Correspondence.

Alcohol vs. Snake Poison.

To the Editor of the Scientific American:

The extract quoted in your issue of November 10, from the paper of Dr. Hudson on this subject, is liable to mislead those who may be called on to treat snake bite; and as the SCIENTIFIC AMERICAN falls into the hands of thousands of people, any statement in it is apt to be of more interest to them than if it were noted in a medical journal, whose readers are mainly professional, and who are not so easily misled as the general public by erroneous reasoning. An experience with twenty-three cases of snake bite in rattlesnake (*Crotalus horridus*) and eight of water moccasin (*Toxicophis piscivorous*), with the study of many instances reported to me by capable physicians, leads me to believe that alcohol *is* the antidote to snake venom, *and the only reliable one.* Laboratory experiments upon the lower animals are of no real value in therapeutics as applicable to man, and those referred to by Dr. Hudson were fallacious in themselves. The admixture of a few drops of alcohol or any other supposed antidote with snake virus is misleading, for the quantity of the antidote is infinitesimal as compared with the concentrated and deadly animal poison. To illustrate, a private in the Second U. S. infantry was bitten by a cotton mouth (moccasin), and within less than four hours he swallowed under my direction three quarts and a little over of good apple jack without any symptoms of intoxication until after the last three ounces, and then only slightly. His pulse and respiration failed promptly unless he was thus stimulated for nearly the whole time. Now, knowing that the snake venom is a powerful cardiac and nervous depressant, is it not reasonable to say that the enormous stimulation was borne only because of the persistent reduction of vitality by the virus injected by the reptile? Where would a few drops of alcohol be in such a case? I have seen and examined the body of a child killed in fifteen minutes by a rattlesnake where the temporal vein received the poison. She had no treatment. Ammonia is too fugacious, bromine and permanganate are useless locally or internally, so also is the reputed cure-all wild violet (*V. sagitatta*). The majority of presumed deadly bites are given by non-venomous reptiles, and the escape of the snake or the loss of presence of mind on the part of the person bitten leads to mistakes; but in *bona-fide* venomous bites, alcohol in some form is an absolute antidote when promptly and freely used. The failure of the pulse is the guide, and as the poison is rapidly absorbed, all ligatures, excisions, and cauterizations are simply useless and aggravating. Intoxication is not desirable, but stimulation should be evident to avert sudden heart failure, and I may say in this connection that in two instances the subcutaneous injection of atropia was markedly serviceable in maintaining respiration.

My cases occurred during my army life, between 1861 and 1872, and in the States of Alabama, Georgia, Tennessee, and Virginia, two during the war and the rest after that eventful period.

W. R. D. BLACKWOOD, M.D.

Philadelphia, Pa.

Capacity of Cylindrical Cisterns.

The *Sanitary News* gives the following table showing the capacity in gallons for each foot in depth of cylindrical cisterns of any diameter:

Diameter.	Gallons.	Diameter.	Gallons.
25 feet.	3,059	7 feet.	239
20 "	1,958	6½ "	206
15 "	1,101	6 "	176
14 "	959	5 "	122
13 "	827	4½ "	99
12 "	705	4 "	78
11 "	592	3 "	44
10 "	489	2½ "	30
9 "	396	2 "	19
8 "	313		

A Test for Saccharine.

In a recent number of the *Chemical News*, Mr. D. Lindo described the following test for saccharine. After placing the saccharine with concentrated nitric acid in a small porcelain dish, evaporate to dryness on the water bath, or by moving the flame of a spirit lamp to and fro under the dish; blowing on the surface occasionally to facilitate evaporation, and taking care that the heat does not rise too high. If the dish is not allowed to cool, and a few drops of strong solution of potash in 50 per cent alcohol are added to the residue, a faint yellow color only will be developed. Spread the liquor over the surface of the dish; and before it has settled to the bottom apply heat with the lamp, as above, quickly all over the under surface of the dish. If the vapor of alcohol happens to ignite, it must be at once extinguished. A great variety of colors will be developed in this way. As the dish cools and moisture is absorbed, the colors fade. By heating they can be reproduced, though not in the same perfection as at first.

PHOTOGRAPHIC NOTES.

Mounting and Finishing Silver Prints.—Probably the best means of insuring the minimum of cockling with a prevention of the expansion (more in one direction than in another) of the print which occurs when it is mounted wet, is to give the backs of the prints a good coating of starch while wet; then allow them to become dry, and, after a final trimming, lay them down upon the mounts, which have been previously moistened by passing a wet sponge over them, and then running each in succession through a rolling press, by which the adhesion is made perfect.

