

to have been voracious, as would appear also from the structure of the teeth; but the points in which it differs from any one animal, and resembles others belonging to classes extremely remote, occasion the author to view it, with the singular productions of New South Wales, as one of the connecting links in the creation, formed for the purpose of preventing any void in the chain of imperceptible gradations, from one extreme of animated beings to the other.

On an easier Mode of procuring Potassium than that which is now adopted. By Smithson Tennant, Esq. F.R.S. Read June 23, 1814. [*Phil. Trans.* 1814, p. 578.]

The process originally discovered and described by Messrs. Gay-Lussac and Thenard for obtaining potassium by means of iron, requires that the iron should at first be intensely heated, and afterwards that the alkali should be applied to it in the heated state. For this purpose a gun-barrel is required of such a length as to pass through a furnace purposely constructed, having at its extremity a second short portion of barrel neatly fitted to it by grinding, for the purpose of containing the alkali; and from which it may be made to flow by means of a separate fire, to be applied by the attendant operator at such a stage of the process, and at such a rate, as is judged to be most advantageous.

Since in this method, though the alkali is, in fact, soon mixed with the iron, the process nevertheless requires the heat to be continued for nearly an hour, the author conceived that nearly the same effect might be produced merely by mixing the same ingredients previously, and distilling them in the following simple apparatus.

A straight gun-barrel, coated well at its lower part with Stour-bridge clay, is filled to about one half its length with a mixture of iron turnings and potash. Into the upper half of this barrel is inserted a smaller and thinner tube of iron, contracted at its lower extremity to a small orifice, sufficient to admit the vapour of potassium to pass, and of such a length that its upper extremity may project a little beyond the end of the gun-barrel; and then both are covered at the same time by a cap, which fits the gun-barrel sufficiently to be closed with cement. In the top of this cap is a cork, with a tube of safety for passage of gas that escapes during the operation.

The advantage of the inner tube, in which the potassium is received, consists not merely in the facility with which the product is withdrawn, but in preventing an admixture of potash, with which it is otherwise liable to be contaminated.

On the influence of the Nerves upon the Action of the Arteries. By Sir Everard Home, Bart. F.R.S. Read June 30, 1814. [*Phil. Trans.* 1814, p. 583.]

The object of this paper is to show that the nerves which accompany the arteries regulate their actions, and occasion different pro-

portions of blood to be supplied to different parts of the body. The facts which first led the author to entertain this opinion, were the accidental consequence of an extremely painful application of pure kali to a wound, which occasioned a general pulsation of the limb to which it was applied, although the pulsations of distant arteries were at the same time undisturbed. In order to be quite certain that this consequence was really dependent on the irritation of nerves, the author made two experiments on rabbits in the neighbourhood of the carotid artery. Having laid bare the par vagum and intercostal nerves, a probe was passed under the former so as to separate it, so that the irritation might be first given to this nerve alone; but no sensible effect was thus produced upon the artery. But when the same application of pure kali was made to the adjacent intercostal nerve, by which the artery is supplied, the dilatations and contractions of the artery were considerably increased, and the violence of the pulsations continued about three minutes before they began to subside.

The same experiment being repeated on a second rabbit, was attended with the same result; and it was afterwards repeated on a dog without any perceptible difference.

These visible effects of the influence which the nerves possess over the arteries, enable the author to comprehend, more fully than he had done before, how different supplies of blood are sent to particular glands; how various secretions come under the influence of the mind, and how the internal actions of the animal economy, connected with the circulation of the blood, are regulated.

If the healthy actions in the complete animal be thus dependent on nervous influence, then also the restoration of parts injured, the regeneration of parts lost; and all, even the most complicated forms of disease, must be regulated by the natural or preternatural operation of the same machinery.

On the Means of producing a double Distillation by the same heat. By Smithson Tennant, Esq. F.R.S. Read June 30, 1814. [Phil. Trans. 1814, p. 587.]

When steam is passed through a tube surrounded with water, it is well known that it becomes condensed on the sides of the tube so long as the water continues at a lower temperature than that of the steam; but since the latent heat given out in the condensation of steam soon raises the temperature of the water to 212° , all transfer of heat ceases at that temperature, and the steam then passes uncondensed. But since the temperature at which water may be raised into vapour depends on the pressure of the atmosphere, the temperature of the surrounding water may be kept permanently lower, by removing that pressure, so as permanently to act in condensing the vapour of the first distillation; and being itself raised into vapour by mere transfer of the same original quantity of heat, may be received as an additional product of the same process, by a suitable arrangement of the apparatus.