in the face, with the chin held well away from the sternum and the anæsthetist wondering what on earth is happening. At last, quite empirically, he pulls the tongue forward with forceps; the cyanosis disappears and the patient is said to have been "swallowing his tongue." What really happened was that the flabby lips permitted expiration, but on inspiration were sucked in and, meeting at their edges, acted as valves, effectually stopping all entry of air by the mouth. Pulling forward the tongue acts in this case by separating the lips; but a finger between the lips is equally efficacious and saves the patient a sore tongue.

Treatment of Simple Ulcers with Ointment spread on Lint.—How often is a circular ulcer seen dressed with a square piece of lint, instead of the lint being cut to exactly fit the ulcer, the dresser forgetting that the continued application of strong ointment to intact epithelium does not improve its power of healthy growth. Even when the lint is cut to fit the ulcer, how often are holes made in the lint to allow of the direct escape from the granulating surface of the inevitable discharges which, mechanically obstructed by the greased surface, are at first pounded up on the ulcer, and ultimately escaping at the edge of the lint, damage and render sodden the ingrowing epithelium, on which depends the ultimate healing of the wound.

The Permanent Suture (Silk) Buried in Muscular Tissues.—The adjective permanent is frequently applied to unabsorbable buried sutures which are expected to hold soft parts, such as muscle and fascia, together indefinitely. My own conviction is that they do nothing of the kind. Their action is very similar to that of superficial sutures. No one thinks of leaving skin sutures indefinitely. At the end of a fortnight or three weeks the tissues have grown together, and remain united perfectly well without the further aid of sutures, which are then removed. If there has been tension on these sutures they have gradually cut through the tissues, and either lie loose among them or come away on their own account. Exactly the same process occurs with the buried sutures, such as are often employed in the cure of a ventral hernia. An unabsorbable suture lying loose among the tissues, although it is supposed to be encapsuled, is always liable to wander, and months or years afterwards make its reappearance to the disgust of everyone concerned. In other words, the "permanent buried suture," after a short time, fails to act as a suture, and not infrequently declines to remain permanently buried. The moral is obvious—dispense with buried sutures as far as possible, and, where they are a *sine qua non*, employ material capable of being absorbed.

Solution of Chemical Antiseptics for Wound Irrigation.—The use of chemical solutions, such as carbolic acid and corrosive sublimate for the irrigation of wounds, is illogical. For several years I have used simply boiled water. To be strictly physiological, a 1 per cent. solution of sodium chloride should be used, and lately I have used this with most satisfactory results. The effects of irrigating a wound with perchloride of mercury 1 in 2,000 is, as far as bacteria are concerned, mainly mechanical. The antiseptic damages the cut tissue without destroying the bacteria, which are washed out together with the blood clots by the solution. Halsted has shown that irrigation of fresh wounds with a corrosive sublimate solution as weak as 1 in 10,000 is followed by a distinct necrosis demonstrable under the microscope. This necrotic material may retard the healing process and act as a culture medium for any bacteria deposited in the wound subsequently. The surgeon is apt to dwell too much on the supposed germicidal power of the one part of antiseptic, and too little on the mechanical effect of the 1,999 parts of water. He also underrates the germicidal powers of the body cells, which are far superior to any dilute chemical antiseptic.

Strangulated Hernia and Peritonitis.—In an ordinary case of strangulated hernia it is often impossible to tell from the symptoms whether only omentum or intestine is involved. We used to be told that the symptoms of obstruction caused by strangulated omentum were due to the omentum and intestine having a common nerve supply. But the fact that strangulation of omentum by a ligature failed to produce obstruction remained unexplained. Surgeons now recognise that traction on the omentum produces kinking of the colon, and in exceptional cases even of the stomach. Sometimes also small intestine becomes strangulated by slipping beneath the

tight band of omentum. In cases of general peritonitis with distension of the intestines, it is not always recognised that there is a real obstruction to the passage of bowel contents caused by a succession of partial kinks, due to the intestines becoming distended in a closed cavity, and having a mesentery attached to one border. The disordered action of the thoracic viscera is also not solely due to the effects of absorbed toxins, but is partly caused by the distended intestines pushing up the diaphragm.

