Correspondence.

Fatal Cases of Rattlesnake Poisoning—Antidotes for the Venom.

To the Editor of the SCIENTIFIC AMERICAN:

In June, 1891, the writer recorded in these columns a death resulting from the bite of the little coral snake of Florida (Elaps fulvius), often regarded even by some scientists as harmless to man. The article attracted wide attention, owing to the fact that it was one of the first authentic cases of the kind ever published.

During nearly fifteen years' residence in Florida, I never heard of but this one death resulting from the bite of a venomous serpent, although three other poisonous snakes are quite common within the limits of that State. These are the great diamond rattlesnake (Crotalus adamanteus), the little ground rattlesnake (Candisona miliaria), and the water moccasin (Ancistrodon piscivorus). It may be added that the copperhead (Ancistrodon contortrix) has been found in the northern part of the State, but its common habitat is farther north.

A few weeks since, however, I received reliable information of two fatal cases of rattlesnake poisoning in Florida. One was the little daughter of James Morgan, a resident of Fort Drum, who received the venom of a rattlesnake and died within two hours afterward. The other was that of a young man, Edwin Hall by name, who was bitten by a large rattlesnake while surveying near Punta Gorda. The reptile buried its fangs into the young man's leg before he was even aware of its presence. The victim was so panicstricken at this sudden attack that he ran at the top of his speed from his companions, thus actually assisting the poison to circulate more rapidly throughout his system. He was finally overtaken, however, when a shoestring was tied tightly around his leg above the wound. None of the usual remedies could be found among the few settlers nearby and the man was taken to his home at Punta Gorda. His leg swelled and he suffered greatly with pain in that member. On reaching home, a physician was immediately summoned, who administered remedies both externally and internally. But the deadly virus had gained the ascendency, and the victim finally died in great agony the same evening—about nine hours after the accident.

Had the deceased been in the habit of carrying a small vial of permanganate of potash about his person when on his trips in the woods, and had he retained the presence of mind to use it immediately after receiving the bite, no serious results would have followed.

Persons who live in sections where venomous serpents are liable to be encountered should always carry this antidote. To use it, the wound should first be enlarged and then saturated with the drug, after having first tied a shoestring, suspender or like ligature around the limb—for the leg or arm is usually the point attacked.

Speaking of antidotes for snake poison, Dr. Thomas R. Fraser, of the University of Edinburgh, Scotland, has recently made public what he calls "an absolute antidote for the bite of the most deadly serpent." Continuing, he says: "I have also found that the substance from which the antidote is secured is strongest and best in the serpent whose bite is the most deadly." Briefly stated, this new antidote is the bile or secretion of the gall bladder. In its crude form, the bile is only administered directly to the wound or by the stomach. But the antidotal constituent of the bile is said to be the most effective when it is separated from the remainder of the substance found in a serpent's gall bladder, and injected beneath the skin. Dr. Fraser says the bile of any serpent is an antidote for the bite of a venomous species. This seems very reasonable, for, as has long been known to scientists, the venom of poisonous snakes has no ill effects when introduced—by accident or otherwise—into either their own circulation or that of the harmless kinds, common belief to the contrary notwithstanding.

Washington, D. C. CHARLES H. COE.

United States Machinery and Tools in Germany.

Consul Crane sends from Hanover, Germany, under date of September 17, 1897, a report which will be published in Commercial Regulations, 1896-97. An extract therefrom of current interest is as follows:

The principal enterprise now on foot in the department of transportation is the extension of the net of electric lines far out of the city, to Hildesheim, fourteen miles away, and the engraftment thereupon of not only a light, but also a heavy, freight traffic. It would not be surprising should wide awake representatives of United States firms interested in such constructions find that there are devices at their command which the Germans would be glad to adopt.

In this connection, it may be remarked that the frequency of railway disasters in this country of late has awakened public attention to a degree that might be suggestive to some of our United States inventors and manufacturers of railway appliances. In an incident of this kind that occurred near here but a few weeks ago, one of unusual severity in its consequences, it was frankly admitted that had not the American air brake operated perfectly, the loss of life must have been much greater. To take advantage of such a hint as this, the parties interested must be on the ground, and for a long time, too, in order to make investigations on their own account and in their own way, as opposed to the manner in which official investigations are conducted.

Miscellaneous Notes and Receipts.

