

wide and four feet long, divided into a scale of ten equal intervals, is painted a dark lead color at one end, fading into white at the other. A large white board having been fastened parallel to it, and at a measured distance below it, the whole arrangement is lowered horizontally into the sea. At the dark end, the upper board appears the darker, but at the white end, the lower board, being seen through a greater depth of water, gives the darker appearance, and, of course, at some intermediate division, the two boards appear to be of the same shade. At that division the relative whiteness of the boards is evidently a measure of the percentage of light absorbed while going down and up again through the distance by which the boards are separated. This relative whiteness is readily estimated at night in the cabin by placing the boards at unequal distances from a candle so as to make them of the same apparent shade at the given division of the scale.

The illuminating powers are to each other as the squares of the distances of the boards from the light. Having once ascertained what percentage of light goes through a fathom, the proportion of daylight which reaches any given depth in the sea can be readily calculated. Suppose, for example, that one-half the light penetrates one fathom; then one quarter goes down two fathoms; one-eighth, three fathoms, and so on indefinitely.

This apparatus is the invention of Dr. Hill, who regards it as still in a crude form and capable of much improvement.

New Method of Cleaning Glassware, etc.—BY DR. I. WALZ.
—The cleaning of beakers and other chemical glassware that have contained oils, fats and similar organic matters, by means of potassium bichromate and concentrated sulphuric acid, is often inconvenient on account of the shape of the vessels, or because sometimes requiring the application of considerable heat, and thus causing breakage. The following method has given me uniformly satisfactory results: The vessel to be cleaned is filled, or, if large, rinsed with a moderately dilute solution of potassium permanganate, the contact of the liquid being prolonged till a film of hydrated manganic oxide has been deposited; the solution is then poured away, and the glass vessel rinsed with some strong hydrochloric acid. Chlorine is then formed, but not enough to cause inconvenience; and acting in the *nascent state* on the organic matter, it speedily converts them into substitution products, that are soluble in the slight excess of acid or water.

The water of the above also communicates the following description of a *curious experiment with mercurous nitrate*. A few drops of strong mother solution from the crystallization of mercurous nitrate (proto-nitrate of mercury) are placed into a porcelain capsule; a little mercury is added and divided by means of a glass rod into a number of minute globules. The solution soon begins "to set" around the globules of mercury, and the latter are forced to the top by a kind of capillary action. If the right proportions have been chosen, and this is very easy to do, tubular vermiform formations will begin to grow out of the semi-solid mass in serpentine windings, each bearing a shining little globule of mercury at the end of the tube. Sometimes they grow very rapidly and attain a length of several inches. I have repeatedly prepared this experiment before going home in the evening, and on the morrow found the capsules filled with what appeared like a large number of tiny snakes' heads of silver, in every position of repose or motion.

A Chemical Experiment.—An experiment involving a molecular change in the condition of an element, can be performed as follows:—Let a copper and platinum strip form respectively the negative and positive terminals of a galvanic circuit; immerse these in a hydrochloric solution of chloride of antimony. The result of the galvanic action will be the precipitation of the antimony in form of a fine impalpable powder upon the surface of the copper, from which, when enough has accumulated, it may be readily removed by bending the copper strip back and forth. The metal thus obtained, if placed in a mortar, and vigorously triturated in with the pestle, will detonate with some violence, the explosions being at the same time accompanied with the evolution of light and heat. This curious phenomenon appears to be purely the result of a molecular change, induced in the metal by the mechanical force employed; the consequence being the conversion of the amorphous powder to a crystalline condition. It would be of some interest to note whether the same result would follow the application of heat to the powder, since, from the announcement of Bunsen, made some years ago, the metals rhodium and iridium, when deposited from solutions of their salts in an analogous manner, manifest this property in an extraordinary degree; so much so, indeed, that the scientific world came very near losing the invaluable services of its illustrious discoverer in consequence of a severe accident which befel him from this very unexpected source. It would be