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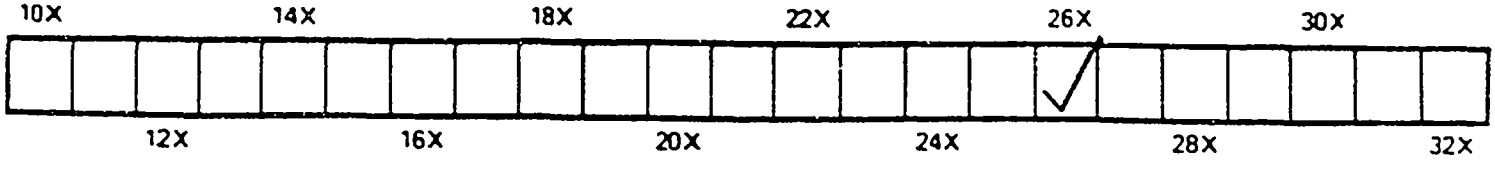


THE TRADER.

TORONTO, ONTARIO, SEPT., 1882.

Sent free to every Jeweler and Hardware Merchant in the Dominion of Canada.

SPECIAL NOTICE.

To ensure insertion, changes or new advertisements must be sent to the office not later than the 27th of each month.

Editorial.

PROGRESS.

With this number "THE TRADER" commences the fourth year of its existance, and we trust that it may not be out of place for us to draw the attention of its readers in every part of the Dominion of Canada to the great improvement that the present issue shews over its initial number.

When the paper was launched, we stated in our first number "that we hoped that the advertisements would defray the cost of publication, and by distributing it free to every Jeweler and Hardware Dealer in Canada, it would fill a long felt want, by affording a sure and inexpensive means of interchanging the ideas between the wholesale and retail trades."

Although looked upon as chimerical by the knowing ones in the newspaper business, we are glad to say that our anticipations in regard to this part of its mission have been fully realized, and although THE TRADER has not yet reached the goal for which it set out, it has shewn a steady and satisfactory progress in that direction. The first number of THE TRADER was an eight page paper, five of which were advertisements and three of editorial and selected matter; our last issue contained ten pages of advertisements and ten of editorial and selected reading matter, in all, twenty pages, or two and one-half times the size of its original number.

The outward appearance of the paper has been greatly improved by the addition of an expensive colored cover, while the general excellence of the typographical work has been such as to evoke expressions of praise from practical printers.

We have aimed to furnish our readers free of charge, a paper at once readable and instructive, and the many flattering encomiums that we have received from different parts of this vast Dominion seems to indicate that our efforts have not only been successful, but they have been thoroughly appreciated.

We have at various times published selections from our exchanges, written by some of the greatest of living horological writers, and we may say without any egotism, that there is not a jeweler in this country who cannot find some useful as well as interesting information in any of our numbers.

We should be pleased to have the Jewelry trade use our columns freely for the interchange of their ideas upon trade or mechanical topics, and we are of the opinion that if such things were more frequently discussed and thoroughly ventilated, much practical good would result therefrom.

Any one taking up one of our American Horological contemporaries cannot but be struck at the large number of intelligent and thoughtful contributions from practical men upon all conceivable subjects connected with the mechanical construction of our present time keepers.

That this interchange of ideas among practical watchmakers can result in other than good cannot be doubted for a moment, and we trust that the attention of our Canadian Craft have only to be drawn to this subject in order to ensure their taking advantage of it to the fullest extent. They may rest assured that if THE TRADER can do anything to further this interchange of ideas by giving them space, its columns shall be freely placed at their disposal for that purpose.

In conclusion, while apologising for saying so much about ourselves, we have only to add that we propose in the future as in the past to speak out plainly regarding any trade abuses or business topics that may come up for discussion. As we have no political axes to grind, we can afford to be independent, and treat subjects entirely upon their own merits whatever they may be.

As heretofore, we shall be glad to secure communications from our readers, and our columns will always be open for the free discussion of subjects that will tend to advance sound principles, and elevate the standard of commercial morality.

THE INDUSTRIAL EXHIBITION.

The fourth Industrial Exhibition which commences in this city on the 6th of this month and lasts until the 16th, promises to be the greatest thing of the kind ever held in Canada.

The entries especially in manufactures are in excess of any previous Exhibition, while the rapid strides we are making in manufactures make it certain that their quality will be far in advance of the average exhibits of former years.

In the way of attractions, besides the many that the city has always to offer, the directors of the Industrial Exhibition have made most elaborate preparations for the entertainment of the myriads of visitors that are expected at the time. In addition to athletic games, and military reviews, they have arranged to have a mock bombardment and torpedo explosion in the lake immediately fronting the Exhibition grounds.

They also propose to light up the grounds and buildings with the electric light, a novelty and a boon that should be appreciated by many who would otherwise find it impossible to visit the collection of exhibits that Canadian enterprise and rivalry have gathered together.

The Exhibition in itself will be a grand one and well worthy of a lengthened visit, but with the additional attractions provided by the directors it will become of more than ordinary interest. Excursions have been arranged on all the railroad and steamboat lines coming into the city, and the very low fares thus obtainable will make this an unusually favourable opportunity for the people of other parts of Canada to see the "Queen City of the West" at its best.

The low fares thus obtainable will also make the Exhibition time a good one for merchants to visit Toronto, and by a personal inspection, select the goods needed for their fall trade. We trust that as many merchants as can make it convenient to do so, will avail themselves of this opportunity, and we can assure them that they will find the wholesale men of this city ready to give them a warm reception and extend to them every courtesy that lies in their power.

THE SUPPLY OF IVORY.

Every merchant who has dealt in Ivory goods of any kind for years past, knows that every year the price gets higher and higher, and it is now a question how long will it be before Ivory gets so dear as to get beyond the purchasing reach of the many millions of toilers who now use it as a matter of common convenience. In the article of table cutlery alone the annual consumption is something enormous, and although Ivory-handled cutlery is to-day common, we are strongly of the opinion that in less than half a century from the present time it will be ranked as a curiosity. That some good substitute will be produced by scientific men we have no doubt, but so far, all their efforts have fallen short of the requisite qualifications for a good substitute for elephants' tusks.

If any inventor could discover an inexpensive process of making hard white rubber, he would have a material that would fill the bill as far as cutlery and similar articles are concerned.

The best cutlery handle in the market to-day for practical usefulness, is by all odds the patent hard rubber handle. It is hard, takes a fine polish, does not crack and will stand any amount of rough usage. Its only objection is its color, few people like to have black handled table cutlery, but apart from that objection it is the best material for handles yet placed upon the market. If the objectionable color could only be removed and white rubber produced as cheaply and as perfect as the black now is, it would push all other imitations out of the market and damage even the sale of the genuine ivory itself. Whether this can be accomplished or not, we cannot say, but the day is not far distant when this or some other equally good substitute must be found to take the place of the gradually decreasing supply of ivory.

In this connection the *Ironmonger* in the course of a very interesting article upon this subject says:—

"The small supply of ivory, and the consequent augmented prices realised, at the recent sale of that material in London and Liverpool will, doubtless, have a tendency to cause those who are searching for substitutes for it to increase their exertions. Good judges have long been of opinion that the world's supply of elephants' tusks is growing smaller each succeeding year, and now that the "civilisation" of Africa is being so energetically conducted by European travellers there can be little doubt that good ivory will soon be spoken of in the past tense. Those who have perused the records of the travels of Stanley, Selous, Thompson, and other modern travellers in Africa will have noted the relative scarcity of elephants over wide tracts of country in which they were quite numerous not many years ago. This is especially the case in the Eastern parts of South Africa, where the extension of colonisation and the persistency of exploration have driven away such of the herds of elephants as have escaped the rifles of the hunters. There is, therefore, no need for wonder that prices should rise or that fine ivory should command prices not very remote from 1,000*l.* a ton. It is, further, quite certain that as time goes on the supply will gradually grow smaller, particularly as the demand is concurrently becoming greater. The level will be reached sooner or later, therefore when ivory will become a real luxury for cutlery purposes, and not, as now, an article procurable at a moderate price. When that limit shall be reached it is evident that such cutlery will only be purchased by the wealthy; hence our manufacturers will be compelled to devote themselves to the production of substitutes to replace ivory for hafting uses. Action in that direction has been taken, we are aware, by some manufacturers especially in the United States. In that country xylonite and two or three other kinds of hafts are favourably spoken of, whilst in this country Joseph Rodgers & Sons, and possibly one or two firms besides, have for several years sold table-knives with special handles which deserve to be highly commended. These are at present exceptions: They will ultimately become the rule, albeit the day when ivory shall be wholly superseded, even in ordinary cutlery, may be far distant That epoch will, and must, come, however; consequently it is but common prudence to recognise its inevitable advent, and to take precautions accordingly. It is rarely safe to prophesy "unless you know," but this appears to be a matter in respect of which it may be safely foretold that the man who provides a cheap and really effective substitute for ivory will not only earn the gratitude of the trade and of the public, but will indubitably fill his own pockets."