Another factor in acute peritonitis and intestinal obstruction, and one which I do not remember to have seen in the textbooks, is that the patient, in addition to being poisoned, is suffering from a large loss of fluid by diarrhoea and vomiting. One cause of the cardiac failure is the absence of sufficient fluid in the circulation for the heart to contract upon. By large intravenous injections of hot saline solution this want is supplied, and the excretory organs, especially the kidneys, get a chance of acting freely, and so excreting the poisons absorbed from the intestines and peritoneum. I have recently had two cases of this nature in which, after operation, this treatment by intravenous injection saved the patients.

AN INOPERABLE CASE OF EPITHELIOMA OF THE LARYNX AND NECK TREATED WITH FORMALIN INJECTIONS.

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For some years I have been so much impressed with the remarkable effects of formalin on the tissues, that it has seemed to me, if its action on the living tissues could be demonstrated to be non-toxic, it might prove useful in treating malignant growths, those which are inoperable, and in preventing or retarding the local recurrence after removal of such as could be removed, and in addition from its styptic action in treating non-malignant vascular tumours such as nævi and uterine fibroids.

That formalin is practically non-toxic in convenient doses the following case demonstrates:

T.M., aged 53, plumber, was admitted into hospital on December 13th, 1898, presenting a tumour on left side of neck, growing beneath the sternomastoid, nearly opposite the thyroid cartilage, extending in front to within half an inch of the trachea, and posteriorly to near anterior border of the trapezius. On the right side there was a smaller tumour, rather less than a tangerine orange, and situated somewhat higher in the neck. Both growths were firm in consistence, the larger one adherent to the subjacent structures, although the skin over it was quite movable. There was also well-marked aphonia, occasionally an inspiratory stridor, and marked dysphagia. Four months previously he noticed the swelling on the neck, and soon after observed that he was getting thin. About a week before admission he noticed his "voice had changed," and was "getting hoarse." The patient was sent to Dr. Woods, Laryngologist to the Richmond and Whitworth Hospitals, who diagnosed a carcinoma involving the larynx, and thought it inoperable, but suggested syphilis as possible.

The patient had well-marked arcus senilis. His arteries were atheromatous and cord-like. The urine had a specific gravity of 1010, and contained a trace of albumen. Mercury and potassium iodide were given for ten days without any beneficial result.

Acting on Dr. Woods's suggestion, I decided not to operate, but as his breathing was becoming daily more embarrassed, on December 21st I performed tracheotomy. The tumour on the left side continued to grow with great rapidity. He frequently begged to have something done, and wished to know when I intended to remove it. About the first week in February he was almost asphyxiated. It was found on removing the tube that the trachea was almost blocked up by some foreign body; this turned out to be a mass of necrosed tissue about the size of a florin which must have sloughed from the primary growth in the larynx. The rate of growth in the smaller tumour was slower.

As it seemed hopeless to attempt removal of the tumour, I had frequently thought of tying the common carotid with the hope of lessening the very rapid rate of growth. It was now evident that in a short time the tumour must displace if not overgrow the tracheal tube. I finally determined to inject either absolute alcohol or formalin. Of the toxic action of the latter I could find no reliable statistics until I saw in the BRITISH MEDICAL JOURNAL of February 11th a valuable paper by Dr. Mitchell on Formalin in the Treatment and Removal of Malignant Growths. Up to this time the skin had not broken, but the tumour looked so excessively vascular that, should it have burst, the hæmorrhage must have been appalling. Accordingly on February 18th I injected into the most vascular part of the tumour 5 minims of a 25 per cent. solution of formalin, having first rendered the part anæsthetic

by injecting subcutaneously and into the tumour one of Burroughs and Wellcome's No. 72 anæsthetic tabloids together with 3 minims of a 10 per cent. solution of eucaïne. The pain continued for only a few minutes, and in less than 20 minutes the patient was asleep. This was followed in about 3 hours by slight œdema of the glottis, and he wrote down on a slip of paper that he felt some shooting pains through the tumour, but was otherwise as usual.

