

the more easily worked magnesian lime of Philadelphia, because it requires a different manipulation. Such are the prejudices formed under the influence of local habit.

NOVEL APPLICATIONS OF DYNAMITE.

From a long article on trials with dynamite in one of our London exchanges, we condense the following valuable report of its use in breaking up a wrecked iron ship and otherwise:

The wreck was that of the steamship Oscar, of Leith, which ran ashore at Whitby; she was of 1,258 tons gross, 824 tons net register, 261 feet long, 31 feet beam, 23 feet depth of hold, and 110 horse power. A futile attempt was made to break her up with gunpowder; subsequently dynamite was tried.

A charge was made up in a common canvas hose from 9 to 10 feet long, consisting of 30 pounds of dynamite, with an extra 10 pounds in a lump fixed firmly to the end. The diver took this charge and placed it in the lazarette, the heavy end being fixed against the stern frame and the tail part trailing forward along the starboard side as the wreck lay on that side. After the diver cleared out the charge was exploded, the result being that the stern frame and all the steering gear were smashed out and lay on the rocks, and the starboard quarter was parted right away. The next charge, placed in the port bow close to the fore foot, blew the fore foot away and ripped the port bow plates through, and the wreck fell over separated from the keel upward.

Several small charges were then exploded in the cylinders and on the condenser, breaking them up. A five pound charge, lowered into the crank pit, blew down the remaining part of the engines and condenser in such an effectual manner that the diver was enabled to send up the condenser and about two tons of brass in half an hour the next day.

The charges were fired by the ordinary "time sea fuse," a long length of which takes as much as a quarter of an hour or twenty minutes to burn to the charge. This is a great loss of time in a tide, and in future electricity will be applied.

No trouble was taken to make the canvas hose that inclosed the charges waterproof, though dynamite is practically unaffected by water for several hours. Put in India rubber hose it would remain for a long time under water without being injuriously affected. In work of this character it is completely successful where gunpowder and gun cotton have failed, and being of a plastic nature, it possesses the advantage of being moulded and pressed into any shape, such as angles, square holes, etc.

Iron masts, beams, chains, and wire rope are cut off by tying small canvas hose containing dynamite round them, and then exploding it.

In the instance of the iron steamship City of Venice, which went ashore on the rocks, after every other plan to raise and haul her off had failed—she had rocks through her bottom in some places four feet high—dynamite was tried. The rocks protruding through the vessel were first removed by use of small charges; the tops of the rocks outside of the vessel were then blasted away, and the vessel was got off without further injury, and saved.

So powerful and effective an agent should be better understood and applied to more purposes than it is. Not only can it be used to remove rocks surrounding a vessel, but in the case of a vessel stranded on a sand or mud bank a channel could be excavated, it seems to us, by the use of long tubes filled with the dynamite; and for open cuttings for roads such tubes could be laid in furrows made by machines like those in use for excavating for drain tiles, and fired with good and economical results.

PROGRESS OF WESTERN MINING OPERATIONS.

The action of the Committee of Security of the New York Mining Exchange, in sending their chairman to Colorado for the purpose of obtaining, by personal observation and in other ways, more accurate knowledge of certain mining properties which are offered in this market, is worthy of high commendation. In a two months' investigation he has found that actual frauds have, in some cases, been forced upon the market here, and that most of the other mines have been overrated.

The dishonest and speculative element, though much weakened by the many successful legitimate enterprises that have been established there within the past two or three years, is, in fact, still powerful, and will finally yield only to the persistent force of public opinion as represented by the scientific and mining press and the various mining exchanges of the Eastern cities, whose aim it should be to discover and explode all mining bubbles.

Our opinion, that if the truth concerning the mining interests there were generally known, a large amount of Eastern capital would be invested there, is fully indorsed by this gentleman, as it must be by all conversant with the conditions.

Intensified by the severe lessons of the past the conservatism of Eastern capital must, ere long, remove the reproach of speculative mining which has so retarded the growth of Colorado, and which is still the curse of the mining regions farther West.

