

On the Venom of Serpents.

The following is by S. Gilman, L. L. D., published in the St. Louis "Medical Journal," and is certainly the most interesting article we ever read on the subject:

"There is much in the history and habits of the reptile tribes, however repulsive they may be in appearance, that is very interesting. During a sojourn of two or three months in the interior of Arkansas, which appears to me to be the paradise of reptiles, I paid some attention to that branch of history called ophiology. I found four distinct varieties of rattlesnakes, (*Crotalus*), of which the *Crotalus Horridus* and *Crotalus Kirtlandii* are by far the most numerous. The former is the largest serpent in North America. The family of moccasin snakes (*Colluber*) is also quite numerous, there being not less than ten varieties, most of which being quite as venomous as the rattlesnake.—By dissecting great numbers of different species I learned that the anatomical structure of the poisoning apparatus is similar in all the different varieties of venomous serpents. It consists of a strong frame-work of bone, with its appropriate muscles in the upper part of the head, resembling, and being in fact a pair of jaws, but externally to the jaws proper, and much stronger. To these is attached by a ginglymoid articulation, one or more movable fangs on each side, just at the verge of the mouth, capable of being erected at pleasure. These fangs are very hard, sharp, and crooked, like the claws of a cat, and hooked backward, with a hollow from the base to near the point. I have occasionally seen a thin slit bone divide this hollow, making two. At their base is found a small sack containing two or three drops of venom, which resembles thin honey. The sack is so connected with the cavity of the fang during its erection, that a slight upward pressure forces the venom into the fang at its base, and it makes its exit at a small slit or opening near the point, with considerable force; thus it is carried to the bottom of any wound made by the fang. Unless the fangs are erected for battle, they lie concealed in the upper part of the mouth, sunk between the external and internal jaw bones, somewhat like a pen-knife blade shut up in its handle, where they are covered by a fold of membrane, which encloses them like a sheath—this is the *vagina dentis*. There can be no doubt that these fangs are frequently broken off or shed, as the head grows broader, to make room for new ones nearer the verge of the mouth; for, within the *vagina dentis* of a very large *Crotalus horridus*, I found no less than five fangs on each side—in all stages of formation—the smallest in a half pulpy or cartilaginous state, the next something harder, the third still more perfect, and so on to the main, well set, perfect fang. Each of these teeth had a well-defined cavity, like the main one. Three fangs on each side were frequently found in copper heads, vipers, and others.

The process of robbing serpents of their venom is easily accomplished by the aid of chloroform, a few drops of which stupifies them. If, while they are under its influence, they are carefully seized by the neck, and the *vagina dentis* held out of the way by an assistant, with a pair of forceps, and the fang be erected and gently pressed upward, the venom will be seen issuing from the fang, and dropping from its point. It may then be absorbed by a bit of sponge, or caught in a vial, or on the point of a lancet. After robbing several serpents in this manner, they were found, after two days, to be as highly charged as ever with venom of equal intensity with that first taken.

During the process of robbing several species of serpents, I inoculated several small but vigorous and perfectly healthy vegetables with the point of a lancet well charged with venom. The next day they were withered and dead, looking as though they had been scathed with lightning. In attempting to preserve a few drops of venom, for future experiments, in a small vial with two or three parts of alcohol, it was found in a short time to have lost its venomous properties. But after mixing the venom with aqua ammonia, or spirits of turpentine, or oil of peppermint, or of cinnamon, or of cloves, or with nitric or sulphuric acid, it

still seemed to act with undiminished energy. It is best preserved, however, for future use by trituration with refined sugar or sugar of milk.

A very fine, large cotton-mouth snake, being captured by putting a shoe-string around him, became excessively ferocious, striking at even the crack of a small riding whip. Finding himself a prisoner, without hope of escape, he turned his deadly weapons on his own body, striking repeatedly his well-charged fangs deeply into his flesh. Notwithstanding this he was put in a small basket, and carried forward.—In one hour after he was found dead, and no amount of irritation could excite the least indication of life.

A large rattlesnake, beheaded instantly with a hoe, would an hour and a half after, strike at anything that pinched its tail. Of several persons who were testing their firmness of nerve by trying to hold the hand steady while the serpent struck at it, not one could be found whose hand would not recoil in spite of his resolution; and one man, a great bully, by-the-by, was struck on the naked throat with considerable force by the headless trunk of the serpent, and staggered back, fainted and fell, from terror.

