by 42 inches. These were plumb to square, of equal width top and bottom, and in forming them the builders seem to have given their greatest care and attention.

A prominent feature in all these ruins were the circular rooms or *estufas*—their council halls or secret places for the practice of their ancient religion. The number of these from each Pueblo varied from but a single one up to as many as twenty-two; their average size was 25 feet in diameter, the largest being a trifle over 60 feet, and the smallest 15 feet in diameter. In two Pueblos these *estufas* had been divided into two or more floors, the beams still protruding from the walls. The interior walls were of the most perfect masonry and perfectly circular.

In all the ruined Pueblos the most remarkable feature was the skill with which the stone walls were built and which has enabled them to withstand for hundreds of years the ravages of human hands and the slower work of the elements. Commencing at the foundation with a width of 32 inches, each succeeding story was built a little less in thickness until the walls of the fourth floor are but 18 inches through, giving them a pyramidal shape and of such solidity that in some cases, although the floors have been crushed down and the crosswalks fallen, yet they remain firm and plumb nearly forty feet in height. They had their methods of laying the stone—big regular sandstone blocks of the size of two bricks, cut and ground to a uniformity—by alternate layers of these blocks with layers of very small and thin pieces of sandstone, generally three courses of the thin to one of the thick, and last by laying the entire wall of these excessively small pieces of thin sandstone. As an example of this last kind I measured off a square yard on the northern wall of the Pueblo of Chetto-Kethe, and counted the number of stones forming the surface. There were 450, each laid so close together that a knife blade could not be pushed between them, and not a particle of mortar of any kind appearing at the surface. This entire wall was 490 feet long, and originally fully 40 feet high and averaged 24 inches thick. Imagine the industry and patience of such builders. The interior of these walls were laid in with rougher stone, and with abundant clay mortar. Binding courses of pine sticks were laid in the wall, both transversely and longitudinally. Every doorway and window was framed with scrupulous exactness, and it would appear as if the plumb and square had been faithfully used in all their work.

Communications.

The Seventeen Year Locust.

To the Editor of the Scientific American:

H. J. Loomis, of Chesterfield, Ill., says, in the SCIENTIFIC AMERICAN of July 7, that what is termed the seventeen year locust appears every thirteen years. In 1829, 1842, 1855, and 1864 they appeared in that region. In Grundy county, Ill., they were numerous in 1854, and also in 1871. I read a few weeks ago that these locusts were appearing in great numbers, if I remember right, somewhere in Pennsylvania, and this is 1877. It does not correspond with either of the periodic appearances as noted above. Is it possible that Nature's operations are so widely variant in the same insect, in about the same latitude? One would think that a seventeen year locust, reasoning from analogy, would remain such in its habits, in obedience to the fixed laws of life; but if it be true that these three appearances of locusts (which by the way are not locusts at all, but cicadas) are one and the same species, can science reconcile or account for these wonderful discrepancies of their appearances, varying four years or more in different localities, and in latitudes not very widely apart? We think they must be different an ddistinct species. We regret we have not an entomological description of our seventeen year locust. One thing we distinctly remember, he had red eyes, which no other species of our acquaintance has. A specific description of a specimen of each of their appearances would determine the identity, or otherwise would show three species. Cannot the scientific readers of the SCIENTIFIC AMERICAN settle the question of identity?

Verona, Ill. R. K. SLOSSON.

Pumping with Tight Connections.

To the Editor of the Scientific American :

In response to your wish for some experimental data in proof of my assertion as to the advantage of a tight connection, I relate the following. In 1874 I was employed by the Boston and Providence Railroad, to go to Mansfield, Mass., to make some soundings for water, which was wanted in large quantities. I drove two 3 inch wells 100 feet apart. They were 21 and 23 feet in depth driven through 3 feet of iron ore, which was very close and solid, effectually excluding air. In testing the wells as to supply, I used a Knowles steam pump, 2 inch suction, 1½ discharge.

