Yet that this does not weaken the argument appears in the metastasis which regularly occurs by way of the blood stream in the course of sarcoma, and is not unknown, too, in carcinoma, as exhibited in the secondary hepatic growths that may arise in connection with columnar-celled carcinoma of the intestinal canal or rectum, or in Sir James Paget's classical case of "malignant chondroma" of the testicle, which, as proved by the late Professor Kanthack and Mr. S. Pigg, was really a chondro-carcinoma infecting the lungs by way of the spermatic veins. It follows as a corollary that, in order for an embolus to proceed to the growth of a tumour, some morbid character must be impressed upon the epithelium so transplanted.

But apart from such metastasis in malignant disease, the epidermal cysts of the palm and palmar aspects of the fingers furnish an instructive object-lesson of the results that follow the traumatic dislocation of epidermal cells into or beneath the corium, and one to which I referred on the occasion of Dr. Lack's bringing his experiment before the notice of the Medical Research Club in July of last year. I have had opportunities of examining three or four such cysts, and quite recently one which was removed by Mr. E. C. Stabb from the palm of a woman, aged 50, who three years previously had run a pin into the palm; the wound bled, and a week or two afterwards a small swelling appeared which slowly increased in size.

The cyst, as now studied, lies altogether beneath, and separated by the fibrous tissue of the corium from, the general epidermis. Its lining has, as in other examples, all the characters of true epidermis, presenting most inwardly a thick laminated layer of horn, beneath this a well-pronounced stratum granulosum, and still more deeply a rete Malpighii with a vertical set of cells set upon the fibrous tissue, which cells, though parallel, are somewhat displaced from the vertical as a result of the oblique incidence of pressure. The rete of the cyst has about the thickness of the general rete where this lies on the summits of the papillæ. The cyst has an ill-defined wall of fibrous tissue, not differentiated in its more superficial or uppermost part from that of the corium, and it is completely devoid of papillæ or glandular structures. Such cysts remain of small dimensions, the implanted tissue behaving in its after-growth much as in the experiments already cited.

After a certain amount of proliferation, growth ceases, but though epithelial cells are here displaced into the lymph spaces of connective tissue, no formation of a carcinoma ensues.

Amongst the same class of phenomena must be ranged the multiple formation of cysts which may follow the rupture of an ovarian dermoid. Here, again, there ensues a production of simple circumscribed cysts, and not a carcinomatous infection of the peritoneum such as should arise were the mechanical hypothesis of the origin of carcinoma a true one.

REFERENCE.

- ¹ *Geschwülsten und Infektionskrankheiten*, and in the *Verhandlung der Deutschen pathologischen Gesellschaft*, 1899, p. 97.

SPASMODIC CLOSURE OF THE LARYNX DURING THE ADMINISTRATION OF ETHER,

PRECEDED BY NITROUS OXIDE: MITRAL STENOSIS: ALTERNATION
OF MURMURS.

By W. J. McCARDIE, B.A., M.B., B.C. CANTAB.,
Anæsthetist to the General Hospital and to the Dental Hospital,
Birmingham

It is known that some patients with compensated mitral stenosis are unable to take ether as an anæsthetic; the following is a case in point:

On February 6th, 1899, an undersized and very nervous youth, aged 16, a patient under Mr. Gilbert Barling, at the General Hospital, Birmingham, was brought into the anæsthetic room to be anæsthetised for the removal of the vermiform appendix. He was markedly cyanosed, especially about the nose and inner parts of the cheeks, and the finger ends were clubbed, but there was no œdema or ascites. There was no history of recent cough nor any evidence of disease found in his lungs. The heart's apex beat was diffuse, and accompanied with a marked rough thrill. A loud presystolic murmur was heard, leading up to a greatly-accentuated first

sound. The second sound was reduplicated, and there was a soft diastolic murmur preceding the presystolic, and separated from it by a short interval. The pulse was of small volume, and rapid but regular.

