Good Draughtsmen.

Draughtsmen worthy of the name seem to be a very scarce commodity in the engineering market just now, if the frequent applications of employers to this office can be taken as an index to the trouble they have in finding men to suit them, says the *Engineering News*. One bridge engineer said recently that out of eighty-odd answers to an advertisement for a bridge draughtsman, he did not find one that was worth employing. Even a satisfactory "tracer" is not easy to discover, as we know from our own experience. The trouble seems to be that too many so-called draughtsmen think that the art begins and ends in handling a drawing pen and in inking-in a pencil plan practically made by some one else. They are exceedingly limited in their knowledge of mechanics, and know little or nothing of structural details; in other words, they are neither well trained nor thorough in their work, and cannot be left to their own resources for a moment.

There was a time when imported German labor of this class met all demands, and usually met it well; but for some reason that we cannot explain the supply has lately fallen off, and the more valuable men already here are secure in permanent employ. The German technical schools devote much time to the thorough teaching of drawing as an essential adjunct of mechanical and civil engineering, and, as a rule, devote nearer twelve than four years to the careful training of pupils fitting themselves for these professions. While we would not encourage young men to adopt the drudgery of draughting for a life occupation, it is, nevertheless, one of the best schools for the mechanical engineer that can be chosen, provided that he goes at this work well trained in the principles and fundamental laws of mechanics, and always works with the combined purpose of making a good machine as well as a good drawing. The same remark applies to bridge draughtsmen and to those engaged in the design of metallic structures of all kinds.

In the time now allotted to "scientific training" in the majority of our technical school, probably all the time devoted to draughting is such as can be safely spared from other work. But in too many of our schools a little less time devoted to pure mathematics, depending practically upon a retentive memory for any future usefulness, and more time devoted to fundamental laws and to the training of the eye, the hand and the mind combined, would result in a graduate more useful than is usually the case to himself and to his employers. The young man leaving his school must necessarily be an assistant until he has had time to gather that worldly wisdom and experience that will alone fit him to successfully enact the role of a creator or leader. But the better and more thorough the previous training of the graduate, the better assistant will he make and the more rapid will be his advancement. It pays the student, therefore, to devote more time to his training, and pays in a proportion that altogether exceeds that of the extra years involved in this training.

Notwithstanding certain prejudices against this occupation, a really good draughtsman in the office of a bridge works or a machine shop, one who thoroughly understands his business in all its details, commands a much better salary than the average engineer on a railroad. And if he is an exceptionally experienced and good man, with individual push well developed, more doors are probably open to his substantial advance than is the case with an equally good man on railroad work. In any event, at the present time there is an army of idle men who call themselves draughtsmen, and will work for $60 to $75 per month, while the really well paid higher positions go begging for the lack of some one to fill them.—*Tradesman.*

Pambutano, a Substitute for Quinine.

Dujardin-Beaumetz has, according to the *Medical Press and Circular*, recently called attention to the antiperiodic properties of an extract obtained from the root of a shrub called pambutano. The aqueous decoction of the root has been largely and successfully used in the treatment of malarial fevers, it has been beneficial in a number of cases in which the symptoms did not yield to quinine. The isolation of an alkaloid has not hitherto been effected, but the plant contains various fatty bodies and essential oils in addition to a special kind of tannin. All the active properties of the root are extracted by maceration in alcohol at 60°. The writer in the *Press and Circular* adds that, while the high value of quinine as a febrifuge and antiperiodic is incontestable, the faults and failures of the old favorite do declare themselves from time to time, and hence the discovery of other vegetable products which have similar powers is not without importance, since some of these may and do succeed when quinine has proved ineffectual.—*N. Y. Med. Jour.*

THAT acid phosphate quickly attacks the teeth is an observation recorded by Dr. Head, D.D.L., in *Int. Dental Journal.*

THE MAGNETIC MAGNIFYING GLASS AND THE BOX OF NUMBERS.

Should we want a new proof of the saying, *Nihil novi sub sole*, we might find it in the magnetic magnifying glass, of which we here reproduce two very distinct forms, one of them dating back at least a century, since we find a detailed description of it in a work published in 1786.

