## Correspondence.

### Cleaning Gauge Glasses.

*To the Editor of the Scientific American:*

As the question of cleaning gauge glasses came up again by R. S. G., query No. 3788, I will tell you the way I clean them, which is quite novel, and very seldom one is any the worse for being cleaned. The idea is original with me, and as I have never seen it in print, perhaps it may be new. So you can give your many readers the benefit of it.

I take a piece of strong twine somewhat more than twice the length of the gauge glass; in the middle of the twine I tie a small bunch of waste, enough to fill the tube fairly tight, being careful the waste is clear from gritty or hard substances, then blow one end of the string through the tube so the knot or waste comes to the other end of glass. That end I insert in a basin of water and pull the knot through the tube (that draws the water after it), then reverse tube and pull it through again, and so on until I have thoroughly cleaned the glass. I have never had one to break after being cleaned in this way. If the tube is oily or unusually incrusted, I use a little silverine on the waste, which acts like a charm.

Asbury Park, N. J.

### Kites without Tails.

*To the Editor of the Scientific American:*

The article on "The Texas Rain Making Experiments" appearing in the SCIENTIFIC AMERICAN of Jan. 2, 1892, from the *Texas Farm and Ranch*, presents wonderfully correct copies of some of the photographs made by the party, but the letterpress accompanying is far from facts.

As stated, "Illustration No. 3 shows one of the many fruitless attempts to fly kites without sufficient tails. It shows Prof. Myers, kite expert, paying out the cord, while the kite is making a vigorous plunge for the earth."

As a matter of fact, this kite shown was not built by me, nor after my designs, and I never saw it flown, and when this photograph was taken (because of the unusual novelty of catching a kite "on the fly" in the act of diving), I was at another camp, a mile away, operating with balloons. The conspicuous deviation from truth in this case indicates a perverting tendency in the reporter's narrative, and his ignorance of facts relating to the flight of kites independent of tails is startling. The Smithsonian Institution at Washington, D. C., contains a large collection of Japanese or Chinese kites to be flown without tails, all of which I have handled, and from which even the critical reporter aforesaid could learn something. A properly constructed kite no more needs a tail than a comet does.

CARL E. MYERS,
Aeronautic Engineer.

Balloon Farm, Frankfort, N. Y.

### A New Mode of Keeping Cool the Interior of Guns.

*To the Editor of the Scientific American:*

It is not the powder pressure that destroys well constructed guns, but we must look to the heat developed by the powder explosion and friction of the projectile. The distribution of the heat loosens the molecules of the metal, the inner part is heated very rapidly, while the outer part remains cool. Metal will expand proportionally to the degree of heat. Therefore, if the interior of the gun cannot expand outwardly, it must do so inwardly. Thereby the bore of the cannon becomes smaller, and a compression of the interior metal takes place.

By a careful examination of a cannon, after ten or a dozen rounds have been fired, it will be found that the inner parts have been compressed, while the outer parts are stretched. In order to mantain a reliable piece of ordnance and prevent disaster, the molecules of the metal must not be disturbed by heating one part while the other part remains cool. Practical experience has taught us that a steel ingot, after having cooled down, on reheating it in a furnace, the expansion of the exterior body, by the quicker heating thereof, will bring about multitudes of cracks in its inner body that will make such ingot unfit for reducing between rolls into reliable bars or rails.

I can see no other remedy for this evil than to use, in combination with gunpowder, a shell or shells filled with non-combustible liquefied gas, to be liberated in the same moment when the projectile leaves the muzzle of the gun, thereby absorbing the heat and preventing it from penetrating the metal to any disastrous depth.

CAPT. FRANK CANE.

34 Ogden Ave., Chicago, Jan. 2, 1892.

ACCORDING to a new regulation made by the Secretary of the Navy, ships of and above five thousand tons displacement will be classed as first rates; those of and above three thousand, but below five thousand, tons displacement as second rates; those of one thousand and above, but below three thousand, tons displacement as third rates; and all those of less than one thousand tons displacement as fourth rates.