Selected Matter.

A ROYAL TESTIMONIAL.

The Emperor of China recently presented the Chinese merchants of San Francisco with a very fine scroll, as a testimonial of his appreciation of the contributions sent by them to the victims of the Chinese famine three years ago. This scroll, which is four feet high and twelve feet long, is described as follows:

"The surface is entirely cross-grained and indented with miniature squares formed by lines running from opposite corners. These squares, uniformly covered with old gold, stand out in bold relief by means of a darker shade of gilt with which the lines are traced. Four large Chinese letters in ebony are carved at regular intervals across the face of the scroll, around which is a rich border of flowers and fruits. The scroll itself is enclosed by a deep, wide frame, upon which is carved a large number of allegorical figures, so wrought and blended together as to appear to have been made of one solid piece of wood. At the lower corners are placed two figures of Chinese gentleman, each holding a sword, the upper corners being devoted to two maidens, each having a tambourine, and depending from which is a long veil, completely encircling their body. The space intervening between the figures is blocked with dark glass, so that under an artificial light the effect is very beautiful." The imperial present has caused a commotion among the Chinese, and great interest and curiosity is manifested by the public in general.—*Ex.*

BURNISHING.

By burnishing the roughness of an object is flattened down until the surface is smooth and polished like a looking glass. Burnishing is an important operation for electro-deposits, which consists of a multitude of small crystals, with intervals between them, and with facets reflecting the light in every direction. The deposited metal is hardened, and forced into the pores of the underlying metal, and the durability is thus increased to such an extent that, with the same amount of silver, a burnished article will last twice as long as one which has not been so treated. The instruments employed for burnishing are made of different materials, and must be of great hardness and a perfect polish. Such are hardened cast steel, agate, flint and blood-stone. For metallic electro-deposits steel and blood stones are especially employed. There are several qualities of blood stone; its grain should be close, hard, and without seams or veins, it should leave no white lines on the burnished parts, nor take off any metal, and its color should be of an intense black red. The steel must be fine and close grained, and perfectly polished. Should the polish of

any burnishing tool alter by use, it is restored by friction upon a skin or leather attached to a wooden block, which is fixed to the bench. The leather is covered with polishing rouge in impalpable powder, or, preferably, with pure alumina, obtained by calcining ammonia alum in a forge fire. Venetian tripoli, rottenstone, tin putty, emery, or many other hard substances finely powdered may be employed. The burnishing tools are of various shapes, such as a lance, a tooth, a knife, a half sphere, or a dog's tongue, and a considerable stock is necessary. The burnishing is divided into two distinct operations. The first consists in roughing, and the second in finishing. The tools for the first have a sharp edge, while for the second operation they have a rounded surface. The tools for the hand or the lathe are fixed by copper ferrules into short round wooden handles, so that the hand is not influenced by their weight. The tools for the arm or vice are fastened to wooden handles, sufficiently long to rest their slender part upon the arm or shoulder. The stouter lower portion is grasped by the hand. The burnishing tools and the objects must be frequently wetted by certain solutions, some of which facilitate the sliding of the instrument, or with others which have a chemical action upon the shade of the burnished articles. Of the first are pure water, solutions of soap, decoctions of linseed and infusions of the roots of marsh mallow or licorice. The second includes wine-lees, cream of tartar, vinegar, alum in water. When burnishing gold applied upon electro-deposits of copper, as is gilding with a dead luster by that method, use pure water, for fear of producing a disagreeable red shade. A solution of green soap is sometimes preferred by operators, although when old, it imparts an unpleasant tinge, owing to the sulphides of the liquor. When the burnishing is completed, the surface is wiped longitudinally with a soft and old calico rag. The polish obtained by burnishing is called black when it reflects the rays like a mirror, and should the presence of mercury or a bad deposit prevent the tool from producing a bright surface, the object is said to be greasy. Articles which have been previously polished, and which generally receive a very trifling deposit, are not burnished, but rubbed with chamois leather and the best polishing rouge. Too thick or too rapid electro deposits cannot be burnished, but must be polished by rubbing with a leather and a mixture of oil and powered pumice stone, tripoli, or tin putty. Coarse powders are used at the begining, and impalpable ones at the end of the operation. Polished silver deposits are more agreeable to the eye than burnished ones, but the hardening of the latter renders them more durable.—*Scientific American.*

REMARKS ON THE WATCH.

Of all the different escapements, a well constructed anchor is undoubtedly the best for all practical purposes. A pocket chronometer is not as reliable, while, if of larger dimensions, and provided with all the possible mechanical appliances, adjuncts, and improvements, a marine chronometer doubtlessly is the best timepiece constructed. When we say "for practical purposes," we do not by any means wish to have it interpreted that the watch may be treated with impunity to any and every indignity, or be used as a toy for children. Let us examine any other piece of machinery; how strong and powerful it is in any and all its parts: still, it is never required to perform one-half the work of the tiny watch, which unremittingly labors day and night, week day and Sunday, month and year, without intermission or stop, and if it has been duly cared for and tenderly treated, it may arrive at the good old age of one hundred years, while the ponderous machinery is cleaned and oiled every day, with hosts of men to attend to its wants, and lasts only for a span of years.

It will be easily seen that any exterior motions exert an important influence upon the vibration, and consequently upon the arbor and pivots of the balance. If this external motion is in the direction of the vibrating plane of the balance, and a vibration occurs simultaneously in the same direction, the vibration arc is increased; if in the opposite direction, such an arc will be decreased, and it is only without damage if it occurs vertical to the balance axis.

The most ordinary external motions, however, occur in another direction than that of the balance, whereby a sensible pressure is exerted upon the axis of the vibrating mass, productive of an increased friction of the pivots upon their bearings, etc., and a retarding, never an acceleration, takes place. For instance, the balance of a watch of a better construction vibrates 18,000 per hour, consequently 432,000 vibrations in twenty-four hours.* Let us suppose such a watch were quietly laid down or hung up for *about ten hours*—*whereby it would go correctly*; but in the next succeding fourteen hours, it would be worn, the general length of time, and if each vibration of the balance were retarded only by 0.0001, it would be equal to fourteen hours to 25.2 vibrations, or 5.04 seconds; by a regular use, therefore, in one week, 35.28 seconds, and in one month, 2.52, or *nearly three minutes.*

By most watches, where the pivot holes are of ruby, the retard of a watch is far larger, and stands pretty well in ratio with the construction and finish of the movement.

A marine chronometer, regulated to an almost imperceptible difference, and having proved excellent upon a long sea voyage, would, when worn as a watch, in consequence of the external motion experienced, go too slow, and far more so than a good anchor watch. Beside all imaginable advantageous improvements, these chronometers are fitted into a separate box, in the so-called compass suspension, and suspended in such a manner that they do or should remain in an equal position in all the different motions of a ship.

From the preceding remarks it is very clear that a careful treatment of any, especially a fine-graded watch, is of great moment, and only with such care it will go apparently correct. The winding should be performed slowly, and strong external motion be prevented, and always be done in the morning; it thus will work well during the day, with the best traction power of its spring, whereby the external motions to which it is exposed *during daytime, are pretty well* counterbalanced, and immensely better than when wound at night, because it has only the weakened spring to offer as resistance next day. The breaking of the spring, also, need not be feared, as it is no longer at full tension during the night,

*Vibrations-18,000 per hour, 432,000 per day 12,960,000 in 30 days (one month), 157,680,000 in 365 days. A seconds pendulum makes 3,600 oscillations in one hour: 86,400 a day: 2,592,000 in 30 days (1 month): 31,536,000 in 365 days—one year: A marine chronometer, which marks ½ seconds, makes 14,400 in an hour, 345,600 per day, 10,368,000 in 30 days. 126,144,000 in 365 days.

and can stand better the ensuing cold. The morning hour is also better fitted for such winding, because dressing takes place at nearly the same hour, more so than going to bed at night.