Causes of Spontaneous Combustion of Oils.—In connection with the experiments instituted by R. Kissling, as regards the increase of temperature caused by impregnation of fibrous or porous stuffs with linseed oil, the author states the results of his researches. In accordance with former observations, a maximum of weight by absorption of oxygen in the case of raw and boiled linseed oil only appears after several days, while with oils treated with metallic oxides this is the case already after twenty hours, old linseed oil showing one of 15-16 per cent, young products up to 19 per cent at most. The spontaneous combustion is well exemplified by the following experiment: A piece of wadding which had been used for the filtration of oils, that contained, besides copal, resin and turpentine oil, chiefly linseed oil boiled with metallic oxides, was laid in a place exposed to the wind, so as to prevent a supply of heat from outside. A thermometer stuck into it soon showed 60°, then 138°, inside of 45 minutes it had reached 275°, and suddenly rose above 300° (C.?) On folding the wadding apart, the interior was found to be strongly charred, and in the charred places glimmering was at once perceptible, which passed into ignition upon admission of a draught of air. According to the explanation of the author, an autoxidation was made possible in consequence of the presence of metallic compounds and the previous heating. Owing to the poor conduction of heat, the heat was held together and through decomposition of organic substances carbon was liberated, which took fire through a supply of air. Further experiments demonstrated that ignition is only possible if the separated carbon comes into contact with a sufficient volume of air.—W. Lippert, Zeitschrift für Angewandte Chemie.

A Peculiar Fabric, which may find a use for many purposes, is made in Brussels. It is flexible, transparent and impervious to water. This textile material can be washed off with cold water, like a glass pane, by means of a sponge, and is mainly to be used for portieres, window shades, umbrellas, etc. The patented process for the production of this tissue consists in filling the meshes of a wide-meshed fabric, such as muslin, with chrome gelatine or with a similar material and then rendering the chrome gelatine insoluble by exposure to light. The fabric is then coated on both sides with boiled linseed oil or fat varnish; the treatment with chrome gelatine and linseed oil is repeated several times and the fabric is ornamented by printing.

Polish for Machines.—Mix intimately 10 parts oil of turpentine, 20 parts stearine oil and about 30 parts of the finest blood coal. This mixture is strongly diluted with spirit and spread with a brush on the machine parts to be cleaned. When the alcohol has evaporated, the coating is rubbed with dry blood coal and rouge, crocus or any other suitable polishing medium. The remedy is said to have been found valuable.

Indelible Ink without Silver Nitrate.—Griud 1¾ grammes of aniline black well with 60 drops of strong hydrochloric acid, and 42 to 43 grammes of alcohol. The liquid thus obtained is diluted with a hot solution of 2½ grammes of gum arabic in 170 grammes of water.

Tortoise Shell Imitation for Inlaid Work.—Technically, the process of imitating tortoise shell is quite simple, but to produce charming patterns a certain amount of skill is necessary. A light gelatine solution is poured, while warm, upon glass plates and asphalt lake is dropped on the upper side in such a manner as to imitate the natural design of the tortoise shell. After it is cold, the gelatine is detached from the glass plate and in a few days may be used for inlaid work. If yellow tortoise, i. e., tortoise from the Chelonia caretta (sea turtle), is to be imitated, the ground of the wood to be used for inlaying should be painted yellow; for red tortoise it should be painted with a suitable red, whereby the gelatine skin, being transparent, will receive the correct natural coloring of the tortoise. The natural tortoise shell is prized the highest when beautifully speckled with very dark spots.

Perfumed Glycerine, an Excellent Hair Oil.—Glycerine possesses in a high degree the property of extracting the fragrance from flowers. Besides, it has proved to be excellent for the skin as well as for the hair, so that it puts even the finest olive oil in the shade. If we take a vessel of best glycerine, putting into it lilacs, faded hyacinths, narcissus, lilies of the valley, mignonettes, violets, roses, lime flowers, jasmine flowers, etc., and leave them in it for three weeks, they will have given off their whole fragrance to the glycerine when taken out. In this manner a hair oil is obtained that cannot be surpassed by any Parisian "parfumeur." Since glycerine can be mixed with water in any proportion (in contradistinction to the fat oils), a few drops may be poured into the water used for washing, in order to perfume it delicately.

Science Notes.

The London correspondent of the New York Evening Post telegraphs that at Maidstone vaccination is being used against typhoid under the direction of the pathological laboratory of the State Army School at Netley. Prof. Wright and Surgeon-Major Temple, of Netley, have so improved the method that they are able to obtain the characteristic reaction of blood serum on typhold bacilli, which is taken as a proof that the individual is protected by the injection. Enough vaccine has been sent to Maidstone to inoculate the whole population if necessary. The number of cases of typhoid fever reported is greater than 1,500.

