## RECIPES AND EXPERIMENTS.

The following recipes and experiments have not been practically tested by the edi or of the SCIENTIFIC AMERICAN, but are published for the benefit of readers who may desire to try them. The editor would be glad to be informed of the results of such trials.

A NEW HYGROMETER made by G. Smith, in Paris, consists of strips of paper dipped in a cobalt salt solution containing common salt and gum arabic. In dry weather, it is blue, and in wet, rose red.

NONINFLAMMABLE FABRICS.—Carteron and Rimmel have taken out a patent in England for the use of acetate of lime and chloride of calcium for rendering goods non combustible. Equal weights of each are dissolved in twice their weight of hot water.

AN ECONOMICAL FIRE KINDLING is made in Paris by dipping corn cobs in a mixture of melted resin and tar, and drying at 100° C.

PURE AMMONFA GAS is obtained by adding 2 parts caustic potassa to one part liquid caustic ammonia.

A PROTECTIVE VARNISH for zincography is made by melting together equal parts of asphalt, wax and resin, and dissolving the mass in hot oil of turpentine.

TO PREVENT GLUE BECOMING SOUR AND MOLDY.—The addition of a quantity of carbolate of soda, just sufficient to give a strong smell to the glue, will accomplish the desired result.

LIQUID INDIA INK.—Dissolve the powdered ink in hot water and, when deep black, add one tenth its volume of glycerin, and shake well together.

ANTIDOTES TO CARBOLIC ACID.—Fatty oil, wood oil and almond oil are recommended by Dr. G. Calvert. Dr. Husemann advises the use of saccharate of lime, made by dissolving 16 parts of loaf sugar in 40 parts of water, adding to this 5 parts good slaked lime, digesting the mixture with frequent stirring for three days, filtering and evaporating the filtrate to dryness at 100° C.

TO CLEAN GOLD CHAINS.—Put the chain in a small glass bottle, with warm water, a little tooth powder, and some soap. Cork the bottle, and shake it for a minute violently. The friction against the glass polishes the gold and the soap and chalk extract every particle of grease and dirt from the interstices of a chain of the most intricate pattern; rinse it in clear cold water, wipe with a towel, and the polish will surprise you.

A USEFUL HINT.—By rubbing chalk on the side of a carpenter's square, the figures may be more readily seen. Near sighted persons will do well to remember this.

ELECTRICITY is developed in metallic wires by merely bending them, and the development appears to be independent of any thermic action.

TO MEND RUBBER OR OTHER HOSE.—Cut the hose apart where it is defective; obtain a piece of iron pipe, ten or twelve inches long; twist the hose over it until the ends meet, and wrap with strong twine, well waxed.

BORAX.—One half a pound will drive the cockroaches out of any house. A large handful of the powder to ten gallons of water will effect a saving of fifty per cent in soap. It is an excellent dentifrice and the best material for cleansing the scalp.

TO MAKE OLD BUTTER FRESH.—Knead with lime water or a very diluted solution of washing soda. Simply washing in water is often perfectly efficacious.

TO BRONZE BRASS OBJECTS.—First warm them, and then wash over with a hot solution of ammonium chloride (sal ammoniac), then place over night in a diluted solution of two parts verdigris and one part ammonium chloride in six parts of vinegar. In the morning, remove and wash.

TO EMPTY LARGE BOTTLES OF LIQUID.—By imparting a motion of rotation to the contents of an inverted bottle, the water or other liquid will issue in the form of a tube, the air entering up the center without impeding its passage. The bottle can thus be emptied in one half the usual time.

ARTIFICIAL PARCHMENT.—The Germans are applying the paper tissue known as artificial parchment for the manufacture of artificial sausage skins—a novel but highly characteristic idea. This membrane is rather indigestible.

LACING FOR SEWING MACHINE BELTS.—An old kid glove makes excellent lacing for securing small belts on sewing and other machines. Cut the gloves into strips half an inch wide, and roll them up tight.

TO JAPAN OLD TEA TRAYS.—First clean them thoroughly with soap and water and a little rottenstone; then dry them by wiping and exposure at the fire. Now get some good copal varnish, mix with it some bronze powder, and apply with a brush to the denuded parts. After which, set the tea tray in an oven at a heat of from 212° to 300° until the varnish is dry. Two coats will make it equal to new.

ALLOY FOR JOURNAL BOXES.—24 pounds of copper, 24 pounds of tin and 8 pounds of antimony. Melt the copper first, then add the tin and lastly the antimony. It should be first run into ingots, then melted and cast in the form required for the boxes.

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THE Academy of Sciences in Bologna has announced that a prize of 1,200 *lire* ($240), the "Aldini Prize," will be awarded to the author of the best scientific experimental essay on galvanism or dynamic electricity. Essays intended for the competition must be sent in between July 1, 1872, and June 30, 1874, and must be written in Italian, Latin, or French. They must be either written or printed; but, in the latter case, must not have been published previously to the two years above mentioned. Each essay is to bear a motto, and to be accompanied with an envelope stating the name of the author. They must be addressed to the Perpetual Secretary of the Academy of Sciences of the Bologna Institution.