On February 19th 10 minims of a 30 per cent. solution were injected as before; the pain did not seem to be increased.

On February 21st 15 minims of pure formalin in 15 minims of water were injected, without producing any more unpleasant effects than a painful sensation, which lasted only about five minutes, and a slight increase in the dyspnoea and dysphagia. The tumour now seemed to become less vascular, and only a single drop of blood escaped at the puncture, whereas on the first occasion of injecting the anæsthetic the hæmorrhage was somewhat difficult to control until the formalin had been injected. A little orthoform on a gauze bandage was put over the site of the injection on each occasion and retained until the following day, which seemed to prevent the skin from breaking down and produced some local anæsthesia.

On February 23rd 15 minims of formalin in 10 minims of water were again injected into the same area, using the same local anæsthetic in each case. I now decided to await results. There certainly seemed to be little or no hardening produced, but the growth in and around the part injected was distinctly less vascular; the skin was now becoming livid, and could easily be pinched up, showing shrinkage of the underlying tumour, which was obviously becoming softer, and displayed signs of deep-seated disintegration.

Owing to my unavoidable absence from hospital until March 5th no injections were given in the meantime, but, seeing the apparently good results, on my return I decided to try gradually increased quantities in the lower and most vascular portion, which was threatening to occlude the tracheal tube. Using the same anæsthetic and, in addition, freezing a small portion of the skin with anæsthe, 20 minims of formalin in 10 minims of water were injected. The acute pain, as on previous occasions, lasted about five minutes, and there was a little more cough, with dyspnoea and œdema of the glottis. After half an hour's interval $\frac{1}{4}$ gr. of morphine was injected into the arm, and he immediately went to sleep.

On March 7th 25 minims of formalin, with 5 minims of water, were injected, the same anæsthetic being used as before, but without anæsthe. On this occasion the pain was distinctly less acute, and only lasted a few seconds, which may, I think, be ascribed to the formalin coming in contact only with the part previously rendered anæsthetic, and to the longer interval—five minutes—between the two injections.

On March 9th 25 minims of formalin, without water, were injected as before. The pain did not seem more acute or prolonged than when the first injections were given. The skin over the first portion injected on March 12th began to slough, exposing a raw surface about 2 inches in area. This was dressed with orthoform powder on gauze covered with absorbent cotton, the dressings soon became soaked with a watery, sanious discharge, without the slightest offensive smell. This continued for the next twenty-four hours, after which it gradually diminished, and although this portion of the tumour seemed to get smaller daily until his death, I could not tell where the discharge was finding an exit, but fancied it had forced its way into the mediastinum, or possibly into the bronchi through the opening in the trachea.

On March 13th I tried Dr. Mitchell's plan of dressing the raw surface with pads soaked in formalin, rendering the part anæsthetic with eucaïne solution painted over the surface; but the patient would not allow this mode of treatment to be continued, as he said he could not bear the pain; even after injecting an anæsthetic tabloid he said the pain was very much worse than when the formalin was injected. The circumference of the neck, which on March 5th measured $19\frac{1}{2}$ inches, was on the 8th 18 inches. This was prior to the sloughing and discharge from the tumour.

Although 60 minims formalin had been injected into the space of about 3 square inches between March 6th and 9th, there seemed not the least sign of hardening. On the contrary, from March 10th till 16th, this portion showed distinct signs of becoming daily softer. From the date of his admission he could not obtain sleep unless by taking morphine either by the mouth or hypodermically. At the time of his death he was taking 1 gr. daily. The pulse was nearly normal throughout until March 13th, but it was generally slower for an hour after each injection.

On March 14th the tracheal tube was becoming frequently blocked by fluid, and the breathing thereby embarrassed. The temperature kept gradually rising till it reached 103° a few hours before death, which occurred on March 16th from collapse and asphyxia.

