PRACTICAL HOROLOGY IN AMERICA.

The American watchmaker, so called, is not usually a manufacturer of watches, or even parts of watches, but simply an artist whose business it is to repair and keep watches in order. He is generally a man of rare mechanical genius, capable of turning his hand to almost anything, hence he is not unfrequently, especially in the country, also a clockmaker—in the same sense—a jeweler, and a repairer of musical instruments. In short, the good watchmaker is almost invariably, if he is disposed to let himself out, a Jack-of-all-trades. He must possess a degree of ingenuity sufficient to qualify him for almost any mechanical performance without the benefit of a previous apprenticeship, or he cannot be a successful watchmaker, for it is a business in which there is no regular routine, as in other trades. Any industrious person, though endowed with nothing above an ordinary capacity, may, in obedience to a long series of instructions, combined with practice, make a master carpenter, blacksmith or wheelwright of himself, but not a watchmaker. The watchmaker, whose skill is to render him deserving of the appellation, must be blessed with a natural gift above the generality. Like the painter, the sculptor or the poet, he must be born to the calling. Not only must he be what is termed a natural mechanic, but a philosopher as well, possessed of a good reasoning power of his own; for instances are sure to occur, and often, in which he will be called upon to ferret out causes and effects never met with or thought of by his instructions.

I throw in these hints, not with a view to the discouragement of any, but in the hope that they may be of benefit to some who are thinking of becoming watchmakers. If the true element is in them, it has given evidence of the fact, and they may go ahead with confidence of success; if not, they had better abandon the idea at once and turn attention to something else; bearing in mind that all were not made for the same vocation, and that he who would not make a useful watchmaker, might more than succeed at some other calling. True, a person might get along at the business without these extra qualifications named, but there would be no chances for him to excel, and unless one could be an excellent watchmaker, he had far better be no watchmaker at all. Unfortunately for us and for them, there are already too many second and third class workmen of the kind in America.

To within a few years back, horology was at a low ebb in the United States. It is beginning to look up now, however, with excellent prospects for a glorious future. I am of the opinion that the day is not far distant when she will make not only all her own time-pieces, but will furnish a very large proportion of those used in other parts of the world. This conclusion I base upon what she has done and is doing already. It is truly astonishing when we take into consideration the fact that the business was a stranger to her shores up to the beginning of the nineteenth century.

The first attempt at producing machines on American soil for the measurement of time was made by Eli Terry, of Plymouth Hollow, Conn., A. D. 1800, in the manufacture of the old-fashioned wooden clocks. He went into the business on an exceedingly small scale at first, doing, I think, all the work himself, and acting as his own salesman and traveling agent. He would finish two or three clocks, it is said, and swinging them upon the back of a horse, would strike out into the country and peddle till the last one was sold; then, but not till then, he would return to his home and engage in the manufacture of a new cargo.

The excellence of Mr. Terry's clocks, and their cheapness when compared to that of the imported article, soon caused his business to grow until the erection of a large establishment became necessary. This continued in successful operation until Mr. Terry's death, a few years ago.

When it became known that the Plymouth Hollow clock factory was a paying institution, other establishments sprung up to rival it. Great improvements were made both in the materials worked and the manner of working them. Indeed, so rapid was the progress made that only a few brief years passed ere America was famed abroad for producing the best clocks in the world, and large exportations were constantly being made.

An establishment for the manufacture of watches went into operation at Worcester, Mass., in 1812, but soon failed. In 1830, another was started at Hartford, Conn., but after turning out near one thousand watches, it too went down, and the hope of competing successfully with English work seemed to die out for the present.

In 1850, Mr. A. L. Dennison, of Maine, suggested the idea of manufacturing a watch entire in one establishment, by properly constructed machinery—a thing not yet thought of in Europe. Others took with the idea and soon joined him in the erection of a manufactory at Roxbury, Mass.

The plan worked to the satisfaction of all concerned, but the site was found to be unsuitable on account of the dust; consequently, in 1854, the concern was removed to Waltham, in the same State, where it is still (1868) in successful operation, turning out the celebrated "American Watches" in large numbers. It is known as "The American Watch Company of Waltham, Mass.," and its watches have acquired a good reputation.