## Service upon Atlantic Cable Business.

If there is one thing more surprising than the fact that it is possible to transmit intelligence beneath the waters of the broad Atlantic, it is the celerity with which that business is performed. In the average time upon each message transmitted between New York and London, the service is barely equaled by the best managed circuits wholly upon the land. For the seven days ending July 20, 1872, the actual time averaged upon messages exchanged between New York and London was 13 minutes and 59¼ seconds. That is to say that a telegram addressed to London, leaving New York at 9 A. M, New York time, reached its destination at a fraction less than 9:14 of same time. When the distance is considered, the fact that the message has to be rewritten four times—at Plaister Cove, Heart's Content, Valentia, and London, and that this is the average upon the whole business for the week, and not the time upon any one message—it speaks volumes for the business management and the skill of the operators engaged.

That the average time of this week was not exceptional, we have ample proof upon the examination of the record.

An exact record is kept of every message by each of the companies engaged in its transmission, the precise time of its reception at each office is taken, and from this a daily and a weekly average is made. In this average, press and government despatches are included, which from their much greater length than ordinary business messages, serve to place the average time somewhat greater than is really occupied in the transmission of business for the general public.

Messages between New York and London pass over the wires of four Companies—the Western Union, to Plaister Cove; the New York, Newfoundland and London, from Plaister Cove to Heart's Content; the Anglo American from Heart's Content to Valentia, and from Valentia to London, by the British lines.

On one of the seven days given above, the average time of transmission between New York and London was actually only six minutes and thirty-five seconds; and the shortest average time for messages for the entire day over one of the four lines was one minute and four seconds.

It is difficult to see wherein this service can be improved, and yet efforts are being made to that end. Mr. H. H. Ward, Superintendent of the New York, Newfoundland and London Telegraph Company, and Mr. Stearns, the inventor of the improved duplex instrument, have left for Plaister Cove and Heart's Content to introduce the double transmitter upon the wires between those points, and the Western Union Company have under consideration the advisability of placing them upon the circuits between New York and Plaister Cove, and also to place Heart's Content in direct communication with New York, thus avoiding one rewriting. When these improvements take place, the average time of transmission between New York and London will be reduced to a minimum.—*Journal of the Telegraph.*

## The Cloud Burst.

Many persons confound the waterspout with what is commonly known as the cloud burst, yet a moment's consideration will show them the difference. Waterspouts are frequently seen on the ocean or upon the broad lakes, and proceed from a whirl wind gathering the water and whirling it upward in a heavy column to clouds. These can be seen at a long distance, clearly defined, carried in the direction traveled by the wind, and are decidedly dangerous customers to come in contact with. Many a good ship, missing and never more heard from, doubtless has fallen victim to some overwhelming waterspout. It is said that they can be broken at a distance by a lucky cannon shot, but if the spout is broken by the ship itself, sure and speedy destruction must follow. Whirlwinds produce a similar effect on land, and out on the deserts to the east of here are frequently to be seen huge columns of sand thus whirled upward, reaching from the plain to the clouds above. Cloud bursts occur in the summer season during heavy thunderstorms, and are simply rain showers of sudden and extraordinary violence.

Some over-laden cloud sailing over a mountainous locality merely turns its watery contents loose, and it comes streaming down, flooding the hillsides, from whence the water flows in sheets into the ravines. So sudden is the flood that, where not a drop of water has been seen for weeks or months a large turbulent, overwhelming torrent comes pouring down carrying away trees, rocks, and everything else before it, washing away railroads, bridges, toll roads, houses; in fact everything in its way. One of these floods, thus pouring down a steep, dry mountain cañon, frequently shows an advancing front of logs, bushes, huge boulders, and similar *debris*, twelve or fifteen feet high. Woe to any unlucky teamster who happens to be passing with his loaded wagon along the bed of the cañon! Those who understand matters are able to guard against the impending calamity by getting their wagons out of the ravine and up on the hillside as far as possible; or, if they have no time for that, they will unhitch their animals and give them a chance to escape. Instances are known where one of these cloud bursts has occurred on some broad slope where, having no ravine to carry off the water, it has plowed and torn a channel for itself of great depth and extent. This is the proper season of the year for cloud bursts, and as one of greater or lesser magnitude visits Gold Hill or Virginia nearly every season, one may be expected before long.—*Gold Hill (Nevada) News.*

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Among the patented contrivances for stopping runaway horses, one consists of a pair of nose stoppers, attached to a bit, and which are closed over the nasal openings of the animal by means of a cord, which the driver pulls if the horse attempts to run. Another consists of a pair of blinders, by which the driver, on pulling a cord, instantly blindfolds the pony.