We do not by any means wish to imply by this that intelligent observation and good judgment cannot find as many opportunities for profitable mining on the Pacific slope and elsewhere as in Colorado, but simply that the elements op-

posed to legitimate and favoring speculative mining exist there in fuller life and vigor, and apparently control nearly all operations. In evidence we quote from a late San Francisco exchange: "The mining share market is now being flooded with outside stocks, every day witnessing the placement of some new wildcat, which seemingly is selling like hot cakes, but for the genuineness of which we would not vouch. Under the present buoyancy many shares may be sold at reported prices, but the advance is altogether too sudden to be fully real, and in this respect we would caution parties about being over-anxious to invest, for this is the opportunity for the free manipulation of all those claims that have no merit whatever."

The mainsprings of these conditions are the continued remarkable output of some of the Bodie District mines, and the new lease of life which it is supposed the Sutro tunnel will give to the mines of the Comstock lode, the output of the Bodie mine alone, for the month of August, being estimated at \$700,000.

From the Black Hills there are encouraging reports of the quality and abundance of the gold and silver ores and of the activity of the mining business; already 135 stamps are at work on ore from one mine there, and 80 at another, from which last \$40,000 in gold was cleared up in about a two weeks' run.

From Utah, too, and Montana further valuable discoveries are reported, and an instance in Montana of important gold diggings, from which three men took out over 300 pounds of gold in less than four months, using only a hollow log for a sluice box.

The establishment, in all the mining districts, of concentrating and smelting works, which purchase ores from those miners who have not the means for erecting reduction works of their own, or whose knowledge of the art is imperfect, has everywhere given great impetus to the mining interests; and as the system grows in favor and the interests are better understood and adjusted, as they must soon be under competition, it will be found, we think, that this division of labor will add profit and safety to mining operations.

THE BOSTON WHITTLING SCHOOLS.

Formerly all American schools were whittling schools; but the art was practiced surreptitiously, the soft pine desks and benches furnishing the only whittling material. With the advent of highly finished hard wood school furniture, all jackknife practice in school was rigorously suppressed; and for a generation or so the art has fallen into decadence. It has revived, however, under improved conditions, the natural spirit of constructiveness—usually called destructiveness—incident to boyhood, being made the basis of systematic training of the most enjoyable and useful sort.

The pioneer institution is the Boston Whittling School, a private enterprise housed by the city. The school-room has been fitted up with work benches, divided into four foot sections, and each boy is furnished with such tools as he may need. Thirty two were admitted the first year, their ages ranging from twelve to sixteen. The school report says that perhaps twelve of them had received some instruction in the use of the jig saw and knife, but none had had any previous training in wood carving or the use of the chisel. There were more applicants for admission to the school than could be received. If any boy was absent two successive evenings, his place was taken by another. A rank list was kept and pasted on the wall, and each boy knew how his work was estimated by consulting the list. A course of twenty-four lessons in wood carving was prepared with special reference to secure the greatest amount of instruction with the least expenditure for tools and material. It was not designed to make finished workmen in wood carving, but to take advantage of the natural inclination toward handicraft, the Yankee taste for whittling which belongs to most boys, and to develop it and guide it to useful applications.

The experience of the founders leads them to the belief "that it would be easy to establish, in connection with all our grammar schools for boys, an annex for elementary instruction in the use of the half dozen universal tools, *i. e.*, the hammer, plane, saw, chisel, file, and square. Three or four hours a week for one year only of the grammar school course would be enough to give the boys that intimacy with tools and that encouragement to the inborn inclination to handicraft, and that guidance in its use, for want of which so many young men now drift into overcrowded and uncongenial occupations, or lapse into idleness and vice."

Northern and Central Europe have been doing this or similar work for years; and such teaching has done very much to hasten the industrial development of the countries that have tried it.

THE RESTORATION OF CUBA.

An official decree, dated September 21, provides that, from the date named, "All mules, horses, cows, and oxen, and all machinery and implements for agricultural purposes, comprised in articles 231 and 614 of the Custom-house tariff sheet, imported into ports of the provinces of Puerto-Principe and Santiago de Cuba, shall enter duty free for the term of one year. The term may be extended to another year according to circumstances. Said animals and goods can be imported from any country, and under any flag."

The ports designated for importation are Nuevitas, Gibara, Baracoa, Santiago de Cuba, Guantanamo, Manzanillo, and Santa Cruz. The franchise is accorded only to the provinces mentioned, with the object of repairing the dam-

age inflicted by the late insurrection. A provision of the decree prohibits the introduction of the animals and goods referred to into the other provinces of the island either by sea or land.