Keys of soft metal should be shunned: also those which fit badly, because ruining the winding square, and leaving metallic dust in the movement. If the watch is laid either at an inclination, or flat, or suspended at night, it should always be done in the same manner—not differing every night. The rate difference between vertical and horizontal is often significant; by second rate watches sometimes two or three minutes in one night; if it is suspended from a nail, in such a manner that it will rock to and fro with the vibration, an accident which occurs often, and a watch provided with a heavy balance will gain, and, *vice versa*, one with a light one will lose. Of course this is in the nature of things. Similar observation have been made by clocks which were not firm within their case.

The temperature difference between the heat of the pocket and a wall nearly to the freezing point, is about 20° or 25° Celsius, and a watch should, therefore, never either be suspended or laid upon it; the sudden change of temperature may produce the sudden breaking of the spring also the oil thickness, especially if no longer pure, which as aforesaid, produces irregularities of rate; if the balance of the watch is not compensated, it must gain from the above-mentioned carelessness, and if it possesses constructive defects, it may stand still from the cold.†

It is necessary to clean the watch pocket frequently, to free it from all accumulating dust and fibres. Even by the cleanest pursuits, a sort of fiber dust will gather in the pocket, caused by the friction of the watch case, and this is very easily transported to the interior of the movement, and is much more pernicious than common dust, by wrapping around the little component parts, and retards—sometimes prevents their motion, similar to the cobweb with flies.

† The author leaves his watch always in the vest pocket, and hangs this on a peg, the watch is thereby prevented from rocking, and escapes other misfortunes, especially when traveling and lodging at strange hotels, where one is called late at times, and something is generally forgotten in the hurry; it is also possible that the watch, instead of being placed in the watch shoe, may be immersed in the holy water vessel, as happened a friend of ours in a Catholic country

No other article should be carried in the watch pocket, such as keys, coin, etc.; it is often done, yet highly detrimental and careless. Watch crystals may be broken, and the dials and hands be injured; if the case is not strong, parts of the train are liable to injury, but in the most favorable condition, the case itself may be injured. The watch should never be worn against the bony part of the body.

The dust cover should never be opened without necessity; dust and fiber is always located around the rim, also the air is continuously charged with dust particles. The canons of the key equally may introduce dust, tobacco and other impurities into the movement, and it should be cleaned frequently. But by even the greatest of care, it is impossible that the watch can go forever without occasional repairs, and it should be cleaned at least once every year. All manner of machinery requires an occasional supervision, and it should be performed at least once a year on a watch, the oil has dried up by this time and become mixed with particles of metallic dust, which act like emery. The author, during a long practice, has had occasion to manipulate costly watches, and several of them were almost ruined beyond repair by having run beyond the time. They generally belonged to people who were afraid to trust their timepieces to bad workmen, and rather risked the consequences. In such a case, it would be better to look the watch away.

We have endeavoured to give a few of the details of how a watch should be treated. Entire chapters could be written without exhausting the subject, but let the above suffice for the layman.—*Jewelers' Circular.*

HOW AGATES ARE CUT.

The variety of quartz known as Agate is a variegated chalcedony, with the color distributed in clouds, spots, or concentric layers. The variety called Moss Agate occurs in veins, while the banded agate is found in the form of geodes or balls, and occasionally there will be found in the side of these balls a sort of funnel through which was introduced the silicious matter forming the layers.

Judging from the number of these agates to be seen one might be led into the error of supposing that they could be found almost anywhere along our shores, and as the prices at which they are sold are very low, it is evident that the cutting and polishing must be done in some country where labor is cheaper than here. However, the explanation is given when we are told that they are German Agates, for although for a number of years comparatively few agates suitable for cutting have been found on German soil, yet we may safely say that, at the present time, nine-tenths of all the commercial agates now in South America, where, especially in Brazil, they occur in great numbers. They are shipped thence as ballast in vessels bound for Hamburg, and from this port and forwarded by rail to Oberstein, where they are sorted into lots, usually in the yard of some well-known inn, and sold at auction. When purchased, they are sent to the agate mills, where they are cut and polished on wheels turned by water power, though of late years steam has been introduced in a few mills.

Along the Idar River, between the towns of Idar and Oberstein, there were, in 1867, one hundred and fifty-three mills, working seven hundred and twenty-four stones. Each mill contains from three to five stones, set on a horizontal axle, one end running outside the workshop and communicating with the water-wheel. The mill-stones are usually red sandstone, about five feet in diameter, and rotate in a vertical plane, the broad edge of the wheel being kept moist by a stream of water trickling down upon it from above. The choice agates are usually cut into shape with steel wheels and diamond powder. The common ones, however, are not sawn, but roughly dressed with hammer and chisel, the workmen acquiring, by long experience, great dexterity in applying their blows so as to obtain the desired fracture.

The grinding is done on the broad edge of the wheel, which is furrowed with channels corresponding in shape with the form which it is desired to give the object in hand. The agate is usually attached to a small stick, and thus applied to the moving wheel.

Each stone accommodates two men, but these men, instead of sitting at the wheel, are stretched in an an almost horizontal position upon a wooden stool made to fit the body. The limbs are thus left free, the hands holding the agate to the wheel, while the feet are strongly pressed against blocks of wood fastened to the floor. After being ground, the agates are polished on cylinders of hard

wood, or on lead or zinc discs, fed with a mixture of Tripoli and water.

Many of the agates, beautiful as they are in nature, are artificially colored in the following manner: Having been well washed, they are placed in a sirup of honey and water, sometimes in olive oil; after this, they are exposed for some time to moderate heat in a vessel embedded in hot ashes, care being taken that the liquid does not boil. When removed, they are washed, placed in sulphuric acid, and exposed to gentle heat. After they have taken color they are again washed, and it is often the practice finally to lay them in a bath of oil, which improves the lustre. Some layers of agate are quite porous, while others are dense and well nigh impervious. When steeped in oil only the porous layers absorb the liquid, which, being deoxidized and blackened by the acid, makes the contrast between the layers more striking, thus enhancing greatly the beauty and value of the agate. Other colors are given agates by various processes; some, such as the reds, by simple exposure to heat; others by immersion in certain solutions; but these methods vary with the different lapidaries, and are more or less trade secrets.—H. L. Preston, *in Jewelers' Journal.*

GOLD.

Gold is the most malleable, ductile, and most brilliant of all the metallic substances; and, next to platina, the heaviest and most indestructible.

Gold is seldom found except in the metallic state. It has been obtained in every quarter, and almost every country of the globe; but North and South America supply a greater quantity than all the rest of the world.

Many laborious experiments have been repeatedly made by able chemists, who appear to have established the fact, that gold exists in vegetables.

A single grain of gold can be made to cover an area of more than 400 square inches; a wire of one-tenth of an inch in diameter will support a weight of 500 pounds; and Dr. Black has calculated that it would take fourteen millions of films of gold, such as cover some fine gilt wire, to make up the thickness of an inch, whereas the same number of leaves of common writing paper would make up nearly three quarters of a mile.

Though opacity is enumerated as one of the characters of the metals, yet gold, when the $\frac{1}{\text{xxxooo}}$th of an inch thick, which is about the thickness of ordinary gold leaf, transmits light of a lively bluish green color. Perhaps all the other metals, if they could be equally extended, would show some degree of transparency, but none of them can be made so thin.

The specific gravity of unhammered gold is 19.258, and is increased but little by hammering. Its hardness is 6. It melts at 32° of Wedgwood; and, if pure, its color when in fusion is not yellow, but a beautiful bluish green, like the light which it transmits.

Gold cannot be volatilized, except at an extreme heat. The utmost power of Parker's celebrated burning lens exerted upon it for some hours, did not cause it to lose any weight which could be discovered; but Lavoisier found that a piece of silver, held over gold melted by a fire maintained with oxygen gas, was sensibly gilt; and perhaps the same delicate test would have shown its volatility by the lens.