A second watch manufactory on Mr. Dennison's plan, was established at Nashua, New Hampshire; but want of capital soon caused it to fail, and the American Watch Company bought its machinery. A third is now in operation at Elgin, Illinois, near Chicago, under style of "The National Watch Company." It was established in 1867, and its productions have a very excellent reputation.—*Watchmaker and Jeweler.*

THE sugar refineries of Philadelphia annually refine 190,000,000 lbs. of raw sugar per annum, worth at present prices $22,000,000.

AIDE MEMOIRE FOR SILICIOUS FORMULAE.

The above is the title of a paper contributed to the *Chemical News*, by the Rev. B. W. Gibsone, M. A. It is an application of mnemonics to the instruction of pupils in mineralogy, and shows such an amount of originality that, notwithstanding the technical nature of the subject, it will be read with interest by those who know nothing of mineralogy, as well as by those who are experts. The latter, by its perusal, will be enabled to see how much unnecessary labor they have undergone, while the former, now that all the difficulties of the subject are removed, may be expected to immediately become intensely interested in the science.

Mr. Gibsone adopts as the basis of this beautiful system, the formula

$$pMO,qSiO_2 + rR_2O_3,sSiO_2 + tH_2O.$$

in which the italics represent the numbers which indicate the proportions in which the substances represented by the Roman letters are found combined in the different silicious minerals. The substitution of the values of the italics, in the formulae expressing the composition of these substances, has been such a severe strain upon the minds of the author's pupils that he has been led to lighten their labors by the following ingenious method, which has given them (or him) such extreme satisfaction, that he has bestowed it upon the public through the pages of the *Chemical News*. As a true citizen of the United States, we feel sorely vexed that this discovery should have been made in England, and we call our school teachers to task for their stupidity. We have looked the late edition of Prof. Dana's Mineralogy through and through, but we find not a syllable that would lead us to suppose that he had any knowledge of this system, and we therefore feel called upon to retract all that we said in its favor in our recent notice of that work. But we hasten to lay this system, in all its fair proportions, before the (it must be by this time) curious reader. Mr. Gibsone says that "abstract numbers may be represented by consonant letters, and these letters may then be grouped by aid of vowels into intelligible words [Query. Are intelligible words sufficient to constitute an intelligible system?] having some relation, obvious or fanciful, to their original.

Thus adopting Howlett's system of *memoria technica*, and calling

s or x	0	d or v	6
q or t	1	c or k	7
h or n	2	b or w	8
g or m	3	p or f	9
r or z	4	y	10
j or l	5		

such a long sequence of figures as 59221 might be represented by the word *elephant*, or 92(10)75 by *physical*, the semi-consonant, y, being combined with the following consonant to form the symbol of any number from 10 to 19.

The following extracts will serve to show what elephantine efforts are saved the fortunate pupils of the Rev. B. W. Gibsone, by the use of this system, which may be said to have converted the usual mental labor of acquisition into the physical labor of shouting in concert, with head thrown back and eyes closed, such exercises as

ALUMINOUS SILICATES.

German calls Garnet Idocrase;
Man makes Staurolite; *grain* of clay's
(*O tœdium di!*) débris Felspar;
Rare gaze to duped eyes Micas are;
Heat Topaz and its tint will *fade;*
Of *murder* Scapolite 's afraid
And Lucy Beryl sweet *good maid*,
Trapezal Leucite brings *them aid*,
But *graver* Epidote can't come;
Pol'd Tourmaline is *set in gum*.

HYDRATED ALUMINOUS SILICATES.

Tune maiden Analcime thy feeble lyre,
While Mesotype searches *the mart* for a buyer.
Quid mi Dave! see Stilbite's lustrous fire;
The zeolyte Prehnite *ne'er meant* to proclaim
Them dead to the fame of frail Chabazie's shame,
Nor that green-slate became for Chlorite *our home name*.