I gave the patient gas and ether by Hewitt's apparatus and method, using about three-quarters of a bagful of the former. After turning on the ether, I allowed a breath of air at three or four separate intervals to obviate any additional heart strain. There was no excitement or struggling, only just a little movement of the limbs; the colour of the face was unchanged. When he was almost under, that is, when the conjunctival reflex had nearly disappeared, and without any warning, the quiet breathing suddenly ceased, though the chest movements continued. I removed the apparatus, pushed forward the lower jaw, but could neither hear nor feel any air current. Meantime the colour of the face was slowly becoming an ashy grey colour, while the pulse continued regular and of fair volume. Then I depressed the lower jaw, whose muscles were quite lax, and pulled the tongue well out with forceps; still no entry of air. I also passed my finger to the back of the throat, but found nothing that could obstruct the air passage. Concluding that there was spasmodic closure of the glottis, I hastily sent the attendant nurse into the theatre for Mr. Barling and for tracheotomy instruments. Mr. Barling explored the pharynx with the forefinger, but found nothing until with some effort pushing his finger beyond the epiglottis he felt its tip entering the larynx, which was firmly closed. After a little steady pressure the spasm relaxed. He withdrew his finger, air entered, and the patient very quickly recovered colour, and began to show every sign of rapidly-returning consciousness. All this happened in two or three minutes at the most, and all the while the chest movements continued. When the patient had regained colour the back of the throat was swabbed out, but only a small plug of mucus was removed. There had previously been no evident secretion.

Waiting until the patient had practically recovered consciousness I administered the A.C.E. mixture on Silk's metal hospital inhaler, and had very little trouble afterwards. Early in the operation I tentatively added some ether to the mixture when the patient was not very deeply under, and he at once began to breathe stridulously. Thereafter I kept him generally deeply under the influence of the A.C.E. mixture until the end of the operation, the pupils being moderately dilated, with pulse and respiration regular. Once or twice only was there a little very slight phonation. The colour was as before the anæsthetic. When the operation, which took about three quarters-of-an-hour, was finished, the patient came round very slowly, and as he showed no sign of consciousness in about 15 minutes, I opened the mouth with the gag and put my finger down his throat and about the epiglottis. This excited some reflex straining and some laryngeal spasm for a minute or so and then he vomited a few ounces of dark green bilious fluid and frothy mucus. It was more than one hour before he came properly round. As regards the operation, his wound healed by first intention and he did excellently. On February 11th, after he had been quietly recumbent in bed for a few days, I examined his heart with Dr. Bernard Bostock, the House Physician, and we found no thrill or presystolic murmur, but a well marked, soft, mid-diastolic murmur.

On March 1st, when the patient was up and about the ward, I examined him again. He said he felt "quite well," denied having had rheumatism, or anything else the matter with him that he knew of, but admitted that he was "short of breath" at times, and tired. On examination in the erect position (he had previously been sitting) I found his heart condition as on February 11th, but after getting him to walk about a dozen yards sharply I found a well-marked thrill and presystolic murmur. After he had been standing still for two or three minutes this was replaced by the mid-diastolic murmur. Thus the mid-diastolic murmur was indicative of less heart strain and better compensation. The patient eventually left the hospital cured of his appendicitis.

Curiously enough, Mr. Barling two or three days before this event had said that in a large experience of operations and anæsthetics he had never yet seen a case of really serious laryngeal spasm during the administration of an anæsthetic. I myself have never before or since observed any condition like this. I had, in choosing the anæsthetic for this case decided to give either the A.C.E. mixture—having in mind the below-mentioned cases quoted by Dr. Hewitt—or gas and ether; but unluckily I preferred the latter. To my mind the laryngeal spasm in this case might have been due to one of two causes. Either a direct irritant effect of the ether vapour of a certain strength, acting on a perhaps particularly sensitive laryngeal tract; or later on in the narcosis the addition of ether to the A.C.E. mixture caused stridor. Whether the sensibility of the mucous membrane to irritation was at all due to the cardiac condition is doubtful. Dr. Frederick Hewitt, in his admirable book on anæsthetics, quotes three cases of mitral stenosis recorded by Mr. Penberthy in which the A.C.E. mixture had been given with the best results. In one of these cases it is noted that "the patient had formerly taken ether with a nearly fatal result." I do not understand why certain patients with compensated mitral stenosis should not be able to take ether, unless their tendency to bronchitis has possibly something to do with it. In another case of mitral stenosis, a girl aged 18, whom about six months later I had to anæsthetise, I gave the mixture of ether 2 parts, chloroform 1 part (E, C₁), by means of a Clover's inhaler without the bag, and had no trouble. Or the laryngeal spasm might have been due to a plug of mucus suddenly inspired into the glottis. Mr. Barling rather favoured this view, though personally I incline to the

