Correspondence.

Gases as Germicides and Disinfectants.

To the Editor of the SCIENTIFIC AMERICAN:

In "Science Notes" of SCIENTIFIC AMERICAN for September 21 is a report of the observations of M. Pictet on the use of a mixture of sulphurous and carbonic acid gases as a disinfectant and an extract from Prof. D'Arsonval's report to the Société de Biologie on the great value as a germicide of this mixture, which he has named "Pictet's gas," and which he says forms a chemical combination.

For the past year I have been conducting a series of experiments with many different mixtures of CO_2 and SO_2, and also of different mixtures of carbonic and sulphurous acid gases, H_2CO_3 and H_2SO_3, under varying hygrometric conditions and of temperature and pressure. These experiments are as yet incomplete, owing to a lack of the necessary chemical and physical apparatus and pathogenic bacteria. As soon as the work is completed the results will be published. So far, I have come to the following conclusions:

1. That the gases are a simple mixture with their derivatives.

2. That in certain proportions the mixed gases have more penetrating power and quick germicidal action than either gas alone under any circumstances tried.

The gases act as germicides, and, therefore, as disinfectants:

1. By altering the specific gravity of the medium, i. e., air.

2. By absorbing moisture from the germ, or by entering in solution with it, forming H_2SO_3 and H_2CO_3, appropriating the hydrogen and liberating the oxygen to reunite or be nascent.

3. By the method of producing and mixing the gases evolving nascent oxygen and hydrogen in the process of disinfection and the liability of forming CS_2 and SH_2, and thus, perhaps, liberating H_2O_2.

4. Removing oxgen (i. e., air) from aerobic bacteria.

5. That the gas, or gases, act with more effectiveness when previously passed through water or moisture.

6. That the possibility of the nitrogen present entering the combination when chemical change takes place and aiding in the process must not be overlooked.

JOSEPH BUFORD GRAHAM, M.D.

Savannah Quarantine Station, September 24, 1895.

Some of the Uses of Shells.

Among the various contributions that nature makes to the wants of man, shells figure quite extensively. As vessels for food and drink and other domestic purposes, many species are very conveniently shaped. The valves of many species of clams are large and deep and available for cups and dishes, and as such have been used by the American Indians, who have also employed them as knives, scrapers and hoes. Shells of the genus Unio have always held an important place in the domestic and mechanical arts of the savages of North America. The valves of many varieties of these shells are well adapted to the use of man. Although not large enough for food vessels, they make very satisfactory spoons and cups; but it is probable that they were much more frequently used by the Indians as knives and scrapers. The very widely distributed Pectens, on account of their beauty of form and color, have been in great favor with all peoples. They were extensively employed by the ancient inhabitants of America as ornaments and rattles, and many specimens obtained from graves and mounds appear to have been used as utensils, paint cups and vessels for food and drink.

The Haliotis affords an excellent example of the varied uses to which the natural shell has been applied by savage peoples. Explorations of the burial places of the ancient tribes of the Pacific coast have brought to light numerous specimens of these shells, which had apparently served as bowls, dishes and spoons. This shell probably formed as important a factor in the commerce of these tribes as did the large conches of the Atlantic coast in that of the mound builders and their neighbors. The rougher and more homely oyster shell enjoyed the favor of the mound-building tribes, and probably served many useful purposes. Many species of the Fissurella and Dentatium shells were in common use, advantage being taken of the natural perforations for stringing, the latter being quite extensively used for money on the Pacific coast.

A great variety of the larger univalve sea shells have been used in the unaltered state, the Busycons probably taking the most important place, and species of the Strombus, the Cassis, the Nautilus, and Fasciolaria following in about the order named. The Busycon perversum has been more extensively employed than any other shell, and the uses to which it was put by the ancient Americans were numerous and varied. Fine specimens of vessels made of this shell are on exhibition in the National Museum at Washington. As domestic utensils, bivalve shells have held a place hardly inferior in importance to that of the large univalves. Marine and fluviatile varieties have been used indiscriminately, and generally in the natural state; but occasionally altered by art to enhance their beauty or add to their convenience. Such alteration consisted chiefly in the carving out of a kind of handle to form a spoon. It is a curious fact that most of such utensils that have been met with have been made from the left valve of the shell, which gives such a position to the handle that they were most conveniently used by the right hand, thus indicating right handedness on the part of their manufacturers and users.

