subsequently made, and the distance measured between the cut and the emergence of the root. This last was rendered more visible by coloring the fibres with hyperosmic acid. We will not enter upon a description of the results obtained; but content ourselves with observing that there is a series of successive centres. The centre of each root commences immediately behind the preceding root, and ends immediately behind its own origin, being therefore upon a transversal line which joins the points of emergence. Behind the tenth pair the cord is not the seat of a reflex centre. The nerve cells of this portion send out sensitive and motor fibres towards the tenth pair, but the cells of these fibres do not communicate amongst themselves, as they would of necessity do if the reflex movements, which fail at this point, were present.

After these preliminary studies, the memoir treats of the anatomical and physiological researches, made by the authors, on the reproduction of the spinal cord in the frog. Schwann, from whose report on this memoir we have compiled this abstract, was the first who verified the reproduction of the nerve trunks in the frog; the reproduction of the cord had never been clearly proved by anatomical or physiological researches. Recently, M. Voit has shown that in pigeons, the hemispheres of the brain can be reproduced after extirpation. According to the authors, the want of success of the experiments upon the reproduction of the cord in frogs probably proceeds from the season, and the too great age of the animals. They have operated on little frogs full of life, and those experiments only which were made during the winter (that is from November to the end of February) were successful. The authors were not content with simply cutting through the cord, but they actually removed sections from one to two millimetres in length. After about six months the healing was complete, and all the functions had returned. These latter came back in the following order:—First, the spontaneous fibrillary movements in the thighs, then voluntary movement of the whole of the thigh, extending gradually to the knee and the foot. The perceptive (*consciente*) sensibility only appeared more slowly, and sensibility and the power of reflex motion were the last to present themselves. The autopsy and the microscopical examination of the reproduced cord showed that the end of the cord in front of the section was a little swollen, as in the case of nerves that have been di-

vided; the posterior end was rounded, and between the two ends there was a substance, at first gelatinous, in which they found multipolar nerve cells, and nerve fibres in the form of Remak's fibres and varicose fibres. The cells appeared before the fibres. They found besides in this gelatinous mass, and in the two ends of the cord, near the point of section, nerve cells in a state of pigmentary degeneration.

Such are the principal results of this interesting work. It fills up a gap which existed in our knowledge of the reproduction of nerve tissue, and closes the list of numerous new observations upon the anatomy and physiology of the cord and spinal nerves of the frog.—*Med. Times & Gazette.*

ON A CHANGE IN THE URINE FROM THE EXTERNAL USE OF CARBOLIC ACID.*

By AUGUSTUS ALMEN.

In a former part of this journal, page 105, Mr. Waldenström has given an account of an altered appearance of the urine, &c., observed in some patients at the Academic Hospital, who were using a solution of carbolic acid in oil, either in dressing, or as an injection into abscesses, and he called particular attention to the danger of the occurrence of nephritis, and to the necessity for examining the urine during the employment of carbolic acid.

Although I have only a few very unimportant observations to make, which should most fitly be taken in common with the paper just referred to, yet, considering the practical importance of the inquiry, and the extremely unusual appearance the urine presented, I will say a few words on the method of determining the presence of carbolic acid in the urine.

The urine of various patients admitted to the hospital, had, after the use of the acid in question, a very dark, almost black, tar-like appearance. It was acid in re-action, turbid, and did not throw down any unusual deposit. The urine contained albumen, but not in any great or extraordinary quantity, in fact only to an insignificant amount. Blood could not be detected,† and the urine

* Translated from the "Upsala Lakareförenings Förhandlingar" (vol. v. part iii. p. 253), by J. W. Moore, M.B., Ch.M. Dub., L.R.C.C.P. Ex. Schol. T.C.D.

