

## Imponderable Agents—No. 3.

The only theory proposed in explanation of the phenomena of Heat, until since the recent discoveries in polarization, was the one even now almost universally received, starting with the assumption that heat or caloric is a fluid, having an independent existence, that so far as we know, it is diffused universally throughout space, and that relative heat and cold are produced by the presence of greater or less portions of the calorific fluid. But it has been lately discovered that heat, as well as light, is susceptible of polarization; and as it is governed in its reflection and refraction, by the same laws which govern the similar phenomena of light, it becomes necessary for those who adopt the undulatory theory of light to apply a similar explanation to the phenomena of heat. Hence we are now taught that heat, as well as light, is produced by the vibrations of an elastic medium diffused throughout space, the different degrees of heat being produced by the varying intensity of the vibrations.

But we shall not permit these philosophers to stop here: it has been shown that electricity is likewise capable of polarization, and as its laws are very similar to those of light and heat, in order to be consistent with themselves, and to maintain their theory at all; for if any other theory will explain this phenomena of electricity, it will equally explain the phenomena of light and heat; the undulatory hypothesis must be also applied to this. If this be done, one of two assumptions must be made, either there are diffused throughout all space three elastic media, each capable of vibrating at widely different rates of frequency and intensity, or there is one medium capable of producing, by its vibrations, results as totally distinct as are those of light, heat, and electricity. We think no one will propose an assumption so labored as the latter, and we shall therefore consider the former as the one necessarily adopted by those embracing the hypothesis in question.

The doctrine of latent heat is established not from theoretical considerations, but from accurate and indisputable experiments. In this manner it has been determined that any body in passing from the solid to the fluid state combines with a certain definite quantity of caloric, which remains in combination with it, so long as it is in the fluid state, but is set free when it again becomes a solid. Let it be remembered this is not theory, but fact. It is therefore possible, according to the theory of undulations for the vibrations of an elastic medium to combine with matter, remain in this state of combination for years or centuries, and then to be again set free in an active state! This we think is carrying theory a little farther than the most ardent theorists will be willing to go, yet the advocates of the undulatory hypothesis cannot escape the conclusion.

But this is not all, experiments have shown that heat is capable of increasing the bulk of matter, that a few increments of heat will sensibly increase the length of an iron rod. More than this the three forms of matter known as solid liquid and gaseous, are acknowledged by all to be produced by the presence of greater or less portions of heat. Is it reasonable to suppose that the vibrations of a medium so rare as to escape the senses, to elude the most careful investigations, aided by the powers of modern experiment and analysis, and known to us only through its results, can produce effects by its vibrations so powerful as those here witnessed?

But again, the vibrations of an elastic fluid can only act on a solid body by generating corresponding vibrations in that body. The change of state from the solid to the fluid then must be an actual shaking to pieces of the particles of the solid body! This borders closely on the ridiculous, but it is certainly a fair inference from the theory under consideration. But we must be allowed here to inquire why so powerful a vibration should not in some other way become manifested. Why, for instance, is it not communicated to the air, and revealed to us by sound. If it be said that the vibrations are so frequent that they cannot be caught by the air, we shall reply that experiment has taught us that bodies have but one tone, and are incapable of vibrating in any other, and more than this, that the air is capable of being influenced by heat, hence it must be capable of

taking up these vibrations. If it be said the air vibrates, but produces heat instead of sound by these vibrations, then we have found an elastic medium, capable of producing two different classes of phenomena by its vibrations, and by the same mode of argument, the phenomena of all the imponderable agents!

Should any one be found bold enough to hazard the assumption that Light, Heat, and Electricity are all produced by the vibrations of a single elastic medium, it would follow, as we have found that the air is capable of producing these results, that there were two media capable of producing Light, Heat, and Electricity by their undulations; and as the same arguments will apply to all other bodies, as well as air, the correct statement of their theory will be, that "a certain definite number of vibrations in a given time produces light," and the same of the other imponderables, it being only necessary to suppose the existence of an undiscovered medium to account for their transmission through space.

The difficulty started by us in our first article has therefore become greatly increased. The sun must be at each moment vibrating at such rates as will produce not only the unnumbered shades of color, but also the totally and widely distinct phenomena of heat and electricity, and the ethereal medium is at the same instant of time transmitting to remote spheres with fidelity they sever different undulations.

