

Correspondence.

The Spiral Fracture of Tubes—Another Instance.

To the Editor of the Scientific American:

The account of the breaking of a glass tube so as to form a spiral, given in your issue of this date, calls to mind a similar experience of our own which may prove of interest in this connection. We had several years ago a test tube break in the laboratory, in precisely the same way, while being cleaned. It formed a spiral spring, which had considerable elasticity. The width of the spiral band was about the same throughout as in the cut you show. We had no reason to think that the tube had been in any way cut or scratched.

GRIFFIN & LITTLE.

Boston, April 9, 1887.

Exposure not Conducive to Health.

To the Editor of the Scientific American:

A writer in your paper of the 9th inst. advances the theory that the exposures of army life are conducive to health. An experience of five years leads me to differ with him. Before the war I spent a year on the plains, and during the service I spent three years in the Northern army. Later I spent another year camping out, and in all that time I have never known a man benefited by exposures such as your correspondent mentions, viz., sleeping in wet clothing, in the rain, or on the frozen ground. Now, the facts in the case are that plenty of physical exercise in the open air, with coarse, plain food, and not too much of it, is healthful, and a man endures the exposures because he has strength. He keeps well because he has a reserve force of vitality. This is shown when the exposure is too long continued and the man breaks down. Then the illness will be of great severity, often lasting a lifetime. I knew a young man in the army who, for a year, was never sick a day and was the picture of manly vigor. Three days of constant exposure broke him down, and though he is still living, he has never been a well man since. Fresh air, plain food, plenty of exercise—these are God's own appointed paths to good health.

X.

St. Augustine, Fla., April 9, 1887.

A Destroyer of "the Odor of Dampness" Wanted.

To the Editor of the Scientific American:

Interested in management of a large hotel at the sea shore, we find great difficulty in keeping mattresses free from a musty odor, which soon comes into them from the damp atmosphere. The best of hair beds, in a few months, become affected by it, and after a year or two of use, so strongly as to be "most unpleasant." Is there any preventive or antidote? Disinfectants there are, but the rule with them is that most whole-witted people prefer the odor they displace to the stench they themselves create. And besides, an atmosphere laden with disinfectant is not only greivous in itself, but its horrible suggestiveness makes it a burden in waking hours, and brings nightmare to those which should procure us sleep, "sweet labor's bath." The present tenant of the "disinfected" room I know by his vileness, which "earmarks" him forever, but what do I know of his predecessor, whom this one was introduced expressly to expel? Was it bugs in the bed, or infection of disease in the circumambient air? The one villain is here, I know, but a dreaded unknown one may also be lurking round, and I cannot discover him because the later pest outsmells him.

Is there anything inodorous which is, at the same time, efficient to destroy the musty smell which will come into beds and carpets at the sea shore, and I suppose wherever there is damp atmosphere? Sun and air are good, but very slow, and when the quantity is great, the labor necessary makes that means impracticable.

We will be much obliged for any suggestions, as soon as may be convenient.

M. K.

Philadelphia, Pa.

Manganese Steel.

Pfeil & Co., London, are making bolts and nuts, bars and plates, and various articles, from an extremely tough soft manganese steel, which is made under their own immediate supervision. In their large stocks of engineers' requirements, Messrs. Pfeil & Co. are no longer keeping iron bolts, studs, and nuts. All are replaced by these very mild steel bolts and nuts, and nearly all the engineering establishments of note, as well as our government works, are using these bolts and nuts and steel. The Engineer says: We recently tested a number of these bolts by very rough and very severe trials, in order to satisfy ourselves that these bolts were really strong as against the very heavy stresses and strains to which they are sometimes subject in practice, and to see whether the steel of which they are made would withstand bending, hammering close, and severe testing by hammering in various ways, or whether the steel would only withstand heavy stresses slowly applied. The steel proved, however, to be of the very toughest kind, for it would withstand

being nicked and bent round away from or closed up at the nick. Bolts up to 5/8 in. were tested by holding the nut fast in a vise, and then hammering the bolt until it was bent down at the screwed part through an angle of 130 deg., and then taken out and doubled down, and closed up with a heavy hammer on an anvil. The screw threads were thus jammed up and compressed upon each other on the inside of the bend, and opened out to double their pitch on the outside. Still the steel did not break.