The burnishing of prints seems a *bete noir* to some, but it is a very simple operation. The print, after being quite dry, is rubbed over with a lubricant composed of three grains of Castile soap dissolved in an ounce of alcohol. This is applied by a pad of cotton wool or by flannel. The best results are obtained by allowing an interval of some hours to intervene between the lubricating and the burnishing. A high polish will not be obtained unless the burnisher has been well heated, for it is the heat and friction combined that cause the polish. The photograph must be passed quite through without any stoppage, even of the most temporary nature, which would insure a mark. To secure the best effect, the print must be passed over the burnisher several times.

Since the introduction of burnishing, the application of encaustic paste to prints, especially those of small dimensions, has fallen much into disuse. But there is no doubt that such paste confers greater brilliance upon prints, more especially on such as are made on somewhat lightly albumenized paper, rendering visible some details which otherwise would not be seen. The practice of waxing the surface of prints is one of a respectable antiquity; we know, at any rate, that for several years anterior to a quarter of a century ago it was adopted regularly in some establishments, *e. g.*, in that of Thurston Thompson, the photographer to South Kensington Museum, not one print in which collection but what underwent the treatment with encaustic paste. The mode of proceeding was as follows: Equal parts, say one ounce each, of white wax and spirits of turpentine were mixed by heat in an earthenware vessel. A portion of this was applied by a clean rag to the surface of the print, which was then subjected to friction by a brush similar to that employed for brushing clothes, until the surface was quite uniform. In the practice of others subsequently the turpentine was displaced in favor of other solvents, such as oil of lavender. The fine surface finish of the portraits of the late Adam Salomon, of Paris, was due to the application of encaustic paste.

A surface finish of a different nature is imparted by the adoption of enameling, so called. By this means the very highest degree of finish capable of being attained is placed within easy access of every photographer. The operation is easy in the extreme. The first thing to do is to select one or more smooth plates of glass without surface defects. No pains must be spared in making one surface of this quite clean. It is then to be dusted over with powdered French chalk, which must be well rubbed over every portion and all superfluous particles wiped or brushed off. It is now coated with plain collodion containing a modicum of castor oil to impart toughness. Enameling collodion, as it is designated, is an article of commerce, and can be purchased cheaper than it can be made. Plates thus prepared may be stored away until wanted for use.

An ounce of gelatine having been dissolved in eight ounces of water, the prints are immersed in this for about a minute and then transferred to the collodionized glass, which has previously been made slightly warm. Examine the print by looking through the glass, and ascertain that there are no air bubbles. Allow the whole to become dry, which takes about a day, then run the point of a small knife around the margin, raise up one corner, and strip the print from the glass.

Almost every operator has his own special way of carrying out details. For example, some apply a layer of gelatine to the collodionized glass, and, allowing it to set until it becomes tacky, they then immerse the prints in plain water, and while wet lay them down upon the gelatined glass. Others coat both glass and print with gelatine, and superpose one on the other just before the surface is set. If air bubbles are observed, they are rubbed out by pressure with the finger; but if the print is removed from the water in a dripping state, and placed upon the glass first at one end and gently laid down in a curve, none will be produced.

The mounting of *glace* or enameled prints is, in our estimation, most conveniently effected in this way: After the print has been on the glass for half an hour, take two thin Bristol boards, and having previously soaked them in the gelatine, place them, one at a time, down upon the print, and allow to dry for twenty-four hours before stripping. If the ordinary card mounts are to be employed, they must be well sponged with the gelatine before application to the print, and pressure applied to the back to insure contact until the adhesion is perfect. It is, of course, well understood that the prints must in this latter case have been properly trimmed previous to the application of the mounts.

These remarks would scarcely be complete were we to omit mention of the mounting of prints in optical contact with glass, notwithstanding that we have so often written about it.

The glass ought to be of as colorless a sample as possible, and made scrupulously clean. The print is first soaked in plain cold water and then blotted off. In a flat dish have a solution in the proportion of two ounces of Nelson's No. 2 soluble, or any other good soluble gelatine, to the pint of water, and soak the print in this. Then, having first placed the glass in warm water—say 115° Fahr.—lift up the print by both ends and lay it down with a slight curl upon the glass. Some place the glass in the bottom of the tray containing the gelatine, and thus insure contact without the possibility of any air bubbles forming. We have seen quite successful results obtained even more simply—a pool of gelatine being poured on the center of the plate and a wet print laid down upon it, so as to force the superfluous gelatine to flow to the margins.