From these and other considerations it has long seemed to us that the undulatory hypothesis supported though it be by the weight of authority in Europe and America is wholly untenable, and as the corpuscular theory of Newton likewise presents difficulties which we cannot surmount, we have been obliged to abandon both, and seek by careful and long-continued research, for an explanation of phenomena which are at the foundation of all physical science, and although we imagine that we have found such explanation, we are not so vain as to suppose that the philosophical world will at once receive it, for new theories have always been distrusted, and it is not likely to be otherwise now.

We have not yet reviewed the two theories of Electricity, but as we adopt mainly that of Franklin, and as our readers are now prepared to understand the general theory we are about to propose, we shall defer our remarks concerning that of Du Foy, as well as a consideration of the subjects of Affinity and Magnetism, until after having given our own views, which we shall do in the next article.

(To be Continued.)

[For the Scientific American.]  
Patent Laws of New Brunswick.

[Synopsis of an Act of the Legislature of the Province of New Brunswick, passed in the Legislative Session of 1853, entitled "An Act to Regulate the Granting of Patents for Useful Inventions." By PETER FRUAS, Barrister at Law, St. Johns, N. B.]

[Concluded from page 27.]

19. Any person discovering an improvement upon a patented invention, may obtain a patent for the improvement, but it shall not be lawful for him to make or vend the original discovery, nor vice versa. Simply changing the form or proportions of any machine, &c., is not to be deemed a discovery.

20. If by mistake or accident, and without any fraudulent intent, a patentee includes in his specification what he has not really invented or discovered, his patent, although void for what is thus included, is good and valid for so much as is really his own, provided it is a material and substantial part of the thing patented, and can be distinguished from other parts patented without right, and suits can be maintained for infringing the valid part of the patent, but costs will not be allowed on recovery, unless before suit commenced a disclaimer is filed in the Provincial Secretary's office of that part patented without right. No person bringing a suit shall have the benefit of this section, if he has deferred for an unreasonable time to file his disclaimer.

21. If by inadvertence a specification is too broad, and claims too much, the patentee may file a disclaimer in writing, setting forth the true extent of his interest, which disclaimer is to be recorded in the office of the Provincial Secretary, and shall be considered as part of the original specification, to the extent of the interest possessed by the party making the same.

22. If a patent becomes invalid by reason of a defective specification, or in consequence of claiming too much, and there is no fraud, such patent may be surrendered and a new one issued for the residue of the term named in the first patent, in accordance with the new specification. The new patent is available to the first patentee and his representatives and assignees.

23. If an original patentee is desirous of adding a description and specification of an improvement more recently discovered by him, he can have the same annexed to his original description and specification, upon like proceedings as in the case of an original application.—The Provincial Secretary to certify upon the annexed, (new) specification, the time of its being annexed.

24. Any person in this Province who discovers an original design for a manufacture, or of art, or ornament, is entitled to a patent for a term not exceeding seven years.

25. No patent granted in England shall have any effect in this Province, until after copies of the original specification and drawing, or duplicates of the original models are filed, or lodged in the Secretary's office.

26. Before the expiration of a patent, the patentee may apply for an extension of it, when his application is referred to a board of three persons, who are to take into consideration the receipts and expenditures of the patentee.

27. If the board is of opinion that the patent should be extended, they will report to the Lieutenant Governor accordingly, who will direct the Provincial Secretary to indorse an extension of the patent. Such extension to extend to assignees and grantees of the original patent.

28. Imposes a penalty of £25 for affixing such words as "patent," "patented," or other words of similar import to unpatented articles, to be recovered in Supreme Court, one half the penalty, when recovered, to be paid into the Provincial Treasury, the other moiety to the party suing for the same.

29. Patentees are required to affix on patented articles the date of the patent under a penalty of £5.

30. Defines the mode of pleading in suits to be brought.

31. Quakers may affirm oaths; when administered here, to be administered by a Judge or Commissioner of the supreme Court. In Great Britain or Ireland, before the Mayor of a city or borough, to be certified under Corporation Seal; in a foreign country by a British Consul or Vice Consul, and certified under his Seal.

32. Fees to be the same as a schedule.

33. Letters patent to be void, if within three years from their date, the patentee shall not establish the manufacture of it in this Province, or in case the materials for manufacturing the same are not here to be had, introduce the patented article into the Province.

