Vital Energy and Electricity.

Thomas A. Edison has spoken his mind, touching energy, as follows:

'Of course there is a source of energy. Nature is a perpetual motion machine, and perpetual motion implies a sustaining and impelling force.

"When I was in Berlin I met Du Bois Reymond, and, wagging the end of my finger, I said to him, 'What is that? What moves that finger?' He said he didn't know; that investigators have for twenty-five years been trying to find out. If anybody could tell him what wagged this finger, the problem of life would be solved.

"There are many forms of energy resulting from the combustion of coal under a boiler. Some of these forms we know something about in a practical way, but there may be many others we don't know anything about.

"Perhaps electricity will itself be superseded in time, who knows? Now a beefsteak in the human stomach is equivalent to coal under a boiler. By oxidation it excites energy that does work, but what form of energy is it? It is not a steam pressure. It acts through the nerve cells, performs work that can be measured in foot pounds, and can be transformed into electricity, but the actual nature of this force which produces this work—which makes effectual the mandate of the will—is unknown.

"It is not magnetism; it doesn't attract iron. It is not electricity—at least not such a form of electricity as we are familiar with. Still, here it is necessary to be guarded, because so many different forms of electricity are known to science that it would be rash to say positively that we shall not classify vital energy as a form of electrical energy. We cannot argue anything from difference in speed. Nerve force may travel as fast as electricity, once it gets started. The apparent slowness may be in the brain. It may take an appreciable time for the brain to set the force going.

"I made an experiment with a frog's leg that indicates something of the kind. I took a leg that was susceptible to galvanic current. The vibration produced a note as high as a piccolo. While the leg was alive it responded to the electrical current; when it was dead it would not respond. After the frog's leg had been lying in the laboratory three days I couldn't make it squeal. The experiment was conclusive as to this point: The vital force in the nerves of the leg was capable of acting with speed enough to induce the vibration of the diaphragm necessary to produce sound.

"Certainly this rate of speed is much greater than physiologists appear to allow, and it seems reasonable that there is a close affinity between vital energy and electricity. I do not say they are identical; on the contrary, I say they are very like. If one could learn to make vital energy directly without fuel, that is, without beefsteak in the stomach, and in such manner that the human system could appropriate it, the elixir of life would no longer be a dream of alchemy. But we have not yet learned to make electricity directly, without the aid of fuel and steam.

"I believe this is possible; indeed, I have been experimenting in this direction for some time past. But until we can learn to make electricity, like nature, out of disturbed air I am afraid the more delicate task of manufacturing vital energy so that it can be bottled and sold at the family grocery store will have to be deferred.

"Electricity, by the way, is properly merely a form of energy, and not fluid. As for the ether which speculative science supposes to exist, I don't know anything about it. Nobody has discovered anything of the kind. In order to make their theories hold together, they have, it seems to me, created the ether. But the ether imagined by them is unthinkable to me. I don't say I disagree with them, because I don't pretend to have any theories of that kind and am not competent to dispute with speculative scientists. All I can say is, my mind is unable to accept the theory. The ether, they say, is as rigid as steel and as soft as butter. I can't catch on to that idea.

"I believe that there are only two things in the universe—matter and energy. Matter I can understand to be intelligent, for man himself I regard as so much matter. Energy I know can take various forms and manifest itself in different ways. I can understand also that it works not only upon, but through, matter. What this matter, what this energy is, I do not know.

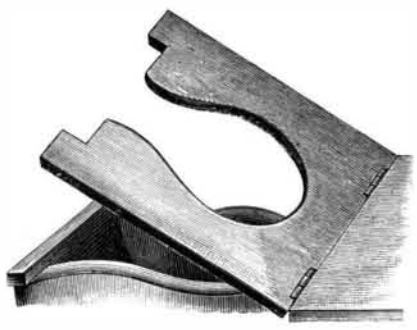
"However, it is possible that it is simple matter and energy, and that any desire to know too much about the whole question should be diagnosed as a disease; such a disease as German doctors are said to have discovered among the students of their universities—the disease of asking questions."—*American Engineer.*

Palpitation of the Heart.

This alarming and often very distressing symptom is often due to dyspepsia, caused by excessive mental or physical exertion. Sir Walter Scott was much subject to it. In his private journal, written in 1826, he says: "What a detestable feeling this fluttering of the heart is! I know it is nothing organic, and that it is entirely nervous; but the sickening effects of it are dispiriting to a degree. Is it the body brings it on the mind, or the mind that inflicts it upon the body? I cannot tell; but it is a severe price to pay for the 'Fata Morgana' with which fancy amuses men of warm imagination. In the country I drive it away by exercise. I wish I had been a mechanic, a turning lathe or a chest of tools would have been a godsend; for thought makes the access of melancholy rather worse than better. I have it seldom, thank God, and, I believe, lightly, in comparison with others."

AN IMPROVED WATER CLOSET.

The improvement shown in the accompanying illustration is especially designed to promote cleanliness,



CHADBOURNE'S WATER CLOSET.

and is particularly adapted for use in the toilet rooms of public places. It has been patented by Mrs. Anne G. Chadbourne, of No. 100 Blue Hill Avenue, Roxbury, Mass. The bowl, which is preferably set up without cover or wood inclosure, is of porcelain or earthenware as usual, and has a wide forwardly extending portion at the top, terminating in a crosslip or strip-like part. This special construction of the upper marginal portion of the bowl in front operates, in conjunction with the form of the seat, to make a practically air-tight joint between the seat and bowl. With this form of closet, the body is kept from contact with the front portion of the seat and bowl, and the seat is kept clean.

LAMBRECHT'S POLYMETER.

