

like to hear it. We cannot afford to have a system, purely American, which has been proved through many a hard-fought battle, and in which consists our great naval strength, actually forced upon our great maritime rival, and that, too, simply because Mr. Fox has taken into his head that nothing short of a heavily-armed monitor will answer his purpose. If Mr. Fox really thinks it necessary for him to inspect the vents and breechings of foreign ordnance, and to place his fingers in the perforations in French and English ironclad targets, and that a national vessel should be detailed for this duty, we cordially approve of the plan; but, at the same time, we must be permitted to suggest that a "double rudder" would be the most appropriate vessel, both from their extraordinary speed and great maneuvering qualities. Either the *Winooski* or the *Eutaw*, if they can be spared from the dock trials and Potomac excursions, are well adapted for this duty.

PRO BONO PUBLICO.

#### Sawing Lumber.

Messrs. Editors:—Having had much experience both in building and in running saw mills, having also acquired useful information upon this subject from others, I think I can justly claim to be "a practical sawyer," and I would like, for the benefit of those seeking information in relation to circular saw mills, to give some of my ideas, and in so doing take exceptions to some of those advanced by Mr. Church in your paper of May 12th.

We are beginning to think out here in "the virgin forests of the West," that we have better and more effective mills, and know better what is required in that line, than is known in the soft pineries and second-growth timber lands of the Eastern States; at any rate, we know that the directions to give the saw one-half inch range toward the carriage in 20 feet, and to give the mandrel one-eighth inch end play, although possibly beneficial under a certain condition of the saw, or perhaps in sawing a certain kind of a log, are not at all to be relied upon under innumerable other circumstances: it is frequently as necessary to give the saw lead or a range "from the carriage as toward it; in fact it is very desirable to be able to vary and change the lead of the saw at pleasure. I like to have a mill constructed so that I can change and control the lead by varying the line or angle of the mandrel in relation to the carriage, so as to correct any tendency of the saw to vary from the true line either way. The provision made for this in the Martin & Ashcroft patent mills is the best and only convenient one I have seen as yet.

In using these mills I have many times in a day had occasion to make this variation, and have often done it while the saw was cutting in the log, and always with the most perfect success in correcting any difficulty in the lead of the saw (it is done by simply turning a nut upon a screw connected with the back box of the mandrel). I have also in the use of these mills found great advantage in keeping the points of the teeth in good order, and preventing the lumber from being scratched by the edge of the tooth, by using the arrangement for throwing the saw away from the log in running back; it saves the edge of the tooth next the log from being worn off unequally, and the face of the saw from being heated by the log rubbing against it.\*

With regard to the one-eighth end play, it is an old idea, and is about run out, out here. If a saw commences to deviate from the true line it will be very apt to continue to do so, (this was learned long ago in using the handsaw). The effect of allowing this deviation is to saw irregularly, and often seriously injures the saw. The right way is to have your saw cut perfectly free and on a true line, and if it commences to vary, correct it at once; have the log held firmly against the head blocks so that it cannot spring, if it has any tendency to.†

The idea that the teeth of the circular saw should have the same form as the sash saw, is, I think, a great mistake, because it is desirable in all cutting instruments to have them as keen and sharp as they will stand in use without bending or breaking, and it is found that teeth of the circular saw will stand to

be much more hooking and pointed than the sash saw.

I find that the best adjustment of the saw for general purposes (have it true, of course, both edgewise and sideways) is to hold it by means of the saw guide exactly at right angles with the line of the mandrel. I swedge back and spread out the points of the teeth of the common plate saw sufficiently to make a firm, cutting edge, and also to cut perfectly free and clear the face of the saw (I do not bend the teeth sideways at all but depend upon upsetting and spreading). I keep the tooth gummed out and filed under as hooking as it will stand; this depends upon the kind of timber to be sawed; the proper line for this will be one drawn from the point of the tooth to a circle from one-half to five-eighths the diameter of the saw. I have found the freest and best cutting saws (requiring the least power) to be those made with inserted teeth; the reason is obvious; the edge of a forged tooth can be drawn out much thinner and sharper and will stand a finer edge than the rolled-steel plate can be made to.\* An objection to these saws is a danger that the teeth may get loose and fly out, yet a great many of this kind are in use with, perhaps, as few accidents as from the use of ordinary machinery. I hope the importance of the saw mill interests will excuse the length of this article, and hold myself ready to verify the correctness of it by practical tests if necessary.

WM. RICHIE.

Thorntown, Ind., 1866.

\*Saws of this kind are manufactured by Messrs. Spalding & Brothers of Chicago, by the American Saw Company of New York, by Woodrough, McParlin & Co., Cincinnati, Ohio, and probably by other saw manufacturers.

#### NEW PUBLICATIONS.

A MANUAL OF BLOW-PIPE ANALYSIS AND DETERMINATIVE MINERALOGY, FIFTH EDITION. Wm. Elderherst, T. Ellwood Zell, Philadelphia, 1866.

This book is used as a text book in several of the colleges, and is the best book on the subject extant, at least in the English language. It will prove of great utility to chemists, miners, and mineralogists.

The blow pipe is an instrument easy to use for ordinary purposes and enables one to determine in the readiest manner the character of minerals. The highest skill in its use, however, requires great study and labor, and perhaps genius. Platner, who might be named the Paganini among blow pipers, could do about as much with a shilling blow-pipe as ordinary chemists with all their costly apparatus and chemicals.