former theory. Perhaps had I not given so much air, which prolonged the induction of anæsthesia, the spasm might not have happened.

Regarding the difficulty of getting the finger down the throat and into the larynx, I have tried the experiment on several cadavera, and have found that in children it is easy to pass my forefinger, which is rather short, past the epiglottis, and push its tip into the larynx. In a woman of ordinary type, by well depressing the lower jaw, and by pushing up the larynx from outside, as in putting on the finger of a glove, I can well get down to the glottis. In the ordinary man or big woman I cannot with the finger by any means touch the vocal cords. They are beyond reach. Hence, in cases of laryngeal closure occurring in full-sized adults, when the finger cannot reach the larynx, tracheotomy would be necessary.

FORMIC ACID AND THE INHALATION OF FORMALIN AS A PREPARATION FOR AND AID TO THE OPEN-AIR TREATMENT OF PHTHISIS.*

By J. LARDNER GREEN, M.R.C.S.ENG., L.S.A.,
Salisbury.

FORMALIN is the name given to the saturated aqueous solution of 40 per cent. of formic aldehyde obtained from wood spirit by oxidation, the dilute 1 per cent. of formalin in water has no corrosive action; it is harmless to warm-blooded animals. One tablespoonful in one quart of water suffices for the disinfection of rooms, clothing, etc. Aronsohn found that 1 part of formic aldehyde to 20,000 parts of water destroyed the typhus and anthrax bacilli. It has the great advantage that it can be used in a vapourised condition and so available for the disinfection of perishable material without destroying them. Formalin is valuable as a disinfectant and deodorant cleansing septic wounds; it destroys bacteria and combines with the fibrous tissues, so promoting rapid healing.

Dr. Mitchell¹ says that formalin is often useful in the treatment of malignant growths; but to the physician it is useful when inhaled in a fine spray in catarrhal and tuberculous affections of the lungs. Diseased mucous tissues are more tolerant of the vapour than are healthy mucous tissues. Formalin has been successfully used in skin diseases, notably in epidermycosis decalvans and E. tonsurans.

Years ago when in search of the best means for preserving cut flowers in their pristine colours by destroying the microbes causing the fermentative changes (whereby their colours become lost) I found formalin the best for the purpose. Flowers thus retain all their brilliancy and are in strong contrast with the ordinary dried flowers of the hortus siccus. This germicidal property led me in 1895 to experiment with formalin in the treatment of catarrh and influenza, with the hope of destroying the microbes accompanying those diseases. The success was immediate and decisive, as reported in my paper read before the meeting of the Southern Branch, November 25th, 1896. I then recommended a trial of the inhalation of formalin in the early stages of tuberculous consumption, stating that formalin diminished the number of the bacilli in the sputum, as was afterwards confirmed by Dr. Murrell early this year. Dr. Cervello of Palermo has experimented in a similar way. In 1895 the inhaler used by me was not equal to the production of very fine mist-like spray of the dilute solution: subsequently various forms of inhalers were tried, the vapour of formalin issuing forth was almost invisible.²

The most satisfactory mixture for the inhalation has been: R Formalin ʒj, glycerin ʒivss, aq. pur. ʒv. M. To be used with an inhaler four to six times in the twenty-four hours, as may be suitable. Should there be more than usual sensitiveness in the air passages, aromatic spirit of ammonia ʒx may be added to the above mixture.

The following cases illustrate the benefit derived from these inhalations:

* Read in the Section of Medicine at the Annual Meeting of the British Medical Association, held at Portsmouth, August, 1899.

