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RATIONALE OF THE THERAPEUTIC ACTION OF ARSENIC IN DISEASES OF THE SKIN.

There is perhaps no remedy in the entire range of the *Materia Medica* that can be relied upon with greater certainty to produce its legitimate results in a given time than arsenic.

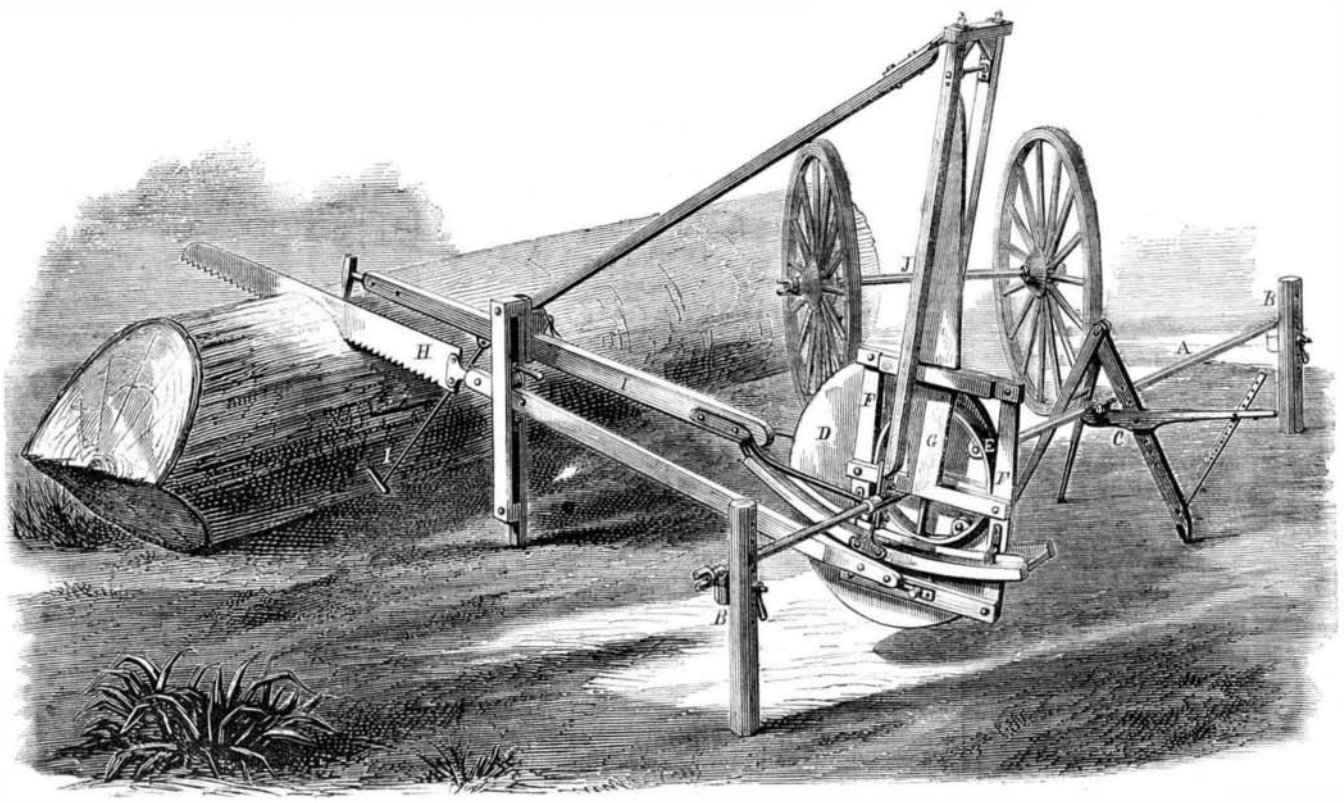
It is generally indicated in diseases of the skin, Eczema being one of the most common of these troublesome affections. It is usually exhibited in the form of K O, As O_3, in solution called in the pharmacopœias, Fowler's Solution, and its effect is so marked and so obviously tracable to itself, as often to create wonder even in the minds of those accustomed to witness its action upon the human system.