After fusion, gold will assume the crystalline form. Tillet and Mongez obtained it in short quadrangular pyramidal crystals.

Gold unites with most of the metals. Silver renders it pale; when the proportion of silver is about one-fifth part, the alloy has a greenish hue. Silver separates from gold as from platina, if the alloy be kept for some time in fusion.

Gold is strongly disposed to unite with mercury; this alloy forms an amalgam, the softness of which is in proportion to the quantity of mercury. It is by mercury, that in South America, gold is chiefly obtained from the earth with which it is mixed, and the gold is separated by distillation. This alloy readily crystallizes after fusion. It is applied by gilders to the surface of clean copper, and the mercury is driven off by heat.

Gold unites freely with tin and lead, but both these metals impair its ductility. Of lead, one quarter of a grain to the ounce renders the gold brittle; but tin has not so remarkable an effect.

Copper increases the fusibility of gold, as well as its hardness, and deepens its color. It forms the usual addition to gold for coin, plate, etc. The standard for gold in America, Great Britain and her Provinces is twenty-two parts pure gold and two parts copper; it is, therefore, called "gold of twenty-two carats fine."

Iron forms an alloy with gold, so hard as to be fit for edge tools. Its color is grey, and it obeys the magnet.

Arsenic, bismuth, nickel, manganese, zinc and antimony, render gold white and brittle. When the alloy is with zinc, in equal proportions, it has a fine grain, takes a high polish, and from these qualities, and its being not liable to tarnish, it forms a composition not unsuitable for the mirrors of telescopes.

For the purpose of coin, Hatchett considers an alloy consisting of equal parts of silver and copper as the best, and copper alone as preferable to silver. The same distinguished chemist gives the following order of different metals, arranged as they diminish the ductility of gold, viz., bismuth, lead, antimony, arsenic, zinc, cobalt, manganese, nickel, tin, iron, platina, copper, silver. The first three were nearly equal in effect, but the platina was not quite pure.

The nitric acid will take up a very minute quantity of gold, but the nitro-muriatic and oxy-muriatic acids are its only real solvents. The two latter acids are of a similar nature, and their effects on gold are increased by concentrating them, by enlarging the surface of the gold and by the application of heat. The solution is of a yellow color, caustic, and tinges the skin of a deep purple. By evaporation it affords yellow crystals, which take the form of truncated octahedrons. These crystals are a muriate of gold; they may be dissolved in water, and will stain the skin in the same manner as the acid.

Most metallic substances precipitate gold from its solution in the nitromuriatic acid; lead, iron and silver, precipitate it of a deep and dull purple color; copper and iron throw it down in its metallic state; bismuth, zinc, and mercury likewise precipitate it. When precipitated by tin, it forms the *purple precipitate of Cassius*, which is much used by enamellers and manufacturers of porcelain.

Ether, naphtha, and essential oils, take gold from its solvent, and from liquors which have been called potable gold, and are used in gilding. The gold obtained from these fluids by evaporation is extremely pure.

If diluted nitromuriatic solution of gold be used to write with upon any substance, and the letters while yet moist,

JOHN SEGSWORTH & CO.,

23 Scott Street, Toronto, Ont.

Our Stock is now complete, and embraces the following Goods, of which we have one of the Largest Stocks in the country. All bought for Cash.

COLORED GOLD, 15 KARAT JEWELRY:—Sets, Earrings, Brooches, Scarf Pins, Lockets, etc., etc.

" " 10 " " —Sets, Lockets, etc.

BRIGHT " 10 " " —Brooches, Earrings, Lockets, Scarf Pins, etc.

SILVER JEWELRY:—Sets, Earrings, Brooches, Bracelets, Bangles, Necklaces, Lockets, Scarf Pins, Gents' Suites, etc.

LADIES' GEM RINGS—A Splendid Assortment. **ENGLISH GOLD CHAINS.**

Also, we keep on hand the Largest Stock of American Waltham Watches in the Dominion, and have in Stock now the Prettiest Designs in Waltham made Gold Cases.

Our Stock of American Jewelry is also very complete in Sets, Brooches, Lacepins, Earrings, Rolled Plate Alberts, Guards and Necklaces of the Newest Patterns and Best Quality.

In addition to the above, we make a Specialty of finely finished Gold Chains of American Manufacture, of all the latest styles, unsurpassed by any stock in the country.

To prove that the above is correct, we would ask our customers and the trade generally to inspect our stock; if not in the City during the Exhibition IT WILL PAY YOU to wait till our Travellers call on you, which will be at an early date.

Yours truly,

JOHN SEGSWORTH & CO.

be afterwards exposed to a stream of hydrogen gas, the gold will be revived and the substance will appear gilt. Ribbons may be gilt in this manner. Sulphurous acid gas revives the gold in the same manner.

Lime and magnesia precipitate gold from its solution in the form of a yellowish powder. Alkalies do the same, but an excess of alkali re-dissolves the precipitate. The precipitate obtained by means of a fixed alkali appears to be a true oxide; it is taken up by the sulphuric, nitric and muriatic acids, but separates by standing with crystallizing. The precipitate by gallic acid is of a reddish color, and very soluble in the nitric acid, to which it communicates a blue color.

Gold precipitated from its yellow solution by ammoniac, forms a powder called *fulminating gold;* this dangerous compound detonates by friction, or a very gentle heat. It cannot be prepared or preserved without great risk. Macquer gives an instance of a person who lost both eyes by the bursting of a bottle containing some of it; and which exploded by the friction of the glass stopper against an unobserved grain of it in the neck of the bottle.

Green sulphate of iron precipitates gold of a brown color; but this soon changes to the color of gold.

The alkaline sulphurets precipitate gold from its solution; the alkali unites with the acid, and the gold falls down combined with the sulphur. The sulphur may be expelled by heat.

The alkaline sulphurets will also dissolve gold. Thus, if equal parts of sulphur and potass, with one-eighth of their joint weight of gold in leaves, be fused together, the mixture, when poured out and pulverized, will dissolve in hot water, to which it gives a yellowish green hue. Stahl wrote a dissertation to prove that Moses dissolved the golden calf in this manner.

Sulphur alone has no effect on gold. The process called dry-parting is founded upon this circumstance. This is used for separating a small quantity of gold from a large quantity of silver. The alloy is fused, and flowers of sulphur are thrown upon its surface; the sulphur reduces the greater part of the silver to a black scoria. The small remainder of the silver may now be separated by solution in nitric acid. The advantage of the operation consists in saving the large quantity of nitric acid which would have been required to dissolve the silver of the alloy in its original state.

The heat produced by the electro-galvanic discharge reduces gold to a state of a purple oxide.—*Jewelers Journal.*

WATCH OIL—CARE TO BE USED IN ITS APPLICATION.

Among the substances used by the watchmaker, oil is one occupying a first rank, being of the greatest importance. No matter how carefully has been the construction of a time-piece, its functions are subordinate to the continuous presence of a fatty body introduced into all the parts where friction occurs; without this precaution, the organs in contact would very soon be subject to early wear and destruction, thus producing the stoppage of the mechanism; the same would equally result if the oil employed were to loose its fluidity, and by its solidification seriously interfere with the rate. It is true that there exists no lubricating agent which indefinitely preserves its primitive conditions; all change with the lapse of time. The duration of the correct rate of a clock or watch is consequently limited by the time until the lubricator degenerates; clocks which possess a large motor and small resistance preserve their oil longer. Cases are not wanting in which they kept correct rate for ten or fifteen years, but as for watches, whose motive power is small, the least thickening of the oil in the last moveable parts, occasions a resistance which soon is impossible to overcome, and the watch stops. The timepiece must be taken asunder, cleaned and fresh oil applied. Its duration does not last beyond one and one-half or two years at most, and these little mechanisms are only in good order when in conditions of having been cleaned at short intervals, so imperfect is the agent used by the watchmaker for lubricating.

It will be seen that a judicious choice of oil must be all-important to him. Watchmakers and chemists have occupied themselves with the question, and more than once the results have, at least in theory, led to the anticipations that the grand desideratum was discovered at last, but practical experience very soon destroyed all hopes—no oil prepared by any new processes has as yet resulted in anything permanent.

