A Magnetized Umbrella.

Some sensational paragraphs have recently appeared in the press about a fortunate umbrella, whose proclivities, being "magnetic," were detrimental to the decent and correct bearing of the compass or "binnacle" on board a Scotch passenger steamer, the Princess Beatrice, plying from Larne to Stranraer. We mention "fortunate," as the umbrella in question has been purchased from the passenger owning it and forwarded by the captain of the ship to Sir William Thomson, F.R.S., in whose laboratory at Glasgow it will doubtless undergo those pleasing sensations naturally incident to a thorough test and report on its scientific complaint.

The helmsman, on a certain voyage of the above named steamer, noticed that the compass by which he was steering was invariably affected by the near approach of a certain passenger, and finally the "fault" was located in the aforesaid passenger's umbrella, which on subsequent trials was found to be strongly magnetic. As umbrellas are usually made of hard steel, this result is not to be wondered at; but even if not distinctly magnetic, the amount of steel in the umbrella would, on near approach to the compass, certainly affect it. Presuming that that umbrella had at a recent date made the acquaintance of an active dynamo, its normal condition would have been altered into a "magnetic" one, and such a state of things we have witnessed ourselves.

It is well known that the too near approach of iron to magnetic needles affects them more or less, and we call to mind an amusing incident related by Captain Marryat, where a native servant placing a frying pan under the binnacle disturbs the superposed magnetic needle. We have seen the magnet of a Thomson galvanometer seriously affected by the pins in a lady's hair, and have ourselves had to replace steel spectacles by non-metallic ones. Indeed, in ordinary testing with a similar galvanometer, it is usual to remove knives, keys, etc., from one's person before making any tests with so delicate an instrument. It was but recently that the vagaries of a not oversensitive horizontal galvanometer fairly for a time puzzled us; the removal of everything in the shape of iron and steel did not alter the erratic behavior of the needle, our near approach for the purpose of examining the deflection produced the same erratic results, until it seemed that it was almost like personal magnetism; but finally the culprit was found in a round felt hat that we were wearing, but as this was supposed to be all "felt," it at the least seemed strange, although the cause was found in a fine steel ring in the outer edge of the hat to give the rim shape, which was strongly "magnetic," having undoubtedly become so from frequent intercourse with active and powerful dynamos. Instances of these kinds are extremely numerous, and it points to a conclusion that as an aid to correct navigation, it would not be advisable to place an umbrella stand round the "binnacle," or that box which contains the steering compass of a ship.

As a practical result of the behavior of this umbrella, we shall probably hear of the passengers to and from the Isle of Man and other places endeavoring to discover whether they are also blessed with a magnetic umbrella. In addition to the usual instruction, "not to speak to the man at the wheel," we shall not be surprised to see the notice, "Passengers are requested not to poke fun at the compass with their umbrellas."—*Mechanical World.*

A Color Blind Fireman.

