pheric electricity to the curing of diseases in plants, and encouraging their development, and he described his means of drawing currents from the clouds and air and distributing them among his cabbages and lettuces. Very surprising effects were produced, but little notice seems to have been taken of them; probably, because there is a natural tendency to ignore phenomena of the rationale of which no clear ideas can be formed. But quite recently M. Blondeau brought before the French Academy of Sciences the results of some experiments quite as startling as those of the worthy Abbé. He says that the current ripens fruits; of this he has assured himself by electrifying some apples, pears, and peaches, all of which ripened under the influence of the fluid, whilst the other fruit on the same trees remained far from ripe. Then he electrified seeds and grains, by steeping them in water and submitting them to the action of a powerful current. Peas, beans, and wheat, were so treated and sown in good soil. By the side of them were sown similar seeds not electrified. The former sprouted sooner than the latter; the development of the young plants was more rapid, and the stems and leaves were more vigorous than those not subjected to electrical influence. But, most mysterious of all, some beans that had been electrified grew upside down, with the roots in the air and the cotyledons in the soil.

For the mechanical and engineering arts, electricity has done much already; but it promises to do more. We have had an electric loom to dispense with the complications of the Jacquard cards, and some of our great iron-clads have been furnished with electrical call-boys for enabling the captain on the bridge to communicate his orders to the engineer below, and to the steersman at the wheel. Now, the engineer has the prospect of relief from his bugbear—boiler incrustation. It is asserted that the placing of a bundle of metallic spikes in the path of the steam as it issues from a boiler, has the effect of generating a stream of electricity, and that if this be led to the metal of the boiler, it sets up an action at the surface which prevents the deposit of saline matter. The question is a disputed one at present.

The phenomenon is unexplained, and therefore, in some quarters, discredited; and as yet, sufficiently crucial tests have not been applied to settle it indisputably as a matter of fact. So we pass on to another, and perhaps better established, application of the twin elements, electricity and magnetism. We allude to their use in the manufacturing and testing of iron. This metal, in its crude state, is full of impurities, such as carbon, sulphur, phosphorus, and silicious bodies. These are electro-negative in relation to iron, which is electro-positive. When, then, a powerful current is directed through the fluid metal in the melting furnace, the foreign matters are expelled with some boiling and commotion, and a very pure metal is produced and drawn off to the casting molds. This method of purification has been tested at Sheffield with remarkable success, and it foreshadows improvements in the manufacture of iron second only to those that have followed from the revolution effected by Bessemer in the making of steel. The author of the process in its present form is Mr. Robinson, of London; but a somewhat similar plan was suggested and tried five-and-twenty years ago, to the proof of the adage that there is nothing new, "except," as cynics say, "that which has been forgotten and re-discovered." The testing of iron castings and forgings by magnetism is an ingenious idea, the credit of which belongs to Mr. Saxby, R. N., one of our dockyard naval instructors. When a bar of iron is placed at a certain inclination to the vertical, it becomes temporarily a magnet, and behaves as such to a compass needle brought into its vicinity. If the bar be perfectly sound, free from cracks or cavities, the compass needle, when passed around it, goes through methodical evolutions, always directing its north point to particular regions of the bar, and otherwise behaving in an orderly manner. But if the iron be cracked or flawed internally, there will be breaks in the continuity of its magnetism corresponding with the mechanical interruptions, and these the compass needle will point out by behaving vagariously when when it passes over them. This is the principle of Mr. Saxby's tests; he has tried them practically at the Chatham and Sheerness dockyards, and with a success that gives great hopes of removing one of the greatest difficulties engineers have to cope with.

We have known an instance in which a large and valuable forging, the paddle shaft of one of our great steamships, was discovered to be defective only when, after weeks of labor, a cutting tool revealed the hitherto invisible flaw. The loss involved amounted to several thousand pounds, of which a part at least, might have been spared had some effective means been known for testing the soundness of the mass of metal.

The latest novelty is an electric organ. One of the most important and valuable properties of the galvanic current is that of transmitting power without motion. If we want to ring a bell at a distance, we must move the whole length of an intervening wire, and this motion takes strength and time. Similarly, to open the valve of an organ pipe by touching a clavier requires the intervention of complicated rods and levers Strength is necessary to press down the key to work these levers, and time to communicate the motion to the pipe's orifice. Electricity requires neither; it instantly transmits force enough to open the valves without demanding more than a gentle pressure upon the clavier. Another advantage is, that the keyboards may be at any distance from the organ pipes. We heard this application suggested long ago; the credit of working it out now belongs to an English organ builder residing in Paris, who has made several instruments on the plan. One has already been erected at the Crystal Palace. Blown by steam—played by electricity—what is the king of instruments coming to?—*English paper.*

THE INFLUENCE OF SCIENTIFIC CONVENTIONS.