Photography on Wood.—The *Revue Photographique* gives the following directions for photographing upon wood. Measure out:

Gelatine	8 grammes.
White soap	8 "
Water	500 c. c.

The gelatine is allowed to swell, is dissolved in the water bath, and the soap is added to it gradually, stirring all the time. The mixture is then filtered through muslin. A little zinc white is added to it, and it is then rubbed well into the wood to be used, and then left to dry. The film should be as thin and equal as possible. A coating of the following solution is then applied to the wood by means of a broad brush:

Albumen	30 grammes.
Chloride of ammonia	1·2 "
Citric acid	0·2 "
Water	24 c. c.

Whip the albumen to a froth, let it settle, and then add (in order) the water, the chloride of ammonia, and the citric acid. When dry, this film is sensitized by pouring on it a little of the following solution, and spreading it with a glass rod:

Nitrate of silver	3·2 grammes.
Water	31 c. c.

Pour off any excess of the sensitizer and allow it to dry again. Print as usual. It is not necessary to over-print. When sufficiently exposed, hold the printed surface of the wooden block for three minutes in a weak solution of salt; in this the print will become slightly paler. Wash under the water tap, and fix for four or five minutes in a concentrated solution of hyposulphite of soda. Wash again for ten minutes under the water tap and dry.—*Br. Jour. of Photo.*

A Novel Scheme for Harbor Defense.

According to a recent report in some of the Philadelphia newspapers, a large company, backed by millions of dollars, has proposed to the Secretary of the Navy a striking and possibly effective scheme for the defense of that harbor and the harbors of other cities from the attacks of an enemy's fleet by shooting ignited petroleum at the unfriendly ships from the bottom of the river and burning them up. The Rear-Admiral has been directed to study closely the harbor of Philadelphia and its approaches. The petroleum defense scheme, the originators of which have induced the government to make this preliminary examination of the Philadelphia harbor, is a brilliant one in more respects than one. A company has been organized at Washington to develop the plan and to show its practicability.

It is proposed to sink perforated iron pipes in the river bed and the approaches to the harbor, through which petroleum can be forced to the surface of the river by machinery and at a high pressure. In this way a fierce stream of blazing oil can be sent down on the enemy's fleet to destroy it or drive it away. It is claimed by the projectors that a flame can be produced in this way as high as a ship's mast, and sent with terrific force on the attacking vessels many miles from the point where the oil is supplied to the system of submerged pipes. Iron vessels could not pass through this lake of fire, because it could be made to extend many miles along the river. A experiment in connection with the scheme will be made at Fort Mifflin in a few weeks. The necessary apparatus is almost ready at the present moment, and great things are expected from this test.

THE first of a fleet of electrical power boats, destined for public use on the River Thames, London, was launched from a yard at Chiswick a few days since. The boat is intended to carry eighty passengers; her length is 65½ feet, beam 10 feet, displacement 12½ tons, and speed, with the conservancy regulation, six miles an hour. The machinery and storage cells are placed below deck. The boat carries 200 E. P. S. accumulators, and two 7½ horse power motors drive twin three-bladed propellers.

Port Arthur.

Mr. H. E. M. James says: Hunchun and the northern garrisons of China are all of small importance when compared with the great military and naval station of Port Arthur, situated at the extreme south of the province of Manchuria. This place has been established to oppose, not one European nation in particular, but all, and it may be said to represent the net outcome of the recent efforts the Chinese have made to adopt European methods and appliances of war and to imitate their system of defense. It is here that the Chinese government consider they have created a first line of defense against the powers of the West, and it must be admitted that a naturally favored position has been rendered the most formidable military station in the empire by the efforts they and their European advisers have bestowed upon it. Mr. James writes:

The hills to seaward are crowned with a series of forts, thirteen in number, armed with very powerful Krupp guns, and manned by artillerymen, who are drilled and instructed by . . . . a German officer. The garrison consists of 7,000 foreign drilled troops, armed with the Mauser rifle, and there are field batteries besides. During the war with the French 25,000 men are said to have been massed at this place, which is in communication by telegraph with Newchwang and Pekin. The hills on the landward side, which have not yet been fortified, are covered with barracks, magazines, and other offices, all connected by telephones, and on the far side of all lies the native bazar. A graving dock and a refuge dock are now under construction, at an estimated cost of £250,000 sterling. On the eminence overlooking the entrance of the port an electrical search apparatus is mounted to illuminate the sea and prevent an enemy approaching under cover of darkness. There are factories for submarine mines and torpedoes, with a supply of torpedoes in stock; in fact, Port Arthur is like a good suburban villa—fitted with the latest modern improvements.