A cable dispatch from London says: A wonderful application of the perfected phonograph has been made by Mme. Anna Lankow, a vocal instructor of New York. She had several talented pupils anxious to secure European experience. Theodore Wangermann, a phonographic expert, supplied the delicate cylinders, and, under his direction, the pupils sang their best into the phonographic horn. Mme. Lankow took the cylinders to Berlin, where the voices were reproduced for the German managers. The experiment was so successful that engagements to sing in Germany in concert and opera were obtained for two of the pupils, based solely upon the phonographic samples.

According to the New York Tribune, the most interesting work now going on at the Weather Bureau is the preparation of an exhibit of this bureau for the Paris exhibition in 1900. Prof. Moore is taking a deep interest in the matter, and, as planned, it will be one of the largest and most complete expositions of this character ever made. A feature of the exhibit will be a daily weather chart of the United States. A code has been adopted by which the conditions of the weather in all parts of the United States will be transmitted by telegraph to Paris. From the material thus obtained maps will be constructed on the order of those now in general use. Prof. Moore, with five or six of his subordinates, will represent the Weather Bureau at the exposition, and nothing is being left undone to make a showing worthy of the United States Bureau, which is acknowledged by scientific authorities to be the finest in the world.

The municipal authorities of Paris are just now engaged in the suppression of an altogether novel form of food adulteration which is assuming phenomenal proportions, says the New York Tribune. Real oysters are expensive in Paris, and so, with the object of suiting slender purses, artificial oysters on the half shell have been invented, which are sold at twenty cents a dozen, and they are so cleverly made and look so nice and fresh that, once lemon juice or vinegar has been added, they cannot be distinguished from the real article, especially when white wine is taken in connection therewith. The only genuine thing about these oysters is the shell, the manufacturers buying secondhand shells at a small cost, and fastening the spurious oyster in place with a tasteless paste. The municipal laboratory has not yet proclaimed the ingredients of which these bogus oysters are composed, but has announced that they are of a harmful character.

Prof. A. E. Dolbear writes to Science as follows: Those who have occasion to have copies of engravings or pictures of any kind made for use with the lantern may be glad to know that such may be printed from the plates used in ordinary printing, if sheets of thin transparent celluloid be taken. Gelatin also may be used. The latter is liable to roll up more or less and needs to be protected by inclosing between glass plates of the ordinary size for lantern slides. Celluloid will not trouble so much in that way, yet it is best to mount such pictures in the same way. Photographic half-tones show very well indeed, the fine meshing not being enough magnified nor dense enough to be noticed upon the screen at the distance of a few feet. Such copies need cost but a few cents apiece, if the electro can be got to print from; and if celluloid be used without the glass cover, perhaps one cent would be the full cost. I inclose a couple of samples that you may judge of the quality of such pictures.

Mr. H. Savage Landor, who left England in March last, commissioned by Mr. Harmsworth, the proprietor of the Daily Mail, to endeavor to enter the sacred city of Lhassa, in Tibet, has not been successful in his undertaking. News has just been received that a few days after crossing the frontier of Tibet, disguised as a Chinese pilgrim, all except two of Mr. Landor's men abandoned him. In spite of this, Mr. Landor continued on his journey, but eventually he lost all his provisions, and by an act of treachery was made a prisoner by the Tibetans. He was sentenced to be beheaded, but at the last moment the Grand Lama stopped the executioner, and commuted the sentence of decapitation to the torture of the stretching log—a kind of rack upon which Mr. Landor was chained for eight days—after which he was released. Mr. Landor has now returned to India, suffering from the effects of the torture to which he was subjected, and which he half anticipated before he set out upon his hazardous journey.

Loss in Stoppages of Electric Cars.

Prof. H. S. Herring, in The American Electrician, says: From a large number of tests I found that the difference between making a stop and start at a station and running past it varies from 75 watt hours to 100 watt hours according to the grade and load, the average for ordinary conditions with a partially loaded 7½ ton car being 85 watt hours per stop. These tests were made by running the car over a road on which definite stopping places were designated, and a different number of stops made on successive trips, each trip being repeated for the same conditions until the readings agreed. The car was loaded with sand bags and weighed on car scales. These values, being obtained from about 100 such tests, are fair average results, but cannot be depended upon for any particular case, as conditions may cause a very large variation. But as an illustration of how these small values aggregate, the following figures may be interesting: Assuming the cost of electrical energy at 1 cent per kilowatt hour, one stop would cost 0·085 cent, nearly one-tenth of a cent. At this rate, the cost of making one extra or unnecessary stop on each trip for fifteen trips daily would amount to 1·28 cents per car per day, and $4.67 per car per year; for fifteen cars, $70 per year; and for 100 cars, $467 per year, merely for one extra stop per trip. This does not include the cost of brake shoes and wear and tear nor the capital invested in the increased size of the power house. Taking an actual instance of an engine house located where two lines of cars pass the door, thirty cars making fifteen round trips a day and each car passing the engine house twice on each round trip, it was found that on this same basis it costs the railway company for electrical energy alone seventy-six cents per day or $278 per year to stop its cars at this one place. Even should the assumption of one cent per kilowatt hour prove too high, yet the results are important.