Prof. S. D Tillman, in his address at the Autumnal Opening of the Polytechnic, on Thursday, the 10th inst., after alluding to the success of the late Scientific Congress at Chicago, said: "Nothing more was needed to confirm the general opinion as to the benefits arising from these annual gatherings. They accomplish for science what conventions do for religious, political, and commercial objects, by securing unity of purpose, concentrated effort, and expeditious action. Indeed, they do much more in dispelling illusions, which are often palmed off as truth among those who are only captivated by novelty. While discovery is constantly extending her domain, opening new paths of progress, and erecting new beacons, to direct those who are to follow, it is the special duty of advanced men to see that no false lights are shown which would lead to the propagation of unsound doctrine. Every new hypothesis or induction should be subjected to the keenest scrutiny of those who are competent to pass upon its merits. A scientist, who reads a paper before his peers, reaches at once the appreciative audience he most desires. If he describes new experiments, they, more than all others, are interested in the results; if he advances new views, they are ever ready to question the correctness of his conclusions. Thus, it frequently happens, that the discussion immediately following the reading of a paper, will dispose of objections, and establish positions which could not be reached in a long time through the medium of printed dissertations. Moreover, the suggestions often thrown out during the free exchange of ideas in a verbal debate, are of great service in exciting that enthusiasm in the votary of science which prompts him to higher efforts in the pursuit of truth.

"The beneficial influence of these scientific associations is not so obvious here as in Europe, where they are older and more firmly established. Of late, the British Association for the Advancement of Science has accomplished much; yet it will be remembered that, even after its formation, Sir John F. W. Herschel, in a note appended to his able treatise 'On Sound,' in the *Encyclopædia Metropolitana*, acknowledged his indebtedness to foreign journals for a portion of the information he then presented and expressed his regret that so little attention was paid in his own country to what was being done by scientific men abroad. 'Here,' said he, 'whole branches of continental discovery are unstudied, and indeed almost unknown, even by name. It is in vain to conceal the melancholy truth. We are fast dropping behind. In mathematics we have long since drawn the rein, and given over a hopeless race. In chemistry the case is not much better.' These, and other words of regret and reproof then written, doubtless hastened the great and favorable change which has since taken place in his country. Certain it is, that the formation of the British Association has led to the happiest results; for to-day it may boast of many distinguished names in almost every branch of science.

"If there is any hindrance at present to the progress of truth, both here and abroad, it arises chiefly from the spirit of exclusiveness sometimes evinced by those who have devoted their lives to the study of physical laws. This should not excite surprise, because the tendency of abstract science is essentially aristocratic. The man who knows, stands on a higher plane than the one who does not know. Hence, the position of the scientist is impregnable. He has riches and power, of which he cannot be robbed. Should he find his chief enjoyment, however, in the reputation he has acquired, he may well fear rivalry. On the other hand, if he pursued truth for the love of it, he will welcome all who labor in the same spirit, and extend to those below him a helping hand.

"The study of natural laws, in the abstract, undoubtedly affords pure enjoyment; yet this feeling is vastly intensified by witnessing their successful application for the accomplishment of new and important results in the useful arts. Such results are often brought about by the artisan who, although he may know but few of these laws, understands most thoroughly all the conditions peculiar to his art, under which they can be effectually applied. Our great inventors have not, generally, had the advantage of a liberal education By ingenuity alone they take the lead, and, of course, counteract to a certain extent the haughtiness sometimes engendered by learning.

"Scientific associations will be entirely successful when they fully recognize the fact that Science in these modern times has a double mission. From serene hights she beckons on the student who longs for clearer views of the divine plan of the universe; yet often she descends to the humblest abodes of men, and watches while Invention weaves some new device. Thus, we find her potent influence in those improvements which lessen manual labor, supply corporal wants, and add to the material resources of our race. We, of the Polytechnic, welcome her in both offices, as revealer of long hidden links in the endless chain of sequences, and as prompter to new combinations of some of those links by which the surplus powers of nature are successfully applied to ingenious mechanism, and by which even new forces are generated, and made obedient to the will of man."

An Alarm.

We have in our house a little invention which we have several times noticed in other dwellings, but having no direct interest in its operation we have not paid much attention to its working. It is a little thing, and stands upon a little shelf in our sleeping room; but in an emergency it is capable of making a good deal of noise, and imparting useful information. It is an electric alarm, with wires entirely concealed from the eye, and which run from it to the doors and windows and scuttle of the house; and should any of these be disturbed, the alarm is at once sounded. By means of a "tell-tale" it can be ascertained at once in what part of the house to look for the disturbance.