This decree gives signal emphasis to our recent remarks with regard to the present importance of Cuba as a field for American enterprise. Now that the new patent law of Spain offers abundant protection for novelties and new inventions on terms of great liberality to inventors and introducers, there is no reason why the United States should not secure and hold a large share of the growing Cuban trade. It will pay our inventors and manufacturers to occupy the field promptly.

OUR SEPTEMBER EXPORT EDITION.

The September issue of the SCIENTIFIC AMERICAN Export Edition presents by far the most comprehensive and varied array of valuable information and important trade announcements ever brought together in a trade journal. The table of contents embraces upward of two hundred articles bearing upon recent advances in the several departments of pure and applied science, notable events, productive industry and commercial enterprise; and is illustrated by upward of one hundred engravings. The advertising pages are not less instructive and valuable, including as they do the business announcements of nearly one hundred and fifty of our leading mercantile and manufacturing establishments, with two hundred and twenty-five engravings of approved machinery and the like.

The influence of such a periodical on the foreign trade of the country can scarcely be overestimated. The high value of its general contents, and its convenient and substantial form, insure its careful perusal and preservation; and its wide circulation makes it an efficient as well as worthy exponent of American industrial and commercial progress. It goes to every American Consulate, the natural resort of all in search of information in regard to American affairs. It also goes to, and is on file in, a multitude of foreign libraries and reading rooms, and the assembly rooms of scientific and industrial societies and boards of trade. And every steamer sailing from this port is furnished with copies for the instruction and entertainment of the passengers. The liberal use of its advertising pages by our enterprising manufacturers is sufficient proof of their appreciation of the facilities thus offered for reaching and interesting foreign buyers.

A REMARKABLE WASPS' NEST.

A few days ago the time ball on the Western Union Telegraph building in this city had to be replaced by a new one. The workmen, who went up to remove the old ball had no sooner begun their work when they suspended operations with surprising abruptness and unanimity. A colony of wasps had taken possession of the ball, and were quite unwilling to surrender their airy quarters. Indeed, it was with considerable difficulty that they were finally smoked out.

The surprising feature of the affair was not so much the unwillingness of the wasps to surrender their home as their taking up with it in the first place. When in position for its noon fall the ball rests at the top of a pole, 255 feet above the sidewalk; and, at the tick of twelve, drops 20 feet. That the wasps should have borne with this daily disturbance of their dwelling place is proof of their tenacity of purpose, to say the least. Whether their persistence was due to practical wisdom or to inherent stupidity is a question for Sir John Lubbock or Prof. Riley to decide.

THE AMERICAN PRIZES AT PARIS.

Although the American exhibitors at Paris were far too few in number to do complete justice to our country's industrial achievements, the proportion of prizes announced shows the display to have been fairly creditable so far as it went. Just how many those prizes are it will be impossible to say positively until the official list is published. The (Paris) *Continental Gazette*, of September 12, however, gives a classified list of American prizes—"unofficial, but to be depended on so far as it goes"—which contains the names of five hundred and twenty exhibitors. Eight of these were awarded grand prizes; ninety-seven received gold medals; one hundred and thirty, silver medals; one hundred and seventy-six, bronze medals; one hundred and eight were honorably mentioned; and three—the Pacific Coast Mineral Exhibit, the Oregon State Commission, and the United States Department of Agriculture—got diplomas of honor.

The full significance of these awards cannot be appreciated without a comparison of the numbers of American and other exhibitors in the several departments, so as to show the percentage of prize takers among them. That cannot yet be done; enough is known, however, to show that there has been no serious falling off in American progress, notwithstanding adverse times.

A New White Paint.

After some ten years of laborious and costly experiments, Mr. T. Griffiths, of Liverpool, has succeeded in producing a new mineral white by the aid of sulphide of zinc, which entirely eclipses white lead and the old zinc white (oxide of zinc), by having much more "body" or covering power and more permanent qualities than either of these, and, moreover, not being of a poisonous nature like white lead, does not affect the health of those who manufacture or those who use it. The white sulphide of zinc is precipitated, washed, calcined, levigated and dried, the product being the most perfect white pigment hitherto obtained.