In reference to the effect of careful handling of the controller, I would say that the difference between the kilowatt hours per car mile required by two motormen is very marked. A number of experiments were made in order to obtain some data. A good average motorman was selected and instructed to run his car in the usual manner. The other motorman was instructed to run the car in the most careful manner, allowing it to "drift" as much as possible and to use the brakes as little as possible. The same car was used in both instances, and was run on regular schedule time, making the same number of stops. The careful motorman used only 80 per cent of the kilowatt hours used by the "regular," although the latter was not careless, but rather above the average motorman. The difference of 20 per cent in the kilowatt hours used by these two motormen represents average conditions and not exceptional ones, but for the sake of avoiding possible exaggeration and allowing that such expert motormen cannot be readily obtained, it would be perfectly safe to halve this figure and take 10 per cent as the amount of energy that can readily be saved by more careful handling of the controller, while on most roads the larger value, or at least 15 per cent, could be saved without doubt. A few calculations based on a saving of 10 per cent may be of interest, being the gain that would result by using less power on the line. Taking the average performance in city running on a ten-mile, fifteen-car, fifteen-trip road as 1,300 watt hours per car mile, a 10 per cent saving amounts to 1·3 cents per trip, 19·5 cents per car per day, $71.20 per car per year, and $1,067 per year for the entire road, or for a company operating 100 cars this amounts to over $7,000 per year.

PRACTICE WITH THE HORIZONTAL LIFE LINE.

A SCHOOL FIRE DRILL.

It is the policy of many schools not to let pass any opportunity which school life may offer to keep the students constantly employed in those forms of right activity which may interest them to make the most of themselves; hence the military drill which is found in so many schools.

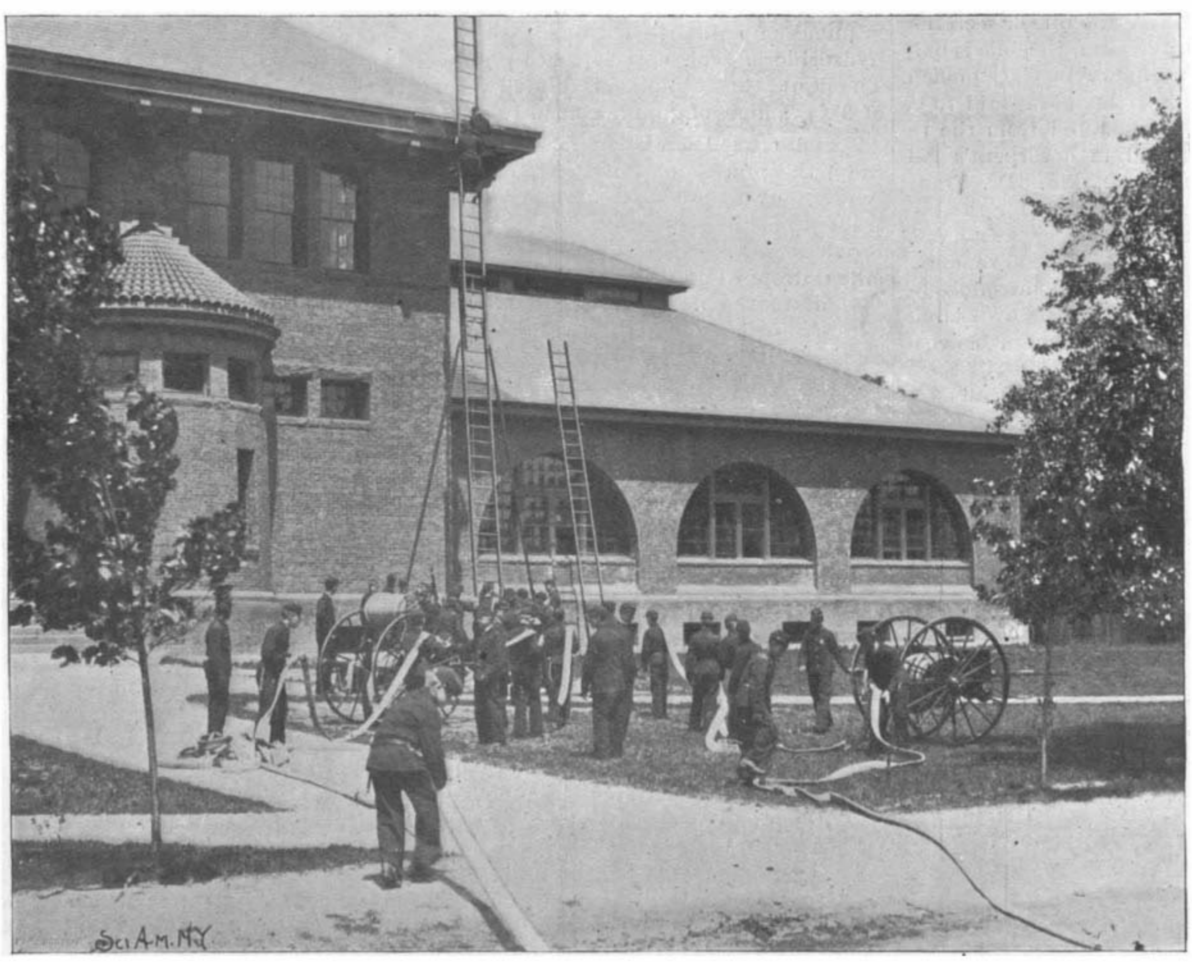
We illustrate and describe a system which combines both military exercise and a useful training of the faculties. It is the fire drill as practiced at the Cambridge Manual Training School for Boys, Cambridge, Mass. There is little doubt that a drill of this kind possesses more usefulness as an educational force than even military drills. As the chairman of the Boston Board of Fire Commissioners recently said regarding the school: "Instead of theoretical soldiers, they are making practical firemen. The modern methods of fire fighting are sufficiently scientific and exacting to produce as large results, whether physical or disciplinary, as any sought by military drill."