MAGNESIAN SILICATES.

Hail Talc, and in Magnesian group
Gib Steatite a part,
Never smoke Meerschaum, or the croup
Will *hurt* Picrosmine's *heart*.

Proud Augite, Pyroxene, Hypersthene *queen*
Has three titles, but Chrysolite Olivine *none*,
Substitutive ferruginous Serpentine *green*,
And tough Amphibole, Hornblende will finish *lay one*.

Splendid exercises for public examinations, and so indicative of superior knowledge upon the part of any one who could by any means remember or interpret their meaning, that we suggest the appointment of a committee of the most eminent educators in the United States to wait on Mr. Gibsone with a request that he should visit America as soon as possible, to give a series of popular lectures, upon the now simplified science of mineralogy, to be interspersed with personal recitations of other specimens of humorous and instructive scientific poetry of which he doubtless has plenty in reserve. Or, if he prefers to sing them, they would be all the more attractive. Peradventure some composer might be found who could set the stanzas to appropriate music.

The Telegraph in Philadelphia.

The Western Union Telegraph Company, at the southeast corner of Third and Chestnut streets, is one of the great institutions in the way of transmitting and receiving information to nearly every town and city in the United States, to Canada, England, Egypt, and even China. To accommodate this vast business, 123 wires enter the building, and are connected with two batteries; one of 65 cups, with a positive pole, which furnishes battery power to 28 different wires; the other with 45 cups and a negative pole, furnishes power to 11 different wires. Of the 123 wires, 49 are known as through wires, sending messages direct to certain given points. Twelve are for way stations; 26 are loop wires for use in connection with branch offices; 11 wires for city office, and 25 to be kept for contingencies. These lines connect with 49 instruments in the fifth story (all messages received by these are given to the operator by sound instead of on paper, as originally invented) and three are connected with printing machines located on the first floor.

The wires lead out of the office as follows: 24 to New York; 15 to Washington; 10 to Pittsburg; 1 to Cape May; 1 to Salem, N. J.; 2 to Scranton, by way of Trenton and Easton; 1 to Atlantic City; 1 to Long Branch, and 1 to Williamsport.

The force required to carry on the business of the office is thus summed up; 39 operators of Morse instruments, 3 of the printing; 16 clerks; 8 office boys; 30 messengers; 1 janitor; 3 for turning printing machine; 1 battery keeper; 3 repairers; 6 branch office clerks; 34 clerks on city line; 1 manager; 1 office clerk; 1 night clerk: 1 cashier; also on city line, 37 operators; 2 clerks; 1 superintendent, and 21 messengers.

The wires of the Philadelphia office have recently been very skillfully arranged by Mr. M. V. B. Buell, Assistant Superintendent. Few men in the service know better how to do it.—*Journal of the Telegraph.*

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Cotton Planting—New Implements Wanted.

MESSRS EDITORS:—The continuous rains from July 1st, to August 10th, have risked the larger portion of the cotton crop; and this, added to the extreme scarcity of money, has, for the last sixty days, suspended all business except that connected with supply of food. This has caused us to delay answering your letter, and we now find that the demand for gin stands, only arising in cases of necessity, has been supplied from second-hand stands, which the diminution in number of acres cultivated has left very abundant. The weather has cleared off, and for two weeks has been extremely favorable for cotton. Picking has commenced under favorable auspices, the price is good, and it is rapidly coming into market. The present crop, yielding very large profits to the grower, will insure the capital for next year, and the cultivation of every acre of ground for which labor can be procured. This will cause a demand for labor-saving agricultural implements, and the introduction of them will yield profits. These implements will first be used on our level lands, now badly drained; but the soil is so pliable as to be easily cultivated. We want a buggy plow, cultivating seven feet, having the water furrow eight inches below the ridge, and a ridge on each side; the ridges upon which the cotton is planted never being broken.