The diseases for which it is administered are situated upon the surface, and have long been suspected, and more recently, by microscopic examination, many of them have been determined to be parasitic in their character. Such being the case, the manner in which arsenic taken into the stomach effects a cure, becomes an interesting subject of inquiry; and as we have never met with an explanation of the phenomenon, we venture to suggest that the following may be the rationale of its action.

Arsenic, and its oxides, arsenious acid, As O_3, arsenic acid, As O_5, and its salts are all highly poisonous. When taken into the stomach they are not assimilated, but are absorbed and distributed through the entire system. When taken in extremely small doses, no inconvenience is felt by the patient; it is eliminated as fast as it is supplied. But if the dose be increased, poisonous effects will be produced, because the system cannot clear itself of the noxious matter with sufficient rapidity. The eyelids present a puffed appearance, which is an indication that the remedy has accumulated, and that its further administration would inconvenience and endanger the patient. Now at this stage the poison is equally distributed, in a state of extreme subdivision, and its elimination takes place largely through the pores of the skin, each of which is a nidus for a parasitic growth, and here becoming mixed with the pabulum which nourishes the parasite, it, by actual poisoning, destroys the cause of the mischief.

Improvement in Portable Reciprocating Sawing Machines.

When timber is felled it must be cut into convenient lengths for transportation, unless the trunk of the tree is intended for spars or long lumber; but especially where it is intended to use it for shingle or stave bolts, or for fuel it is evident that much time and labor will be saved in the cutting up of the logs *in situ*. This is the object of the machine herewith illustrated. It is a simple frame supporting the driving apparatus for a saw, and capable of being moved from place to place as occasion may demand. A long shaft, A, is supported near its ends by stakes, B, driven into the ground, having adjustable boxes for the purpose of properly leveling it and being further sustained and prevented from springing by movable supports, C, also adjustable, constructed in a manner similar to the carriage jacks in common use. On this shaft is a balance wheel, D, and an eccentric, E, the latter of which plays between two parallel upright bars, F, secured to a swinging bar, G, and by this device the saw, H, is driven by means of a pitman attached to the lower part of the swinging bar, G. Suitable dogs, I, hold the log while being sawed, and a guide and support driven into the ground near the log control the movements of the saw. In this guide is a box with rollers for the pitman, the box having a handle by which it and the saw can be raised.



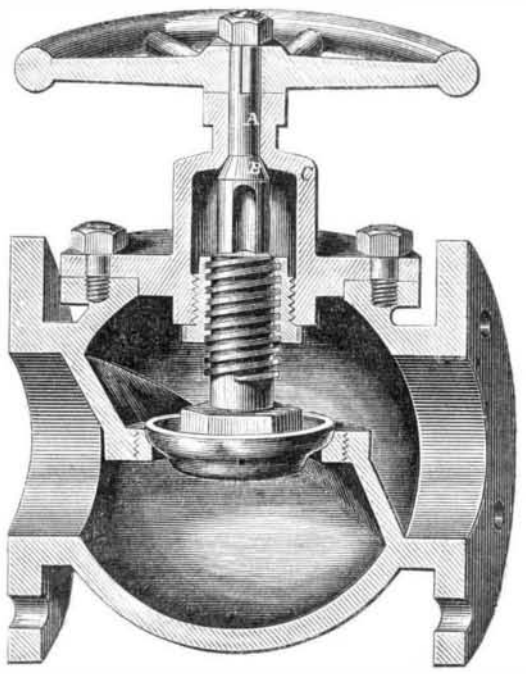
BELL'S PATENT PORTABLE SAWING MACHINE.

The shaft, A, is slotted nearly its whole length and the wheel and eccentric, D and E, have a feather in their hubs to engage with it. By this arrangement a log of many feet in length may be sawed into a number of bolts without disturbing the supports of the shaft. A pair of wheels, J, on a shaft of the same diameter as A and similarly slotted, is used to transport the machine from place to place, and also when slightly sunk in the ground they serve as supports to the machine while in operation. The power, of any sort, is attached to the end of the shaft by a clutch or any other suitable means.

Patented through the Scientific American Patent Agency Feb. 4, 1868, by G. W. Bell, who may be addressed for further information at Rising Sun, Ind.

PATENT SELF-PACKING STEAM VALVE.