The magnetic magnifying glass is the first of the magnetic recreations described by the author, Mr. Guyot, of the Literary and Military Society of Besancon. To describe the old apparatus is also to describe the modern one, and we cannot do better than to pass our pen over to the writer of the last century.

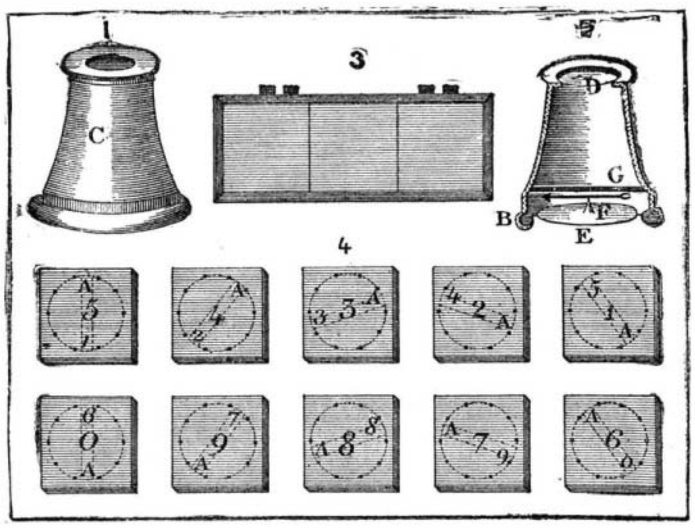

Fig. 1.—GUYOT'S MAGNETIC MAGNIFYING GLASS.

Nos. 1 and 2. The instrument. 3. Cover of the box. 4. Arrangement of the magnets.

"Have an ivory tube turned so thin that the light can pass into the interior of it. Give it a height of about two and one-half inches, and let it be nearly of the form shown in Fig. 1. Let the top, A, and the bottom, B, be screwed into this translucent tube, C. Let there be at the top of this tube a groove for the reception of a lens or ocular, D, whose focus is two inches. Let the ivory circle, B, be open in order that there may be placed therein a glass, E, that you will cover within with black paper and a small circle of cardboard. Put a pivot, F, in the center of this circle, and place thereon a very small magnetized needle, G, that is to say, a little smaller than the diameter of the circle. Cover the latter with a glass, so as to secure the needle and prevent it from leaving the top of its pivot. Finally, let this arrangement be a sort of compass placed at the bottom of an ivory tube translucent enough to allow the direction of its needle to be perceived, and the eye piece of which serves the better to distinguish the letters or figures that are to be drawn upon the cardboard disk at the bottom of this magnifying glass. Let it have, moreover, such a form as to give this compass the appearance of an ordinary magnifying glass, and make one imagine that he perceives by means of it the objects hidden and inclosed secretly in different boxes, as will be explained in the course of this work.

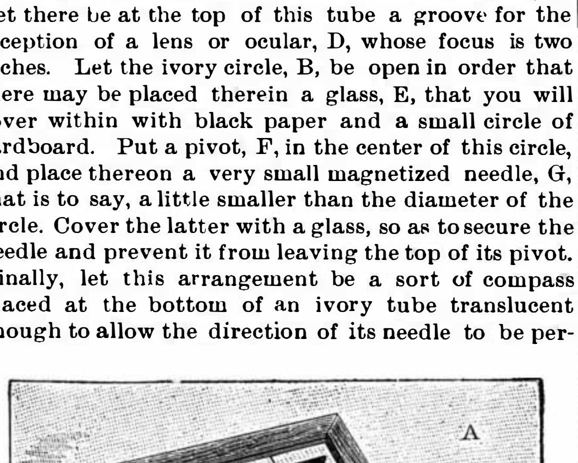

Fig. 2.—THE NEW FORM OF THE APPARATUS.