Seven venomous serpents belonging to five different species, were made to fraternize and dwell amicably in one den. A beautiful pair of long-bodied speckled snakes, known as king-snakes, known to be fangless, and consequently without venom, were duly installed as members of the family. Some uneasiness was perceptible among the older members, but no attempt was made to destroy the intruders—though they might have been killed instantly. The next morning four of the venomous serpents were found to have been destroyed by the king-snakes, and one was still within their coil, and the two remaining ones would make no effort at self defence. A large rattlesnake seemed stupid and indifferent to his fate. He could not be made to threaten or give warning even with his rattles. The smallest king-snake was afterwards inoculated with the poison of one of the serpents he had destroyed, and died immediately after—thus evincing that they must have exercised some power besides physical force to overcome their fellow creatures.

In short, the result of a great number of experiments performed with the venom on a great variety of serpents, seem to lead to the following conclusions:

1. That the venom of all serpents acts as a poison in a similar manner.
2. That the venom of some varieties is far more active than that of others.
3. That a variety of the colluber, known as the cotton-mouth, is the most venomous serpent in Arkansas.
4. That the venom of serpents destroys all forms of organized life, vegetable as well as animal.
5. That alcohol, if brought in contact with the venom, is, to a certain extent, an antidote.
6. That serpents do possess the power of fascinating small animals, and that this power is identical with mesmerism.
7. That the blood of small animals, destroyed by the venom of serpents, bears a close resemblance to that of animals destroyed by lightning or hydro-cyanic acid; it loses its power of coagulation and cannot be long kept from putrefaction."

A correspondent of the New York "Times" of the 24th, attempts to criticize the above, but for what object it is difficult to tell, excepting to assert that aqua ammonia, if freely drunk, will act as an antidote of venom. He also asserts in confirmation of what Dr. Gilman says, that alcohol is a remedy. The following extract from his letter will show how deeply scientific he is:

"It throws no light on medical science to say that those substances that fail to preserve unimpaired venoms or poisons are 'antidotes,' and it is not purely professional eminence to class as 'antidotes,' substances that destroy or impair certain properties, or change other matter, 'if brought in contact with it.' Oxygen is an excellent supporter of combustion, and although hydrogen, mixed or brought into con-

tact with it, may destroy its burning properties by converting it into water, yet hydrogen is not, on that account, an antidote to oxygen, and no authority of L. L. D. could make it so."

Hydrogen mixed with oxygen will not destroy its burning properties, nor will it convert it into water. Hydrogen and oxygen burned on a piece of lime, produces the most brilliant of lights.

Foreign Scientific Memoranda.

THE GREATEST STEAMER IN THE WORLD.—The immense screw and paddle steamer, building by Scott Russel, at Millwall, England, for the Eastern Steam Navigation Company, is to be completed in twelve months. Her keel has been laid down, and several of her bulkheads, or compartments, are raised, and the works are proceeding with energy and expedition. A railroad has been laid down the entire length of her way, to facilitate the conveyance of the materials from the factory to the different parts of the vessel. The exact dimensions of the ship are as follows:—Tonnage, builder's measurement, 22,000 tons; tonnage burthen, 10,000 tons; extreme length, 680 feet; extreme breadth, 83 feet; extreme depth, 58 feet; power of engines (screw and paddle), 2600 horse. Her engines are in the course of construction, and will be fitted in the vessel before she is floated off. The hull will be entirely of iron, and of more than usual strength, the magnitude of her size enabling Mr. Brunel, the architect, to introduce many precautionary measures conducive to support and security. From her keel up to six feet above the water-line is double, of a cellular construction. The upper deck will also be strengthened on the same principle, and will form a complete beam, similar to the tube of the Britannia bridge, so that any external injury will not affect the tightness or the safety of the ship. She is divided into ten separate water-tight compartments, each being sixty feet in length, enabling her to take out sufficient fuel for a voyage to Australia and back to England without stopping.

DISCOVERIES IN THE OLD RED SANDSTONE IN SCOTLAND.—The "John O'Groat Journal" says, within the last few weeks two very important and highly interesting discoveries have been made in the Lower Old Red Sandstone beds of Wick and Thurso, by Mr. Peach of this place, the well-known naturalist and zoologist. Fossil wood and shells, the existence of which in Caithness was hitherto unknown, have been abundantly found *in situ*; the former at Thurso, and both wood and shells at Wick and in the vicinity; the shells having undergone considerable abrasion. These are facts extremely interesting to geologists, and will give new life to the explorers of the old red sandstone formation, bestowing, as they do, positive evidence of what has formerly been considered at best but doubtful—the existence of vegetable organisms *in the land* at the Old Red period.

