(For the Scientific American.)

Intervention---Science.

Intervention or non-intervention, that is the question. Whether it be better for this model Republic, which boasts itself as the cradle, conservator, and propagator of liberty, the defender of the rights of man, the missionary of intelligence, the pioneer of progress, to interpose its giant arm, and rescue the struggling sons of freedom on the Danube from the jaws of the Northern Bear, or keep aloof and witness the throes of expiring liberty?—this is the all-absorbing query of the day. We leave the decision, of course, with our legislators, merely giving our humble opinion that this country ought to interfere.

But there is another kind of intervention to which we are decidedly opposed. It is the intermeddling of the literary in the affairs of the scientific world, and vice versa,—the officious interposition of the penny-a-liner, or of one who has never opened the great Book of Nature, to adjust the apparent difference of ologists, by either giving a theory of their own or condemning the whole. Many are now walking the earth, who verily think those who deal in the mysteries of the material universe, *i. e.*, scientific men, are a genus of fanatics and forever harp on any seeming discrepancy or statement which conflicts with what they term reason. The spirit which starts these intrusions is often one of sudden anxiety for the safety of religion. Mathematicians, they say, are prone to skepticism; but they only can read those marks of design and unity which argue the being of a God. "Copernicus and the Septuagint will never agree," said the bigot; and poor Galileo must recant. Jealousy eyes Chemistry, since it announces that the world cannot be burned, the greater part having already been oxidized. But no science has more excited the fears of the illiterate and drawn forth greater specimens of their ignorance, than Geology. They would reconcile its votaries and harmonize its principles with revelation by consigning the whole to oblivion. Time and again have these lines been their fort:

"Some drill and bore
The solid earth, and from the strata there
Extract a register, by which we learn
That He, who made it and revealed its date
To Moses, was mistaken in its age."—Cowper.

In the Poet's day Geology was in its infancy, and had, we admit, *some* reckless advocates; but the statements of the sacred historian "meet the most hearty concurrence" of all modern geologists. When talent comes into the field of fair discussion, it will be met; but when ignorance shoots her bombshells, it is insupportable. In 1842, John Budge, "a practical miner," in the bowels of mother earth, made an ascent to the world, and thus threw down the gauntlet against the champions of this science:—

"How these talented infidels try all they can to sap the foundation of the Christian's faith!—Their first, second, and third formations. One thing produced by another. Coal formed of vegetable matter, and lately they have discovered that slate is a marine production! I declare I know not a single instance where any good has emanated from their exertions to the value of a swabbing-stick! How amusing to the practical miner it is to read 'The Transactions of the Royal Geological Society,' and to see how wild, erroneous, and contradictory their notions are! Not one of them is valiant for the truth, *i. e.*, cotemporaneous creation."

Query, Mr. B.,—if fossil shells were never inhabited by shell-fish or if fossil teeth were never intended for mastication, what becomes of final causes? Science is the handmaid of Religion, and so illuminates the world that we can discern the foot-prints of a great Creator. The fact is, the pick-axe would better befit such persons than the pen, and this should be their motto, *Ne sutor ultra crepidam.* "Let not the shoemaker go beyond his last." To be sure, truth will not suffer from their inept and unscientific gunnery, nor can able investigations be set aside by ridicule; but human nature is demeaned when one man spits fire at another simply because his taste runs in a different channel. The man who turns the clod is called a farmer; but if he meddle with the rocks below, just to look at them, he is stigmatized an atheistico-fanatic. Men of science, like others, have their differences, but they are not decidable by arbitration or force. Geologists will settle their own disputes without the mediation of those who take "no particular interest" in Geology; Science will fight her own battles without the intervention of ignorance. J. W. O.

Great Improvements in Photography.

Mr. William Henry Fox Talbot, of England, the discoverer of the Talbotype, which bears his name, and a cotemporary inventor with Daguerre, has recently taken out a patent for improvements in photography, which are of great value and of importance to artists. The following is the substance of the specification:—

"The first part of this invention consists in obtaining photographic images on plates of glass prepared by the following means:—A plate of glass should be selected having a smooth and well-polished surface; and in order to obtain a photographic picture the operator proceeds as follows:—

He takes albumen, or white of egg, and mixes the most liquid portions thereof (rejecting the rest) with an equal quantity of water, and having spread the mixture smoothly and evenly over the surface of the glass, allows it to dry spontaneously, or dries it at a fire.

