

crushed or refractured and straightened. Then the handles are removed and the blades left in position for two or three days. The whole procedure, notwithstanding the frequent application of cocaine, is said to be exceedingly painful. After removing the blades, Jurasz employs ivory olives, fastened together and held in the nose for some time, until the septum gets accustomed to its central position again. Many writers use the galvano-cautery for the removal of deviations. Among them are Stoker, Voltolini,<sup>18</sup> Walsham, and Zedziak.<sup>19</sup> It is particularly useful in the case of cartilaginous spurs. Bronner and Lennox Browne advocate the dental drill, while Jarvis<sup>20</sup> speaks very highly of the electro-motor drill. Electrolysis has recently been received largely into favor, particularly in France, where it was introduced last year by Moure and Bergonié.<sup>21</sup> Dr. Moure read a paper before the International Congress at Berlin largely dealing with this method of treatment. They employ electrolysis in two ways: (1) The so-called unipolar positive puncture; (2) the bipolar galvano-puncture. In the first, a large indifferent electrode is attached to the negative pole and placed between the scapulæ, while the positive pole is attached to a steel needle and inserted into the centre of the deflected portion of the septum. A current of 30 milliamperes is sufficient. Each sitting lasts from ten to twenty minutes. In the second, each pole is attached to a needle, and both are inserted into the deviation, care being taken that they do not touch. Of course, cocaine is used in each case; still the treatment is painful and tedious, and not always successful. Some years ago Woakes made the first use of the saw, followed shortly afterwards by Seiler. It remained, however, for Bosworth<sup>22</sup> to place the nasal saw in its proper and important position as the most efficient and satisfactory of all instruments in the treatment of septal deviations. As early as 1887 Bosworth reported as many as 166 operations which he had personally performed. Since that time he has added hundreds of others to his list, with a very large percentage of satisfactory results. The saws are narrow in blade, varying from  $\frac{1}{8}$  to  $\frac{3}{16}$  of an inch in width. They are several inches long, and attached to

the handles at an angle of 45°. After anæsthetising both nasal cavities with a strong solution of cocaine, the saw is introduced in such a position that, in cutting, the whole of the projecting portion can be removed, the object being to restore, as far as possible, the natural outline. To use Bosworth's words: "It is to be sawed down, as we saw a board out of a log." After entering the instrument, the sawing is done with as rapid a motion as possible, consistent with precision, and continued downward through bone and cartilage until it emerges below. In some cases it is more convenient to cut upwards, using a blade with the teeth on the upper edge. In others both methods are necessary, the cuts meeting each other at the centre of deviation. The fragments are easily removed by forceps, and projecting points can be trimmed by scissors or galvano-cautery. Usually the hemorrhage is not severe. The contraction of the capillaries produced by cocaine no doubt lessens the tendency to bleeding. Sometimes, though rarely, plugging is necessary.

In many of the operations practised for the removal of deviations, the surgeon endeavors to preserve the mucous membrane by dissecting it backwards, and subsequently reattaching it by sutures. In Bosworth's method no such preservation is attempted. The mucous membrane covering the outgrowth is simply removed with the rest of the fragment. As the part heals, new membrane is proliferated from the marginal epithelium, and in a few weeks a new mucous membrane usually covers the surface without producing either ulceration or cicatrix. The danger of perforating the septum with the saw is not nearly so great as one might suppose, for the reason that there is always marked thickening or hypertrophy at the seat of the fracture. Bosworth, in his new work issued last year, states that perforation has only happened once in all the cases treated by him. In my own cases, when either cristæ or great thickening were present, I have, as a rule, followed Bosworth's plan; but I have also found a course of daily after-treatment necessary in order to obtain the best results. Spraying out the passage with Dobel's solution, following this by a 2 per cent. solution of cocaine and then inserting absorbent cotton soaked in albolene and repeated every twenty-four hours for the first three or four

18. "Die Krankheiten der Nase," 1888, p. 108.

19. *Journal of Laryngology*, April, 1891, p. 145.

20. *New York Medical Record*, April, 1888.

21. *Journal of Laryngology*, December, 1890.

22. "Diseases of the Nose and Throat," 1889, p. 303.