The material is being used for piston and other rods, and in slabs for forging and welding into screw propellers for torpedo boats. It has also been tested for shields and armor plate purposes by the Woolwich authorities, with results that show that its toughness and general behavior are uniform. The following table is from a report on tensile tests of three pieces of manganese steel round bar, by Professor Alex. B. W. Kennedy. In each case the "remarks" are, "finely granular in center, edges silky."

Dimensions.			Limits of elasticity.		Breaking Load.		Ratio of limit to break	Extension on whole length of 10 in. Per Cent.	Reduction of area at fracture.
Breadth In.	Thickness In.	Area Sq. in.	Lbs. Per sq. in.	Tons.	Lbs. Per sq. in.	Tons.			
1.054 in. diameter.		0.873	43,460	19.40	65,760	29.35	0.661	25.7	55.0
1 1/4 in. diameter bar									
1.055 in. diameter.		0.874	38,580	17.23	64,510	28.90	0.598	27.8	54.5
1 1/4 in. diameter.									
0.849 in. diameter.		0.566	43,890	19.60	62,700	27.99	0.700	23.7	57.1
1 1/4 in. diameter.									

From this table it will be seen that steel combines toughness and elastic strength in a most remarkable degree.

Some tests were also made with hooks forged of S. C. Crown iron and this manganese steel, with the result that the iron hooks opened out equally with a pull up to 8 tons. With load in excess of this the iron hook opened faster than the steel hook, and ceased to hold as a hook with 11.7 tons. The steel hook was still serviceable, and showed no signs of distress.

News, Facts, and Prophecies.

Public Opinion, published in Washington City, has compiled from various sources the following items of interest:

There are forty-seven vessels under construction at lake ports, which will cost \$6,440,000. This extraordinary activity in preparing for the summer water traffic between the West and the seaboard is encouraged in part by the average profit of 25 per cent earned last year by the lake carriers, but mainly, no doubt, by the expectation of large additional water traffic to be driven from the railroads by the operations of the inter-state commerce law.

Cast steel driving boxes will never run against cast iron wheel hubs, and the sooner trying to make them is abandoned, the nearer will be the day when delays due to hot boxes are no longer to be feared. Either the wheel hubs or boxes must be lined with brass or its equivalent.

It is reported that a syndicate of Belgian and English financiers have offered the Chinese government a loan of £32,000,000, repayable in ten years, for the construction of 1,500 miles of railroad, partly from Nanking to Peking and partly from Canton.

The purchases of pine lands in northern and central Louisiana still continues. A single firm, representing leading lumber interests in Grand Rapids, Michigan, has just bought 30,000 acres more of government pine land in Natchitoches parish, making its total holdings there 290,000 acres, all bought within the last two years.

In the extreme southwest corner of Louisiana lies what is claimed to be the largest producing farm in the world. It contains 1,500,000 acres of land, and is operated by a syndicate of Northern capitalists. All the cultivating, ditching, etc., is done by steam power. The Southern Pacific Railroad runs for thirty-six miles through the farm. Three steamboats are running on the waters of the same estate; also an ice house, bank, shipyard, and rice mill belong to the same.

The price of some of the largest locomotives used on the English railways is at present about £2,000 each.

The mining industry of the United States to-day owes its present promising condition, its general activity, the favorable state of public opinion, the investment of capital, and the wonderful development everywhere witnessed more to the influence of the press than to any one or all other influences combined, but its return for all this benefit has, as a rule, been most negligently and certainly unjust.

In view of the fact that the work of opening and developing a mining property is costly, and requires, usually, an extensive outlay of capital, often with uncertain results, shows the necessity of a better adjustment of the relative price of a mere claim and a mine worthy of the name.

Mayor Hewitt has been petitioned to establish scales

at convenient points in the city, where all coal shall be weighed.

