

engthens the seconds to minutes. At length you think it is all over, when, as you rise from the chair, a small struggle is perceived, and the food taken is emitted from the mouth, life and breath being again restored, to be again miserably interrupted, should the attempt be repeated. Infants thus treated suffer many deaths. Severer symptoms are not produced by strangulation with the rope. Food, therefore, or the breast, ought not to be offered when these violent symptoms result. Life might, perhaps, be prolonged, by injections into the bowels; but the mind at this tender age being wisely constituted, without the instinctive fear of dissolution—of no use to a being which cannot help itself—a few hours or days are not desired; and why should we attempt to add a little space to existence, and to prevent that death which nature uses as the only effectual remedy for the disease?

When, during swallowing, the food passes the pharynx or hinder cavity of the mouth, muscular action grasps the bolus, and, at the same time, closes all the passages, with the exception of the gullet, and, of course, the air-tube among the rest. Observe the rapidity with which the water, in large gulps, flashes along the œsophagus of the horse when drinking. When we are well, and full of appetite, deglutition, like winking, is accomplished with the same promptitude; and, therefore, the stay of the food in the pharynx being less than momentary, the closure of the passages is unattended with inconvenience. But with infants, in whom the œsophagus is imperforate, this is not the case; for, the food entering the pharynx, the rima glottidis becomes closed, and the bolus, involuntarily grasped on all sides by this muscular cavity, being propelled towards the œsophagus, where descent is prevented, the aliment remains in the pharynx, spasmodically detained, forming a sort of gag, till approaching death relaxes the muscles, opens the passages, suffering the food to escape, and the air to return to the lungs.

Ah! if our surgery could triumphantly interpose with one of its natural miracles—if the art which gives hearing to the deaf, and sight to the blind, and legs to the lame, and patent legs, too, could also help us here! but this may not be. One case of this kind was dissected by Mr. Hallum; another in conjunction with him by myself; a third by Mr. Burrows, an excellent practitioner in the city; and, in all three of these throughout the mediastinum to the extent of several inches, the œsophagus was unformed, or represented by a mere ligament, stretching from the closed extremity of the œsophagus to the orifice of the stomach. The trochar and canula, therefore, can be of no service.

Death is the natural remedy. Infants, who die under this disease, are, I believe, frequently thought to perish from convulsions. As I know myself of three cases, I presume it is by no means very uncommon. Van Swieten describes an affection called a swallowing of the tongue, in which suffocation is said to follow the attempt to swallow, in consequence of the tongue, too loose in the mouth, getting into the cavity of the pharynx, and lodging over the rima glottidis. Having never seen this disease, I feel inclined to think that Swieten may have been deceived by an imperforation of the œsophagus. Should swallowing of the tongue really occur—if the practitioner do not reach the infant till apparent death is produced, the tongue ought to be drawn down into place with the incurvated shank of a spoon, or any other convenient instrument; and though the child have lain to appearance dead for twenty or thirty minutes, artificial respiration, and the warm bath, ought to be diligently tried. New-born infants may, now and then, be resuscitated, after they have lain in a state of asphyxia for a good part of an hour. We ought not, therefore, in these cases to despair too soon.

FOREIGN DEPARTMENT.

EXPERIMENTS ON THE VELOCITY OF CIRCULATION.

By M. HERING, of Stuttgart.

HALLER and Sauvages were the first who tried to ascertain, by experiments, with what velocity the blood is carried through the vascular system; their calculations, however, were fallacious, as they were founded on the supposition, that the movement of the blood depended exclusively on the action of the heart. Haller's conclusions respecting the velocity of circulation in frogs, and small fishes, are more correct, as they were confirmed by autopsy; but his observations were confined to cold-blooded animals, and we need hardly mention how hazardous it would be to infer from them the velocity of the blood in warm-blooded animals. The same remark applies to the experiments of Spallanzani and Dollinger. In more recent works on the subject, the comparison of the quantity of blood contained in the ventricles of the heart, with the whole mass of the blood, and with the number of pulsations in a certain time, was considered sufficient to determine the relative velocity of the blood; a method,

the uncertainty of which clearly appears from the circumstance, that the quantity of blood cannot be made out with precision, and that the number of pulsations, and the capacity of the ventricles, differ very considerably in different individuals. (M. Hering found the capacity of the left ventricle in horses, differed from 3 to 11 ounces, and that of the right ventricle from 4 to 38 ounces.)