Not among the least of the annoyances attending the operation of ordinary gates or globe valves is the necessity of



occasional and sometimes frequent packing of the stem. Efforts have been made to construct a valve that should be self packing and be always, under all circumstances, tight. This valve seems to be perfect in this respect. Externally it is like the ordinary valve, but internally very different. The revolving stem, A, has formed on it a valve, B, the seat of which is in the under side of the bonnet, C. The lower part of this stem is slotted, forming a key which fits loosely in a corresponding recess in the screw stem, which is of usual form. Thus the two are not rigidly connected, but one is allowed to act, in a measure, independent of the other.

The result is that while the revolving stem will readily, as in the ordinary valve, turn the screw, it will not prevent the valve of the latter from finding its seat. As this portion moves freely on the revolving screw it is evident the valve of the former will always prevent the escape of steam or water. There can be no transverse strain upon the stem under any circumstances. The valve is manufactured by Morris, Tasker & Co., 209 South Third street, Philadelphia, Pa, under patents issued to Sargent & Towne, June, 1865, and John C. Schaefer, Feb., 1866. All orders and letters relating to this invention should be addressed to Morris, Tasker & Co., as above.

Influence of Anæsthetics on Brain and Nervous System.

Dr. Richardson's fifth lecture, was a study of the influence exerted by anæsthetics on the brain and nervous system. The obvious fact that the motion of the heart and the movements of respiration continue in action while the rest of the body is under the narcotic effect, during anæsthesia, proves that the whole nervous system is not involved, and that the involuntary and semi-voluntary muscular mechanism is also not involved except when extreme and fatal symptoms are developed. What parts, then, are influenced by an anæsthetic? The idea was almost intuitive that the brain was the organ affected, and that the centers of consciousness are those chiefly held in abeyance. But, to prove this as true, experiment was necessary. In proof, the lecturer took a large pigeon, narcotized it deeply with chloroform, and in this state passed through its body, from the head to the foot, a rapid intermittent induction current. The bird instantly rose from the table, extended its wings, opened its eyes, and seemed as if restored; the current was then stopped, and the bird was shown to be as deeply asleep and as powerless as before. Another bird was put to sleep by freezing the brain, and when utterly insensible was subjected to the electrical shock in the same way, when it flew from the table into the room, where, breaking its connection with the battery, it dropped on the floor comatose, motionless, and as anæsthetized as before, in which condition it remained for many minutes. The lecturer in these experiments demonstrated that the anæsthetic action was localized in the cerebrum. His battery was like an outer brain, which supplied power without intelligence, and which, by the effects of its current, showed that all the muscular elements were ready for work, and only awaited the order from the brain. The lecturer next discussed the question—What, during the process of anæsthesia, leads to this change in the brain? Is there a chemical action on albumen? Is there pressure on brain matter? Is there deficient oxidation of the blood? Is there contraction of blood vessels, and diminished supply of blood from that cause? All these hypotheses were experimentally tested and negatived. It was admitted that during extreme anæsthesia there is reduced oxidation and a singular reduction of temperature. These changes are inevitable, because the anæsthetic vapors replace oxygen during their diffusion into blood; but the diminished oxidation is not the cause of the insensibility. In proof of this Dr. Richardson showed an animal breathing an air in which the oxygen was reduced by addition of nitrogen from 21 parts to 9 parts in the 100, side by side with another similar animal breathing an air in which the oxygen was reduced by the addition of vapor of bichloride of methylene only to about twenty parts in the 100, viz., four cubic inches in 500. The result was that the animal in the extremely reduced atmosphere was quite unaffected, while the animal in the slightly reduced atmosphere was in the deepest narcotism. Then a correcting experimental test was adopted, and the bichloride was administered in an atmosphere containing an excess of oxygen, the oxygen being present in double its ordinary or natural proportion; the excess of oxygen exerted no perceptible obstacle to the anæsthesia.

To determine whether there was contraction of blood vessels under anæsthetics, the lecturer had had recourse to transparent small trout; through their bodies, with the microscope and the inch lens, the bloodvessels could be seen, and the corpuscles flowing through them. These animals can be narcotized readily by making them breathe water saturated with