Choice of Oil.—We will quote M. H. Robert by saying that the best watch oil is made of olives. Some prefer animal oils, notwithstanding its greater viscidity; they find it to withstand the influences of the sea better than that from olives. Experiments have been tried with neats', mutton, even ducks' foot oil, and all, with due care, have given good results.

Animal oils are submitted to a pretty high temperature, for extracting, while those from olives should not be heated beyond 50°.

There exists no other means, actually, than a sufficiently long experience for distinguishing good or bad oils. The watchmaker, consequently, is reduced to confidence when purchasing it. The good faith and renown of the manufacturer are his only guarantees. These remarks are specially applicable to olive oil.

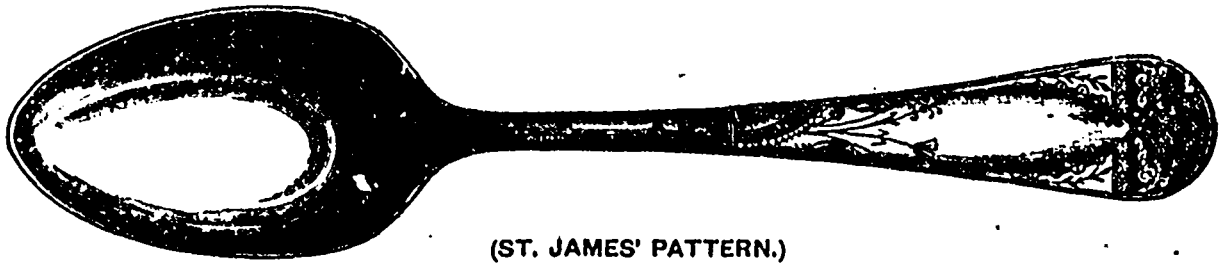
It is believed that certain indications will betray the quality, from the manner in which it behaves when brought into contact with brass for several days. It would not be prudent to put too much faith in the presumptions, as they may occasion mistakes.

A good watch oil should have the following qualifications: 1. It must preserve its primitive fluidity for a long time; 2. It must not attack the brass with which it is brought into contact; 3. Possess a good fluidity; 4. It must not thicken on exposure to cold; 5. It be absolutely free from all glutinous or resinous substances.

Of all these qualifications, the preservation of its fluidity is the most important; of course, no oil preserves it *forever, all thicken and solidify with* time, and it may be expected that a retardation of rate will commence with the change. Oils prepared by the watchmaker himself may last for three years, and clocks may still continue to preserve a good rate for longer time. Astronomical clocks will go as long as twelve years before requiring a cleaning, but chronometers should never be let go more than three years; watches require to be cleaned every eighteen months at longest.

Brass oxidizes more or less in contact with oil this will even eat into it, and it assumes a clear green, and at times a black color. If these symptoms appear in a pronounced manner, at the end of a short time, the oil had better be thrown one side as unfit.

A fluidity more or less great is of no importance, but it is utterly indispensable

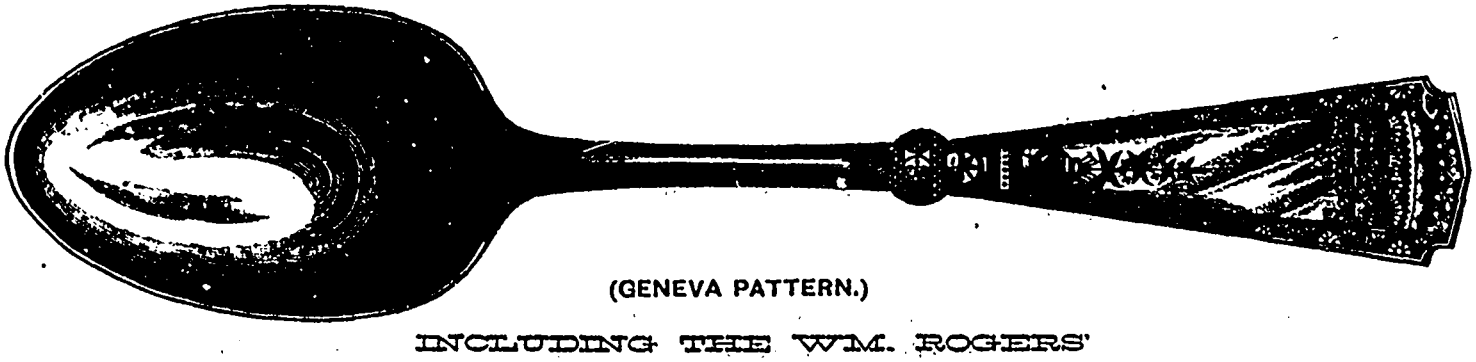


(ST. JAMES' PATTERN.)

Simpson, Hall, Miller & Co.,

Manufacturers of

FINE SILVER PLATED WARE.



(GENEVA PATTERN.)

INCLUDING THE WM. ROGERS'

SPOONS, FORKS, KNIVES, ETC.,

MADE IN

EXTRA, DOUBLE, TRIPLE; ALSO IN SECTIONAL PLATE.

Extra Plated upon all points most exposed to wear.

STAMPED "WM. ROGERS X12."

FACTORIES:

WALLINGFORD U.S. —AND— **MONTREAL, CANADA.**

The Wm. Rogers' Goods sold by us are made under the supervision of Mr. Wm. Rogers, formerly of Hartford and West Meriden, son of the old original Wm Rogers, who died in 1873. Please do *not* associate us with goods made in Hartford, Ct., with which we have no connection. We make all the goods we sell, and have our own especial patterns.

SIMPSON, HALL, MILLER & CO.

that the oil should preserve it without thickening. If attention were bestowed simply to the inconvenience occasioned by the resistance on the pivots, the most fluid would only be used, especially for the latter moveable parts, whose velocity is greater and power less; but we have on this side the fact that too fluid an oil does not keep. Thus, if one too fluid in consistency were used on cylinders, the parts would very soon run dry, but the same kind of oil would answer very well for the smaller pivots, by reason of their greater adaptability to the sinks. The consistency of the oil should therefore be in proportion to the pressure, and a thicker oil will be found better adapted for the first moveable parts. It is rare however, that the watchmaker uses all the care requisite, chronometers excepted; the same kind of oil is used at all train parts.

Animal oils, being generally thicker, are better adapted for large clocks; they could be well used for lubricating the blade and pivots of the mainspring. Some chronometers makers prefer them to that from olives, and think it is better preserved at sea.

Freezing.—Olive oil shows a very variable manner under the action of cold, even when appearing to be identical in their nature. It is not good to judge of the quality by the temperature in which it congeals. This change of state occurs from 4° to 20.?

Congealed oils neither have the same appearance nor the same state. Thickened oils are more viscid than fresh ones under the action of cold, and offer greater perturbations in the rate than the latter. In general, an oil curdling with an average degree of cold is not objectionable for the first wheels; it suffices it hould preserve its fluidity with—4°. The rate of the timepiece is not affected thereby. A contact with metal will keep oil fluid; and it may still be so at the pivots while that in the bottle from which it has been taken has already become congealed.

Many causes contribute to degenerate oil. Thus,

1. The nature of the oil itself. Every oil deteriorates after a while of itself, independent of foreign influences.

2. A contact with the air. The elements in the air combine little by little with it, and modify its nature.

3. An action of light. This influence singularly favors a degeneration.

4. Humidity.

5. A rise of temperature, or an intense cold; in fact, every sudden variation of temperature.

6. Emanations arising either from persons or localities; chronometers frequently deteriorate at sea, and on some vessels more than on others. Some persons are obliged to have their watches cleaned oftener than others.

8. Clocks enclosed in not thoroughly seasoned oak timber; the tanic acid given off slowly decomposes the oil.

8. The nature or composition of the metal or alloy employed.

9. The state of the lubricating surfaces.

10. The kind of friction. A pivot badly rounded or polished, or working in too large a hole, is liable to wear; also a high pressure, etc.

The different kinds of brass do not behave alike with oil; certain ones alter more or less, and are more or less affected by others; simple cast brass is very inferior to the drawn or hammered article. The same kind of brass even acts differently, in accordance with having been hammered more or less in a cold state.