M. Hering tried another method, which seems to lead to a more accurate result. He mixed a solution of the hydrocyanate of potassium with the blood; he then took, at certain intervals, small quantities of blood from various parts of the body; and from the chemical examination of these different portions of blood, and from the comparison of the time which the substance required to arrive from one vessel into another, endeavoured to ascertain the relative velocity of the blood. The hydrocyanate of potassium seemed to answer best, as, even in a considerable quantity, it can be mixed with the blood, without causing any important derangement in the economy, and by chemical re-agents, it is easily, and with great accuracy, detected in the fluid, and also in the solid animal parts.

The fluid was not injected, but by means of a small funnel, instilled into the vessel. The sulphate of iron was principally employed to discover the presence of the hydrocyanate of potassium; as, however, the blue colour of the precipitate, produced in this manner, does not form immediately, a few drops of hydrochloric acid were added, to accelerate the latter effect. By these means, one particle of hydrocyanate of potassium is detected in 20,000 particles of serum. In order to obtain the latter as pure as possible, the chemical examination was made some days after the blood was taken. The experiments were made on horses. A solution of two drachms of the hydrocyanate of potassium, in twenty-two drachms of distilled water, was instilled into one of the jugular veins, and at the intervals of a minute, sometimes only of ten seconds, a small quantity of blood was taken from other parts of the body. The instillation of the fluid had, in most cases, no injurious effect on the animal; it even had no influence on the pulse. In some instances, where the animal was killed immediately after the experiment, most of the fluid and solid parts were submitted to a chemical examination. We omit detailing the experiments, and give our readers only the conclusive remarks of M. Hering.

1. The time, within which the hydrocyanate of potassium, after having been mixed with the blood, passes from one of the jugular veins into the opposite, is from twenty to thirty seconds; from the jugular

vein into the thoracica externa, it requires twenty-three to thirty seconds; into the saphena magna, twenty seconds; into the arter. masseterica, fifteen to thirty seconds; into the arter. maxill. externa of the opposite side, from ten to twenty-five seconds; and into the arter. metatarsi, from twenty to forty seconds. It would seem that an increased frequency of the pulse is not accompanied by an increased velocity of the blood; for, in several experiments, where the pulse differed in a considerable degree, the velocity remained the same.

2. The hydrocyanate of potassium, within a very short time after the experiment, is excreted by the serous membranes, but in a small quantity. The time varies from two to eight minutes.

3. The mucous membranes excrete the hydrocyanate of potassium more slowly; that of the right half of the stomach surpasses, in this respect, that of the intestines, and the latter that of the respiratory organs. In the mucous membrane of the urinary and genital system, the excretion is slowest. On those parts of the mucous membranes, which are lined by an epithelium, as the eye, the mouth, œsophagus, and left half of the stomach, no trace of the hydrocyanate could be discovered.

4. In the kidneys, the excretion appears to take place with the greatest rapidity; in all experiments, within one minute after the instillation, the hydrocyanate of potassium was found in the cortical, sometimes also in the tubular substance, and, in a few instances, in the pelvis renum.

5. In the lungs, the hydrocyanate of potassium was found in very small quantity.

6. Only one minute is required to bring the substance from the jugular vein into the thoracic duct; in the lymphatic glands, it was not found in several experiments, although it appeared in considerable quantity in the ductus thoracicus. This apparently confirms the recent experiments concerning venous absorption, and makes it highly probable, that there is a direct communication between the lymphatic and arterial systems.

7. The foreign substance is, within a short time, eliminated from the blood; after twenty-four hours, no trace of it could be found even in the solid parts.—(*Zeitschr. für Physiol.*)

ON THE USE OF CIRCULAR LIGATURES IN INTERMITTENTS.

There are some interesting observations in La Clinique, on the effect of circular ligatures applied to the extremities in ague, and several other diseases. In a person with intermittent fever, circular ligatures were applied to the extremities, with a