As mentioned in the SCIENTIFIC AMERICAN for September 18, 1897, this school furnishes the nearest approach to a school of fire extinguishment of any institution in the world. It is not, of course, expected to make firemen of the boys, but to give them coolness, courage and promptness in emergencies, and they also gain what so small a portion of the public have—a clear appreciation of the gravity of fire risks in cities and towns and intelligent ideas in regard to the prevention of fires.

The drill was arranged by the late Harry Ellis, superintendent of the school. It was introduced at first as a voluntary element, chiefly for the sake of the physical exercise and recreation it furnished, but the results were so satisfactory that it is now required from all the boys, excepting those who are physically unable to undertake it.

Every part of the drill is under the personal supervision of some instructor who has a thorough knowledge of all its details, and who is held responsible for the discipline of the boys and their officers and for the safety of all during the drill. As a preliminary, the pupil, on entering the class, is given a course of lectures explaining the use of a knowledge of fire prevention and fire fighting, the present methods employed and the improvements needed. Each boy is examined physically to find out his weaknesses, if he has any, so that they may be corrected. Simple marching movements are first introduced, and considerable time is devoted to the "setting up exercises" as practiced in the regular army. The boy is next given a belt and a long police club and instructed in the club drill. Later a sword made of tough wood is substituted for the club and instruction is given in single stick exercises similar to those of the navy. As a part of this preliminary drill, each boy is required to attend a course of lectures at the school given by skillful surgeons upon the various ways to render first aid to the injured. The pupil then begins work with the fire drill. The boys are formed into a battalion divided into hose companies, ladder companies, an engine company and an emergency corps. After this the pupil begins work, which includes holding and jumping into life nets from heights varying from eight to twenty-two feet; different forms of rope work, involving about all of the known methods of life saving, erecting and climbing ladders and the various ways of handling ladders; different forms of drill for fire hose, including coupling, carrying lines through buildings and up ladders, handling and use of nozzles, hose strips, spanners, etc.; shooting the life lines and other exercises tending to secure acquaintance with the different forms of fire or emergency apparatus.

To become a non-commissioned officer a private must have been on drill one year and then have passed a severe examination regarding his knowledge of military movements, Red Cross emergency work, handling of fire apparatus, etc. At the end of the second year, by passing another examination, he may become a sergeant.



FIRE DRILL—GETTING THE HOSE READY TO CARRY UP THE LADDER.