passing to the intestines and great omentum. The tumour was thus slung across the upper part of the true pelvis, and the tightness of the suspensory bands accounted for the limited mobility of the growth. After it was freed from all adhesions and lifted up, no attachment to the uterus could be found, and the tumour simply required to be drawn out of the abdomen. The two months' pregnant uterus now came into view, lying retroverted in Douglas's pouch. Two subperitoneal myofibromata were attached to its anterior wall by a common pedicle two inches wide by half an inch in thickness. The larger of the two, rather larger in size than a pigeon's egg, felt suspiciously soft and boggy, so the removal of both was decided upon. The pedicle was tightly clamped, ligatured in three sections between clamp and tumours, and the latter cut off. Further examination of the uterus showed that two more (interstitial) myofibromata were growing in its wall. There was not the slightest trace even of a very fine pedicle, which might have been torn through when the calcified fibroid had been lifted up, gently as this had been done. Practically no blood was lost. The abdomen was closed, a glass drainage tube being left in. This was removed on the third day.

After-History.—The patient did well, except for some temporary intestinal paralysis, which soon passed off, and she is now, at the time of writing (April 15th) in pretty good health. The pregnancy continues, the uterus being felt now well above the pubes. The morning sickness has never recurred since the operation.

Description of Tumour.—The calcified tumour weighed 1 lb. 2 oz. It was irregularly oval in shape, measuring 12 c.cm. in length, and 9½ c.cm. in greatest width. On section the cut surface presented the appearances offered by fibromyomata of the uterus, except at the periphery, where a narrow calcified zone extended more or less completely around the tumour. After pieces of tissue had been removed for microscopic examination, the two halves of the mass were carefully needed, but no trace of deep calcareous deposit could be discovered. The calcareous shell—the *calcification en coque* of older writers—varied in thickness, but this nowhere exceeded 1 c.cm. It is noteworthy that the shell was thickest over areas to which adhesions were attached. At one point just beneath the shell was a cleft-like cyst, containing turbid fluid. Microscopically the usual structure of uterine fibromyomata was distinctly recognisable, but scattered about in the substance of the tumour, more numerous towards the centre, were many small rounded cavities and elongated clefts and fissures, the latter of which pursued often an irregularly tortuous course between the fibrous bundles. The tissues bounding these spaces in some cases appeared structureless and homogeneous. There was no trace of any lining epithelium, and the contents, when any were present, were merely granular debris. Thorn¹ found similar spaces in his specimen of calcified submucous fibroid, but he regarded them apparently as extensions of uterine glands, the epithelium of which had been lost or destroyed. Fatty degeneration was specially searched for but not found. Of the two pediculated tumours the smaller was quite solid; the larger, measuring 7 by 4½ cm., contained one large and several smaller cystic cavities, a condition which confirmed the suspicion aroused at the time of operation by the boggy sensation obtained on palpation. These cavities contained a turbid, greyish fluid without trace of blood.

It is uncommon during life to find fibromyomata lying free (that is, separated from the uterus) in the peritoneal cavity, and very rarely are such tumours calcified. Two cases have been reported lately where such tumours were removed by operation.

Dr. Amand Routh² removed by laparotomy from a woman, aged 50, a calcified fibromyoma which was attached only by vascular adhesions to the small intestines. A scar on the fundus uteri marked the site of its former attachment to that viscus. The tumour lay behind the uterus, and, in the absence of uterine symptoms, was diagnosed as a dermoid. It was "almost non-vascular, even when cut into, and was in an advanced state of calcareous degeneration."

Dr. Gill Wylie³ reported a case where the patient suffered from melancholia, subinvolution of the uterus, and a tumour which lay between the symphysis pubis and the retroposed uterus. On opening the abdomen he found the tumour to be a calcified fibromyoma. It was lying entirely free, without adhesions, and was of the size and form of a kidney. There were no traces of other myomata in the uterus.

The deposit of calcareous material in fibromyomata seems to depend to a great extent on interference with their vascular supply (Meadows,⁴ Matthews Duncan,⁵ Gusserow⁶), such as may occur when a pedicle becomes attenuated, as in the case of a "free" (as distinct from an "encapsulated") subserous myoma; or when a myoma having contracted adhesions elsewhere loses its connection with the uterus, or when the menopause arrives. It is generally about the latter period, according to Gusserow,⁶ that calcification occurs, and all writers are agreed that the internal irregular deposit is commoner than the external shell-like form. There are three specimens of the latter and two of the former in the Pathological Museum of University College, Liverpool. As a fibromyoma increases in size by proliferation of tissues at its periphery (Haultain⁷), calcification occurring here will arrest growth, if the latter has not already ceased, in consequent of deficient nutrition.

