

ing in the medullary canal and guarding against the spread of inflammation or suppuration which may be present in the soft parts. It has been proved by experiments on animals, that a flap of periosteum rapidly closes the open end of the medullary cavity, and prevents the occurrence of osteo-myelitis and also that on the inner surface of this membrane a thin layer of osseous tissue is rapidly formed. M. Nicaise in the paper to which I have already alluded, mentions a case of amputation of the thigh, for chronic disease of the knee in a tuberculous patient aged 42 years. After death, which occurred 29 days after the operation, when the stump had almost entirely healed, the lower end of the divided femur was found completely closed by a septum of thickened and granular periosteum, above which was a layer of newly formed bone tissue about  $\frac{1}{2}$  of an inch in thickness.

The first case in which I performed the operation was a hospital patient, H. W., who was strongly predisposed to bone disease. He was about 26 years of age, had a good family history and was very healthy up to within 6 months from the date of his admission to the Toronto General Hospital in 1879. He was admitted with caries of the bones of the foot, and it was decided to perform Syme's amputation at the ankle joint. On removing the tips of the malleoli it was noticed that the bones were very soft. The stump did badly, the bones showed no disposition to heal and it was finally decided to amputate at the junction of the middle and lower third of the leg. This seemed to me a good case in which to test the utility and value of the periosteal flap, and accordingly I determined to give the patient the benefit of the operation. When the tibia was sawn through in the operation at the point selected, the marrow was found exceedingly soft and unhealthy-looking, so much so that Dr. Aikins who was present remarked that I would have to go higher up. I did not do so however, but simply contented myself by raising the periosteum to the extent of an inch and a quarter, removing the denuded bone, and bringing the periosteal covering over the end of the divided bone. There seemed to be very little difference in the appearance of the two sections of the bone. The stump healed kindly and rapidly, and the patient left the hospital cured within four weeks from the date of

the last operation. Another case which I regarded as a test case, was that of a young man, aged 22, upon whom I performed amputation of the thigh for chronic disease of the knee joint. The family history was not very satisfactory, and the patient presented evidence of constitutional syphilis. The disease of the knee had existed for seven or eight months before his admission to the hospital. With the concurrence of the staff, amputation of the thigh was decided upon. On sawing through the femur the bone was found very soft, and the medullary canal much enlarged, soft, and unhealthy looking. In this case I made a moderately long periosteal flap, so as to cover completely the end of the bone. The case did remarkably well; the stump healed without suppuration, and the patient was going about on crutches in three weeks' time. I might mention a number of cases, somewhat similar in character to the foregoing with equally good results. There is one case, however, of simultaneous amputation of both legs which is worthy of being placed on record. The patient, H. F., aged 60 years, healthy and of good family history, had the misfortune to lose both his feet through frost-bite. A modified form of Syme's amputation was performed by the surgeon, but the stumps refused to heal. The patient had been in this condition for about a year when he came under my care. After due consideration I decided to perform double synchronous amputation of the legs below the knee. This was concurred in by the consulting surgeon. As all surgeons speak of successful operations of this nature as extremely rare, and inasmuch as the patient was advanced in years, I felt considerable anxiety as to the result. On sawing through the tibiae I found the same condition of the medullary canal mentioned in the previous cases, but more marked in the right than in the left tibia. Periosteal flaps were formed in both stumps, and the result was most satisfactory. The left stump was healed completely in three weeks' time, and the right in about four. Considering the age of the patient, and the nature of the case, the success was most gratifying. Taking this case by itself, or all three cases mentioned in this paper together, they do not prove that the success was due to the periosteal flap. But having regard to the success in these cases, and in many others, in which I have adopted this method of amputation, and compar-