Science and Art.

Vaporgraphic Glasses.

An ingenious person may afford no end of amusement to himself and friends by the aid of a few dozen vaporgraphic glasses, on which are invisibly delineated a variety of questions and answers of an appropriate character, such as love questions, conundrums, &c. Real "dissolving" views may also be depicted on these glasses, possessing an interest according to their artistic value. Glass valentines may also be made in the same way, which may have invisibly impressed upon them any written theme, poetry, or initials—

Breathe on this glass, and you'll divine
The portrait of your Valentine.

These vaporgraphic glasses are very easily made, and at a cost not worth mentioning. When finished they have nothing peculiar in their appearance to indicate their latent graphic powers; hence, to a stranger to the mystery, they only appear like ordinary glass.—The secret is this:—Procure a few pieces of window glass, about the size of an ordinary playing card; then write or draw on them whatever may be thought proper with a quill pen that has been dipped in hydrofluoric acid, using this watery liquid just as you would ink. After the design has thus been depicted upon the glass for about two minutes, the glasses are to be washed in clean water, and polished with a silk handkerchief, or a dry soft cloth. The drawing or writing will now be perfectly invisible, but if breathed upon the pictures or letters become "as clear as noonday." The same effect is observed if the glasses be held over the steam of hot water; hence their name, *vapor*, or steam; *graphic*, relating to writing. Hydrofluoric acid, as it eats into glass, is sold in leaden bottles by the laboratorian chemists.

SEPTIMUS PIESSE.

Encroachments of the Ocean.

The New Jersey Geological Report shows that the Atlantic is steadily, and rather rapidly, encroaching upon the land on its coast.—At Cape Island the surf has eaten inwards full a mile since the Revolution. Along the Bay Shore in Cape May the marsh wears away at the rate of a rod in two years. One of the beaches upon the coast is mentioned as having moved inward one hundred yards in the last twenty years. It is also the opinion of the oldest observers that the tides rise higher upon the eastern New Jersey uplands than formerly. Prof. Cook, of the Geological Survey, is confident that the shore is now settling at the rate of about two feet in a hundred years. The sand beaches on the coast are drifting inward every year. Egg Island, the western point of Maurice River Cove, which in the year 1694, covered three hundred acres, now contains at low water from a half to three fourths of an acre, and at high water it is submerged.

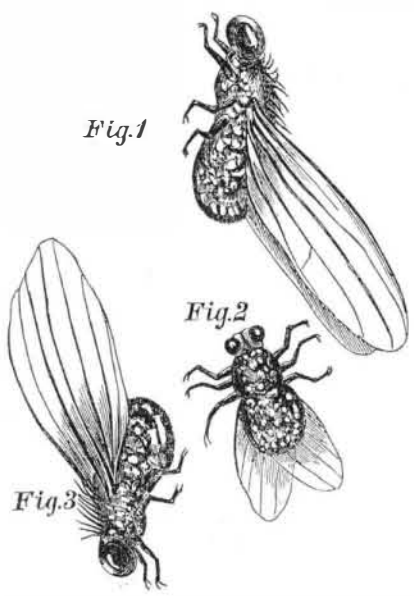
British Porcelain.

At a recent meeting of the Burslem School of Design, in Staffordshire, England, H. Minton made a speech, in which he stated that in the manufacture of china and earthenware England surpassed France, but great efforts were required to maintain their present position. It is a singular fact that the British porcelain manufacture may be said to be the product of one ingenious working man, and he lame and enfeebled—the well-known "Wedgewood," who, from a journeyman potter, elevated the porcelain manufactures of England from a rude to a most elegant art, was elected a member of the Royal Society, and died wealthy and in the esteem of his countrymen.

Tobacco Packed in Lead.