He mixes an aqueous solution of nitrate of silver with a large proportion of alcohol, so that the mixture shall contain about three grains of the nitrate to each ounce of liquid. (This proportion may be varied from one to three grains in the ounce of liquid; but three grains is considered to be the best proportion.)

He dips the prepared plate for a few seconds into this mixture, then withdraws and dries it by a gentle heat, or allows it to dry spontaneously.

He dips the plate into distilled water, to remove any superfluous nitrate of silver.

He applies a second coating of albumen in the same way as above directed, and dries the plate by the application of gentle heat, avoiding the use of too much heat, by which the nitrate of silver might be decomposed.

He takes an aqueous solution of protiodide of iron, containing 140 grains of the protiodide to the ounce of water. A small quantity of free iodine in the solution, by which its color would be rendered slightly yellow, will be found to be of advantage. To one measure of the solution he adds one of acetic acid and ten of alcohol, and allows the mixture to stand for a few days previous to use.

He dips the plate into the solution, or allows the liquid to pass over the whole of its surface in a continuous stream. It is then dried, when it should be of a pale yellow color, very clear, and uniformly transparent; and this completes the preparation of the plate. All the preceding operations may be performed in moderate daylight, but avoiding exposure to too strong a light, or to sunshine.

When it is desired to obtain a photographic picture, the operator takes a solution of nitrate of silver containing one hundred grains of nitrate of silver to an ounce of water, and, having mixed two measures of the same with two of acetic acid and one of water, he dips in the plate once or twice, for a few seconds each time (performing the operation in a darkened room or by candle light), for the purpose of rendering it sensitive. If the weather is cold, the plate should be slightly warmed before so dipping it. He then removes it to the camera without loss of time, as the plate ought to be used a few minutes after taking it out of the solution; and when a sufficiently strong photographic image is supposed to be obtained, the plate is transferred from the camera to the dark chamber or operating room.

It is then immersed in a solution of sulphate of iron, composed by mixing one measure of a saturated solution thereof in water with two measures of water (but the solution may be stronger or weaker, at the discretion of the operator), by which the previously invisible images will rapidly be rendered perceptible.

The plate is then washed, and dipped in a rather strong solution of hyposulphite of soda in water, which, generally, in about a minute, renders every part of the image more distinct and visible. The picture is then washed in distilled water, and the surface of the plate may be cleansed from any particle of dust, or other impurities, by rubbing it gently with cotton dipped in water; and if the above-described operations have been properly performed, the surface of the plate will not be at all injured by this cleaning. The picture is then dried, and the operation is then finished. For the purpose of better preserving the picture, the plate may be covered with a coating of albumen or fine transparent varnish.

Although throughout the above processes certain proportions of chemical substances have been named, they may be varied very considerably, as is also the case in photographic operations generally.

The images obtained by his improved method Mr. Talbot calls, "Amphytypes," because they appear either positive or negative, according to the circumstances of light under which they are viewed. Thus, if held against a bright light, or against a sheet of white paper, they appear negative, and the reverse when held against a black surface and seen in oblique reflected light. It is in the power of the operator, by varying the proportions of the chemicals employed, to obtain at pleasure positive images more or less distinct in comparison with the negative images. When it is intended to copy the image on paper, it is desirable to obtain as strong a negative as possible on the glass plate, which is then copied on the paper, to produce thereon a positive image in the usual manner; but when the operator wishes to have a picture on the glass, he should endeavor to obtain a strong positive image. When this is obtained to his satisfaction, it may be preserved from injury and from contact of the air, by pouring black paint over the pictured side of the plate, and then by turning the glass the picture will be seen correctly, and not reversed as regards the right and left sides. This method of blacking one side of the plate is not however any part of the present invention. Throughout the specification the words negative and positive are made use of in the sense in which they are generally employed by photographers, viz., a positive image is that in which the lights and shades of the object are represented by lights and shades on the photograph, and a negative image is that in which a reverse effect is produced.

In fixing the images on paper, it is recommended, after washing them, to immerse the paper in a hot solution of iodide of potassium, before dipping in the solution of hyposulphite of soda, by which means a better fixation of the image will be obtained.

Under this branch of his invention Mr. Talbot claims the mode of preparing the glass plates, especially the use of a weak solution of nitrate of silver immediately after the first coating of albumen; also the conjoint use of protiodide of iron and sulphate of iron upon albumized glass plates; and also the simultaneous production upon glass plates of images, which are both positive and negative according to the light in which they are viewed.

