in early life compared to more mature age. The explanation of this, I venture to suggest, is that up to puberty the tissues are in a much more active condition; tissue change is more rapid, and impressions on the organism more easily effaced than in adult life.

The Local Government Board do not allow public vaccinators to be paid for re-vaccinations upon children under ten years of age; but in the face of these results I would suggest that in small-pox epidemics every child in whose case four years have elapsed since the primary vaccination should be re-vaccinated. The condition of the arm on the eighth day after re-vaccination varies exceedingly. The areola appears much earlier than in primary vaccination. In 197 cases it was present on the second day. On the eighth day it varies from a circumferential blush around the vesicles to a uniform redness extending from the shoulder to the elbow, of a bright crimson colour, disappearing on pressure. I regard this condition as different to that in which we see oedema and redness extending down to the finger-tips. Some enlargement of the axillary glands can always be discovered if looked for. In 106 cases these glands were large, hard and tender, and in some instances exquisitely painful. In three cases the glands above the clavicle were also affected. Lymphangitis was present in nine cases, the lymphatic vessels being felt as hard, swollen, tender cords along the course of the axillary vessels. Induration and oedema of the arm were present in ninety-eight cases, and were of a curiously persistent character. They did not appear to be associated entirely with the glandular affection, but were apparently dependent upon the intensity of the local inflammation at the site of the vaccination.

Constitutional symptoms, except the temperature, are difficult to estimate, apart from the idiosyncrasy of the patient. Several complained of aching pain in the lumbar region, headache and nausea which, while not uncommon symptoms of a febrile condition, are the cardinal symptoms of the early stage of variola. Lassitude, giddiness, and loss of appetite were common among the male adults, whilst fainting and neurotic manifestations were noticed among the females. Post-vaccinal rashes were only seen in four instances. It was impossible to take the temperature of all the cases, but in those in which fever was noted the pyrexia appeared directly proportional to the amount of inflammatory action in the arm. It is commonly accepted that the amount of inflammatory action depends to some extent on the active use of the arm during the week following vaccination. In all my cases the occupation was noted, and it was found that the most severe cases occurred in women who had worn slings directly the vaccination showed signs of being successful. Its severity appears to me to depend entirely upon the general constitutional condition and the environment of the individual.

The treatment of severe cases was simple and apparently successful—free saline purgation, rest for the arm, the application of a lead and opium lotion, early and frequent removal of the scabs, and a boracic ointment dressing for the subjacent ulcers.

Acacia-road, N.W.

THE CONTINUOUS ADMINISTRATION OF NITROUS OXIDE GAS AND OXYGEN DURING MINOR SURGICAL OPERATIONS.

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EIGHT years have elapsed since the possibility and distinct advantage of giving small percentages of oxygen with nitrous oxide gas to produce anæsthesia at ordinary atmospheric pressures were first pointed out in THE LANCET by Dr. Frederic Hewitt.¹ Though this method has now obtained a very wide and substantial footing in the dental profession, it can hardly be said that its remarkable value in prolonging the anæsthesia and rendering the patient flaccid and free from spasm for several minutes at a time has

procured sufficient recognition among surgeons, who would have been expected to readily appreciate a mixture which leaves neither nausea nor mental disturbance after its inhalation, and, more important still, which subjects a patient to the least possible risk incurred by the exhibition of any known anæsthetic agent. The presence and concurrent inhalation of from 10 to 15 per cent. of oxygen with nitrous oxide gas are sufficient to maintain the due proportion of oxy-hæmoglobin in the arterial blood, and thereby to render an inhalation which formerly was cut short by the supervention of asphyxial symptoms capable of being sustained while many minor surgical operations are being effected. While the condition produced by the presence of oxygen is clinically free from asphyxial symptoms in those surgical procedures which are undertaken after removal of the face-piece, I have also found that a very tranquil anæsthesia may be obtained in those others which permit of its continuous application, even with quantities of oxygen rather larger than those usually administered in the first class of cases. To illustrate the kind of painful operation for which I think this method has proved to be appropriate the following cases are taken from my notebooks.

CASE 1.—A man, aged forty-seven years, with good chest expansion, stoutly built, and of rather florid colour, required the removal of four sebaceous cysts from the scalp. Before the administration he was seated in a comfortable armchair. The surgeon washed and prepared the skin around the cysts, and the face-piece was then applied. Commencing with a small percentage of oxygen (to allow for that already present in the lungs), the amount was gradually increased whilst the lid-reflex disappeared. Breathing continued deep and free as during sleep; the colour was good; no inconvenient movement occurred; and the operation—during which the cysts were excised and the incisions sewn up—proceeded for five and a half minutes. At its completion the patient awoke—one minute after removal of the face-piece—without any untoward sensations whatever.