The *American Journal of Medical Science* calls attention to the evil of packing tobacco in lead. It states that recent researches establish the fact that the moisture of the tobacco oxydizes the lead, and produces a poisonous salt, and that from six to thirty grains of this salt has been found in half a pound of tobacco. We cannot credit this; and, besides, it is well known that very little tobacco is packed in lead. It is put up in foil made with lead and tin. A lead ingot is placed between two tin ones, and these are rolled out into foil. The tin is therefore always next to the tobacco, and the lead in the center.

The Cause of Cholera, and its Remedy.



When the Cholera first visited our country in 1832, it created universal fear, because the destroyer who struck down the old and young, the bold and strong, dealt his terrible blows suddenly and unseen, and could not be resisted. At that time many persons also feared that, like some modern fevers, cholera would never leave the country after having found a foot-hold in it. These fears have been confirmed by repeated outbreaks of this scourge since. It was believed by many, however, that even if this plague became a permanent disease among us, physicians would either discover a preventive for it, or else find such remedies as would, in a great measure nullify its fatal effects. But until the cause of this fatal disease is known, neither a sure remedy nor a certain preventive by any possibility can be discovered. To ascertain its cause, then, is the grand desideratum. Cholera has been attributed to various causes, and two theories have been put forth regarding it. One called the "geological theory," which assumes that it is connected with the geological character of a country, and the other called the "insect theory," which assumes that it is caused by small poisonous insects, inhaled during respiration, taken with food, or drank in water.—Our readers will remember that on page 30, this Vol. SCIENTIFIC AMERICAN, we presented a summary of the views of J. Franklin Reigart, Esq., on the insect theory of cholera, taken from his manuscript. He has just published those views in a neat pamphlet, which is now before us, in which he claims to be the discoverer of the cholera insect, three microscopical views of which are now given, and are here represented by figs. 1, 2 and 3. This insect is of a dull yellow color, and quite small, being only one-fortieth of an inch long, and the one-eighth of an inch across the spread wings. Mr. R. believes it to be not only the cause of cholera, but also yellow fever; and says, "the cause of these diseases being discovered, scientific men may be enabled to stay its ravages," (the insect's.)

We would like to see these insects tested upon some animals, in the same manner chemists test poisons, in order to witness their effects upon the animal economy. Until this is done, their poisonous nature, to which the cholera is attributed, may be disputed. The views of Mr. R., however, find support in an able article on the subject by Dr. Hartshorne, a contributor to the *Medical Examiner*, Philadelphia, who asserts that "cholera is generated only in the presence of a certain unknown contingent, whose capriciousness of migration, and partial subjection to temperature and other habitudes, suggest the probability of the animalcular hypothesis."

A short period after we published the views of Mr. Reigart, on the page referred to, we received a communication from John Lea, of Cincinnati, the author of the "geological theory of Cholera," his discovery dating as far back as 1832. He attributed the cause of cholera to lime water, which Mr. Reigart believes is an antidote. Their views are therefore antagonistic. He asserts that it has always been most virulent in the limestone districts, while it passes over the primitive formation of New England. He believes that rain water as a drink is a preventive, and that the inhabitants of every city supplied with rain water will never suffer from ita ravages. Dr. Hartshorne and Mr. Reigart believe that cholera is connected with the decay of organic matter, in which the poison is generated, and that by preventing such decomposition taking place in exposed places, the cause of this disease will be removed.

As the cholera in past years has visited a number of places in the south-west and west early in the spring season, the foregoing views should now claim the attention of persons living in those parts of our country. They should be very careful to bury underground organic matter left on its surface during cold weather, which is liable to undergo a rapid change when the warm season opens. They should also be very careful to use no impure water, for the purposes of cooking and drinking. Great good may result, and no harm can arise from following these precautionary measures.