The cotton is brought to a stand in early spring by a sweep skimming the surface, and cutting the tender grass, leaving the young cotton in a margin on top of the ridges three inches wide, the young grass being cut off just below the surface. The cultivation is in drills, never in squares; and after a stand is obtained, the entire culture is by throwing fresh earth to the cotton, the ridges never being broken; the main sustenance to the plant being from the tap root, and no fruit is produced until this root reaches the hard or unbroken soil. An agricultural implement, with seat for driver, would enable one man and two mules to do the work for which six men and as many mules are now required, and this with sweep for skimming the surface, and cutting the young grass, are all the implements required. The sweeps are usually made in shape of a V, the angle in front, and with cutting edges. The young cotton plant is very delicate until high enough to have dirt thrown upon it, after which it can be cultivated altogether by mule power. The use of improved agricultural implements, on the level lands of the Mississippi and its tributaries, by negro men and boys, would add enormously to its production; the gathering being done at so much per pound, the women and children then assisting, and all receiving cash for their labor.

Vicksburg, Miss. A. M. PAXTON & Co.

The Philosophy of the Velocipede.

MESSRS. EDITORS:—The velocipede is attracting considerable attention in the East, not only from the surprising feats which it is made to perform, but also the ease and rapidity with which the operator is enabled to traverse short distances, compared with the time and labor necessary to travel the same by walking.

That a carriage or velocipede, with but two wheels, the one following the track of the other, and propelled by the feet of the rider (by simple crank motions), should maintain an upright position is, to the superficial observer, one of the most surprising feats of practical mechanics.

When, however, we consider the law of moving bodies, and their tendency to continue in the direction of the impulse that set them in motion, and apply it to the velocipede, we have the philosophy of the whole problem. The ease of the operator to maintain his equilibrium while the machine is in motion, or rather the tendency of the velocipede to be self-sustaining, after a certain velocity is attained, is the same as that which sustains, against the law of gravity, the spinning top, the revolving wheel, and the rolling hoop. In experimenting upon this subject, we observe that a wheel of given dimensions will maintain its equilibrium while revolving down a slightly inclined plane, with no greater velocity than from five to six miles per hour; and when its motion becomes sufficiently retarded to incline to either side, that the wheel does not immediately drop, as in the instance of one set upright and not in motion; but as it is more retarded, it describes a spiral curve of decreasing form, and, finally, comes to the ground.

Now, from the very nature of this curve being in the direction, or on the side of the falling wheel, it has a tendency to raise the wheel to an upright position; and were its motion, while in the act of falling, a uniform and not a retarding one, it is evident that, like the velocipede, it would regain its balance, and with no interfering obstacle, would again move off in a direct line.

The rule that governs the motions of the simple wheel is applicable to the more complex velocipede, with this difference, that, in the latter, the propelling force is continuously applied, and for this cause, that the rider could upset his vehicle while moving in a straight line, and with a certain velocity, is impracticable.

Hence, as we understand the philosophy of the velocipede, and its mechanical simplicity, we infer the practical utility of the same, and wonder why it was not brought into use sooner. H. O.

Center of Gravity of a Revolving Wheel.

MESSRS. EDITORS:—The assertion that in a vertical revolving wheel the center of gravity shifts when in motion is not new. It was suggested here some ten years ago, at the time that many inquiring minds tried to explain the action of the rotascope or gyroscope, when this little old apparatus became, in a new shape, generally known to the public. Some asserted that the weight of a wheel diminished when revolving, others that its center of gravity was moved upward, or that it was moved forward from the axis; every assertion being a ground less hypothesis by which the explanation of the rotascope was supposed to be made easy. At that time, I demonstrated by actual experiment, before the Mechanics' Institute, of New York (now, alas, defunct), the falsity of each of these assertions. The last one (the one in question, page 178) was disproved by attaching to each extremity of a balance beam an easily movable vertical wheel, rotating in the same plane as the beam, when, by putting this wheel in motion, the center of gravity had been shifted from the axis of the balance or towards it, it was supposed that the equilibrium established beforehand would be destroyed. This, however, was nevertheless the case; when there was equilibrium before the rotation, it remained so during the rotation of the wheel or wheels in any direction.