## Hardness of Minerals and Metals.

We say in general that one body is harder than another if it can scratch it. In mineralogy, hardness is an important property, and a scale was established by Mohs, running from one to ten, which is adopted by all writers of the present day. It is as follows:

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|---|---|---|---|
| Talc | 1 | Felspar | 6 |
| Gypsum | 2 | Quartz | 7 |
| Carbonate of lime | 3 | Topaz | 8 |
| Fluor spar | 4 | Corundum | 9 |
| Opatite | 5 | Diamond | 10 |

We constantly see it said, in scientific works, "the hardness is 6, 7 or 8," and by reference to the above table we at once comprehend the expression. The following list may serve to impress the subject on the mind:

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| Diamond | 10 | Turquoise | 6 |
| Ruby | 9 | Lapis lazuli | 6 |
| Cymophane | 8.5 | Felspar | 6 |
| Topaz | 8 | Amphibole | 5 5 |
| Spinell | 8 | Phosphorite | 5 |
| Emerald | 8 | Fluorspar | 4 |
| Garnet | 7 5 | Cœlestine | 3 5 |
| Dicroite | 7 5 | Barytes | 3·5 |
| Zircon | 7 | Carbonate of lime | 3 |
| Peridote | 7 | Mica | 2·5 |
| Quartz | 7 | Gypsum | 2 |
| Tourmaline | 7 | Chlorite | 1 5 |
| Opal | | Talc | 1 |

The hardness of metals is usually estimated by the resistance offered by wires of equal diameter and same temperature when drawn through a hole of given size. The following is the order in which a few of the metals are ranged:

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|---|---|---|---|
| Steel | 100 | Iron | 42 |
| Iron | 88 | Platinum | 38 |
| Brass | 77 | Copper | 38 |
| Gold | 73 | Zinc | 34 |
| Copper | 58 | Tin | 11 |
| Silver | 58 | Lead | 4 |

According to Thomson, the order of hardness of metals is as follows: steel, iron, platinum, copper, silver, gold, tin, antimony, lead.—*Journal of Applied Chemistry.*

## Auguste Krantz.

We regret, says the *Journal of Applied Chemistry*, to have to record the death of Dr. Auguste Krantz, of Bonn on the Rhine, which took place from an attack of erysipelas, during a visit to Berlin, on the 6th of April last. Dr. Kranz was a scientific merchant in rocks, fossils and minerals, one who not only knew accurately the commercial value of his collections, but was intimately acquainted with the scientific worth of every specimen which passed through his hands. His agents explored every mineral locality in the world; and, by a system of exchanges and the establishment of correspondents, he was able to obtain the choicest specimens from the most remote regions. It has often been remarked by scientific men that in order to obtain a complete suite of the minerals of the United States, it would be necessary to send to Dr. Krantz, in Bonn. There is probably not a museum of any size, in any part of the globe, that is not enriched from his collections. He was, if not the oldest, by far the most extensive, dealer in minerals in the world, and he leaves an immense and valuable collection, both of minerals and fossils, the results of the labors of a long life devoted to their accumulation. No scientific man ever passed through Bonn without going to visit the museum of Dr. Krantz, and every stranger was received with polite attention, although he was often imposed upon by tourists who really had no claims upon his time. He was truly a scientific merchant, and his death will be severely felt at every institution of learning in all parts of the world. We believe it is the intention of Madame Krantz to carry on her husband's business, with which she is well acquainted.

## What is Dirt?

Old Dr Cooper, of South Carolina, used to say to his students: "Don't be afraid of dirt, young gentlemen. What is dirt? Why, nothing at all offensive, when chemically viewed. Rub a little alkali upon the dirty grease spot on your coat, and it undergoes a chemical change and becomes soap; now rub it with a little water and it disappears. It is neither grease, soap, water nor dirt. That is not a very odorous pile of dirt you see yonder; well, scatter a little gypsum over it and it is no longer dirty. Everything like dirt is worthy our notice as students of chemistry. Analyze it; it will separate into very clean elements. Dirt makes corn, corn makes bread and meat, and that makes a very sweet young lady, that I saw one of you kissing last night. So after all, you were kissing dirt, particularly if she whitened her face with chalk or fuller's earth; though I may say that rubbing such stuff upon the beautiful skin of a young lady is a dirty practice. Pearl powder I think is made of bismuth, nothing but dirt. Lord Palmerston's fine definition of dirt is 'matter in the wrong place.' Put it in the right place and we cease to think of it as dirt."

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TANNING WITH GLYCERIN.—The property of glycerin to preserve leather has been known for a long time; it is now proposed to employ it in tanning, to increase the elasticity and resistance of the leather. This system of tanning is particularly adapted to straps and belts of machinery, as it keeps them from drying and cracking. It is only necessary to immerse the leather, tanned in the usual manner, in a bath of glycerin, and to leave it for several weeks, when the pores will be impregnated with the greasy substance, and the leather will be found to be much more elastic and tenacious.