The gilding of watch trains by means of mercury serves the double purpose of stopping the oxidation and keeping the oil from spreading; it is caused by the graining left by the gold amalgam on the parts.

Gold, of all metals, preserves oil best; next to gold, gilt brass. Brass of good quality, well hammered, also gives good results. When simply cast, it alters the oil very rapidly. All other metals tried up to date, copper included, are inferior to brass, as far as regards their oil preserving qualities.

PRESERVATION OF OIL IN THE RUBBING PARTS.

It now remains to examine how oil behaves on subjects, and what precautions must be taken to prevent its spreading. This action, altogether mechanical, is regulated by natural laws, and may be determined beforehand; but these questions appear to have little engaged the attention of artisans, and we are forced to collate them from works of different authors, who have barely spoken of them.

The interior cylinder walls retain the oil well. This fact favored by the form of the club teeth of the scapewheel, has eminently contributed to the success of the cylinder escapement, and explains in a great measure the universal regard in which it is held. A number of escapements, obsolete to-day, do not deserve their fate, but for the difficulty with which they retain oil. A lack of this is followed by the wearing of the rubbing parts; destruction progresses, and the timepiece soon becomes *unfit for use, giving* rise to frequent repairs. Thus, a service of only short duration is obtained, which of itself is a capital offense of the mechanism subject to many other accidents. The cylinder escapement, if executed on sound principles, will go a long time without wear.

If the *scapewheel teeth are pointed,* the oil is kept from spreading by filing on the face of each tooth a little groove; it is well to extend it to the other side, it may be cleaned with greater dispatch. The oil tending to run to the wheel's center, is forced to stop at or near the point. Th. Reid, an English horologer, practised this disposition with success. Others have found it practicable to file a little cleft at the end of each tooth, to serve as sink. Mr. Robert, in his carefully constructed timepieces, pierces each tooth of the scapewheel for the same purpose.

Others make these teeth of concave form; the oil being driven from the two sides finds a place to lodge.

Cavities introduced for the purpose of *storing oil at the pivot holes, to lubricate* the rubbing part, are known by the name of sinks. Their forms must comply with three conditions, viz., Maintain the oil at the same place—without running; inclose the largest possible quantity; prevent an exposure to air of the oil.

A certain amount of oil, put into the *sink will remain there without spreading;* by increasing the quantity, it will run out and the pivot runs dry. Only use sufficient, for fear of running out.

As a contact with air changes the oil and forms a pellicle over it, this destructive agent must be guarded against by offering the least surface possible.

To apply oil intelligently, plunge a clean steel rod into the bottle, and withdraw it quickly; the oil remaining attached thereto is put into the oil cup; and with a little steel staff or drill apply it to the parts; put it exactly to the bottom of the hole, only in a quantity sufficient to be contained within the sink; taking care not to touch it elsewhere, it might call out the other oil, by offering it a facility to run.

Preservation.—It is not sufficient that the watchmaker be provided with good oil, he must seek to preserve it, as follows:

WE BEG TO CALL THE ATTENTION OF THE TRADE to the well known quality and elegance of finish of our Gold Cases, guaranteed by us to be of eighteen karat Gold, U. S. Mint assay, or of fourteen karat Gold, as may be stamped, and also to our mode of selling the same, charging only for the ACTUAL WEIGHT *of the gold used, and not for the base metal comprised in springs, key pipes, filling of crown, etc. To illustrate which we here show copy of tag accompanying each one of our Gold Cases, which plainly indicates not only the gross weight of the Case, but also the* NET *weight of the gold.*

AMERICAN WATCH COMPANY,

ROBBINS & APPLETON,

New York, August 1st, 1881.

General Agents.

IN EXPLANATION OF THE ABOVE we desire to say that the old plan of charging for the gross weight of the case, as if it were all gold, worked well enough as long as the manufacturers were content with the amount of brass and steel actually required in its construction; but when the business was degraded into a contest as to who should get the most base metal into the least quantity of gold and call it a GOLD case, then the time came when, in the interest of dealers in American Watches, it became necessary to adopt a plan of selling, showing the buyer exactly how much GOLD each Case contained.

In adopting this method we act in conformity with the earnest wishes of the leading houses of the Trade, some of whom have already undertaken to carry out the same idea in their own business.

ROBBINS & APPLETON,

GENERAL AGENTS.

1. By keeping it in shelter, from contact with the air; the bottle must constantly be kept vertical, and it should be long, narrow, and carefully corked. Never tip the bottle to one side, to pour out; let none run on the sides. Let the cork be of the best quality.

2. Keep it in a perfectly dark place, and do not expose the bottle to the light any longer than necessary to take oil therefrom, in the manner prescribed.

3. Keep it under cover in a dry and sweet place; removed as much as possible from all agitations of the air and exposures to sudden changes of temperature.

We have endeavored to elucidate the question, and leave it to the practical experiment of the watchmaker to "charge, alter, and amend." Every intelligent horologer will concur in saying that we are not yet by any means in possession of the best lubricating agent possible.—*The Jewelers' Circular.*

BUSINESS CHANGES FOR AUGUST.

Rob. Wilson, Odanah, Hardware, style now Wilson & Harrison; Adam Hope & Co., Hamilton, Wholesale Hardware, Mr Adam Hope of this firm dead; Thexton Bro., Lindsay, Hardware, offering 50s on the dollar; A. D. Cooper, Midland, Jewelry, removed to Waubaushene.

BUSINESS NOTES.

H. LAFONTAINE, watchmaker of Sorel, is making a watch to indicate the seconds, hour, day of the week and month, and the moon's phases. It will be composed of 500 parts.

MR. JOHN SEGSWORTH has just returned from his English trip, and looks much the better for the change. He brings with him a large stock of new jewelry, and intends to rush things during the next few months.

WE are glad to notice the return from Europe of Mr. R. Y. Ellis, of the firm of P. W. Ellis & Co., Wholesale Jewelers, of this city. Mr. Ellis looks well, and says he had a splended time while away, and is now fit to do any amount of work. From present indications he will have plenty to do before the year is out.

As will be seen by our advertising columns, Mr A. C. Anderson, Wholesale Jeweler of Hamilton has recently returned from England, where he has been on a business trip. His selections will be found of the latest styles and his customers may depend upon getting good value.

SAYS the *Monetary Times*, "An Oshawa hardware man, Mr. T. W. Gibbs, has been in trouble for a long time. Several years ago he got an extension of time and carried out the arrangement. Now, we are told that his Montreal creditors have again consented to favor him. He has made earnest efforts to succeed."

MR. SAMUEL STERN, who has been absent in Europe for the past three months, is home again, after having personally supervised the shipment of his fall purchases. His stock of clocks and fancy goods will be unusually complete this year, and buyers visiting Toronto should drop in and inspect his goods before placing their orders.

THE new telephone recently placed in Messrs. Zimmerman, McNaught & Lowe's office is the first and only one in any jewelry establishment in the city. The firm find it exceedingly useful in many ways, and fully appreciate the saving in time effected by its use. Buyers visiting the city are invited to avail themselves of its assistance, where possible, in the transaction of their business.

THE Toronto Silver Plate Co. are getting rapidly into shape, and expect to have some goods of their own manufacture upon the market in the course of the next few weeks. Under the able superintendance of Mr. J. A. Watts, the machinery is being put in, and the other arrangements pushed rapidly forward. They have already about thirty hands at work and expect to employ about fifty more when in full running order.

HON. ADAM HOPE, who died last month of paralysis, was a well known and honored Canadian merchant, of amiable character and marked ability. He was born in East Lothian, Scotland, and at the time of his death was in his 70th year. Having been some six years in the counting-house of a Leith firm, in which Mr. David Davidson, formely General Manager of the Bank of Montreal, was then a partner, Mr. Hope came to Canada in 1834, and entered the office of Young, Weir & C., merchants, Hamilton. Beginning business on his own account in St. Thomas in 1837, he removed to London in 1845, where the firm was Hope, Birrell & Co., the late Mr. John Birrell being the partner, and subsequently to Hamilton in 1865, when the firm became Buchanan, Hope & Co. The deceased gentleman was senior partner in the wholesale hardware firm of Adam Hope & Co., Hamilton, President of the Hamilton Provident and Loan Society, and Director of the Canadian Bank of Commerce. He had been, too, the first president of the Huron & Erie Loan Co., founded about 1864 in London M. Hope was called to the Senate by Hon. Alex. Mackenzie five years ago.