CASE 2.—A girl, aged seventeen years, of average height and build but rather anæmic, suffering from a tuberculous abscess in the left side of the neck, was seated in an upright chair with a head-rest while the swelling was incised, thoroughly scraped, cleaned out, and then sutured with four separate stitches. During this operation, which lasted four and a half minutes, she was kept absolutely tranquil with a good, regular pulse under the influence of nitrous oxide gas and oxygen. The recovery was rapid and presented no after-effects of any kind.

CASE 3.—A man, aged thirty-five years, of average height but rather thin and pale, had two suppurating cysts on the scalp, one of which was very painful. He was seated in an easy-chair when the face-piece was applied. Again the percentages of oxygen with the gas were gradually increased until he was softly snoring as if under chloroform. The pupil remained of moderate size and the pulse and colour were very good whilst the incision, scraping, and dressing of the inflamed areas were completed. This operation also lasted four and a half minutes. He afterwards said it was very pleasant to inhale, that he felt quite well, and had not the slightest sensation or consciousness during the administration.

In the course of my work at Charing-cross Hospital I have lately administered nitrous oxide gas and oxygen during the excision of a varicocele lasting fourteen minutes. The patient, who was a male, aged twenty-two years, of a rather florid type, was inclined now and then to become a trifle dusky in colour, but this was owing to there not being quite sufficient oxygen at command; his absolute flaccidity and quietude during the time were, however, quite satisfactory to the operator. His breathing remained regular and the circulation was well maintained throughout. Recovery was complete in two minutes and he was not sick subsequently.

It has been my custom for the past two years to administer this anæsthetic in the aural department for the removal of post-nasal adenoid growths, and the advantages which may be claimed for its use are: (1) that it is not attended with danger to life; (2) that preparation for the operation is not absolutely necessary, though undoubtedly the best results are obtained after abstinence from food for three or four hours; (3) that hæmorrhage is unaffected by it; (4) that the jactitation and cyanosis produced by pure nitrous oxide gas are absent; (5) that any posture desired by the operator may be safely assumed; (6) that when the face-piece is removed the available anæsthesia is about fifteen seconds longer than that

¹ THE LANCET, April 27th, 1889, p. 832.

yielded by gas alone; and (7) that unpleasant after-effects of any kind are of very rare occurrence. After an experience of several hundreds of cases I ought to state that during this operation some of the patients will move a little and in some there will be a little phonation; but, on questioning them it will be found that they felt nothing of the operation and would quite willingly take the anæsthetic again. This result is not often attainable with gas alone, for children yield a very short anæsthesia under its influence and may be very blue and rigid, whilst if oxygen be present there will be muscular relaxation with good normal colour.

For the removal of enlarged tonsils the mixture is a distinct improvement upon gas alone, because there is less venous turgescence and therefore less swelling of the tonsils and tongue, with a corresponding immunity from obstructed breathing during unconsciousness. Incision of the tympanum, removal of aural and nasal polypi, and other procedures of a like nature have also been successfully accomplished under its anæsthetic influence.

I believe that for the painless movement of stiff joints and the stretching of adhesions in their vicinity it forms by far the most suitable agent at our disposal, because muscular flaccidity is quickly produced and the patient will not object to a second inhalation of these tasteless gases if the operation has after an interval to be repeated.

In sensitive subjects the passage of a catheter is often a matter of apprehension and pain; those who would otherwise resist the surgeon's manipulations can be kept quietly unconscious by inhaling the mixture until this procedure is accomplished and fear of suffering is at an end. I hold that it is an anæsthetist's aim and ideal to render his patient insensitive to pain with as little damage to the physiological processes of his system as possible, and for these or similar operations I find this method a great improvement upon gas alone, while the danger of chloroform and the sickness resulting from the use of ether are entirely avoided by its employment.

Welbeck-street, W.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CLINICAL NOTE ON THE PROPERTIES OF ACETANILID.

By EDWARD F. GRÜN, M.R.C.S. ENG., L.R.C.P. LOND.

