

The Evolution of Surgical Technique During the Last Half Century.

Mr. H. A. Boyce, Superintendent of the General Hospital, Kingston, Ontario, read an interesting paper on the above subject before the third meeting of the Canadian Hospital Association. He said, in part, as reported in the *International Hospital Record* :—

There are three discoveries in the history of surgery which are of paramount importance. One was when Ambrose Paré substituted the ligature for the red hot knife and cautery; a second was when Morton demonstrated that human beings could be operated on painlessly under the influence of anaesthetics; and the third, and last, when Lister, founding upon the researches of Pasteur, introduced the antiseptic principle in wound treatment.

The discovery of ether and chloroform brought with it great changes. Patients anxious for relief from pain submitted more readily to operation now than formerly. New operations were devised and carried into effect. As the field of surgery widened, the disappointments to the surgeon increased. Nearly every wound became infected; as a result, the patient either succumbed or after months of pain finally recovered. It is impossible to find words adequate to describe the condition of the patients in the surgical wards of hospitals prior to the days of antiseptics. In one corner of the ward there was a patient whose teeth were chattering from the chills of pyaemia; near by was the bright red shining face of erysipelas; a little farther over was a patient in the death agony from tetanus; still farther down was a patient suffering from moist gangrene. Pus was streaming from every wound. The very air was alive with pathogenic germs. The stench of the wards was so bad that many a student fainted on entering them. Healing by first intention was so uncommon that, when it did occur, it was attributed to some freak of nature.

Many surgeons still clung to the idea that balsams, lotions, etc., were necessary for the proper healing of wounds. However, Syme, of Edinburgh, recognised the fact that union of the tissues depended on some living power in them. This surgeon recommended the tying of large arteries with long well waxed silk ligatures. The ends of the ligature were left long for the proper drainage of the wound. The skin was sutured with silver wire as recommended by Sims in 1857. As soon as suppuration began the lint which had been placed over the wound was soaked off. Condy's fluid was

used to irrigate the wound. Union never occurred till the silk ligatures sloughed off.

Sir James Y. Simpson, thinking these long silk ligatures were the cause of all the infections, recommended the compression of arteries by needles. By this method immediate union occasionally occurred.

This was the state of the Glasgow Infirmary when Lord Lister was appointed surgeon in 1860. Prior to his coming to Glasgow he had begun investigations into the nature and cause of suppuration of wounds. For some time he had taught that this condition was caused by decomposition of blood and serum brought about by the action of minute particles suspended in the air.

About this time the researches of Pasteur on fermentation and putrefaction were published. In these he demonstrated that this was not due to oxygen or gaseous constituent, that air owed this property of producing putrefaction but to minute particles suspended in it. Pasteur further stated that normal healthy tissues are devoid of bacteria. It is upon this postulate that the science of bacteriology is based. It is to this assertion we owe the greatest advance in surgical technique the world has ever known. It has led to the saving of multitudes of lives; upon it Lord Lister based his antiseptic treatment. From this has developed the antiseptic era. In fact, the whole modern treatment of wounds has been determined and evolved from the assumption that normal tissues are free from germs, and hence, if germs from without are prevented from entering the wound it will heal by first intention.

For some time Lister had advocated the frequent washing of the hands of the surgeon and his assistants, and also the frequent dressing of suppurating wounds. In the infirmary, he continued this work with greater zeal than ever. Stimulated by the facts gleaned from the lately published researches of Pasteur he continued his work on antiseptics. The results of his further investigations are best told in his own words:—"In the course of an extended investigation into the nature of inflammation and the healthy and morbid conditions of the blood in relation to it, I arrived several years ago at the conclusion that the essential cause of suppuration in wounds is decomposition brought about by the atmosphere upon blood or serum retained within them; and in the case of contused wounds upon portions of tissue destroyed by the violence of injury. To prevent the recurrence of suppuration with all its attendant risks was an object manifestly desirable, but till lately apparently unattainable, since it seemed hopeless to exclude the oxygen of the air which was universally regarded as the agent

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