In the case I have related there would seem to be some imilarity between the condition of the tumour and litho-

pædion (as distinguished from lithokelyphos) formation, which, according to Albers,⁸ is associated with the presence of adhesions between the foetus and its surrounding sac. The fact that the deposit was thickest where adhesions were attached seems to point to a definite relationship between them.

REFERENCES.

- ¹ Thorn, Zur Kasuistik der Uterosteine, *Zeits. f. Geburts. u. Gynäk.*, Band xxviii.
- ² Amand Routh, *Trans. Obstet. Soc. Lond.*, vol. xxxviii, p. 388.
- ³ Gill Wylie, *Proceed. New York Obstet. Soc.*; *New York Jour. of Gynecol. and Obstet.*, March, 1894.
- ⁴ Alfred Meadows, *Med. Times*, 1855, ii, p. 171.
- ⁵ Matthews Duncan, *Med. Times*, 1885, i, p. 39.
- ⁶ A. Gusserow, *Die Neubildungen des Uterus*, p. 34, Stuttgart, 1885.
- ⁷ F. W. N. Haultain, *System of Gynecology* (Alburt and Playfair), p. 567.
- ⁸ Albers, *Zur Geschichte des Lithopædion*, *Monats. f. Geburtskunde*, 1861, Band xvii, p. 42, quoted by Webster, *Ectopic Gestation*, p. 96.

HEREDITARY KERATOSIS OR TYLOSIS PALMÆ.

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THE following is so complete and remarkable a history of the handing down of this rare disease in unbroken succession for at least one hundred and fifty years that I have considered it worthy of being placed on record.

My attention was called to the palms of the hands and soles of the feet of a woman, aged 36, of a phlegmatic Teutonic type. The palms and palmar surface of all the digits presented a hard, horny epidermis, cracked in many directions, and blackened with dirt on account, as the patient explained, of the impossibility of keeping them clean. The whole of the affected area was seen, as the hands were held extended palms upwards and the fingers approximated. The margin strictly outlining the hand was marked with a thin red line, except in the case of the digits, where the thickened skin joined the normal skin with an abrupt edge. The whole thickness of the skin could be pinched up, or, more correctly, the margin could be raised as though it were a sheet of mill-board attached to the normal skin of the dorsum of the hand. Where deep cracks occurred, a pinkish soft line, tender to the touch, was seen at the bottom of these fissures. The plantar surfaces presented a like appearance, except that the fissures were not so numerous, and the whole thickening was even more marked. The lesion was exactly symmetrical.

My patient gave the following account of herself, and said that it equally applied to all the affected members of her family, varying only in the degree of suffering caused by the disease.

At birth her palms and soles were noticed to be redder than is normally the case, and a week later, when her mother was "churched," the surfaces were becoming scaly. There has been no change in their condition throughout her life, nor have the lesions spread beyond the original limitation. From time to time the horny layer is shed in flakes, and leaves a raw bleeding surface very tender to the touch. A two hours' "washing" always causes her trouble, owing to subsequent scaling and soreness. Her state of health directly affects the condition of her hands and feet. Her maternal aunt concurred with her in the statement that the disease always attacked the same areas in all the cases, and that there was no record of any individual having infected another. My patient anoints her hands with vaseline, but no other remedy has been used, as she says that it is well known that "no doctor can cure the disease." I had an opportunity of examining the hands of her sister and one of her nephews; they would not show me their feet, as they were very sensitive about their "affliction," and they presented precisely the same appearances as above described.

The appended family tree was obtained without much difficulty from my patient and her aunt, as their memory is kept green by the constant recurrence of the condition in each generation. There is a family tradition that it was introduced by the marriage of an ancestor with a German woman. In this connection it is worthy of note that the three members affected whom I saw were of German type, and the aunt unaffected of a spare, wiry, English type. I give the genealogy as it stands in relation to my patient:

F. = Free from the disease.

The table shows that the disease has been transmitted mainly, but not entirely, through the female line, and that the offspring of those who escaped have never been affected. The family is a long-lived one.

In the second volume of Hebra's *Atlas* will be found an admirable representation of the condition of the hands; it is named "keratosis or tylosis palmæ." Crocker's *Atlas*, vol. i, also figures the condition. Unna (edition 1896) calls the disease "keratoma palmare et plantare hereditarium," and gives the following histological account from Thist: Elongation of papillæ, granular layer thickened; the main thickening found in the middle layer of epidermis. The cutis and fatty tissue with the blood vessels enlarged. The coil sweat glands much hypertrophied with very large mouths.

Ulna concludes that the thickening of the cutis and fatty tissue, as well as the very marked acanthosis and hypertrophy of the coil glands stamp this congenital tumour formation as a naevoid hypertrophy of the whole palms and soles. He notes especially the "reddish margin" so well observed in my case. It would be interesting to know whether Professor Weismann would consider this transmitted disease as evidence in favour of his pangensis theory of heredity.