NEW PREMISES.—A Strathroy Exchange says: Mr W F. Snell can now be found in his new store two doors west of his old stand. Mr. S. has shown considerable taste in the arrangement of his new premises. In addition to the plate glass front the walls have been nicely papered and bordered, and the ceiling very handsomely frescoed. Tables of cherry with walnut trimmings are used in place of counters, on which rests his show cases; walnut bracket shelves are arranged on the east wall for to show off his stock of clocks and the west wall is to be filled up with glass show cases for silver and plated ware. In the rear is a large storeroom and workshop. When completed Mr. S. can boast of having one of the finest jewelry establishments west of Toronto.

WORKSHOP NOTES.

SCALE BRASS-ALLOYS.—Bristol brass (Prince metal), 6 parts copper, 2 zinc; Japanese brass (Sinchu), 10 parts copper, 5 zinc. White brass, 1 part copper, 8 zinc, 1 iron — very suitable for statue casts in place of bronze.

RUST.—Nuts are oftentimes so tightly rusted upon screws that other means must be made use of to loo en them; kerosene or naptha, even turpentine, will in a short time penetrate between nut and stem. Next heat them in fire which quickly severs them.

BRONZE.—Bronier claims to have discovered a simple method to make bronze malleable; it consists in the addition of from ½ to 2 per cent. of mercury, and appears to act rather mechanically than chemically. It is added to one of the metals of which the alloy is made.

VARNISH FOR PASTEBOARD, WOOD, METAL, &c.—Marine glue, 2 parts, yellow, gum lac, in scales, 1 part. Dissolve in wood spirits (pyroligneous spirits). This varnish may be applied to paper, pasteboard, wood and metals. If thick it may be used for gluing wood.

BRONZING MEDALS.—According to the *Revue ind.*, medals are bronzed in the *Paris mint* by boiling them in a copper kettle, not tinned, however, in a solution of 500 grams pulverized verdigris, and 375 g. pulverized sal ammoniac, in 160g. strong vinegar and 2 liters water. The medals are kept apart by wood or glass rods.

VARNISHES.—*Gold varnish for brass objects, physical instruments*, etc.: Gum lac, in grains, pulverized, 90 grams; copal, 30 g.; dragon's blood, 1 g.; red sandal wood, 1 g.; pounded *glass, 10g.*; strong alcohol, 600g.; after sufficient maceration, filter. The pulverized glass simply serves for accelerating the dissolving, by interposing between the particles of gum lac and copal.

POLISHING STEEL.—If the steel is of moderately good temper, use a zinc polisher with diamantine; a tin polisher is better for soft steel. The diamantine should be mixed on glass, using a beater also of glass, with very little watch oil. Diamantine mixed with oil becomes gummy, and quite unfit in a day or two, and turns black, if brought into contract with metal in mixing.

CLEANING RAGS.—The rags, which are excellent for polishing metal surfaces, are prepared in the following manner: Dip flannel rags into solution of 20 parts dextrine and 30 parts oxalic acid in 20 parts logwood decoction, wring them gently, and sift over them a mixture of finely pulverized tripoli and pumice stone. The moist rags are piled above each other, placing a layer of the powder between each two. They are then pressed, taken apart and dried.

WRAPPING PAPER FOR SILVER.—The *Archiv. d. Pharm.* gives the following for preparing a good wrapping paper: 6 parts caustic soda are dissolved in sufficient water until the hydrometer shows 20° Beaumé; 4 parts oxidized zinc are added to this solution and boiled until dissolved. Sufficient water is then added to dilute the mixture to 10°B. The paper or calico is dipped into it, and dried. All silver articles wrapped in it, are protected against the sulphuretted hydrogen, which, as is known, is contained in the air of all large cities.

CEMENT FOR CAOUTCHOUC.—It is recommended to macerate pulverized shellac in ten-fold its weight of a strong aqueous solution of ammonia, so-called spirits of hartshorn, whereby a transparent, gelatinous mass arises, which becomes fluid if the bottle containing the gelatine is immersed in hot water. It also becomes fluid after standing from three to four weeks. When to be applied, both surfaces to be united are moistened with the mass and pressed together. As soon as the ammonia is evaporated, the caoutchouc becomes as hard as the homogenous caoutchouc mass itself. The cement is also suitable for uniting caoutchouc to glass, metal, etc., in fact, upon all smooth surfaces.

SOFT GOLD SOLDER.—Melt equal parts of 14-karat gold and silver solder, and hammer it into a thin sheet upon the anvil. This solder will satisfy all the demands of a watch repairer. It is advisable to use silver solder for low grade, say 6 or 8-karat gold goods, which consists of 2 parts fine silver and 1 brass, with the addition of a gram of tin. Another nice soft solder for 8 and 14-karat gold, consists of 1.5 parts fine silver, 0.5 fine copper, 1.16 14-karat gold and 0.4 zinc: the first three metals are well melted and mixed together, and when well in a fluid state, the zinc is added, the whole left for a few moments in fusion, until it melts, not volatilizes, and then cast.

TO SILVER GLASS.—Dissolve 3 grains of ammoniacal nitrate of silver in 1 oz. distilled water, which solution must be rendered somewhat clouded by sufficient nitrate of silver, and then filted. Immediately before use, mix 1 oz. of this solution with 2½ grains Rochelle salt. The glass to be silvered having been cleaned to its utmost, is placed into a suitable vessel, the bottom of which is provided with a few cones, thus raising the glass about one inch above the bottom, and the fluid is poured over it. The vessel is placed on the northern part of the house, or in a place with deadened light, and the silver precipitated will be sufficiently thick in two hours. It taken out, washed and dried; if the glass with the silver pellicle is to be used as reflector or speculum, the coating must be protected by varnish.

CRYSTALS.—Dr. Bottcher publishes a very simple method of coating paper, wood, or glass with crystals: Mix a very concentrated salt solution, in cold, with dextrine, and apply the fluid with a broad, soft brush upon the surface to be decorated, spreading it in a layer as thin as possible. After drying, the surface will show a very handsome, pearl-lustrous coating, which on account of the dextrine, very tenaciously adheres to the surface. It may be made adhesive to glass by coating it with an alcoholic solution. Salts especially suitable for the purpose are specified Dr. Bottcher to be sulphate of magnesia, acetate of soda, and sulphurate of zinc. If paper is to be decorated in the same manner, it must be sized. Unsized paper absorbs the fluid, and prevents a regular formation upon its surface. Visiting cards of this style, by the name of alabaster cards have for some time been in high favor. Colored glass provided with such a coating, is very handsome if light can penetrate it.

CLEANING IVORY ORNAMENTS.—Ivory ornaments are quickly cleaned by brushing them with anew, not very sharp tooth brush, to which a little soap is given; then rinse the ornament in lukewarm water; next dry the trinket and brush a little, and continue brushing until the luster reappears, which can be increased by pouring a little alcohol upon the brush and applying it to the trinket. Should this have become a little yellow, dry it in gentle heat, and it will appear as if new. Ivory that has become yellow may easily be bleached in the following manner: The article is placed under a glass bell, together with a small quantity of chloride of lime and muriatic acid, whereby chlorine is developed, and exposed to sunlight. Be very cautious not to breathe the vapors, as they are very poisonous. The bleaching power of the chlorine destroys the yellow pigment upon the surface, and the article will be restored to its original luster.

CLEANING SILVER.—A correspondent to *La Nature* sends the following recipe, the practical value of which he has tested for years: Cyanide of potassium, 30 gr.; hyposulphite of soda, 20 gr.; water, 1000 gr.; ammonia, sufficient quantity. The liquid is prepared cold and the silver is immersed cold.

Another subscriber sends the following recipe water, 1 liter; sulphate of amonia, 5 gr.; sal ammonia, 10 gr.; cream of tartar 10 gr.; common salt, 10 gr.; alum, 15 gr. Dissolve and boil, and plunge the articles therein for a short time.

GOLD COLOR UPON BRASS.—To color brass gold color, dip it, after having been polished bright, into a diluted solution of neutral acetate of copper (crystalized verdigris), in which, however, must be contained no free acid.