When ready to make connection I found I had no reducing coupling suitable, and I inserted the suction pipe inside of the well tube in the same manner, but could not run my pump more than 15 minutes without drawing air, the pump running 34 strokes per minute.

Next day I made a tight connection and set my pump in operation. I was astonished at the result. I cannot give you any data on the first trial, for I kept none except the number of strokes per minute and the length of time of the run. On the second trial the pump was in operation one week constantly, from Monday morning at 8:45 until Saturday night at 5:30, pumping 165,000 gallons per day of 24 hours. I have tried the same thing many times and the result has always been the same.

Waltham, Mass. J. R. SMYTH.

Raw Taste of Tobacco.

To the Editor of the Scientific American:

I have been a slave of tobacco for so long that I have given up the idea of ever stopping the use of it. There is so much of the plug tobacco that causes the mouth to become raw, besides containing hair, feathers, and other little dainties too numerous to mention, that I have determined to use none but leaf tobacco hereafter. Will you be kind enough to tell me, through your valuable paper, how to remove the raw taste from the natural leaf, and oblige a subscriber who fully appreciates the value of the SCIENTIFIC AMERICAN?

New Cumberland, Pa. J. W. F.

[ANSWER—We believe that the common method of removing the raw taste, that our correspondent complains of, is to soak the tobacco in urine. Tobacco thus treated and then sweetened with molasses dirt, is considered "lovely," the "solace" of mankind, "honey dew," etc.]

Eruption of a South American Volcano.

The eruption of a volcano, probably Cotopaxi, has caused serious damage in Ecuador. The *Comercio* of Guayaquil, of June 29, gives the following particulars:

"A volcanic eruption occurred in the interior at from 9:30 to 11 o'clock A.M., on the 26th instant. We do not know which of the volcanoes is in action, but suppose it to be Cotopaxi, which for a century past has had an eruption every ten years. On the day mentioned, from Babahoyo to Tumbez, detonations resembling the discharge of cannon were heard. At Yaguachi it was said the reports came from the north. At 6 o'clock P.M. of that day a heavy shower of ashes commenced to fall, and continued until this morning. A calculation has been made of the quantity of ashes which has fallen in thirty hours, and it is estimated that on each square kilometer of space 313 kilogrammes of ashes had fallen. A mineralogical analysis of the ashes is made with the following result: Volcanic ashes composed of exceedingly fine particles of lodestone, vitreous felspar, hornblende, and an amorphous substance. On account of the absence of acids in the ashes they are not likely to be injurious to the crops or cattle, as on previous occasions.

"The steamer Islay, on her way from Panama to Guayaquil, first noticed the fall of ashes at Manta, and continued to receive them till arriving at Guayaquil, from which it is inferred that the winds from the higher latitudes have carried them to a great distance. No doubt, as on other occasions, the ashes have been transported to a distance of two hundred leagues from the volcano which threw them out."

The authorities between Ambato and Guayaquil report that, at 10 o'clock on the morning of June 26th, a frightful noise was heard in Latacunga, which was followed immediately by a tremendous flood, which, taking the course of the rivers Cutuchi, San Felipe, and Yanayaco, and passing, washed the city to the chapel known as El Salto. The volume of mud and water was so great as to completely cover the hacienda Valle, including the distillery in front of Latacunga. The flood in its course carried with it many cattle, and, what is more sad, many human bodies. The bridge of Latacunga, the handsome bridge of Bolivar in Pansalco, those of wood of Culapachan and Patate, and that of masonry of Agoyan, were all destroyed. All of the haciendas situated on both sides of the river have suffered enormously, and the desolation is terrible and complete.

Renovating Grass Lawns.