This is a combination instrument for indicating the state of the atmosphere, its temperature, relative humidity or percentage of moisture, vapor tension, and dew point or absolute humidity. For meteorological purposes it has been stated by high authority to be more accurate than the wet bulb hygrometer, and far more convenient, as it indicates the relative humidity of the atmosphere on a dial which can be read as one reads the temperature on a thermometer scale. The thermometer on the stem of the polymeter gives the temperature of the air in Fahrenheit degrees, the same as any standard thermometer, but, as is well known, the amount of moisture which the air will carry, or the greatest possible vapor pressure without precipitation, varies constantly with the temperature. At 30° F., the maximum of vapor pressure is 0·165 in.; at 40° F., 0·248 in.; at 50° F., 0·361 in.; at 60° F., 0·518 in.; at 70° F., 0·733 in.; at 80° F., 1·023 in. Relative humidity is the percentage of moisture in the atmosphere at any degree of temperature, and this the polymeter gives by the index hand on the dial, zero being extreme dryness and 100 extreme saturation, or the air filled with moisture. The quantity of vapor which completely saturates the air at 32°, on having its temperature raised to 50° becomes only one-half saturated, and the index of the polymeter will point to 50 per cent; on a further rise of temperature to 70°, the amount of vapor remaining the same as at 32°, the index hand will point to 25 per cent or one-quarter saturation, which is too dry for human health and plants.

By the use of this instrument one can better calculate the prospects for fair or foul weather, the temperature and dew point or absolute humidity being given. Those who keep meteorological records, either for scientific or practical purposes, will find it a great aid, and for the physician it has a special value, as in a moment he or the nurse can ascertain the humidity of the air in his patient's chamber, and note whether it is too dry or moist. This knowledge in some diseases is very important. If the air is found too humid, a little fire in an open grate will remedy it. If too dry, the moisture may be increased by the evaporation of more water.

The instrument is made and sold exclusively in the United States by Gall & Lembke, 21 Union Sq., N. Y.

How to Preserve Potatoes.

The French Minister of Agriculture publishes the details of the process in the official *Bulletin du Ministere de l'Agriculture* for March, 1891. The following is a translation of the essential part of the scheme:

1. The method of preservation consists in plunging the tubers, before storing them away, for ten hours into a 2 per cent solution of commercial sulphuric acid in water; two parts of acid to 100 parts of water.

2. The acid penetrates the eyes to the depth of about one-fortieth inch (two millimeters), which serves to destroy their sprouting power; it does not have any appreciable effect upon the skin of the potatoes.

3. After remaining in the liquid ten hours the tubers must be thoroughly dried before storing away.

4. The same liquid may be used any number of times with equally good results.

5. A barrel or tank of any kind will do for the treatment. The acid is so dilute it does not affect the wood.

6. Chemical analysis shows that potatoes treated by this process are as nutritious and healthful after eighteen months as when freshly dug.

7. Potatoes thus treated are of course worthless for planting.—*Gerald McCarthy, N.C. Experiment Station, Raleigh.*

A Secure Base for Electrotype Plates.

Plates which offer little space for nails are usually fixed with very fine pins which very soon rust through in the perpetually damp wood, and before you know where you are, a plate is torn off its block by the inking rollers and crushed flat into the type by the printing cylinder. Sometimes the damage is even greater.

Every printer can rid himself of this nuisance in the following way: Take the plate off the wooden block, fit it with very strong wire pins, and bend these with nippers into hooks at the back of the plate. Of course these hooks must be less than type-high, and under no circumstances must the plate be bent. This plate is now to be placed on a table, and surrounded with type-high furniture slightly smeared with fat. Good, slow-setting Portland cement should now be mixed to a stiff consistency, poured into the form and allowed to project a little above the top.

This work is best done in the evening and the cast left to dry and set overnight. In the morning the electro and its block can be taken out of the form, after scraping away the superfluous cement with a brass rule. The block will then have been worked down to type height; that is, if a medium degree of warmth has prevailed in the room during the night, otherwise the drying will require a longer time. The cement block must now be allowed to dry another twelve hours in the air, and then placed twelve or twenty-four hours under water to harden.

A block of this kind has now been systematically treated for truth, warmth, cold, and damp, and will stand any amount of printing without alteration.

A plate mounted in this way, being anchored fast into the block, cannot now loosen; it can only be separated by destroying the block, but the cement is so cheap that that does not matter.

It must be admitted that the length of time required for making a cement block prevents their manufacture as an article of trade, but for the printer who can do this kind of work at odd moments this is no disadvantage. By this process one gets electro blocks which are far preferable to cast-on metal blocks and almost as durable.

The writer of this article has had electros thus mounted in use for more than three years, and asserts that they last splendidly.—*Paper and Press.*

Tone Signaling.

The last of a series of demonstrations of a new method of signaling was lately given at the Naval Exhibition, London, by the inventor, Mr. W. B. Chalmers. The apparatus consists of a series of ten immensely powerful reeds, arranged to give a complete diatonic octave with a note on each side, by means of which it is, of course, possible to produce a virtually unlimited number of short groups of notes standing for letters, numerals, or whole sentences, such as are most likely to be required in a fog, or at night by two ships meeting. In many cases three notes suffice for a message that with the ordinary fog horn using the Morse code would take about half an hour to transmit. The first strains of the various national hymns are, of course, used to declare the nationality of the ships using the code, and some of the groups of notes are very happily chosen. For instance, the minor cadence, C, B, A, standing for "I am in distress, stand by me," may almost be said, in the words of the analytical programme, to "speak for itself," and a cheery phrase for "I will send a boat to you" is scarcely less obvious. There will probably be little difficulty in finding men who can readily work the signals, as no musical complications are suggested, and for the use of unskilled ears a small set of organ pipes can be applied to the instruments, for purposes of verification.