

restricted (provided of course it is effected by a safe method) when there are no contraindications to its employment? Schleich, who has won many adherents to the use of local anaesthesia (after Koller had enriched the world in 1881 with the discovery of cocaine), has evidently far overshot the mark in regard to the indications for its use.

Minor operations may certainly be undertaken under local anaesthesia. It is, however, just these so-called minor operations that make patients fight shy of further surgical measures which may be deemed necessary. The local anaesthesia process is not always so painless as its description would lead us to believe, and even Schleich candidly admits that he occasionally has to have recourse to the use of the chloroform mask. If a patient has suffered pain, for instance, from the excision of a small primary cancerous tumour, he is almost certain to refuse to allow the removal of the glands to be undertaken subsequently, at the proper time.

Further, there is the risk that, in removing a small malignant primary tumour with local anaesthesia, the operation may not be sufficiently thorough. Schleich, in a monograph on the subject, mentions 75 cases where malignant growths were removed by means of a local anaesthetic without recurrence of the malady, but one looks in vain for the exact details of the operations, which ought surely to be produced in dealing with results of so marvellous a description.

If the thoroughness and accuracy of a surgical undertaking are at all prejudiced by the use of a local anaesthetic, general anaesthesia must be substituted, provided its use is not contraindicated. This point must be plainly understood by the physician whose attitude in regard to early operation at the beginning of the disease so often influences the ultimate fate of the unfortunate sufferer from cancer.

The full significance of the words "local anaesthesia" is, in our opinion, most clearly demonstrated when the analgesia is produced at the site where the anaesthetic is injected. In this form local anaesthesia was first exclusively developed, and was brought into most extensive use by Reclus and others. It is still the principal method of rendering the skin insensitive prior to incision.

At the present time this method is extensively employed, especially in the majority of our operations on the thyroid. It consists in infiltrating the skin and subcutaneous tissues along the line of incision, which is marked on the skin by a fine scratch with the point of the knife, so that the cocaine can be injected with accuracy. An angled cannula is used, and 1 to 6 grammes (20 to 100 min.) or more of a 1 per cent solution of cocaine in normal saline are injected, the solution being sterilised by boiling once. It must be remembered that cocaine loses a considerable part of its anaesthetic effect when heated to boiling point.

The needle is inserted immediately under the skin, and the injection is made while the needle is gradually withdrawn, the point, at the same time, being kept in contact with the skin. In a minute the incision can be made without pain, and without any risk of poisoning, as there is not sufficient time for absorption into the blood stream.

The infiltration anaesthesia of Schleich¹ is quite distinct from this process, as he does not regard his method as a cocaineization of the tissues in the same sense as in the older method. According to Schleich, the 2 per cent saline solution he uses produces analgesia by purely physical means, the cocaine being added only to make the process of infiltration painless. It is the flooding of the tissues with a heterotonic fluid (2 per cent instead of the normal .75 or .8 per cent) that causes loss of sensation.²

Schleich's injection consists of a solution of cocaine (1 to 1000) in saline (2 to 1000), with morphia ($\frac{1}{4}$ to 1000). A quantity not exceeding 50 g. ($1\frac{3}{4}$ ounces) of this solution may be injected without harm, till an oedema similar to that in acute Bright's disease is produced. When required, the solution may be strengthened by the addition of a trace of tropococain or diluted to a tenth with saline lotion, when

¹ *Deutsche Klinik*, v. Leyden und Klemperer, 1901.

² Gans (*New York Med. Record*, 1904) uses only sterile water to produce anaesthesia in operations about the rectum. 1 to 15 c.cm. are injected.