IN THE LANCET of June 27th, 1891, you were kind enough to insert an article written by me on the treatment of what I designated "Specific Bronchitis." In that article I adverted to the germicidal properties of what at the time was a comparatively unknown drug, acetanilid, giving bacteriological proof of the very high comparative value in arresting growth of all forms of micro-organism in nutrient media, and urging medical men to give the drug a trial. Since that date—now nearly six years—I have taken every opportunity afforded me by private practice to test the value of this compound as a dressing for wounds, and the result of my experience is that for convenience, reliability, and general utility there is no antiseptic drug to equal it. This question is so easy of proof (which is not always the case with drugs recommended for internal use) that I feel the preparation has only to be thoroughly tested under fair conditions to become universally accepted as the dressing for wounds *par excellence*. During the past six years among a number of cases which have come under my care the following will serve to illustrate the valuable healing powers of this compound of aniline. There is no necessity to quote the names of the cases, but many were seen by members of the profession beside myself, and I can, if necessary, give the full details. It is sufficient to say that every one healed without the formation of pus and the majority by first intention, although the operations described were often performed under conditions which rendered antiseptic precautions absolutely impossible.

CASE 1.—July 14th, 1895: A compound fracture of the metatarsal bone, caused by the wheel of a waggon loaded with

two tons of coal passing over the foot of a man, was complicated with severe laceration of the skin. The patient was able to resume work in about twelve weeks from the date of the accident.

CASE 2.—Aug. 18th, 1895: After amputation of the forearm of a woman union by first intention resulted, and the dressings were removed at the end of a fortnight.

CASE 3.—Sept. 30th, 1894: A man was operated upon for strangulated hernia. The operation was performed in great haste in a cowshed, the sac being opened and Gimbernat's ligament divided. The patient was removed to the infirmary at Alton on the same day, and was discharged cured at the end of seven days. The wound healed by first intention.

CASE 4.—1893: This was a case of removal of the breast for suppurating cancer. The breast had been injected with methyl-violet, according to Professor Moestig's method, which caused suppuration of the cancer. The breast was subsequently removed. The wounds were entirely healed at the end of ten days.

CASE 5.—In this case the operation of amputation of the leg was performed in the tap-room of a public-house. The patient was removed to the hospital, and he subsequently made a very good recovery.

The foregoing are the most serious cases in which I have made use of acetanilid as a dressing for wounds. In addition to these I have made use of the remedy in innumerable cases of minor surgery, such as removing fingers or toes, burns, lacerations, &c. I was induced to try the drug in 1891 on purely theoretical grounds, and am happy to say that in actual practice the beneficial results far exceeded my anticipations. As many of your readers may not be acquainted with the physical properties of this compound I may say that it is a white, crystalline powder, quite tasteless, inodorous, and almost innocuous when taken internally up to quantities of from five or ten grains. It may be mentioned that occasionally it causes a bluish tinging of the skin and some blueness of the lips and finger-nails. The urine occasionally is tinged with blue. The bluish discolouration I believe to be due to some impurity which was formerly present in the commercially prepared compound, for latterly I have failed to notice any of this colouring in patients under the treatment. The drug is applied as a dry powder, when it appears to cause a dry, healthy scab on lesions of continuity, and a gluing together of the edges of incised wounds. Recently I have been using this remedy for treatment of ulcerated legs in old people, and find that in the majority of the cases a clean, dry surface is formed in a few days and healing rapidly promoted without the necessity of bandaging or strapping.

Southwick, near Brighton.

"FUNCTIONAL ACTIVITY OF MAMMARY GLAND IN AN INFANT."

By F. S. D. HOGG, M.R.C.S. ENG., L.R.C.P. LOND.,
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MR. HAWTHORNE's communication on the above subject in THE LANCET of May 29th is of interest as relating to a somewhat unusual occurrence in the infant and one which is not referred to by many writers on infantile complaints. I came across such a case a few days ago. I was asked to see a female child, one week old, on account of her having vomited a small quantity of blood and, as the nurse believed, having passed some blood by the vagina. On examining the child I could find nothing amiss with her excepting that the breasts were considerably enlarged, not painful, and a milky fluid could be expressed on slight pressure. I directed that this milky fluid should be expressed occasionally, and have heard nothing further of any trouble with the child. The mother of this child and the nurse who was with her at all her confinements stated that both her former children (a boy and a girl) secreted a milky fluid in the same manner, and the mother further states that as infants she and her brothers and sisters were similarly affected. I have only seen one other case, in a child, a female, now eight years old, whose breasts do not now at all differ from those of other children of her age; but on the hearsay evidence of several mothers and nurses I think that this condition must be more frequent