Mat, greenish-gray upon same.—Paint it several times with a well diluted solution of chloride of copper.

Violet upon same.—Heat brass until you can barely hold it in your hands, and then, with a ball of loose cotton, paint it uniformly with ordinary officinal chloride of antimony, and it will color a handsome violet.

NICKEL-PLATING.—Dr. Kaiser describes a single process of nickel-plating. Prepare a bath of pure granulated tin tartar and water, and having been heated to the boiling point, add to it a small quantity of pure red hot oxide of nickel. A portion will soon dissolve, and give a green color to the grains of tin. Articles of copper or brass plunged into this bath in a few minutes acquire a bright metallic coating of almost pure nickel. If a little carbonate or tartrate of cobalt is added to the bath, a bluish shade, either light or dark, may be given to the coating, which becomes very brilliant, when properly polished with chalk or dry lime dust.

METALLIC objects may be colored by immersing them in a bath formed of 640 grains of lead acetate dissolved in 3,450 grains of water and warmed to from 38° to 90° Fah. This mixture gives a precipitate of lead in black flakes, and when the object is plunged into the bath the precipitate deposits on it. The color given depends on the thickness of the skin, and care should be taken to treat the object gradually, so as to get a uniform tint. Iron treated thus acquires a bluish aspect like steel; zinc, on the other hand, becomes brown. On using an equal quantity of sulphuric acid instead of lead acetate, and warming a little more than in the first case, common bronze may be colored red or green with a very durable skin. Imitations of marble are obtained by covering bronze objects, warmed to 100° Fah., with a solution of lead thickened with gum tragacanth, and afterward submitting them to the action of the above mentioned precipitate of lead.

SCIENCE NOTES.

DETONATING WATCHES.—Watches with alarm are an old contivance, but one which at the appointed time fires a shot, certainly is a product of the present era, not much known yet, and still less "to Solomon in all his glory." The mechanism producing the effect is that in common use, and regulated at the dial; on the outer case rim is a spring which is cocked at the same time, a little piston protrudes upon which a cap is placed. At the appointed hour, the spring flies off, hits and explodes the cap with a noise sufficient to waken Rip Van Winkle himself.

AMALGAMATING salt for optical and mechanical use, is, according to the *Central Ztg.*, made by dissolving ½ kilo. mercury in a mixture of ½ kilo. nitrac acid and ½ kilo. muriatic acid. The solution is prepared in a porcelain dish in a sand bath, under a well drawing chimney like a blacksmith's furnace. Another good method is to dissolve 8 parts of oxyde of mercury in 100 parts water and 10 parts muriatic acid. Dip the zinc parts into this fluid for a moment, then rinse and brush them, and they will be found coated with a silver like coat. The application can be made with a small brush or sponge. Protect your hands against the poisonous properties of the salts of mercury; it might penetrate through the skin into the body and cause salivation and mercury-poisoning.

PEARL fishing on the coast of Lower California is an important industry, no less than 1,000 divers being employed in bringing up the costly black pearl, which is found in a great state of perfection in the deep waters of La Paz. The pearl oysters are found from one to six miles off shore, in water from one to twenty-one fathoms deep. Merchants provide hats, diving apparatus, etc., for the prosecution of the business, on condition that they can purchase all the pearls found at prices to be agreed upon. These boats, which are usually of about five tons burden, sail up and down the coast from May to November, searching for treasures. The product of the year's work is about $500,000, estimating the pearls at their first value.

THE Berzelius pencil to cut glass is made in the shape of a pencil, red heated in the fire and applied to the glass, which it cuts with facility; the point of beginning is to be started with a file. It is composed of the following ingredients. gum arabic, 60 parts; gum tragacanth, 23; benzoin or benjamin, 23; lamp black, 180; water in sufficient quantity. The gum tragacanth is steeped in water for several hours, and the gum arabic is dissolved in a sufficient quantity of water, while the benzoin is pulverized very finely. The three components then are mixed, the lamp black and enough of water added to make a dough of a consistency to be moulded into pencil shape, which are finished by being rolled between two flat surfaces. With skill, a bottle may be cut into a spiral shape which draws out like a spring; the pencil is a very appropriate tool in the workshop of any tradesman.

All great pageants have their lubicrous side. At the last at Windsor, the "beef-eaters," in scarlet and gold, with their knotty joints protruding in all kinds of shapes beneath their white silk hose, their sad and sorrowful countenances contrasting with the wreath of red and white roses encircling the round flat cap of black velvet belonging to their costume, their stiff white ruffs standing out against their sturdy beards and wrinkled chin—all presented a mirth-inspiring aspect which would have been most precious to an caricaturist. In solemn silence they stood before the buffet where the $2,000,000 worth of gold plate was piled up, with Lippo Sahib's footstool, a tiger's head of gold, with eyes of rare and brilliant gems, and that cynical monarch's golden bird, whose eyes are of diamonds so brilliant that they seem to light every object around, and whose claws are of pearl, pronounced by Rundell & Bridge, the great jewelers of the last generation, as being too valuable for any London goldsmith's tools to touch.

Another Monster Bell.—St. Paul's Cathedral, London, will at an early date be provided with a new bell, that may well rank among the monster bells of the world. It was cast on the 23rd day of November last, in the factory of M. Taylor, of Loughborough. The smelting occupied 8½ hours, and the casting, four minutes; but only after six days the cast was sufficiently cool to issue from the mould. The dimensions of the bell are, height, 2.692 m.; diameter, 2.896 m.— (0.91 meter =one yard). It has not yet been weighed, but it is presumed that it may be classed between the bell of Olmutz (18,182 kilog.), and that of Vienna (17,930 kg.). Next comes that of Erfurt, 13,960 kg., of Sens, 13,200 kg., and of Paris, 12,190 kg. The St. Paul Bell will cost about 75,000, *t.s.* in which is comprised the cost of putting it *in situ* in the northwest steeple of the church

An Indian Bronze.—The Hindoos possess a remarkable ability for making alloys of iron, copper, zinc and tin. Let us cite the *biddery;* the alloy is called after the city where it is mostly prepared, and is most encountered in all its purity. The eminent qualities of this alloy are, that it is non-oxidizable in air, even if the latter is charged with humidity, under the burning tropical sun. It is perfectly malleable and does not crack, except, perhaps, by violent blows. Objects of art manufactured from this alloy, are colored black by plunging them into a simple solution of saltpeter and sal ammonia, or sea salt and blue vitriol. One receipe for preparing the alloy reads as follows: 16 parts copper, 4 lead and 2 tin, melted together. Zinc is combined with this mixture in a proportion of 3 to 10. Dr. Hamilton gives another formula: zinc, 126 parts; copper, 460; lead, 414 (without tin). These parts are finely broken, and enclosed in a crucible with a mixture of beeswax and resin, to prevent calcination, and to simply effect fusion. The fusing alloy is run into an earth mold, and shaped into the desired form. To give it a black color, a solution of sulphurate of copper is used.

Correcting Brittle Gold.—As soon as a gold ingot shows sufficient ducility to withstand the first two or three annealings without breaking, and if by the effect of this first test it gives indications of brittleness, by the appearance of cracks and fissures upon its surface, resourse must be had to a sort of mold casting, what the French call "brassage." This operation is easily performed. It consists in taking a soldering coal, sufficiently large to receive the ingot, preparing it thus with a file that a deepened half-round hollow is worked in. The ingot is now heated upon a coal to nearly white heat, and in this condition it is laid upon the prepared coal, and covered with borax at all points, to facilitate the melting, which is about to be undertaken; the thus prepared ingot is exposed to the influence of a heavy wick of the soldering lamp, and by aid of a somewhat long blowpipe, the flame is directed upon one end; the fire is maintained until the surface begins to melt, whereby all cracks disappear, without raising the temperature sufficiently, however, to either shorten the ingot or separate it into several parts. The requisite degree of heat will be recognized, as soon as the bar begins to give way, and begins to conform to the smallest angles of the coal, as well as by the rainbow-hues which begin to appear upon its surface, and finally, by the union of the cracks, which dipappear in proportion as the angles of the bar conform to the angles of the coal, under the heat of the flame. When the ingot has reached this degree of heat, in its entire extent, the operator may be assured of its malleability.