It is astonishing how long a lawn will retain its verdure without assistance in the way of manure. No doubt a lawn gets impoverished in time by being continually cut; but still it seems to sustain little or no injury. The roots of grass appeared to be endowed with an extraordinary vitality, and the rains to which they are exposed recuperate them for the close cropping to which they are subjected, and perhaps the fact of the grass never being allowed to seed has also something to do with maintaining fertility. The vitality of grass roots is best exhibited in dry seasons. In the dry summer of 1868, I knew large trees to die through drought at the root, and many to be seriously injured; but though the lawn was as brown and dead-looking as if it had been scorched by fire, the grass was not killed. I thought it was in many places, for to all appearance the roots appeared shriveled up, as well they might be, being close to the surface, and the grass having been kept as closely shaven as a carpet till the drought came; but when the rains came in October it began to grow, and by next summer all traces of the drought had disappeared. It must not be supposed, however, that I approve of lawns being allowed to become exhausted; by no means. A starved sward is never a very green one, and greenness and freshness are everything in a lawn; and upon the whole it is not difficult to keep it in that condition, for, however neglected it may have been, it quickly responds to stimulating treatment. The best and most convenient plan is to apply artificial manure of some kind in the form of a top-dressing. Guano is good, but it does not produce the greenest verdure; soot surpasses it in that respect, and it is cheaper. It is not needful to top-dress the lawn annually, and when necessary most gardens should provide the materials. If all combustible rubbish in the way of prunings of trees, rakings of shrubberies, etc., be collected into a heap, they will serve not only to consume themselves, if set fire to, and produce a good quantity of wood ashes, but will reduce to ashes all the short grass that has come off the lawn, weeds, roots, and other rubbish, and at the same time burn a considerable quantity of soil, which may with advantage be mixed with the ashes and the whole applied to the lawn as a top-dressing. There is hardly anything better than this for grass, and its effects are more lasting than guano or soot alone, and it may be applied without fear of injury. Should the lawn be mossy, it should be well harrowed with a rake first, and then cleaned and dressed.—*Correspondent in the Garden.*

The New Metals Ilmenium and Neptunium.

About thirty years ago R. Hermann announced the discovery of a new metal, ilmenium, accompanying tantalum and niobium in various minerals, and closely allied to them in its general characters. Several years later he relinquished his claims to the discovery, in consequence of researches by Marignac in the same field leading to entirely different results. Later investigations have, however, strengthened his belief in the existence of ilmenium, and in the February number of Kolbe's *Journal für praktische Chemie* he not only brings forward results tending to establish the individual character of ilmenium, but describes a new metal neptunium, belonging to the same group, and occurring in tantalite from Haddam, Connecticut. As the quantities obtained are small, the characteristic reactions limited, and as the spectral properties cannot be made use of, chemists will naturally reserve their opinion till confirmatory observations have been made by some other well known investigator. The following are the essential results obtained by Hermann. The mineral was found to consist of equal portions of columbite ($ROMe_2O_3$) and ferro-ilmenite (RO_2MeO_2). By fusion with potassium bisulphate the hydrates of the metallic oxides were separated out in the following proportions: Ta_2O_5, 32·39; Nb_4O_7, 36·79; Il_4O_7, 24·52; Np_4O_7, 6·30; total 100.

The hydrates can be changed into double fluorides, and from the greater solubility of potassium-neptunium fluoride, it may be obtained free from tantalum and ilmenium salts but retaining a small quantity of the niobium salt; these, however, on being changed into niobate and neptunate of sodium, may be separated on account of the greater solubility of the latter. By fusion of the neptunate of sodium with potassium bisulphate and treatment with water, the hydrate of neptunic acid was obtained in a pure condition. Neptunium may be distinguished from niobium and ilmenium by its having, along with tantalum, the property of forming an amorphous insoluble precipitate on the addition of caustic soda to the boiling solution of the fluoride; the other two form crystalline and easily soluble compounds. The very soluble character of neptunium potassium fluoride as compared with the corresponding tantalum salt serves to distinguish it from that metal. The reactions with phosphorus salts in the inner part of the Bunsen flame are the following: tantalic acid, colorless; niobic acid, blue; ilmenic acid, brown; neptunic acid, wine yellow. Addition of tincture of galls to solutions of the sodium salts give characteristically colored precipitates. The atomic weight of neptunium, determined from the double salt $4KFl+Np_2Fl_7.2H_2O$, was found to be 118. Hermann has also obtained ilmenium in the form of a black powder by heating potassium ilmenium fluoride with potassium chloride and potassium.—*Nature.*

The Hayden Survey.