### Choice of Occupation.

Every year in thousands of families, as the boys attain the age when they are supposed to have finished their school education, the important question arises. What shall be the future occupation of the boy? The question is not so easily answered, and whenever the choice of occupation has been made without full consideration, it is too often found that the selection has been made without reference to the physical and mental fitness of the boy for the chosen field. The wish of the boy is very seldom consulted, and though young yet and without mature experience, it seems but fair that his preferences should be taken into respectful consideration. Parents frequently make the mistake at this important juncture of choosing occupations for their boys for which the boys' physical system is ill adapted. Weakly boys with narrow chests should never be put at indoor occupations. Some trade that will keep them in the open air is better suited for such. Then, again, too many parents look upon all trades as something beneath them, and erroneously teach their boys that it is more respectable to enter one of the professions or even to go into clerking for a livelihood. All mechanical trades need to be recruited from the intelligent classes, and the condition of mechanics can only be elevated when accessions to their ranks come from well educated, respectable, honest, self-respecting people. Too many boys are annually consigned to other occupations, for which they are not fitted, to the great damage of themselves and of society, and in which, after a long and one-sided struggle for mere existence, which is getting year by year more and more precarious and difficult, they are finally left a stranded wreck, with the consciousness that the mistake in choosing their occupation has been the main cause of their misery and distress.

Most of this is due to the false pride and prejudice against a mechanical trade, which would have offered a good field for the wrecked boy by intelligence, industry, and perseverance to have become a man able to support himself and family and useful to society. Who can doubt the truth of this? If we look about us, we cannot fail to see that in all occupations the standards of requirements have been raised, and particularly in those employments which are not included in the mechanical branches much more is now expected from applicants for positions than formerly. Look at the increasing numbers of those who are studying for the law, the ministry, or the medical profession. Count the numbers of doctors, lawyers, and ministers who can barely eke out an existence. Scrutinize the advertising columns of any of our newspapers and see the overwhelming numbers of those who seek employment, having nothing to offer but willing hands and feet, ordinary intelligence, and very little education. Just look at the army of clerks and so-called bookkeepers constantly offering their services; indeed, it would be more truthful to say begging for employment at anything that offers. These are the direct consequences of an overcrowding in those employments which do not require knowledge of any mechanical trade. It is not so bad where these boys have parents with means who can help them, but when they have nothing but what they can earn, it would be well if our cry of alarm were heeded and false pride and prejudice were made to give way to the true interests of the boy.

On the other hand see how intelligent, well trained mechanics progress. It is not necessary here to cite examples of living men, who, after having thoroughly learned a mechanical trade, have by industry, economy, brains, and force of character lifted themselves into enviable positions of business success, honor, trust, and wealth. There are plenty who, from small beginnings, have attained success. All work is honorable and ennobling, and those who, probably being idlers themselves, profess to look upon the mechanic with disdain, and would, if they could, deny him equal rights, should remember that idlers are always superfluous in this world's economy, but that the good mechanic is constantly in demand, as he is the one who lays the real foundation of all business success, and that his industry is an absolute necessity to the capitalists. If these people who turn up their noses at the mechanic allege as a reason for their exclusiveness that the mechanic is lacking in refinement, they should be told that it is partly due to the fact that those who deem themselves more refined have scrupulously withdrawn their refining influences from the mechanic by not associating with him. But the mechanic is not excluded from true culture, and one can find as many true gentlemen of culture and refinement among mechanics as among the so-called professional classes, indeed often one searches in vain for refinement among the latter.