The necropsy was limited to the neck. The tumour occupied the entire left side of the neck from near the jaw to the clavicle and sternum, and was with the greatest difficulty separated from the deep muscles. The prevertebral fascia had disappeared, as also most of the sterno-mastoid muscle, which, together with the great vessels, was embedded in the cancerous mass. Two centres or foci of degeneration, corresponding to the sites of injection, appeared deep in the substance of the tumour. On drawing up the trachea previous to division, so as to divide it as low down as possible, it was noticed that the tube was filled with fluid. On section about half a pint of fluid poured out, which in consistence and colour resembled the broken-down *débris* which was discharged after the posterior portion of the tumour sloughed. The asphyxia to which death was immediately due was thus accounted for.

The tumour, together with the surrounding parts, was sent to Dr. McWeeny for examination, who reported that the tumour was an epithelioma of the larynx, apparently starting from the left aryepiglottic fold, and involving the interior of the larynx and the anterior wall of the pharynx.

The following conclusions seem to follow from this case:

1. Up to half a drachm of pure formalin can be injected into the body without producing toxic symptoms.

2. Although a powerful styptic, it does not seem so liable as other styptics to produce clotting or embolism.

3. It is probably as safe to use formalin undiluted as diluted with water.

4. When used undiluted it seems to produce an anæsthetic effect more quickly.

5. Unlike most other powerful antiseptics or irritants, it does not stimulate, but retards cell multiplication or growth in malignant tumours.

In conclusion one may, I think, hazard the opinion that formalin, being such a powerful antiseptic and exercising, as it undoubtedly does, such destructive influence on all low forms of organic life, if any of the neoplasms or malignant growths owe their malignancy, as some believe, to any form of organism, not only palliative but also curative effects may reasonably be expected to follow its judicious application.

I have to thank Dr. Woods for having so kindly examined the patient. To Professor McWeeny, in particular, I am greatly indebted not only for his examination and report of the tumour, but also for valuable hints and suggestions. I wish also to thank Dr. Taylor, our late house-surgeon, and Dr. Copley, our present house-surgeon for their assistance and attention to the patient during my absence.

MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

A RARE ABNORMALITY OF THE MOUTH.

On May 19th I was called to attend Mrs. S. in her sixth confinement. Before my arrival the child (seemingly a healthy male) was born; it was at about the eighth month of gestation, and cried in an apparently natural manner. In the evening I was asked to see the child again, as neither mother nor nurse could make him swallow anything. On examination, the gums were found to be completely adherent to each other, and the cheeks to the gums posterior to the position of the future canine teeth. With some difficulty the adhesions between the gums in front were broken down by the finger sufficiently to enable him to swallow diluted milk slowly administered with a spoon. He refused the breast, but sucked strongly at a finger introduced pretty far back into the mouth. A cleft, apparently confined to the hard palate, was also discovered, from the sides of which two small fleshy ridges hung vertically downwards. Next evening I had again to visit the child, and found him cyanosed, but artificial respiration with elevation of the angles of the jaws soon restored him. The heart was examined, and found normal. A second time cyanosis supervened, but the nurse, following my instructions, treated it in the same manner with a like result. A third attack, however, proved fatal during the night.

A *post-mortem* examination was not made, but permission to explore the mouth thoroughly was given. A gag having been introduced, the exertion of a pretty considerable force was found necessary to separate the jaws sufficiently; motion took place at the joint, there being no evidence of ankylosis. Only the posterior half of the tongue was developed, that organ looking like the stump after excision of the anterior portion; there was no *frænum lingue*; the stump of tongue was found closely applied to the cleft in the hard palate. The soft palate was continuous with the posterior wall of the pharynx; there was no opening of the posterior nares and no uvula. As far as could be ascertained by the touch, the epiglottis and larynx were normal. Evidently death was due to the tongue obstructing respiration through nose and mouth at the same time.

The points of special interest in the case are:

1. The fact that the child cried loudly and naturally immediately after birth, notwithstanding the great abnormality of the buccal and nasal cavities.

2. The unusual nature of the deformity.

3. The embryological point of view. Are the adhesions found to be considered as originating in an arrest of development (as the cleft in the palate presumably did), or in a process due to inflammation or the like taking place subse-