I know some arguments may be opposed against this form of the experiment, which it would be unprofitable to discuss here. The only point I wish to prove is the antiquity of the hypothesis of which you have so well explained the absurdity, on page 179. P. H. VAN DER WEYDE, M. D.

New York city.

White Opaque Glue.

MESSRS. EDITORS:—Mr. Jones states, in regard to mixing Paris white with glue, that he saw by the microscope the white enclosed in separate cells formed by the glue, and that he could see each grain. From this it is evident, first, that he did not mix the white thoroughly, second, that he used too much white altogether, and, third, that his white was not pure enough, as real Paris white will not show "grains" under the microscope. I will add for his information that the best white Cooper glue, rightly so celebrated for its superior sticking qualities, is all made white and opaque by an admixture of Paris white, but of so fine a quality and so well incorporated that no microscope will show any grain or any cell or sac separating the glue.

In conclusion, I will say that many practical men assert that the sticking qualities of glue *are* really improved by a limited quantity of very fine Paris white well incorporated; but whatever may be the case, the valuable information I did give on this subject, page 83, was brought out by the blundering of some correspondents; one of whom recommended, for whitening the glue, gritty bone ashes, the other recommended chemicals which destroy the glue entirely. I therefore analyzed a sample of white opaque glue of excellent sticking quality, examined it with the microscope, etc., and gave the result gratuitously to the readers of the SCIENTIFIC AMERICAN, many of whom appeared anxious to know how white opaque glue was produced.

P. H. VAN DER WEYDE, M. D.

New York city.

Unreliability of the Glass Gage for Steam Boilers.

MESSRS. EDITORS:—Being a reader of your valuable paper, I observed an invitation to the hard-fisted sons of toil to be more communicative, and that their compliance would be pleasing. As this is so, I wish to say a few words on water gages for steam boilers, particularly those having a glass indicator set in front of the boiler with a steam communication at the top and a water communication at the bottom of the chamber. I think they are not to be implicitly trusted.

A short time ago the engine and boiler which I run, were inspected and tested by an expert employed by the insurance companies, and he stated that there was no scale for sediment in the boiler; yet two days after the glass indicator showed water to the hight of three gages, when, on trying the cocks, the second one barely gave indications of water, and it was only by letting it remain open and permitting the steam to escape that I could draw water. The communication at the top of the glass had become partially clogged. I believe that no matter how low the lower gage cock is placed, if the steam connection with the indicator is partially closed or clogged the pressure of the steam will raise the water in the indicator tube above the level of that in the boiler.

Sheboygan, Wis. J. S.

[The laws of hydrostatics show that a small column of a fluid will balance a large column. The level of water shown in the glass indicator tube is that of the level in the boiler if the proper communication is maintained between the tube and boiler. Our correspondent's experience does not prove the unreliability of glass indicators, but shows the necessity of care in keeping them clean and the passages open.—EDS.

A Word for the Old Fashioned Trip Hammer.

MESSRS. EDITORS:—Having been for many years a constant reader of your valuable paper, which is always open to both sides of the question, I wish to speak in behalf of the old fashioned trip hammer. On page 161, current volume, you speak slightingly of the trip hammer, that is, of the old style with its wooden handle or helve. Hundreds of mechanics believe it to be the best hammer in use. Consider the usage a hammer gets, the necessity of "striking while the iron is hot," and the advantage of rapid blows retaining if not increasing the heat, and you will see that the old style hammer is justly preferred in nearly all steel and tool shops. It is not apt to get out of repair, can be run rapidly, does not rebound, can be readily adjusted to draw tapers, is easily managed, and will stand long the hard usage in plating or drawing thin steel which no cast iron hammer would bear.

The necessary movements to give a graduating blow only add unnecessary parts to be kept in order without giving in return any benefit to a good forger. It is nice to look at a hammer cracking a nut or drawing a shaft, but the peanut eaters do not employ a steam hammer when two stones will do the work. Would you?