† The most delicate, simplest, best, and a really practical test of the presence of blood in the urine, is that mentioned by me at the meeting of Naturalists in Stockholm, 1865 ("Proceedings of the Meeting, Stockholm 1865," p. 481), viz., the gualacum test, which is most readily carried out in the following way:—Tincture of gualacum (a solution in spirit of gualac resin), and ordinary

did not present anything unusual except its black tar-like color, and a peculiar smell. When no absolutely certain re-action of carbolic acid could be obtained, either with the urine itself or with the residuum after the ether, with which the strongly acidulated urine had been agitated, though the presence of carbolic acid was highly probable from the smell of the fluid, about 400 cubic centimetres (some 14 ounces) of the urine was strongly acidulated with sulphuric acid, and about a third part was distilled from an ordinary retort, with glass condensing tubes. The distillate was as clear as water, colorless, smelt strongly of carbolic acid, and gave beautiful and undoubted re-actions of the same. For comparison, an analysis was instituted at the same time with distilled water, in which some drops of carbolic acid had been dissolved by agitation.

The distillate and the aqueous solution of carbolic acid, when mixed with some ammonia, and, subsequently, chlorinated lime, assumed the same pronounced and beautiful blue color. Very thin chips of fir-wood (spruce fir), thoroughly soaked in the two liquids, and afterwards dipped into dilute-hydrochloric acid; and exposed to the sunlight, became with both mixtures beautifully blue, especially at their thinnest edges. The distillate, agitated with ether, and the clear ether evaporated in a watch-glass, left as a residuum oil-drops, smelling strong of carbolic acid, which, when mixed with water, and also when treated in other ways, for example with strong nitric acid, behaved like carbolic acid; although on treating them with concentrated sulphuric acid, then neutralizing with chalk and filtering, I was not fortunate enough to obtain with per-chloride of iron the beautiful

turpentine in about equal parts, or from half to one cubic centimetre of each, are blended into an emulsion in a test-tube, after which, a small quantity of urine is added in such a way as to sink to the bottom in a separate layer. Whether the urine is normal or unhealthy, for example, containing albumen, but not blood, the emulsion undergoes no change until a rather long interval, but if the least blood is present in the urine, or if a drop of blood be added to it, the emulsion immediately on mixing with the urine becomes of a light-blue color, then darker, and finally the blue resembles a solution of indigo or Prussian blue, these changes varying in rapidity and intensity, according to the quantity of blood present. Many years' employment of this simple test has convinced me of not only its incredible delicacy, but also of its reliability. Neither normal nor ordinary albuminous urine, if free from blood, changes the guaiacoturpentine emulsion at all in such a way that any doubt or uncertainty can arise as to whether blood is present or not; and this test for blood is for clinical purposes (for medico-legal) simpler and far better than all others. How Ferichman's blood-crystals may be obtained from urine and other fluids containing blood is mentioned in the same Proceedings, at page 482.

violet color which is, without difficulty, got in the case of pure carbolic acid.

No doubt as to the presence of carbolic acid in this urine remained, and that its amount was not trifling, I conclude from the fact that the small quantity of urine which was subjected to distillation, afforded a distillate of which a small part, agitated with ether, left a not inconsiderable oily residuum. Although I have not instituted any comparative experiments with normal urine, I yet take it for granted that it does not contain carbolic acid in any such quantity as was the case in the present instance.

The unusual tar-like appearance of the urine naturally cannot depend on the presence in it of carbolic acid, and as urine so affected is not observed during the internal use of this substance, Mr. Waldenström's presumption, that it results from the presence of oxidized products of carbolic acid, formed even before the absorption of the acid, seems a very probable one. As is well known, carbolic acid and creosote have a great tendency to change; even when kept in well closed glass bottles they become tinged with a more or less reddish-brown color, and carbolic acid dissolved in water when treated with chromic acid (or with $K O_2 Cr O_3 + SO_3$) turns to a dark brown, not unlike the urine under discussion. It seems not improbable that the carbolic acid mixed with blood and pus should, on exposure to the air, and, perhaps, through the properties possessed by the blood of ozonifying and promoting acidulation, undergo a rapid and energetic acidulation with the formation of the dark products of oxidation, which, afterwards, along with the unaltered carbolic acid, are absorbed, and pass off in the urine. At an hospital an experiment could easily be instituted as to whether a little carbolic acid, mixed with similar pus, and agitated with exposure to the air, after some time assumes a dark, tar-like appearance. That the dark color is not developed after the water is passed, or while it is in the bladder, seems to me likely, from the fact that, if the urine is agitated with a little carbolic acid, and exposed, without shelter, to the air, neither its reaction nor its appearance is changed (it does not putrefy), and a smaller quantity of urine evaporates even without undergoing any noticeable alterations.