Much depends upon the quality of the material which enters the mechanical trades, and if many of those who now make the mistake of studying an unprofitable profession should learn a trade instead and determine to lead a refined life, it will not be long before even this somewhat imaginary reproach is taken away. It is not necessary either to go from one extreme to the other, and that all should rush into the trades, nor that the other great mistake be made of thinking that one mechanical trade is more honorable than another and that every boy must pick out what seems to him to be a little more elevated a trade. We plead for the proper training of boys in the mechanical trades, for their thoroughly mastering the whole trade and not one branch of it. All mechanical trades offer a good livelihood, steady employment, and fortune for those who have the patience, perseverance, and industry to find it. Learn a trade! In this connection we may say that the question why boys do not properly and thoroughly learn a trade in these days has been partly answered by an old employer, who gives what, in his opinion, are the reasons. He says that boys nowadays are different from what they were when he was a boy. In those good old times they came to learn as much as possible, now to earn all the money they can. Then apprentices were the children of comparatively well-to-do people, who took pains to bring their children up properly and were more solicitous, by having their sons properly instructed and by making good mechanics of them, to make them independent of the world. Now apprentices come mostly from the poorer classes and are expected to bring as much wages home as possible, so as to help support the family. They only look for the immediate present, regardless of the future. The first question an apprentice asks is how much he is to get a week; he thinks only of his earning capacity and not of the time it takes to instruct him, nor of the materials he spoils. The next question generally is, what hours he will have to work.

Then again in the olden time the master or foreman generally helped his instruction along by an occasional whipping, and many a good master workman to-day gratefully remembers the wholesome chastisement that made a man of him. Those days are passed, and Solomon's wise saying that he who spares the rod spoils the child is forgotten. The result is that employers now endeavor only to get as much work out of boys as they can, and take no interest in teaching them anything; in fact, boys in workshops nowadays are looked upon as so many necessary evils. When the employer ceases to be looked upon and respected as a teacher and educator, and only as an employer, there is an end of any hope for the proper instruction of boys in any mechanical trade. The labor and trade unions are much to be blamed for this state of things in their unwise attacks on the apprenticeship system. Times have changed, and with them old methods have passed away. We doubt very much if the newer methods are really an improvement. Time will tell.—*The Leather Manufacturer.*

### Improvements in Distilling Oils.

At a recent meeting of the Royal Scottish Society of Arts, John Laing, F.I.C., Edinburgh, described three methods by which mineral oils could be "cracked up" into lighter products. The first of these was effected by a still so arranged that the oil was continuously being distilled into itself until the required density was obtained. He showed that radiant heat was a powerful agent in breaking down oil vapors, and could be utilized by passing the gases as they left the still through a superheater at a high temperature, placed between the still and the condenser. He also detailed his method for distilling under pressure, by means of which a hold was kept of all the condensible gases until liquefied. In this arrangement a relief tank was interposed between the pressure valve and the condenser, into which the gases escaped as they came from the still, and here the pressure got distributed over such a large area that it was practically reduced to *nil*, the oil running to the receiver at ordinary atmospheric pressure. Mr. Laing likewise brought forward a new form of still—which he has just invented—for the purpose of preventing oils being broken down, as in distilling for lubricating oils and paraffin wax. This still was so constructed that the non-conducting heavy residues which were continually forming under distillation were continuously being removed from the source of heat. The still, being fed by a ball cock arrangement, was always at the same level, and as the fires required no forcing to overcome the heavy residues as at present, a great economy of heat was effected; while oils of higher gravity and greater viscosity were produced, and a longer life was secured to the working plant.

### Liniment.

Dr. Geo. Flory, in the *Physio-Medical Journal*, gives a formula for a liniment which he thinks is very efficient:

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| R. | Oil sassafrae, | |
| | Oil organum, | |
| | Oil cajeput., aa | ℥j. |
| | Tinc. capsicum, | |
| | Tinc. lobelia sem., aa | ℥ss. |
| | Pyle's pearline | ℥ij. |
| | Aqua ammonia | ℥ss. |
| | Aqua pura, q. s | Oj. |
| M. | | |

Place the pearline in your container, add the aqua ammonia, shake until the pearline is thoroughly dissolved, then add the tinctures and oils, shake until they are emulsified, then add the aqua pura, and it is ready for use.