The other night, before retiring to bed, we had the assurance of the servant that everything was close and secure. We set the alarm, but instantly it set to ringing, and we knew that something was wrong, and upon examining the "tell-tale, we found out where to look for the cause. The laundry window was dropped about an inch, and the little machine would not keep still until the matter was made right.

By the use of this little apparatus, thousands of dollars worth of property have been saved from burglars.

The Geysers of California.

A correspondent of the New York *Journal of Commerce*, writing from Sonora county, California, thus describes the Geysers of that state: After ranging through a considerable part of the State of California, seeing that which is most grand and beautiful, I am constrained to tarry here and in common with travelers who have peeked into the crater of Vesuvius and witnessed other strange spectacles in the Old World, to declare that the most strange and wonderful of all has been reserved for the last, when we gaze upon the extraordinary phenomena known as "The Geysers." Few objects in nature are more deserving of attention from those who delight in scientific investigation or desire to merely to gratify a love for the marvelous.

A deep serpentine canon or ravine about a quarter of a mile in length is flanked by walls of denuded rock, precipitous and rugged, full one hundred feet in hight, and through their entire extent strong jets of sulphurous vapor spring from every crevice, while along the base streams of water hot, hissing, gurgling, contribute to swell the volume of the torrent that sweeps down into the valley of the Russian river, its course marked by clouds of steam. The substances held in solution by these waters coat every boulder with mineral incrustations, and above the water line the disintegrating rocks bristle with crystalline sprays of sulphur, borax, alum, etc. Indeed that must be a desperate case which could not be cured by medicines found in that great laboratory; if no cure be effected, they would certainly do the other thing. Yellow, green, and gray colors predominate, with a large admixture of oxide of iron. The place where you thread is almost too hot for endurance. If you sit awhile to contemplate the extraordinary scene a sensation of discomfort suggests an immediate change of base. If a longer stay prove admissible, the probability is that clothing thus brought in contact with strong alkalies and acids would quickly be destroyed. This singular gorge is therefore not inappropriately named "Devil's Canon." In fact every object here is suggestive of something Satanic. The visitor is shown "The Witch's Cauldron," "The Devil's Smoke Pipe," "The Devil's Tea Kettle," etc. The roar of boiling water and the rush of steam commingle, rendering the human voice inaudible, except at short distances. The one is deep, profound, sepulchral, suggestive of spectral shapes, with horns and other diabolical appendages. The other is sprightly babbling, as if in mockery. A cane thrust into the yielding embankment is withdrawn, smeared through its entire length with a sticky pigment representing colors of every hue. Large masses are readily detached, rolling to the bottom, where they dissolve and float away. Seventeen varieties of mineral substances have been found here. In truth, if the contents of a huge drug store were multiplied one hundred times, then mixed promiscuously, and the whole villainous compound thrown into a chasm heated by subterranean fires the product might bear a faint comparison with the geysers of Sonora county. In one place a pool of water, black as Erebus, and about ten feet in diameter, is seen boiling furiously. To fall in would be instant death. Elsewhere the stream escapes from fissures in the rock with a power sufficient to hurl stones from the opening with great violence.

These phenomena have been variously explained, some ascribing their origin to a volcanic agency, as scoria and lava are found plentifully. Others suggest that the mixture of acids, and alkalies taking place causes a combustion, the effects of which are apparent. The last theory advanced receives support from the fact, that the geysers manifest much greater activity after a season of heavy rain; erudite professors must settle this question.

More Vandalism.

One of the peculiar faculties of the late Prof Faraday consisted in his great mechanical ingenuity and constructiveness, as evidenced in the apparatus for conducting the original and elaborate experiments by which he arrived at such great results. Their main character was simplicity, which is indeed the perfection of ingenuity, and the distinguishing feature of the work of genius. As has lately been remarked by a good judge, "the practical powers were never perhaps more strikingly displayed by man than in the various contrivances he adopted while conducting his researches—some of them being almost equivalent in ingenuity to the compilation of a steam engine." We regret to have to record the fate of the greater portion of these contrivances. Shortly after Mr. Faraday's death they were given by his wife to the porter of the Royal Institution, who, we need not say, could scarcely appreciate them. He accordingly sold them piecemeal, and even parts of the same apparatus to different buyers, thus breaking up combinations that probably were understood by few except their gifted inventor Thus it is probable that all this splendid collection is destined to be scattered and distributed among those to whom their only value will be as souvenirs of departed greatness.

A CURIOUS accident recently happened at Almond, Mich. The jack wheel of a threshing machine burst and killed Albert Tucker, who was in charge of the machine.