According to Pictet, large shells called tritons were used in ancient times as vessels for offering libations with.

Rondelet, speaking of the Olearia, says that the goldsmiths make very elegant ewers of this shell by adding a foot and handle to it, and that some regard these vessels as a preservative against poisons.

In the cottages of Shetland, the Fusus antiquus is suspended horizontally and used as a lamp, the oil being placed in the cavity of the shell and the wick passing through the canal.

Patellæ, in the vicinity of Cancale, serve as an oil reservoir in small lamps called "crassets."

The common mussel and a few other shells are called artists' shells, from artists' colors being put in them.

Saint James shells, a species of Pecten, are frequently used in Brittany as milk ladles and drinking vessels.

According to Pliny, the round cockles were used for measuring oil.

In China, certain Tridacnæ are used as watering troughs for cattle, and some of the wealthy mandarins possess baths made of a species of this shell. A pair of valves of T. gigas, weighing upward of 500 pounds and measuring about two feet across, are used as holy water basins in the church of St. Sulpice, Paris. They were obtained from Francis I, to whom they had been sent by the Republic of Venice.

In several countries of the Indies the windows are glazed with transparent shells cut into squares. The species used for this purpose is Placuna vitrea, or "window shell." All the churches of Goa still have their windows glazed with this shell. De Guignes states that the same use of the Placuna is made in China.

We meet with numerous examples of the use of shells as instruments of war, hunting, labor, and construction. Drake tells us that some of the South American tribes had hatchets and knives made of shells that often reached a foot in length. These were carved and polished with art, and must have lasted a long time.

In New Caledonia, flat axes are made of shells of large size and round form.

The shells of the genus Tridacna are quite thick, but their edge is thin enough to allow the Polynesians to make picks, axes, and other instruments of the kind out of them. The Indians of Florida made their tomahawks out of the shell of Busycon perversum.

Among the Fuegians, the only native tool is a large shell of a sea mussel, carved and sharpened and firmly affixed by a seal skin strap to a stone designed to be held in the hand.

The Indians of Vancouver's Island still carve their wooden sepulchral images with knives made of shells.

Celts made of Strombus and Busycon shells have been found in various parts of America. These are polished like the similar instruments made of stone. These implements are frequently mentioned by early writers. Wood, speaking of the Indians of New England, says that their canoes were made of pine trees, which, before they were acquainted with English tools, they burned hollow and scraped smooth with clam and oyster shells. The great majority of scraping implements obtained from the mounds, graves, and shell heaps of the Indians are simply valves of Unio or clam shells, unaltered except by use.

The first explorers of the Atlantic coast found many of the tribes tilling the soil with unworked shells lashed to rude handles, the shell most frequently used being that of the clam.

The use of shell in the manufacture of fishing implements seems to have been almost unknown on the Atlantic coast, but hooks of shell are very plentiful in the burial places of the Pacific coast, and are frequently so well shaped as to excite admiration.

Among the Caradjis of Australia, and several other peoples, a sharp shell is used for tattooing.

The Indian chief Powhatan tortured his enemies with the shell of a mollusk, and his wives made use of the same kind of implement for cutting their hair.

The Indians of Florida used the shell of the Busycon as a club head in the manufacture of their casse-tetes.

A rather novel use of shells by the Indians is mentioned by early writers. The two valves of the small mussels or clams were made to do service as tweezers for pulling out hair.

The spiral column of certain univalve shells was used by the Indians for making pins. Some of these were pointed at both ends, while others had heads like the pins of civilized people. The exact uses to which these objects were applied are unknown. The favorite idea of archæologists seems to be that they were hairpins, used by the savages to dress and ornament their hair.

Shells were largely used by the American Indians for the manufacture of articles of personal adornment, such as beads and gorgets, and for money.