## TABLES OF FEES.

If a British subject, whether original inventor or assignee of an invention in the Province, or of any letters patent abroad, in full for obtaining letters patent, exclusive of recording assignment	£5 7s. 6d.
If a foreigner, whether original inventor or assignee	50 0 0*
Fee for adding to a patent specification a subsequent improvement	4 0 0
On surrendering an old patent to be re-issued to correct mistake of patentee	4 0 0
For a disclaimer	3 0 0
On application for a design	3 0 0
Copies of patents, or other papers	2s. per 100 words
Recording assignments not over 300 words	2 0
Every additional 100 words	1 0
Copies of drawings and models to be matter of agreement.	

\* This heavy expense may, to a considerable extent, be avoided by American citizens, who can assign patents taken out by them in the United States, under Section 7, to subjects here, who can re-assign at a trifling cost.

## New Furnace.

A patent for a smokeless furnace has been recently secured by Mr. Lee Stevens, of England. The invention consists in an arrangement by which the hot cinders from the fire-box, falling on

a grate underneath, are there turned to account in heating a current of air, which, passing into the furnace, prevents the generation of smoke. Two favorable examples of the working of the patent have been exhibited, and gave great satisfaction to those who witnessed them. The arrangement is applicable to all furnaces, and involves only a trifling expense. It has the advantage of striking at the root of the smoke nuisance, and preventing instead of curing it.—[Exch.]

[We do not see how this can prevent the smoke nuisance; it requires more air than is fed into the furnace, to mix with the carbonic oxyde, and this ignited, to consume the smoke. Hot air to supply furnaces is nothing new; Mr. Stevens, however, may have made a good improvement in heating his feed air.]

## The Science of the Fire Annihilator.

An experiment was lately made at Buffalo, with a building one and a half stories high, having dry sticks and shavings in it. Three annihilators put out the fire. The house was built and all prepared for the application of the annihilators at the right time. One of our contemporaries thus explains the principle of the annihilator:—

"The Annihilator operates on strictly scientific principles, and must of necessity, to a greater or less extent, produce the intended effect. The largest size is constructed so as to contain a cubic foot of water, which during the process is converted into steam—expanding to 1,700 cubic feet. This alone is a powerful agent in subduing flame. In the center of the machine is the gas producing compound, weighing about thirty pounds. This is composed of nitrate of potash and charcoal or carbon, so arranged as to be capable of being instantly ignited. The combustion decomposes the nitrates setting the nitrogen free, which is an extinguisher of itself. The oxygen combines with the carbon, forming carbonic acid gas, which is destructive of combustion as well as of animal life. This process generates heat, which converts the water into steam, when all these three annihilating agents are projected upon the fire which cannot survive the embrace."

[It follows from this, then, that the steam generated by one annihilator is only sufficient for a room twelve feet square. The carbonic acid gas generated is surely not different from the gas generated by a fire itself—it is the very same. It is not known to many that although carbonic acid gas readily puts out flame, it has but little effect upon red-hot embers or other material, hence the necessity for steam or water in some state, to act along with the carbonic acid; this is something older than Phillip's Annihilator.]

## Singular Electrical Effect.

The following extract from a letter from Capt. Tessier, of the ship Austria, to her owners, describes an effect of electricity which we do not remember ever to have seen mentioned before. It is of some practical interest, and shows the necessity of isolating instruments on shipboard as much as possible.—[Charleston Mercury.]

LIVERPOOL, Sept. 2d, 1853.

"My chronometer stopped, as I informed you in my last, on the fourth day out from Charleston. The cause of it has been ascertained beyond the possibility of a doubt. On its being taken to pieces, the balance spring was heavily charged with electricity, and actually bent, and all the other works composed of steel more or less injured. At the time it stopped a heavy storm of thunder and lightning was passing over the ship, the surrounding atmosphere was in such a state of commotion that the Austria fairly trembled in her every timber, and we distinctly heard the lightning hiss as it struck the water in rather uncomfortable proximity to our sides. All our compasses were also slightly injured, and had to be sent on shore for correction, on the arrival of the ship in Liverpool."

## Sewing Machine Claims.

E. Howe claims to be the inventor of the needle with an eye near the point for sewing. He threatens in a card to sue all who use such needles without his consent. This information will be of interest to many who have written to us on this subject.

We shall devote some attention to the Fair of the American Institute, and report in our next.