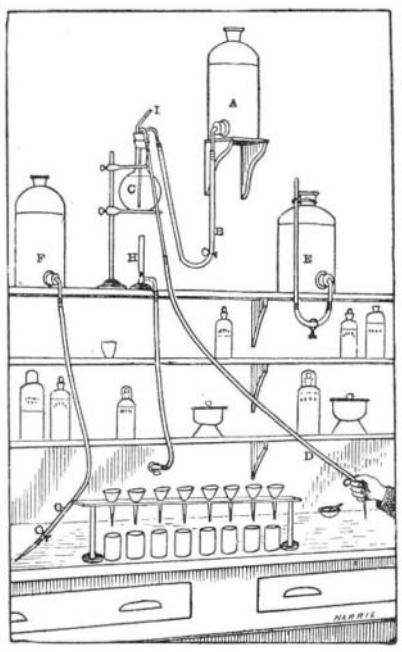
Mr. Julius King, who is the examiner for color blindness for the Lake Shore and Michigan Southern Railroad, has discovered a remarkable case. The patient is an employe of the railroad company. He is a man about 40 years old, and is a fireman. Mr. King made three tests in his case. First, colored glass globes were placed over a gas jet, and the man, at a distance of 20 feet away, asked to tell the colors. He named the red globe correctly when it was first used, but on second trial declared it to be green. Then railway signal flags of different colors were waved before him. He called the red flag green, the green flag red, and when two flags, both red, but of different shades, were waved, the fireman insisted that they were green. Red and green flags held up together he declared to be green. The next test was made with a small rack in which hung zephyr worsted of different colors. The standard color of green was pointed out to the man, and he was asked to select the worsted in the rack of the same color. He immediately picked out bright red, old gold, and light brown bunches. The unfortunate fireman had to be discharged. Mr. King said that he had examined a very large number of men for color blindness, and that about four men in every one hundred are defective in their eyesight in this respect. But very few people are as color blind as the fireman. He said that women were seldom found color blind, as they constantly trained their eyes in selecting colors in ribbons and dry goods, and in discriminating between delicate shades and tints. In answer to a question, Mr. King explained: "The theory of the cause of color blindness is that parts of the retina of the eye respond each to different colors. When any of these parts are deficient, absent, or undeveloped, the person cannot see the color that it belongs to, leaving some other responsive part to act."—*Des Moines Leader.*

AN IMPROVED WASH-BOTTLE FOR CHEMICAL LABORATORIES.

BY H. B. BATTLE, ASSIST. CHEMIST, N. C. AG. EX. STATION, RALEIGH.

By this simple device the washing of precipitates and the cleansing of vessels used in the process of analysis, which before required the use of the ordinary wash-bottle, can now be done with much more facility and in a shorter time.

It consists essentially of a thin glass flask, C, placed about three feet above the level of the working desk, and closed by a three-hole rubber stopper. Through one of the holes issues a rubber tube, D (or glass with rubber connections), descending to the desk and ending in a glass nozzle. Connection is made by a second hole in the stopper with a reservoir bottle, A, placed above the top of the wash-bottle. In the third hole is placed a glass tube bent at an angle to keep out dust. On filling the flask from the reservoir—the flow being stopped by a pinch cock—the water is started by suction from below, and the stream through the nozzle can be regulated or stopped at will by a pinch cock placed conveniently to the hand, the height of the water flask furnishing the pressure, which is sustained by the siphon.



A Bunsen burner, H, is placed underneath the flask, and the water can be heated when it is so desired. Hot water as well as cold can thus be used in treating precipitates. Other solutions can be employed equally as well as water. (See bottle F.)

The advantages of this system are:

1st. The saving of much time and consequent labor attending the use of an ordinary wash-bottle, especially where several analyses are carried on at the same time, the exertions required by the mouth and lungs being thereby avoided.

2d. No air exists in the tube, as in an ordinary wash-bottle, and consequently the full force of the liquid is utilized immediately.

3d. When used with a wash solution of ammonia water, no trouble is experienced with free ammonia, which ordinarily is quite hurtful to the mouth and eyes.

The large bottle, E, with the accompanying tube, shows a convenient arrangement for holding any solution and delivering the same.

A CONVENIENT ARTICLE FOR HOSPITALS AND SICK ROOMS.

The illustration herewith shows an improved form of cover for vessels for use in chambers and sick rooms, the device embracing an easily operated lever attachment, on the top of the cover, in connection with the handle, whereby the cover is made to fit closely on a rubber washer, and thus serve to confine all the bad odors within the vessel. The device is an extremely simple one, inexpensive to make, and adding but slightly to the weight of the cover, and is so made that the latter can at any time be readily cleansed.

This invention has been patented by Mr. Agur Judson, of 111 Commerce Street, Newark, N. J.

WITH most people, says a sensible writer, the want of a well defined system or method is one of the chief causes of their getting behindhand with their work. A systematic method of working, combined with industry, will complete a vast amount of work in a day and finish it with ease; but without system and application, the worker may be in a continual rush, and yet accomplish little.

Sale of the Great Eastern.