The area to be surveyed includes something over 30,000 square miles, divided into three districts, lying mainly in Wyoming Territory, but trenching on Utah and Idaho on the west. Two of these districts, the Green River and Sweetwater, have as their southern line the parallel 41° 45′ (or about the northern boundary of Clarence King's survey of the fortieth parallel), and the parallel 43° as their northern line. They extend from longitude 107° to longitude 112°, and are separated by meridian 109° 30′, the Sweetwater Division taking the eastern portion and the Green River Division the western. The Snake River Division works an area extending as far north as 44° 15′, and having the same meridians at east and west boundaries. The organization of the Green River Division is typical of all. It is composed of the following persons: Henry Gannett, Topographer in charge; Dr. A. C. Peale, Geologist; J. E. Mushback, Assistant Topographer; F. M. Eastman, Geological Assistant; two packers and a cook. Mules are used both for riding and for the conveyance of the outfit; *i.e.*, tents, baggage, bedding, instruments, and rations. By using pack-mules we are rendered entirely independent of roads, and can move our camp to within a short distance of the mountain summit, and also feel sure that they will be able to endure a campaign where horses and ponies would be sure to fail us. All our mules have been in service since 1873, and after the first few days out fall into line like old veterans. It is amusing to watch them the first day. While the *aparejos* or pack saddles are being put on, they puff themselves out and hold their breath as long as the packers pull on the circingle. When the load is on and the mule allowed to go, the circus commences; and if any animal in the world knows all the inside mysteries of "bucking," it is a Western mule. Our packers, however, are tried men, and put the load on to stay, which fact the mule is not long in finding out, and after one or two mornings he travels along so demurely after the bell-mare that you can scarcely believe him the same animal. Packing is an art, and the head packer is an important person in the camp. He has charge of the constantly diminishing cargo which each morning has to be made up into "loads" of equal weights.

He also has charge of the train on the march while the scientific men are at work in the surrounding hills and mountains. The plan of work is about as follows: After breakfast the head of the party leaves word for the train to travel 8, 10, or 15 miles in a certain direction, and then to camp while the scientific corps spends the time in occupying the stations of the day. These are generally the highest points in the region, from which the topography can be readily made out. All mountain peaks, spurs, junction of streams, and hills are located by means of angles in connection with angles taken from other stations. The station is located by angles on the primary points determined by the party of primary triangulation, which traverses all the districts. Contour and profile sketches of the surrounding country are made, and elevations taken with mercurial and aneroid barometers, and by depression or elevation angles are taken with the gradieuter. The geologist makes sections of the rocks, giving their position, character, and thicknesses, notes the absence or presence of mineral matter, and makes a sketch showing the areas occupied by the different geological formations. Besides this, the general character of the country and its agricultural capabilities are noted. By 4 or 5 o'clock the work of the day is generally completed, and the party turns campward, striking the trail of the train, which is followed until the camp fire is sighted.—*Correspondence of the New York Tribune.*

The Adulteration of Food.

We take the following extracts on the adulteration of food from an article which recently appeared in the *Evening Post:*

"While it is certain that needless alarm is frequently excited by exaggerated statements regarding food adulteration, there can be no doubt that many of the articles of food met with on our tables often contain foreign ingredients which are introduced either for the purpose of lessening their cost or improving their taste and appearance.