Gas Works in a Cold Climate.

In the discussion of a paper read before the recent meeting of the American Gas Light Association, Mr. J. F. Scriver said: I happen to be one of the unfortunate fellows who live in a cold country—Montreal. I do not know that we get down to 36° below zero there, but we very often have it at zero, which is quite cold enough to be comfortable. We have a great deal of trouble, as you have heard, from the extremely cold weather of our northern climate.

The greatest trouble which we experience is the trouble with capital. We require at least double the capital to construct gas works in Montreal, Quebec, or Halifax that you need in New York, Brooklyn, Washington, or any point about there. We have to put our pipes down to a very great depth in the ground. We lay our pipes with a covering of at least 5 feet. We find that it is not safe to have them any nearer the surface than that. We have to construct over all our machinery very expensive buildings. I wish that we could run our gas holders in the open air, as they are represented in the pictures which are exhibited here. But we cannot do that, and we have to put up very expensive buildings, with costly iron roofs over them. We have to cover in our purifiers and condensers, and all the machinery that we have has to be thoroughly housed. We have not only to keep them covered with buildings, but we have also the additional expense of keeping them warm and keeping everything from freezing. It would not do for us to allow the gas holder to freeze, and, therefore, we have to keep an immense space heated. With regard to the freezing of pipes, I may state that in Montreal we have on more than one occasion found our pipes frozen solid for at least 100 feet. Then with the temperature below zero, we have to open the ground, expose the pipes, and thaw them out, and the only way to get the frost out of the pipes under such circumstances is to build coke fires upon them, and it is rather a strange sight in the middle of winter to see about 100 feet of ground open, filled with hot coke, burning away night and day for three or four days, until the frost is removed.

Another difficulty with which we have to contend is that bugbear naphthaline. The cold weather makes naphthaline very readily. Our greatest difficulty, however, is not in the extremely cold weather, but when the winter sets in. We are not troubled with it very much about our works, but outside of the works for a distance of half a mile is where we get the most. We do manage to keep the naphthaline out of our works, but when it travels from cold pipes to pipes that perhaps lie in low damp ground, the naphthaline accumulates to a large extent, although I am happy to say it has not troubled us to the extent that it seems to trouble people in Hamilton at the present time.

Another additional expense (and I refer to it because it requires additional capital) is the furnishing of buildings for the storage of our coals. Our American brethren get their supplies of coals in daily, I presume, as they want them, but in Montreal we have to store 35,000 or 40,000 tons of coals for our winter's supply. Therefore we have to purchase a great deal of ground on which to erect our shed. We do not pile our coals high in Montreal. We find that we cannot pile our coals more than 6 feet or 7 feet high. We build our sheds with open sides and with the roof sustained by iron columns, so as to allow a free circulation of air, and you can readily understand that it requires a great deal of ground to pile up to a height of 6 feet or 7 feet 40,000 tons of coals. This is absolutely necessary with us, because we have not railroad communication with the mines, and have to lay in a sufficient supply in the summer season.

IMPROVED FLOATING SCOURING DAM.

This apparatus was devised by Mr. John Kingston, for clearing away silt deposits from rivers by the action of the current intensified and directed upon the bottom by the obstruction of the dam.