The Friendly Islander wears the orange cowry as a mark of chieftainship. Another cowry is used by the Asiatic islanders to adorn their dress, to weight their fishing nets, and as a medium for barter. The New Zealander polishes the Elenchus into an ornament more brilliant than the pearl eardrops of classical or modern times.

Shells, especially of the large species of Buccinum, have been quite frequently used as musical or calling instruments. In antiquity, the name of the war trumpet was that of the Buccinum, which had been used from the remotest times.

The Polynesians use a sort of marine trumpet made of the shell of a huge mussel.

The Corsican mountaineers, in their wars with the Genevese, used a marine shell as a horn. On all the islands of the Pacific the Triton is the conch blown as the signal of war. The lambis, a sort of large snail of the American sea, serves as a hunting horn to several savage nations.

Throughout Provence, principally during harvest time, horns made of Buccinum undatum are used for calling the laborers to work and also for corresponding to great distances by means of sounds previously agreed upon. Upon the seacoast of Upper Brittany large whelk shells are used for the same purpose.

Shells were among the number of musical instruments of the Peruvians. They were also used by the Mexican priests in their religious ceremonies.

The chank shell (Turbinella pyrum) is carved by the Cingalese, and several varieties of it, from which the priests administer medicine, are held sacred.

The valves of Anodonta cecula are used as skimmers in Brazil, and the shells of an Ampullaria serve to dip up caoutchouc gum.

The mussel shell has a few applications. When polished, it is made into needle books, scent bottle holders, earrings, pincushions, etc.

Some of the cockle shells are made into pincushions, and the shell-flower maker uses them to form the hop and other imitations. Common, cheap pincushions are made of the whelk and many other shells.

Large quantities of small shells enter into trade use for making shell flowers and different articles of shellwork.

The shells chiefly used for imitation flowers are parts of the valves of barnacles, Dentalium, Oliva, Morginella, Strigella, Pholas, Cardium, etc.

Of late, among the curious uses to which the Turbo and some other shells have been put in Europe is for pipe bowls.

The shell of a species of Mitra is used for the same purpose by the inhabitants of the Banshee group.

The shell of the pearly nautilus is made into a drinking cup by the inhabitants of the East, and that of the N. pompilius is often mounted on a stand in Europe and used for holding flowers.

The shell of an Anodonta is used for the bridge of musical instruments by the Mittoo tribe in Africa, and round fragments of the shell are used by them for gambling purposes.

In Japan, the ladies play a game with the valves of shells with designs painted upon them.

The "green snail" of the dealers (Turbo olearius) is very largely used for ornamental purposes. Slices of the shell ground down to a thin surface are employed for inlaying various articles. Buttons, earrings, and other objects are made of it, and also very pretty ornamental stands that open with a spring and inclose scent bottles, etc. Of late years handsome sections obtained from this shell have been largely used for ornamental buckles for hats, shoes, and belts.

Fine, large shells of this species formed the drinking goblets of the Scandinavian monarchs, and are often still met with, very elegantly mounted and set in jewels.

Another shell of this genus, the Turk's cap, from the west coast of Africa, is used for making small articles, such as caskets, scent bottle holders, brooches, etc.

Invention of the Electro-magnetic Telegraph.

An interesting series of papers upon the history of the telegraph, by Mr. A. M. Tanner, published in the Electrical World, concludes as follows: "As early as the year 1837 the French Academy of Sciences had a permanent commission on electric telegraphs, composed of Arago, Becquerel and Savary. None of these distinguished savants ever questioned the claim of Morse to being the inventor of the electro-magnetic telegraph, and whatever may be said as to the date when the alphabetical code was first thought of, it is clear that there is no published nor acceptable proof that any one but Morse invented it. An unbiased or impartial opinion based on proof is that the essential features of the modern electro-magnetic telegraph—viz, the electro-magnet, the armature with its retracting spring, transmitting signals by a finger key, and reading them by sound—were invented or proposed by Morse in the year 1838, and made known to the public at that time. Therefore, let Morse forever be considered the father of the electro-magnetic telegraph."