CASE I.—G. P., a gentleman over 30 years of age, went in 1878 to South Italy for the purpose of securing a milder climate—there he had hæmoptysis with continued feeble health—during each subsequent winter spent in England the cough and catarrh returned. In 1895 he used the inhalation of formalin with great relief; since that date he has been free from chest complaints.

CASE II.—B., a young woman, aged 21, had always suffered from winter cough and bronchitis, with symptoms of the first stage of phthisis. In 1897 she inhaled formalin, and has not since suffered from any severe cold or cough.

CASES III AND IV.—Two cases reported to me this year by a physician in Harrogate. He writes: "The first patient said after using the formalin a few days it had given her more relief than anything she had previously tried." The second: "W.C., aged 40 years. Illness began with pleurisy of both sides, May 25th, 1899. On June 5th there was a second attack, with congestion of both lungs. Temperature was normal for three days (June 16th to 19th), then it gradually began to rise a little each day until it reached 104° F. The consolidation of lung tissue continued, especially of the left lung. The cough was very troublesome. Angier's petroleum emulsion was given, but the temperature remained at 102° F. I began," my correspondent continues, "with your prescription of formalin; in two days the temperature became normal and has remained so for a fortnight. July 25th: The patient is gaining flesh, the lungs are slowly recovering, and the breathing has become normal."

These cases, my own personal experience, and the numerous cases reported in the European and American journals, prove how bright a prospect is opened up by the inhalation of formalin when given to suitable subjects of phthisis. This being so, I conclude from the proofs of the very excellent results of the open-air treatment that the question arises, Would it not be best to combine these two effective methods for each to supplement the other?

Cases of phthisis in their early stages may, in the first instance, be treated by the inhalation of formalin together with suitable dieting, so as to kill or weaken most of the bacilli before the patient starts upon the open-air treatment, and during that time he is still to continue the inhalation, as may be thought advisable; in this way the length of the sojourn in the sanatorium would be shortened by probably one-third. We may deem the benefit derived from the open-air method arises chiefly from the strength and hardiness conferred upon the patient who thus becomes able, on leaving the sanatorium, to resist the invasion of the tuberculous bacilli. By these combined methods of combating the inroads of phthisis we not only relieve the patient more quickly from suffering, but by shortening the time spent in the sanatorium we diminish the outlay, and shall thereby be able to meet more fully the needs of the poorer patients, who form, both absolutely and relatively, the majority of consumptives, for more of them could thus be accommodated.

The combination of both these tried and successful lines of treatment is earnestly recommended to those who have many opportunities to carry out in a wide field for observation the suggested mode of treatment in the confident hope that we shall greatly lessen the number of the unhappy victims of the greatest scourge of the civilised world; we know that at present "of every seven persons who die, one of them dies of some form or other of tuberculous disease."

NOTE AND REFERENCE.

¹ BRITISH MEDICAL JOURNAL, February 11th, 1899, p. 337. ² (a) Messrs. Oppenheimer's "Vapouriser." (b) The Formalin Hygienic Company's "Atomiser." (c) Messrs. Slater Brothers' "Cloudiser." (d) Messrs. Burroughs, Wellcome, and Co.'s "Atomiser."

A CASE OF JACKSONIAN EPILEPSY CURED BY OPERATION.

By H. DRINKWATER, M.D., C.M., M.R.C.S.,
Wrexham.

THE following case is of interest because at the present time, more than four and a half years since the operation, the man is well and able to work as well as ever he could. The case was a severe one, for the man at the time of the operation was almost helpless, and was rapidly losing his mental powers.

T. W., a joiner, aged 38, first seen in the summer of 1894, had complained of severe and almost constant pain in the left temple for several months, and had occasional "fits" with loss of consciousness. He had been a heavy drinker, but said he had not suffered from venereal disease. The pain in the left temple was soon followed by pain in the right arm, with some loss of power, so that he could not put on his coat without assistance. In August, 1894, he fell down in the street; he "suddenly turned round," dropped down, and frothed at the mouth. He recovered in a few minutes. The next fit occurred six weeks later, whilst at work. He kept well for six weeks, and