The Great Eastern, the largest steamship in the world, was recently sold at public auction in London for £26,200. The career of the rival of Noah's Ark has been very checkered. Her construction began May 1, 1854, and the work of launching her, which lasted from Nov. 3, 1857, to Jan. 31, 1858, cost alone £60,000, hydraulic pressure being employed. Her extreme length is 680 feet; breadth, 82½ feet, and including paddle boxes, 118 feet; height, 58 feet, or 70 feet to the top of bulwarks. She is provided with eight engines, capable of actual work of 11,000 horse power, and has in addition twenty auxiliary engines. She was sold in 1864 for £25,000, and was successfully employed in laying several ocean cables.

On Tidal Theory and Tidal Predictions.

In a paper reprinted from the *Journal of the Franklin Institute*, Mr. E. A. Gieseler, the Superintendent of Construction, Fourth Lighthouse District, has presented a clear mathematical view of the agencies which influence the tides and the local conditions which must have place in tidal predictions. It is now so generally acknowledged that the tides are caused by the difference in the attractions of the sun and moon on those parts of the earth nearest to them, and on their antipodes, that any detail statements concerning the main theory seem entirely superfluous; since, however, the heavenly conditions causing the tides are by no means simple or uniform, but are subject to constant changes, it becomes a matter of some interest to investigate the causes of those variations, and to learn their quantitative effect.

The first cause which suggests itself is the changes in the distance of sun and moon from the earth. The moon's orbit is an ellipse, the earth being at one focus, and during her revolution, therefore, she constantly changes her distance from the earth. This cycle of change, represented by one lunar revolution, occupies a little over twenty-seven days, during which time the moon passes from her greatest distance to her smallest distance, and back again to her greatest distance. In addition to this disturbing influence, the axes of the moon's orbit are not constant, owing to solar attraction, but vary in a period of about nine years.

With the sun the case is reversed, for here it is the earth which changes her distance during her elliptical revolution about the sun, and passes from her least distance in winter to her greatest distance in summer, and back again to her summer position in the period of one year. Another series of variations is due to the relative meridional position of sun and moon; for if both bodies culminate simultaneously to-day, the motion of the moon will carry her 12° east of the sun by to-morrow, and she will consequently culminate 49 minutes after him. A day later, and the distance and time will be doubled, until, after 14¾ days from conjunction, she is 12 hours behind the sun, or in opposition. At the end of about 29½ days, both heavenly bodies once more culminate simultaneously. This period between two successive conjunctions, which is called the synodic month, differs from the moon's sidereal revolution by 2¼ days.

The changes in the declination of the sun and moon offer still another factor in this complicated chain of causation. As the plane of the earth's equator forms an angle of 23° 28′ with the plane of her orbit, or the ecliptic, the sun reaches this declination twice a year, at the summer and winter solstices, while the points of intersection of these great circles give the two periods of no declination, the vernal and autumnal equinoxes. The moon's orbit lies in still a different plane, inclined at an angle of about 5° to the ecliptic. Her declination, accordingly, varies in a period of about 19 years from 18° to 29°, according to the position of the lunar nodes, which is not fixed, but revolves around the earth.

The synchronous influence of these three causes, the changes in the distance of sun and moon from the earth, the changes in their relative meridional position, and the changes in their declinations, furnishes the material for a complicated calculation; for the resulting curve which represents the actual tide is made up of constantly varying elements. When, in addition to these, the local conditions of prevailing winds and coast topography are also taken into consideration, the question of tidal prediction is seen to be a very intricate one. In the second part of his monograph, which relates to tidal prediction, Mr. Gieseler records his observations made at Cape Henlopen, and publishes the details of his system for general application.

A Horse with More Sense than a Man.

At the recent Horse Show, New York, during the exhibition of the jumpers, the horse of one of the gentleman riders leaped the 5 ft. 8 in. bar, but in coming down struck head first, made a complete somersault, and threw himself on the ground flat on his back; the rider, being pitched ahead, cleared the horse. Fortunately neither rider nor animal was seriously injured. After this most narrow escape the rider again mounted and endeavored to make the horse try the same jump again, but the creature showed more sense than the man by resolutely declining the dangerous job.