The writer further states on the same page (161) that the ordinary trip does not strike a square blow except on a thin piece of work. Now, if the hammer comes down square on a thin so it will on a thick piece, if the dies are properly adjusted by being left slightly open toward the fulcrum; the hammer moves in the arc of a circle, hence the necessity of setting the die at an angle below the center.

Again, the trip does not fall by gravitation, as the writer asserts, but the weight of the blow is increased proportionably to the resistance necessary to compel the hammer to move up and down in the alternate spaces between the lifts or cams; the more force in lifting so is the blow heavier. A one hundred pound hammer lifted eight inches by cams and run four hundred blows per minute, strikes a blow of about a half tun weight. P. McC.

Newark, N. J.

[Our correspondent, whose practical suggestions, drawn from a long experience, have often enriched our columns, does not appear to have made out a very clear case for the superiority of the old fashioned trip hammer. We do *not* " see that the old style hammer is preferred in nearly all steel and tool shops," for quite a number we know have removed them and replaced them by direct stroke hammers because of the advantage of the latter in rapidity of blows and ease of manipulation. As to striking square blows equally on thin and thick work, our correspondent admits our statement by asserting that the dies on a trip should be "adjusted by being left slightly open toward the fulcrum." If so adjusted no square blow could be had on a thin piece of work except at the outer point of the dies, and the angle that would give a square blow on an inch square bar would not on one of two inches square; this is self-evident and requires no argument. He denies that the trip works only by gravitation and asserts that a "one hundred pound hammer lifted eight inches and run four hundred blows per minute strikes a blow of nearly half a tun weight." It is evident that unless the hammer has a spring, only its weight, plus the distance of the fall, *i.e.* gravitation, produces the force of the blow. In the case mentioned it is simply the force of one hundred pounds falling eight inches. What he means by the weight of the blow being increased proportionably to the resistance, etc," we are unable to comprehend.—EDS.

Planchette a Humbug.

MESSRS. EDITORS:—Having noticed your remarks some time ago with regard to "Planchette," I purchased one of the creatures, and I have it now in my possession some three weeks; and having myself, and some twenty or more of my friends, repeatedly tried it, we unanimously agree that it is a humbug. When two persons put their hands on it, it certainly runs about the paper (I should like to see two persons with nerves steady enough to keep it from running); but as for forming letters, that it will not do, unless one or both of the persons whose hands are on it scheme and help the instrument to form the letters.

In Messrs. Kirby's pamphlet they say: "Planchette is sometimes coy, suspicious, reluctant, will not work for the skeptical," etc. They are quite right, it will only work for those who make it work.

Probably, however, there are no spirits living in this cold country of ours.

Kingston, Canada. H. A. M.

ARCHBISHOP KENDRICK ON THE PLANCHETTE.—When we published our first article upon the "Planchette," we had not the least idea that we were engaged in anything very diabolical, but we begin to fear that we have "put our foot in it," especially as Archbishop Kendrick, of St. Louis, has instructed the clergy of his diocese to warn Catholics, that if they do not desist from the use of "Planchette," they will be excommunicated. The toy is pronounced a "diabolical invention."

TUMBLING BARREL.—In relation to the tumbling barrel which we illustrated on page 168, current volume, SCIENTIFIC AMERICAN, stating that we believed it had not been patented, Mr. J. S. Fifield, of Westerly, R. I., claims that he holds the patent for it under date of June 11, 1867. We can only say that we saw it in use, both as tumbling barrel and coal sifter, at least five years before that date in Hartford, Conn., and on that fact we based our statement.

How to Poison Children.

One naturally touches the point of his pen with great timidity at a reputation like that of the illustrious Liebig. But the learned professor, since his stay in Paris in attendance on the exhibition, has promulgated in the journals of science new food for children, which he declares is being fed with success to thousands of children in Germany; or, to use his own expression: "*A des petits tudesques par milliers.*" This food is a chemical compound intended to contain the component parts of human milk, and to be a substitute for it. To accomplish this object, that is to say, to furnish to new-born children, deprived for any reason of their natural food, a substitute, he went to work and reproduced a milk by chemistry, which, chemically speaking was correct, and which, he contends, children may take with perfect safety and advantage.