Sharing Mr. Waldenström's view, that a dangerous nephritis might possibly arise from the external use of carbolic acid, I yet

do not believe that we should therefore abstain from a judicious employment of it. The acid in question possesses, as is well known, unusual antiseptic properties, even when used in extremely minute quantity, and therefore I cannot imagine any advantage that is likely to accrue from employing it in so large an amount, and in such concentrated solutions as physicians appear to prefer. In my opinion its good effect depends less on the quantity of the acid than on a complete and general contact with the pus, and, doubtless, quite as good results might be obtained with much less acid. On the dressing a more dilute solution in oil should be the best, but for injection an aqueous solution appears to me the more serviceable, if it is brought into contact with the interior of abscesses, an end which is most readily attained by an injection of a large quantity of an aqueous solution of carbolic acid, which should subsequently be rinsed or squeezed out. Experiments with this solution, or even better with a solution in spirit, of which various quantities, according to various cases, may be added to the water used in washing, and to an injection fluid, would be of advantage. From what is already known of the action of carbolic acid on the kidneys, it is then always our duty not to omit an examination of the urine, for albumen, during even the external use of this substance, and this, too, even if the urine does not present any abnormal appearance.—*Med. Press and Circular*.

Medical and Surgical Journal.

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IN MEMORY OF THOSE WHO DIED FOR THEIR COUNTRY.

It is a sad, but interesting record, which Dr. Toner, of Washington, D. C., gives us, in the October number of the *National Medical Journal*, of those physicians, now deceased, who served their country professionally, in the army and navy, in the War of the Rebellion. Before publication, the list was submitted to the Surgeon-General U.S.A., and the Chief of Medicine and Surgery U.S.N., and we may be sure it is as complete as such a list can well be on its first issue. It contains an amount of

information of the greatest value to the physician and the historian, and reflects the highest credit on its compiler.

We have learned to read with grateful respect the names of thousands in every grade of the service who gave up their lives for the furtherance of plans which only Omniscience could conceive and Omnipotence only could execute; which we feel to be still incomplete, but will be carried to their full development in the coming centuries. As members of the medical profession, however, we linger with warm regard over the record of our own men; who left us—with their lives in their hands—to bind up the wounds of their fellows, to brave contagion and malaria, and to undergo exposures, which each one knew might fix the seeds of disease of a necessarily fatal character; and all this with that devotion to humanity and to duty which makes a true physician's path a clear one. It is, then, with especial interest we of New England recall the forms, as we read the names of Bell and Fox, Davis and McLellan, of Revere and Sargent and Ware, Bryant, Hayward, Foster, Page, Gibson and a score of others. It was said of one of these by his fellow-prisoners in Richmond—but it might have been said of each one—"when he came, sunshine came with him, and when he went away darkness followed." "Killed in action," or "in the line of his duty," "died in rebel prison," or "of disease contracted in the service," these are the records which oftenest appear in our medical necrology of the war; honorable records, indeed, which it becomes us to emulate, as well as admire.

It is not in a spirit of fault-finding that we mention the occurrence of some omissions and some slight errors in Dr. Toner's list. Only to those who have undertaken such a list can the difficulties of the work be known. The preparation of a roll of honor is indeed like that of a dictionary of a new language. The omission of a name or a false date constitutes an error, and such errors are only to be overcome by successive editions. Our own experience in a work of a similar character has given us convincing proof of the liability to similar mistakes.