The price of this book is \$2.50 and in this city may be obtained of D. Van Nestrand, 192 Broadway.

DIFFERENTIAL CALCULUS.—With Unusual and Particular Analyses of its Elementary Principles, and Copious Illustration of its Practical Application. By D. John Spare.

We have received the above work from Messrs. Bradley, Dayton & Co., Boston. We do not doubt that it is a valuable mathematical work, but we would thank the publishers who send us books to be noticed, to forward them at their own expense, and not charge us for the privilege of noticing them.

THE IRON MANUFACTURER'S GUIDE.—This is the title of a volume of over 800 pages, royal octavo, compiled by J. P. Lesley, Secretary of the American Iron Association, under whose authority the work is issued. Two hundred and sixty-two pages are devoted to a full history of all the anthracite and charcoal furnaces, bloomeries, forges, and rolling mills in the United States, making it highly valuable as a book of reference to the manufacturer, dealer, and capitalist. The remainder of the volume treats of iron as a chemical element, an ore, and a manufactured article. It will be seen that the geologist, the mineralogist, the miner, and the manufacturer, have each somewhat of interest in the work. It is evidently a book of practical utility as well as of theoretical interest. Published by John Wiley, New York.

COAL, IRON, AND OIL.—This is the unpretending title of a work just published by Benjamin Bannan, editor and proprietor of the *Miner's Journal*, Pottsville, Pa. The book is compiled and edited by himself and S. H. Daddow, mining engineer, and is the most practical and exhaustive treatise on the subject that has come under our observation. The theories explaining the formation of coal and the generation of petroleum are somewhat novel, but appear to be based upon careful observation and analogy. We cannot but agree with the evident belief of the

authors of this treatise, that the formation of petroleum, if not of coal, is not altogether and wholly an event of the past, but that the process is still going on, although perhaps not so rapidly as formerly.

The description of the great coal and oil basins of this country will be found valuable and interesting to the business man and general reader, while the statistics and information relative to these two great natural products, will arrest the attention of the practical man and the scholar. The manufacture of iron from the ore is treated in an eminently practical manner, making the work one of great value to mechanics and manufacturers. We shall take occasion to refer again to this treatise when time and space permit.

The volume is one of eight hundred pages and contains over two hundred engravings with numerous tables. It is a most valuable work, and one that deserves to be read by all intelligent men.

#### Report on the Cattle Plague.

The possible introduction of this dreadful scourge into our country cannot be contemplated without causing much uneasiness, when the fact is borne in mind that in England the plague has swept off sixty-five thousand cattle, valued at \$4,500,000. A commission was appointed by the British Government to consider this subject, and the result has been any thing but conclusive. There has been a great deal of confusion about remedies, and medical treatment has been of no avail. It is, however, made clear by evidence that the proportion of recoveries is very largely increased "by judicious feeding with soft mashes of digestible food." Under this treatment, out of 503 cases, 191, or nearly 38 per cent, recovered. It is remarkable, moreover, that dividing these beasts into two groups, according as they belonged to large or small stocks, in the former 22 per cent, while in the latter 62 per cent, recovered. The explanation offered is that in smaller stocks fewer beasts are ill at once, there is less concentration of the poison, less crowding, and, not least, better nursing. An analysis of another group of 813 cases indicates still more conclusively the influence of feeding. Among cottagers' cattle, generally fed on mashed food, the recoveries were 73 per cent; in large stocks, where dry food was often given during convalescence, the recoveries were 57 per cent; with mixed food of mashes and hay they were 22 per cent; while among cattle fed entirely with dry food, and treated medically with drugs, the recoveries were but 13 per cent. The number of cases is too small for us to depend on these averages; but they are sufficient to establish the general fact. We may take it as ascertained that "powerful drugs of all kinds greatly heighten the mortality of the Cattle Plague.

Perfect cleanliness, ample ventilation, constant disinfection of the air and discharges by tar acids, and the most careful feeding with soft mashes of the most digestible food—such, and such only, are the measures which our present experience sanctions for the treatment of the disease." Such a conclusion is quite in accordance with the congested state of the stomach which has been observed after death, and the commissioners believe that a similar restriction as to diet formed the most important part of the cure.

#### Storage of Gun-cotton.

Gun-cotton is now made into ropes for storage, and kept under water. When an order is received at the manufactory, a few hours suffice to send the cotton on its way. It has been found that by making the ropes with many air channels through the mass, the cotton explodes almost instantaneously, and is as violent in action as the strongest fulminates. Charges for guns are now made into two parts; an exterior composed of cotton of loose texture, the ignition of which starts the ball, and an interior of denser material, which supplies the gas necessary to keep up the constantly accelerating speed of the ball. The result is great gain in initial velocity. Compared with powder in an Enfield rifle the cotton gave a trajectory having an incursion of  $3\frac{1}{2}$  inches, the powder  $3\frac{3}{4}$  inches in the first 100 yards.

SLATES.—The test of a superior slate is its ability to remain unbroken, after being made red hot in a furnace, and suddenly immersed in cold water, while at that heat.

\*The use of Martini's & Ashcroft's patent is owned by Messrs. Owens, Lane, Dyer & Co., of Hamilton, Ohio, who are extensively engaged in manufacturing them.

†A good device for this in many cases is an improved saw mill 93, patented by A. S. Pettigrew, August 2, 1864.