The second part of this invention consists of obtaining, under certain circumstances, the photographic picture of objects which are in rapid motion. An electric battery of the greatest power which can be conveniently obtained, is arranged in a darkened room, and, supposing the moving body whose picture is required, is a wheel revolving upon its axis, the camera is placed at a convenient distance from it, and adjusted so as to have the image of the object in its focus. A glass plate is then taken, which has been previously prepared in the way described above, and it is rendered sensitive with nitrate of silver in the way also above described; it is then placed in the camera, and the electric battery is discharged, producing a sudden flash of light, which illuminates the object; the image thus taken on the glass plate is then rendered visible and the process finished, as before directed. If the process is properly conducted, a distinct positive image of the moving body will be seen upon the glass, the rapidity of the motion not affecting the accuracy of the delineation."

[We presented a brief notice of the second part of this invention on page 3, this Vol., Sci. Am.

Leap Year.

This notable year of 1852 is one of especial privilege to the fair sex; it is leap year. In olden time the ladies went a-courting in leap year. At present they have more backwardness, but they have just as much right, and we advise them to stick to their privilege; don't give up the ship.

The Air Rendered Visible.

The Paris correspondent of the Washington Republic says:—

"At the last sitting of the Academy of Sciences, a very remarkable paper was read. It was presented by a well known engineer, M. Andraud, who has made many public experiments on compressed air as a substitute for steam on railways. I gave you a *resume* of the contents of this paper. It is entitled Æroscopie, or the visibility of the Molecules of the Air. Some of the deductions made, in a medicinal point of view, are in the highest degree curious. M. Andraud proves that, by a very simple contrivance, the air is rendered visible. By taking a piece of card, colored black, and piercing it with a fine needle, this interesting fact is established. If we look through this hole at the sky on a fine day, or at a strong lamp having a ground glass shade, we see a number of transparent globes moving in the midst of confused nebulosities. These little globes, some of which are more transparent than others, are molecules of air. Some of them are surrounded with a kind of halo. These latter, says M. Andraud, are the elements of azole. After continuing the observation for some time, we shall see small points detach themselves and disappear in falling; these, says M. Andraud, are atoms of carbon. This phenomena of vision, it is essential to remark, passes within the eye itself; the molecules of air observed, are those which float in the liquid, which occupies the interior part of that organ. According to the author of this paper, the discovery is not interesting merely as a phenomenon, but may be applied to important purposes in medicine. He says:—'The physician will one day make use of the æroscope as an important means of diagnosis.—Vertigo, giddiness, which are the forerunners of apoplexy, will be announced by the perturbation in the molecules. Fever always exists when the molecules, under the action of a magnetic current circulate on a vertical ground—sometimes in one sense, and sometimes in another; and, when this movement of gyration becomes more precipitate, the patient experiences the singular sensation of turning, as it were upon a wheel of ixion. I cannot resist remarking that, in most cases of opthalmia, a prompt cure might be effected by securing the eye completely against contact with the external air; for inflammation (which is only an oxydation) is kept up by the too abundant absorption of our molecules of air, which is effected by the pores of the prunella; this absorption being prevented, the malady must cease. This observation may apply to all cases of inflammation, for the air is an element of which the affected part must be deprived.

[It is our fortune or misfortune, we cannot tell which, not to obtain the same results with a black card as M. Andraud, nor can we acquiesce in his conclusions. The same kind of globules are seen when the eye is strained or pressed.

Geology.

At the December meeting of the Boston Society of Natural History, Mr. Teschemacher exhibited a specimen of anthracite coal, containing a flattened branch of Stigmaria, one foot in length, and three inches in diameter, with the usual marking of cicatrices of foliage, two of which were very perfect. Mr. Desor exhibited some of the proof-sheets of the illustrations to Messrs. Foster and Whitney's Report of the Geological Survey of the Mineral Lands of Lake Superior. Among them was the representation of a slab of singular character, from the Clinton group at Green Bay. It was a question whether the marks upon it were the remains of a fossil body, or the track of some animal. The same gentleman also presented, in the name of the Geologists of the Survey, a Geological Map of the Lake Superior district, and pointed out and explained its different features. He remarked that the immense cedar swamps of that region, he thought, might at some future day be of value for the sleepers of railroads, from the indestrutible character of the wood.