Flour is subjected to adulteration with other and inferior meals, such as rice, beans, rye, potatoes, and Indian corn, the addition of which cheapens the price and in some cases bestows a good color upon a damaged or inferior grade, or causes it to take up an abnormally large quantity of water. The addition of foreign meals to flour is practised, however, almost exclusively in Europe, as most of the substances of this class used have in this country a greater value than pure wheaten flour. A more probable illustration with us is the use of alum and mineral substances; the former is occasionally employed to impart a white color to the flour, the latter, which include sulphate of lime, kaolin, chalk, and bone dust, being used to produce increased weight. It has quite recently come to light that a flour containing ten per centum of a mixture of chalk, plaster of Paris, and barytes has for some time formed a steady article of export from Holland into other European countries. The presence of such substances as these can be detected by placing the flour in a long tube nearly filled with chloroform, shaking the mixture, and allowing it to stand, when the pure flour will rise to the top of the liquid, the heavier mineral adulterants sinking to the bottom.

Bread naturally contains the foreign ingredients added to the flour from which it is made; but in addition to these, other substances are sometimes used in its preparation. Alum is employed to prevent the action of the diastase upon the starch, and to prevent the bread from becoming sour and mouldy; and although this salt undoubtedly tends to accomplish these results and imparts a fine white appearance to the bread, its use is not justifiable. When taken into the stomach it is liable to occasion acidity and dyspepsia; furthermore, it prevents the solution of a large proportion of the gluten of the bread, thereby causing a decrease in its nutritious value. A far more reprehensible adulteration consists in the addition of sulphate of copper, which has the same effect on the color of the bread and on the diastase. Although this salt is but seldom employed, and then in very small amounts, its use is to be condemned in the strongest terms, as it acts as a virulent poison, and its effects are cumulative. A simple and delicate test for detecting the presence of copper is to moisten the suspected bread with a few drops of solution of ferrocyanide of potassium, which will cause a pinkish color to become apparent if the metal be present.

Pickles and preserves are often artificially colored. The deep green color frequently noticeable in the former is almost invariably due to the presence of a sort of copper (the sulphate or acetate), which is either directly added to them or is produced by using copper vessels in their preparation, both methods being recommended in several cooking books. This adulteration can be detected by allowing a piece of clean and polished iron to remain immersed in the pickling vinegar for a few hours; in presence of copper a thin coating of this metal will be deposited upon the iron.

The condiments used at the table are also frequently far from pure. Additional acidity is often imparted to vinegar by the addition of sulphuric acid, the use of which was formerly considered necessary in order to prevent its decomposition, and was allowed by law in Great Britain; but although the fallacy of this belief has been demonstrated, the practice is still resorted to. A few weeks ago five carloads of vinegar received in Washington from Chicago were found to contain over fifty-four grains of sulphuric acid per gallon, in the form of sulphate of lime, in addition to five grains per gallon of the free acid. On adding a little nitrate of baryta to vinegar containing sulphuric acid, a heavy white precipitate will be immediately formed.

The sophistications practised upon tea are large in number and often harmful in character. The greater part of the adulteration occurs in China, but the English and Americans appear to have become skillful imitators of the Chinese in at least some branches of this nefarious industry. Mineral and organic substances are used to increase the weight and bulk of the tea; fictitious strength is imparted to it by the addition of certain vegetable substances, and pigments are employed in order to produce a desirable color. The operation which is most generally carried on, at least in this country, is the artificial "facing" or coloring of teas. This practice is almost entirely confined to green teas, of which, it is said on high authority, but few grades reach the consumer in a pure state. The pigments most used for coloring green teas are Prussian blue, indigo, turmeric and china clay: the peculiar glossy appearance they frequently present being produced by means of black lead, talc, and soapstone. Other and far more dangerous substances, such as arsenide of copper, chromate of lead, and Dutch pink, are said to be sometimes employed. When hot water is poured upon a faced tea, the coloring matter present often becomes detached and either rises to the top or sinks to the bottom of the liquid, forming a sediment which can be readily recognized as a foreign body, especially by aid of a magnifying glass.