The Boston Journal says that the record of business misfortunes for the first quarter of the present year is by no means a short one, the number being 3,128 in the United States. Last year the number during the corresponding quarter was 3,362, but in 1885 the number was 4,050. In the active year of 1880 the number of failures the first quarter was only 1,394. The larger part of these failures are for small amounts, and are due to overtrading, to the folly of four parties entering into trade in a place where there was a field for but two.

The Pittsburg Commercial Gazette thinks that strengthening the position of the railroads everywhere at the temporary cost of commerce may lead to building new lines and extending others, but the Canadians, by reducing tolls on their canals and cutting prices on their railroads, will do something toward attracting to their territory considerable transportation which would otherwise go by American routes. They cannot affect seriously the great volume of trade in this country, but they will be stronger competitors than heretofore against our trunk lines.

It is astonishing, but indisputable, that there are towns of 15,000 inhabitants west of the Missouri River in which real estate is daily changing hands at higher prices than similar property brings in St. Louis. We may say that this is illogical and unhealthy, but the fact remains that such trades are being made, and that the boom constantly gains in energy and dimensions.

—St. Louis Globe-Democrat.

The Edison Company have closed a contract for electric lighting in Tokio, Japan. The central station will supply several thousand lights, a large number of which will be used in the Mikado's palace.

Mr. Daniel Davis, who died recently at Princeton, Mass., made much of the earliest telegraph apparatus for Morse, and in his shop also, it may be noted, was made by Elias Howe one of the earliest sewing machines. He will, however, be best remembered through his work on magnetism, entitled, "A Manual of Magnetism, including Galvanism, Magnetism, Electro-Magnetism, Electro-Dynamics, Magneto-Electricity, and Thermo-Electricity."

Some observations made in France by M. Cosson may throw light upon many mysterious fires. In one instance spontaneous firing arose from an air current heated to seventy-seven degrees Fahrenheit only. The wood slowly carbonized at that temperature, and, being thus rendered extremely porous, a rapid absorption of oxygen resulted, and sufficient heat can then be produced to inflame the dry material. In another case the warmth from the air-hole of a stove was sufficient to set fire to woodwork.

A syndicate of Minneapolis capitalists have formed a company to put into practical operation a patent that promises to revolutionize the system of smelting and refining the precious metals, gold and silver. The patent was devised by John A. Potter, of the Union Steel Works, of Chicago.

Prof. C. V. Riley, the entomologist of the United States agricultural department, has gone to California to investigate various matters which have been demanding the attention of his bureau for some time. His special mission is to investigate the Coltony cushion scale, an insect imported from Australia, which is doing immense damage to the citrus orchards of California.

The second spring meeting of the Indiana Academy of Sciences will be held on May 19 and 20, 1887, at the "Shades of Death," near Waveland, Montgomery County, Ind. This place is situated on the banks of Sugar Creek, which here passes through a deep gorge cut in the sub-carboniferous sandstone.

The marine laboratory of the Johns Hopkins University has been opened at Nassau, New Providence, West Indies, under the direction of Dr. W. K. Brooks.

A halibut weighing thirty-four pounds and measuring 41 inches in length was captured recently in the lower Potomac, near Colonial Beach. This is the first authentic case of a halibut in fresh water. Hitherto it was supposed that the vicinity of Long Island was the extreme southern limit of the habitat of this fish.

The J. B. Lippincott Company have become the publishers of The American Naturalist, which will be continued under the editorial management of Prof. E. D. Cope and J. S. Kingsley.

Heavy machinery is now run by artesian well power in many parts of France, and the experience of the French show that the deeper the well, the greater the pressure and the higher the temperature. At Grenelle a well sunk to the depth of 1,802 feet, and flowing daily 500,000 gallons, has a pressure of sixty pounds to the square inch, and the water from this well is so hot that it is used for heating the hospitals in the vicinity.

The failure of Congress to provide for sheathing with copper the new steel vessels authorized to be built for the navy will result in the raising of a great crop of barnacles on the hulls of the gunboats and cruisers. Several thousand dollars have been expended in experiments during the last two years, but up to this time no method of protecting vessels from fouling has been discovered equal in efficiency to the old system of sheathing.