English Patent Case.

TEETH.—In our excellent cotemporary, the London "Mechanics' Magazine," we find the report of an interesting patent suit which was tried before Lord Chief Justice Campbell, on the 27th and 28th of last June, and as it is one which interests dentists, who are neither few nor far between in point of numbers, we will present the whole pith of the matter, not only for their benefit, but for all others interested in patents.

The plaintiff was a Mr. Truman, the defendant a Mr. Bellis. The charge was for an infringement of a patent granted to the plaintiff, on the 15th August, 1848, for an invention entitled "An improved method of constructing and fixing artificial teeth and gums, and of supplying deficiencies in the mouth." It consisted in fixing artificial teeth upon a skeleton frame, by rivets or pins, like fixing them upon plates in the usual way; then gutta percha was placed underneath so as to form the bearing to rest upon the natural gums, the gutta percha being also pressed up over the sides of the frame and round the bottom of the teeth, to the same height as the natural gums before they were deprived of teeth. The defendant called several witnesses to prove the application of gutta percha in various ways in the man-

ufacture and repair of teeth before the date of the patent, and amongst others a dentist, who testified that he had repaired a set of artificial teeth for an aged lady, and the gums having fallen, he put in a layer of gutta percha under the plate so as to rest upon the natural gums, and then pressed it over the sides of the plates and around the bottoms of the artificial teeth.

The Lord Chief Justice upon this testimony declared this to be exactly what was claimed and described by the plaintiff, and the Jury was directed to give a verdict accordingly.

Electric Engines.

MESSRS. EDITORS.—I notice in your journal of this date an article on Electro-Magnetism, signed J. Mascher; as I have never heard of this person before, I cannot know anything of his opportunities for obtaining knowledge on the subject, but from the absurd and ridiculous positions he has therein assumed, and the conclusions drawn from them, his cultivation on this subject must have been to very little profit. I do not propose to discuss his fallacies or be drawn into any controversy on the subject. My reason for noticing the article at all is to correct a statement therein contained, which is utterly false, namely, that the engine of Prof. Page was a failure. Prof. Page's engine has not yet been proved defective in any particular, and there has never yet been published by the most scientific and learned, or by any one else, any tangible reason why the machine of Prof. Page will not operate cheaply and efficiently. May I trouble you to give the above an insertion in the columns of your journal? J. J. G.

New York, July 29th, 1854.

[Will the author of the above, who has been familiar with the experiments of Prof. Page for some years, have the kindness to inform the readers of the "Scientific American" how successful the said Electric Engine has proved—to what practical purposes it has been applied—how long it has been in operation, and something about its present state and condition? It will be interesting for the public to know all the facts of the case. We assure him the community will not rest satisfied with the simple charge of *falsehood* against the assertion of the failure of said engine,—the opinion expressed by Mr. Mascher being the one generally entertained in the community.

New Brunswick Patent Law.

MESSRS. EDITORS.—In the "Scientific American," Nos. 4 and 5, this volume, you published an abridgment of the law of New Brunswick relating to Letters Patent for new and useful inventions; our government fee, as therein stated, which was required to be paid by any other than a British subject, was \$200. I am now happy to say to you, for the information of your numerous readers, that after the first of next month, that charge is reduced by the Revised Statutes of 1854, to \$40.

As we have a large amount of ship building and various kinds of steam and water-propelled machinery in New Brunswick, I entertain a reasonable hope that some 115 miles of railway, connecting this thriving city with the Gulf of St. Lawrence, will be in successful operation by the autumn of 1856, we may fairly anticipate a prosperous field in this country for very many of the useful patents which have originated in the United States.

PETER STUBBS.

St. Johns, N. B., July 25, 1854.

White Blackberries.

The "New Albany (Ind.) Tribune" says:—Now don't laugh at the seeming incongruity of the thing. A friend of ours from Franklin township laid on our table yesterday, a fine specimen of *white* berries, gathered from the common blackberry bush. They are equal in flavor to any blackberry we ever ate, and would make a splendid preserve.

A letter from Alexandria, in the "Trieste Zeitung," says that the coasting trade in the Red Sea is nearly destroyed, all the coffee which was formerly sent to Suez from Arabia being now sent to England in British vessels, which have discharged cargoes of coal in that port,—much of it being brought back to Egypt from England.