THE USE OF NITROUS OXIDE GAS AND OXYGEN DURING SURGICAL OPERATIONS.

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So many advantages might be claimed for the introduction of an anæsthetic agent which would combine the four attributes of safety, a rapid unconsciousness, muscular relaxation, and freedom from after-effects, that a few further remarks on the results which are at present attainable with nitrous oxide gas when mixed with suitable proportions of oxygen may prove of interest as offering the addition to our list of an inhalation less incapacitating than chloroform and ether, but scarcely inferior in value for many surgical procedures of moderate gravity.

The question at once arises, Under what conditions will such an anæsthetic be of special value?

1. A complete examination of the pelvis and abdomen is often needed before a diagnosis can be arrived at in cases which may require either for an operation shortly afterwards; on these occasions, without any special preparation, gas and oxygen will prove a most convenient help.

2. As ether is very safe, in modern days it is no exception to find patients who have inhaled it several times, but suffer considerably from after-effects; to these the substitution of a tasteless gas during a surgical operation is a great relief.

3. Many operations require some further painful procedure during convalescence, the removal of drainage tubes, the moving of stiffened joints, the reopening of a wound for hæmorrhage or redressing; in these it is particularly desirable not to upset the patient's digestion by a second dose of ether if nitrous oxide can be made to rise to the occasion.

The apparatus invented by Dr. Frederic Hewitt for use in dental practice is adaptable to surgical cases after a slight enlargement of the oxygen apertures in the mixing chamber, from 10 to 20 per cent. of oxygen being required when the face-piece is kept continuously applied. About 50 gallons of nitrous oxide and 7 or 8 gallons of oxygen are inhaled on the average during each quarter of an hour's narcosis. Beginning with 2 or 3 per cent. of oxygen the patient inspires the gases for

five or six breaths, and by means of a dial plate the oxygen is then increased in amount, according to the depth and rate of breathing and the colour of the ears and face.

We know exactly the symptoms of asphyxia which nitrous oxide given alone produces—namely, cyanosis, jerky, rapid breathing, twitching of the limbs, and dilated pupils. These objectionable results are avoided by the presence of oxygen, and by means of experience in the use of gas alone the amount of oxygen required in each case is discernible the moment respiration tends to vary at all from that of normal softly snoring sleep. Clinically, if the breathing grows faster and deeper and colour a trifle dusky, more oxygen is wanted; if quieter and slower, the oxygen must be reduced.

Let us now inquire what type of anæsthesia is produced, and the symptoms observable during the narcosis. The colour is normal, the breathing of a softly snoring type, not so stertorous as with ether, not so quiet as under chloroform; the pulse is strong, full, and regular; the abdomen is generally quite flaccid, but the limbs may show a slight tendency to rigidity; though the legs will offer no resistance to being placed in the lithotomy position, they may show slight reflexes from time to time. The blood from an incision during this anæsthesia may appear somewhat venous at intervals; this is not, however, due to congestion, but to the fact that nitrous oxide to some extent replaces oxygen in the hæmoglobin and the purple colour of the new product becomes evident in the flowing blood, even while the facial colour is healthy in appearance.

Alcoholic patients are not good subjects, nor are very powerful athletic men ; but most women and well-nourished persons generally can be regarded as suitable cases, while those who are weakened by illness often take the gases remarkably well.

In my first article on this subject, in the *Lancet* for June 12th, 1897, I gave an account of the uses to which I had applied this anæsthetic during the previous two years. In the August number of the *British Gynecological Journal*, 1897, I gave a further account of its suitability for certain cases in that branch of practice, citing, in each paper, several instances of its prolonged inhalation.

Since that time I have notes of a number of successful administrations lasting from 15 to 20 minutes, and in these I have not observed any symptoms which would indicate that the anæsthesia has any more definite limits with regard to time than that of chloroform or ether.

The recovery to consciousness after removal of the face-piece has been very rapid, often complete in 2 to 3 minutes, and sickness has been conspicuous by its absence.

Such operations as the removal of a cystic adenoma from the breast, dilatation of the cervix uteri, removal of an inflamed hymen, reopening of a lumbar renal incision, opening and curetting of a large mammary abscess, and several cures for varicocele among the number, will illustrate the usefulness to which these gases may attain.

I think the safety of nitrous oxide and oxygen is greater than that of the former gas alone—the safest of all known anæsthetics—for during the past eight years its adoption in dental practice has been rapidly becoming general, and no fatality has ever been recorded under its influence.

BACTERIOLOGICAL INSTITUTE FOR CEYLON.—Dr. H. M. Fernando will probably be the Director of the Bacteriological Institute to be opened in Colombo shortly, and is leaving for Europe in connection with the institution. The final plans of the building have been completed, and the work will be taken in hand at once. It is expected that it will be opened early next year. The apparatus and laboratory fittings have been ordered out.