The cholera has not been strictly confined to the limestone formations, nor have districts on the primitive formations been exempt from it; at least, this was the case in New York State during the year 1854. The experience of that year was not favorable to the "geological theory." The experiments of Dr. Thomson, of London, in St. Thomas' Hospital in 1854, seem to be in favor of the insect theory. He weighed a cubic foot of air in August, 1854, when the cholera was raging, and its gravity was 525·6 grains; the same quantity of air in August, 1855,—a healthy month—weighed 523·5 grains. Thus the air was heavier in London when the cholera prevailed, and this was also the case in other places; it also confirmed the experiments made in the cholera season of 1832 by Dr. Prout. Dr. Thomson then took a blower and forced a great quantity of air from a large room in the Hospital, filled with cholera patients, through Woolf's bottles, containing distilled water, so that he was able to retain matter suspended in the atmosphere, and then examine it. It was examined with a microscope, and found to contain fibres from the clothes of the cholera patients, hair, fungi, sporules of fungi, and an abundance of vibriones, or lower forms of animal life. When the same room was but partially filled with cholera patients the atmosphere was treated in the same manner; then the vibriones were very few; and when the room was empty no vibriones could be detected in the air. By applying the same means to force air from a neighboring sewer through distilled water, it was found to swarm with vibriones, in various stages of advancement. The following are Dr. Thomson's conclusions on the subject:—

"These experiments render it obvious that organic living bodies constantly surround us in close apartments. They fail to point out any matter capable of communicating cholera from one person to another through the medium of the air, (not infectious by the air,) and so far, are important to the public; but they show that foreign animal matter, injurious to health may speedily be concentrated in certain localities which will, undoubtedly, assist in the production and propagation of the disease, in conjunction with meteorological conditions."

A chemical examination of the atmosphere during epidemics, in many places, has failed to detect any cause of disease. The only proper method to examine the atmosphere is that pursued by Dr. Thomson. Our physicians would do well to follow up his investigations.

The Effects of Cold on Machinery.

The intense cold, this winter, has increased the working expenses of our railroads, for breakages, in a most extraordinary manner. It is well known that during frosty weather a thick bar of cast-iron can be broken with great ease, by a smart blow from a mallet; and the same can be done, but not so easily, with a bar of wrought iron. On this account, the locomotives on all our railroads have had a serious time of it, by breakages from frequent concussions while running. The machine shops at the stations have been working day and night. Pumps have been frozen and bursted, slide rods and connecting rods and axles broken, and wrought-iron tyres, three inches thick, of wheels, have snapped like rings of glass.

Philadelphia Locomotives.

The *Ledger* states that at the works of Baldwin, and those of Norris, Philadelphia, there are employed 1000 men who make on an average about 130 locomotives annually; the average weight of each being in the neighborhood of 23 tuns. The iron used in their manufacture will weigh between 3000 and 4000 tuns, the balance being of brass, copper, wood, &c. When orders are received for locomotives, a mechanical engineer prepares the drafts, and all parts to be forged are sent in a detailed form to the blacksmith shop, and the portions to be cast are given in charge of the molder. The entire force, consisting of boiler makers, blacksmiths, coppersmiths, machinists, pattern makers, molders, carpenters, &c., are set to work to finish the portion of the locomotive given to them in accordance with the plans of the designer and draftsman. When each part is completed, the finishers put them together, after which steam is placed in the boiler, and a trial takes place.

Brittle Annealed Iron.

We have received from A. Hotchkiss, of Schenevus, Otsego Co., N. Y., a piece of iron which is a curiosity. The piece is part of a quantity that was brought to that place for malleable iron from certain Malleable Iron Works in this State, and was found to be more brittle than common cast and gray iron. When a piece of it is struck with a hammer, it flies into numerous pieces like glass. This iron was heated with wood, and was also annealed, which makes its brittleness still more surprising. It has no fiber, but is crystaline, the crystals of the broken edges being long and and glassy, having the appearance of some galena that we have seen. How this iron is so crystalline, and consequently brittle, after undergoing processes designed for the very purpose of making it malleable and tough, is something we cannot explain. Who can?