"When this magnifying glass is placed at a small distance above a magnetized bar or any box in which the piece that contains the bar is hidden, the magnetized needle contained therein will necessarily place itself in the same direction as this bar, and will, consequently, indicate which side is its north or its south. The north of the needle will indicate the south of the bar. . . . It is necessary to observe that the bar should not be too distant from the needle, particularly if it is very small, and that the pivot of the needle must be placed over the center of the bar, without which its indication might be erroneous, especially when in the pieces there are several bars that may act in unison upon the needle."

After thus describing the construction and effect of the magnetic magnifying glass, Mr. Guyot passes in review the different experiments that it permits of, beginning with the box of numbers represented in facsimile in Fig. 1. This box is capable of receiving three blocks selected from among a collection of ten, upon which are inscribed the first nine numbers and the zero, thus permitting of writing a great many numbers of three ciphers. In the interior of each of these wooden blocks there is concealed a small magnet, the position of which differs in each block, as shown in Fig. 1 (No. 4). After marking the corresponding numbers on the bottom of the compass once for all, it suffices to place the magnifying glass successively over the centers of the three squares which indicate the place of the three numbers concealed in the box (in which they have been previously arranged in secret), in order to know each of them and to rapidly read through the cover the number formed.

Fig. 2 represents the modern form given to Mr. Guyot's device. The experiment is made by means of four rectangular blocks, the place of the magnets that they contain being indicated by the four letters of the word ALLO printed upon the cover. In lieu of a magnifying glass, two small cardboard tubes are used, one of which, C (the only one offered to the novice) is a simple cylinder closed at one end, for which the experimenter always substitutes another tube, C', of identical appearance and containing the indicating magnetizing needle.

Mr. Guyot describes no less than forty-six scientific experiments that are made for the most part with the magnifying glass and magnets. Our perspicacious readers will have no trouble in increasing the number of them, by taking advantage of the well known properties of magnets and the laws of magnetic action.—*La Nature.*

Beef Extract.

We may, for convenience, divide the factory into three departments: First, pressing; second, bottling; and third, finishing. To the first of these, supplies of the choicest parts of the ox are brought in the morning of every working day straight from the shambles. It is at once cut up into succulent steaks, each of which get a slight sprinkling of table salt, is then inclosed in a new muslin bag and an outer canvas bag, and with dozens more is placed between the perforated metallic plate of an hydraulic press. When the company commenced work, they were content with a press which took a charge of about 100 steaks at a time, but they have had to meet a greater consumption than was anticipated, so that lately they have installed an exceedingly powerful press, which would do perfectly for making bales of cotton, and this is tested to give a pressure of 400 tons. When the pile of steaks is put on the receiver, the whole is surrounded with a jacket (iced in the summer), and the pressure applied. We need not follow the process too minutely; it is so simple. The juice as it is collected is mixed with an innocuous preservative, set aside for a month to clear, and then transferred to the bottling department. Here the liquor is filled into bottles by a siphon arrangement, so that the liquid comes into contact with as little air as possible; and the bottles when filled are transferred to a separate building, where they are corked, capsuled, labeled, and boxed. Our traveler observed that a girl examined each bottle before it was passed on to the capsuler, and any one which showed a speck of suspended matter, or was in the least cloudy, was set aside. It was explained that this is part of the principle of the manufacture; the liquor is the pure juice of beef, and in order that it may keep, the most rigid attention must be given to exclude foreign matter from it, and, as far as our representative could judge, the principle was adhered to throughout. And what becomes of the pressed steaks? Well, they are like cardboard when they come out of the press, and as dry as a stick.—*Chem. and Drug.*

Powerful Hopper Dredger for the Nicaragua Canal.

There was recently launched at Renfrew, complete, with steam up, a powerful screw propelling hopper dredger built and engined by Wm. Simons & Co., for the Nicaraguan Canal Construction Company under the direction of Chief Engineer A. G. Menocal.

This vessel has a capacity to carry 400 tons of dredgings, and will load itself with ordinary material in an hour. The bucket ladder, which works in a central well, is fitted with an endless chain of steel buckets and adapted to dredge banks and shoals to a depth of 35 feet under water level. The hull is constructed with the builders' patent raised forecastle, which permits the buckets to dredge in advance of the hull.