with the Continental telegraph. It has been promoted by the European Telegraph Company, and one of its peculiar novelties is that it is being laid down along the old coach road, through Deptford, Greenwich, Shooters-hill, Dartford, Gravesend, Strood, Rochester, Chatham, Sittingbourne, Faversham, Canterbury, &c., to Dover. As may be known, the South-Eastern Railway Company are the proprietors of the present telegraph, and as the company would not sanction the formation of a second line of telegraph, the plan was devised of laying the wires under ground along the road, similar to those which are conveyed under the London streets to the several telegraph stations. Sanction, was obtained of the different road trusts, and some 200 or 300 workmen are now actively employed day and night on the works. The copper wires, six in number, are encased in gutta percha; and being deposited in a kind of trough, constructed of Kyanised timber, it is laid in a trench dug in the road, some foot and a half from the surface. In order that there should not be the possibility of the wires falling, test boxes, by which the wires are proved, are erected every mile. The works are proceeding with the utmost expedition. A mile and a half is completed every day. According to the present arrangements, the six wires will be so apportioned—two to Paris, two to Brussels, and two for the Mediterranean route. At present it is not known whether there will be any intermediate station between London and Dover. The telegraph is completed as far as Chatham from Cornhill.

Large Boilers.

The Royal Mail steamer Arabia, built for the Cunard line, is now getting her boilers on board. They are of tubular construction, the tubes running athwart-ships, with the furnaces of the two boilers facing each other. The boilers are shipped in sections, and riveted together in the hold of the ship. They are the largest boilers ever constructed, and are intended to supply steam to the largest engine ever built.