Coffee is probably more extensively adulterated than any article yet mentioned. When sold in the ground state it almost invariably consists of a mixture containing little or no coffee and a great deal of chicory and roasted grains, such as peas, beans, rye, and wheat. The addition of chicory is frequently defended on the ground that it improves the taste and quality of the coffee; but owing to its comparative cheapness, there is a great temptation to use an undue quantity of this substance, and unless the amount of the addition is specified on the packages (as is required in several European countries), it undoubtedly constitutes a true adulteration; moreover, chicory itself is very often mixed with foreign substances. Pure coffee will remain floating upon the surface of the water for some time, and fails to impart a perceptible color to it, whereas chicory and beans (especially the former) at once sink to the bottom and color the liquid decidedly. Other substances which also rise to the surface of the water can be easily distinguished from coffee by their appearance and taste. A simple test is to spread the coffee out on a slip of glass, slightly moisten it with water, and then touch the layer in different parts with the point of a needle; in this way the presence of soft, non-resisting foreign ingredients can be easily detected.

The artificial coloring of confectionery also merits consideration, owing to the important sanitary effects involved. One of the most common and deleterious substances used in the coloring of confectionery is chromate of lead, which is employed for the production of a yellow color. Red, another favorite hue, is obtained by means of cochineal, but such poisonous compounds as red lead and vermilion are also sometimes used for its production. Green and blue colors, which are fortunately less often met with, are usually produced by means of Prussian blue, Brunswick green, Scheele's green, etc., all of which must be classed as dangerous substances. These colors can be obtained by using vegetable dyes which are quite harmless; and although the tints are then less brilliant, this fact is certainly no excuse for resorting to poisonous pigments.

In most foreign countries effective means have been adopted to expose and prevent the adulteration of food, but with us little has been accomplished in this direction. In Europe boards of public analysis are appointed, who carefully examine suspected articles of food; here this duty usually devolves upon some member of the local Board of Health, whose time, as a rule, is fully occupied by other employment. During the last few years our Custom House officials have exercised commendable care in regard to the quality of the drugs admitted through the customs, and the question naturally arises: Should not at least equal importance be attached to the subject of the purity of the food sold by our grocers and consumed by our families?

Why are we Right-Handed?

Investigations which were very recently carried through by a French physician, Dr. Fleury, of Bordeaux, have adduced facts showing that our natural impulse to use the members on the right side of the body is clearly traceable to probably physiological causes. Dr. Fleury, after examining an immense number of human brains, asserts that the left anterior lobe is a little larger than the right one. Again, he shows that, by examining a large number of people, there is an unequal supply of blood to the two sides of the body. The brachiocephalic trunk, which only exists on the right of the arch of the aorta, produces, by a difference in termination, an inequality in the waves of red blood which travel from right to left. Moreover, the diameters of the subclavian arteries on each side are different, that on the right being noticeably larger. The left lobe of the brain, therefore, being more richly hæmatosed than the right, becomes stronger; and as, by the intersection of the nervous fiber, it commands the right side of the body, it is obvious that that side will be more readily controlled. This furnishes one reason for the natural preference for the right hand, and another is found in the increased supply of blood from the subclavian artery. The augmentation of blood we have already seen suggested; but the reason for it is here ascribed to the relative size of the artery, and not to any directness of path from the heart. Dr. Fleury has carried his investigations through the whole series of mammalia; and he finds that the right handed peculiarities exist in all that have arteries arranged similar to those of man. At the same time such animals, notably the chimpanzee, the seals, and the beavers, are the most adroit and intelligent.—*The Eclectic.*

Stereoscopic Relief in Microphotographs.