With such an authority as that of Liebig, therefore, the whole scientific world of Europe has been trying this new compound; for, to find a substitute for mother's milk, especially for the use of the foundling hospitals, is an immense desideratum. But here at Paris it was tried on but four children, and these four it killed—two in three days, and two in four days. The experiment was made at the Lying-in-Hospital of Dr. Depaul, professor of clinical obstetrics of the faculty of Paris, and the children selected were those abandoned by their mothers. The artificial milk quickly brought on bilious purging and prostration. Of course, Prof. Liebig declaims loudly against the fairness of the experiment; but Dr. Depaul is a competent judge, and the whole Academy of Medicine, after a fair report from the chemists in their body have decided not to take the responsibility of a further experimentation with so dangerous a compound. What is the use, the Academy judiciously says, since we have in our hands so excellent a substitute, and so nearly an analogous substance, in cow's milk with the addition of a little water and sugar? And upon this substance, which is so easily obtainable, the Academy has decided to rely for the feeding of the foundlings and all other children placed in their charge. Prof. Liebig has undoubtedly lost a point in this discussion.—*Paris Cor. Times.*

Electricity and the Sensitive Photographic Film.

M. Becquerel finds that chloride and bromide of silver deposited on plates of platinum, when acted upon by light, give rise to a strong current of positive electricity, which is just the reverse of the kind of current which would be afforded by the platinum plate alone under the same cirumstances. Now the chloride and bromide of silver are actually decomposed by light—the former obviously so, the latter less visibly—yet the bromide indicates a current of even higher intensity than the former. The conclusion is, that a precisely similar action takes place when the light acts on the chloride and on the bromide of silver, viz, reduction to a subschloride and subbromide respectively. On applying this curious test to the iodide of silver, it was found that it likewise gave rise to a current of positive electricity under the influence of light of nearly as high intensity as that afforded by the chloride. The inference clearly is that iodide of silver is reduced to a subiodide, just as the chloride is to a subchloride, and the bromide to its lower state of combination.

In following the various stages of the discussion of a vexed question, it is singular to notice the changes in the bearings of the numbers of facts presented from time to time. Until recently all the evidence seemed to be tending to support the purely mechanical theory of the formation of the latent image; latterly, the complexion of affairs has quite altered, and the evidence all tends in the direction of a distant chemical change as being the result of the action of light, the experiments of M. Becquerel, referred to above, forming a strong link in the chain. Will some ingenious experimentalist now step into the arena and propose a crucial test which shall decide this vexed question once for all?—*British Journal of Photography.*

Iron Experiments.

A simple illustration will serve to show two facts connected with iron:—The first is its elasticity, and the second the power exerted by the pressure of the hand of any person. Make a hoop of one inch square bar iron, about the size of the brim of a man's hat; let the inside of the hoop be made quite smooth and true. Such a hoop being examined, it would appear that the power even of a horse could in no way alter its shape or form, provided the strain be put to it fairly and equably. Now make a rod of iron of the thickness of a lead pencil, that shall exactly fit the diameter of the inside hoop so that, when placed in the hoop, it will not fall out unless the hoop be altered in shape. If, acting in a similar way, we took a child's wooden hoop, so that, when placed in the hoop, with a stick across it in the center, and then pressed it at the sides opposite to that of the cross stick, the hoop would assume an oval shape, and of course the cross stick would fall out. Just so does the iron hoop described act; when any one presses it the iron rod falls out, showing clearly the elasticity of the iron. The hoop will become oval shaped with a very little pressure, not greater than that which can be exerted by a young girl.—*Septimus Piesse.*

M. TOURNACHON, the photographer, recently performed a feat worth recording. Having ascended to the hight of nearly a thousand feet in the captive balloon at the Hippodrome, Paris, he succeeded in taking several photographic views, accurately representing the city from a birdseye view. The chief difficulty he encountered was the rotary motion of the balloon. His success shows the practicability of obtaining correct representations of the positions of military forces safely and rapidly.