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The young man's book of amusement

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Galvanic Experiments on the Dead Body of a Criminal

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zinc end of the battery, if the wire be of gold or platina, is found as before mentioned, to be oxygen; but if the wire be of any more oxidable metal, no gas will appear, but the wire will be oxidated. The gas furnished by the wire from the copper end of the battery, of whatever kind of metal the wire may be, is pure hydrogen. If the immersed part of this, however, be previously oxidated, no gas will be observed for some time, the hydrogen being employed in reducing the oxide upon the surface. Both the gases are furnished by the decomposition of the water.

Powerful Batteries.

Sir H. Davy's great voltaic battery consisted of two thousand double plates of copper and zinc of four inches square.

Each plate of Mr. Children's large galvanic battery consists of thirty-two square inches, and produced intense heat. Iron was instantaneously converted by it to blister steel, and diamond powder disappeared.

Galvanic Experiments on the Dead Body of a Criminal.

The following interesting experiments, illustrative of the amazing powers of Galvanic operations, will be highly acceptable to the reader. The subject of these

experiments was a middle sized, athletic, and extremely muscular man, about thirty years of age. He was a murderer, and after hanging nearly an hour, underwent the experiments about to be detailed.

Experiment 1. A large incision was made into the nape of the neck, close below the occiput. The posterior half of the atlas vertebra was then removed by bone forceps, when the spinal marrow was brought into view. A profuse flow of liquid blood gushed from the wound, inundating the floor. A considerable incision was at the same time made in the left hip, through the great gutteal muscle, so as to bring the sciatic nerve into sight, and a small cut was made in the heel; the pointed rod connected with one end of the battery was now placed in contact with the spinal marrow, while the other rod was applied to the sciatic nerve. Every muscle of the body was immediately agitated with convulsive movements resembling a violent shuddering from the cold; the left side was most powerfully convulsed at each renewal of the electric contact. On moving the second rod from the hip to the heel, the knee being previously bent, the leg was thrown out with such violence as nearly to overturn one of the assistants, who in vain attempted to prevent its extension.

Experiment 2. The left phrenic nerve was now made bare at the outer edge of the *sternothyroidhus* muscle, from three to four inches above the clavicle, the cutaneous incision having been made by the side of the *sternocleffo mastoideus*. Since this nerve is distributed to the diaphragm, and since it communicates with the heart through the eighth pair, it

was expected, by transmitting the galvanic power along it, that the respiratory process would be renewed. Accordingly a small incision having been made under the cartilage of the seventh rib, the point of the one insulating rod was brought into contact with the great head of the diaphragm, while the other point was applied to the phrenic nerve in the neck. This muscle, the main agent of respiration, was instantly contracted, but with less force than was expected. Satisfied from ample experience on the living body, that more powerful effects can be produced in galvanic excitation, by leaving the extreme communicating rods in close contact with the parts to be operated on, while the electric chain or circuit is completed by running the end of the wires along the top of the plates, in the last trough of either pole, the other wire being steadily immersed in the last cell of the opposite pole, I had immediate recourse to this method. The success of it was truly wonderful. Full, nay, laborious breathing, instantly commenced. The chest heaved, and fell; the belly was protruded, and again collapsed, with the relaxing, and retiring diaphragm. This process was continued without interruption, so long as I continued the electric discharges.

In the judgment of many scientific gentlemen who witnessed the scene, this respiratory experiment was perhaps the most striking ever made with a philosophical apparatus. Let it also be remembered, that for full half an hour before this period, the body had been well nigh drained of its blood, and the spinal marrow severely lacerated. No pulsation could be

perceived meanwhile at the heart or wrist; but it may be supposed, that but for the evacuation of blood, the essential stimulus of that organ, this phenomenon might also have occurred.

Experiment 3. The supra-orbital nerve was laid bare in the forehead, as it issues through the supra-ciliary foramen in the eye-brow: the one conducting rod being applied to it, and the other to the heel, most extraordinary grimaces were exhibited every time that the electric discharges were made, by running the wire in my hand along the edges of the last trough, from the 220th, to the 270th pair of plates: thus fifty shocks, each greater than the preceding one, were given in two seconds. Every muscle in his countenance was simultaneously thrown into fearful action: rage, horror, despair, anguish, and ghastly smiles united their hideous expression in the murderer's face; surpassing far the wildest representation of a Fuseli or a Kean. At this period several of the spectators were forced to leave the apartment from terror or sickness, and one gentleman fainted.

Experiment 4. The last galvanic experiment consisted in transmitting the electric power from the spinal marrow to the ulnar nerve, as it passes by the internal condyle to the elbow: the fingers now moved nimbly, like those of a violin performer: an assistant, who tried to close the fist, found the hand to open forcibly, in spite of his efforts. When the one rod was applied to a slight incision in the tip of the forefinger, the fist being previously clenched, that finger extended instantly; and from the convulsive agitation of the arm, he seemed to point to

the different spectators, some of whom thought he had come to life. About an hour was spent in these operations.

PNEUMATICS.

The Air Pump.

It will be advisable in the first place to describe the way in which the Air Pump is usually constructed. In the frontispiece, Fig. 15, represents the cheapest form, and in its action it exactly resembles the common sucking pump. Within each of the two strong brass barrels in front is fixed (at the bottom) a valve, opening upwards; these valves communicate with a concealed pipe leading to the hole under the glass receiver. The barrels also include moveable pistons, with valves opening upwards. To the upper parts of the pistons are attached rack-work, (part of which is elevated in the cut,) these racks are moved up and down by means of a little cog wheel turned round by a handle affixed. A little beneath the pistons is a small screw which serves to re-admit air into the receiver when it is in a state of exhaustion. When the Air-Pump is to be used, *a slip of wet leather should be placed under the edge of the receiver*, be-