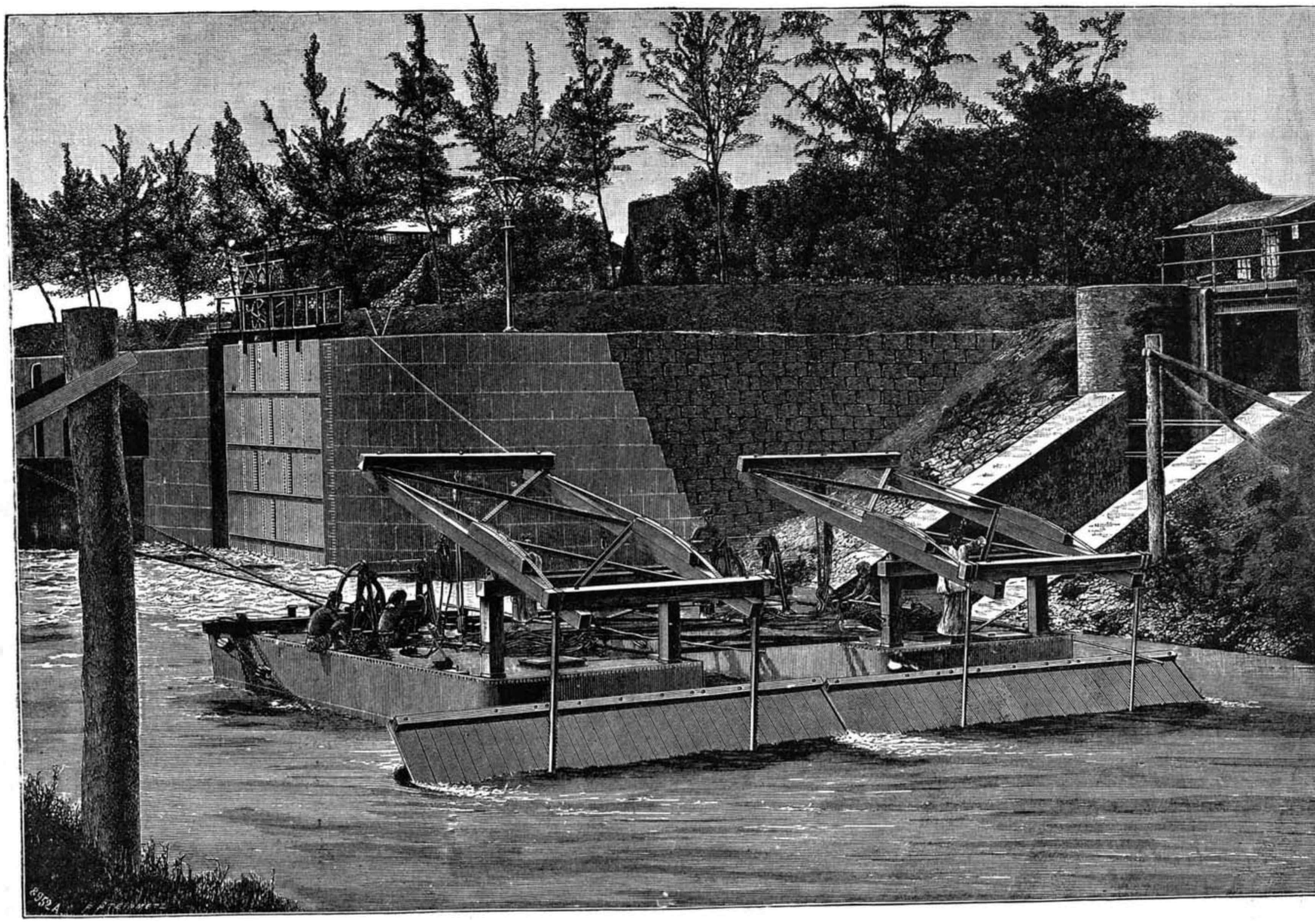
Mr. James Henry Apjohn, a canal engineer in India, has applied the apparatus for keeping clear of silt the channels 200 feet to 300 feet in length between the canal locks and the tidal rivers with which they connect.

The water of these rivers is for the most part very full of silt, which rapidly deposits in the back water of the lock channel, and to such an extent does this silting up in many instances take place, that the bed of the channel is often as much as 8 feet to 10 feet above the lower sill of the lock, which consequently can only be entered by boats at or about high water. There is generally plenty of water for scouring purposes available from the canals, but merely letting it run out through the silted-up channel during the time of low water was found to have but little effect until Mr. Kingston's scouring dam was brought into use.

These dams are now in operation on the Orissa coast canals and the Calcutta circular canal. We give illustrations and the following particulars from *Engineering:*

The apparatus consists of an iron boat carrying a dam or shutter (19 feet wide and 8 feet high) over the stern, capable of being raised and lowered by a rocking beam to which it is suspended. When it is desired to scour out the channel, this shutter is let down in the water, until the lower edge is close to the bottom, and it is held there by chains in a position inclined to the current. The boat being secured by warps, the water is let out through the lock valves, and being obstructed by the shutter, it heads up and escapes with increased velocity underneath and on either side of it, and it is practically found that the silt is rapidly cut away and carried into the river. As the bottom is scoured away the warps are slackened out until the whole channel has been swept clean through to the river.

An improved shutter was provided with tines or teeth on its lower edge, which in case of an exceptionally hard bottom are forced into it by letting down the shutter vertically when the lock valves are closed,



IMPROVED FLOATING SCOURING DAM.