It is not improbable that the announcement of a prize being offered by the Photographic Society of Great Britain for the best microphotograph will act as an incentive to those who may be halting between two opinions concerning the production of photographs of this kind for the forthcoming exhibition. To those feeling an interest in practical microphotography, whether they be intended exhibitors or not, we purpose giving a few practical suggestions and hints regarding this branch of science, although in connection with a certain department about which little appears to be known —that of producing stereoscopic effects in the enlarged images of minute objects to be pictorially delineated.

It is commonly believed that in order to obtain stereoscopic microphotographs a binocular microscope is essentially necessary. From what follows it will be seen that not only is this instrument unnecessary for the production of that class of work, but that in a majority of cases better results can be obtained without than with such an appliance. It is necessary that in all descriptions of binocular photography both images should be photographed under precisely similar optical conditions. In the case of that form of binocular microscope which has attained the highest measure of popularity in this country, such conditions are not possible, because of the dissimilarity of the images, one of them having to be transmitted through a prism, in the course of which it undergoes two reflections, while the other is projected onwards without having to undergo such treatment.

There are two other forms of binocular instruments in which both the dual images are necessarily similar, namely those of Nachet and Stephenson. In these the deflecting prisms are constructed in such a manner as to render both images strictly identical. But, however perfectly they may be constructed, they are still open to two objections—that of not being much used in this country, and of necessitating the formation of each of the images with only half a lens, or, at any rate, with one half of the objective. In a method we adopted several years ago, these drawbacks are entirely eliminated.

A single-barreled or monocular microscope of any convenient form must have fitted to it a super-stage attached to the main stage, and capable of being influenced by the rectangular or mechanical adjustment of that stage. This super-stage is so constructed as to allow of the small platform upon which rests the object slide to oscillate from right to left within a limited sphere. This is easily effected by having the slide holder pivoted at its two sides into guiding side pieces, the axis of motion being adjusted in such a manner as to nearly, if not quite, coincide with the object to be photographed.

The super-stage having been depressed at one side, a photograph of any suitable object is taken; after which, without moving the light, the camera, or any of the lenses, a tilt in the opposite direction is given to the stage, and a second photograph taken. The pictures obtained in this manner, when combined in the stereoscope, will show an amount of relief very astonishing.

The nature of the action by which this stereoscopic effect is obtained will easily be understood from the following illustration, which will approve itself to the ordinary, in contradistinction to the microscopic, photographer: At the distance of a few feet from an ordinary portrait camera let a bust or statuette be placed on a table. Now take a negative of the bust, and then, without moving the camera, or doing anything else than very slightly rotating the bust on its axis, let a second negative be taken. Prints from the negatives thus obtained will possess all the solidity of binocular pictures if examined in the stereoscope; nay, not only so, but unless special care have been taken not to move the bust too much when rotating it between the first and second exposure, the effect of relief in the stereoscope will be much exaggerated.—*British Journal of Photography.*

Improved Electro-Magnet.

M. Cance has called the attention of the French Academy to a new system of electro-magnets with multiple cores, similar to that of Camacho, but with series of small rods of soft iron substituted for the tubular cores, and enveloping the different coils. The rods are all put in contact with the breech of the electro-magnet, and strongly fastened at their base with a bronze collar, so as to make one solid piece. This arrangement is said to offer the following advantages: 1. Retaining permanent magnetism very little (as the demagnetization of the rod is almost instantaneous). 2. Giving a sphere of lateral attraction as extensive as may be desired (since it is in relation to the number of rod cores). 2. Easier construction than that of electro-magnets with tubular cores. The sole inconvenience is that the system gives pretty strong sparks of extra current; but with systems of interrupters by deviation from the main circuit, or condenser, the evil may be obviated.

A Remedy for Bed Bugs.

A correspondent writes to the *British Medical Journal* as follows: "The best remedy for bugs in hospitals is a bug-trap made by boring a series of holes in a piece of wood with a gimlet, and placing this under the mattress of each cot. The piece of wood is to be placed periodically into a basin of boiling water. This is an Indian hospital plan."