soon after the second operation, in which a coil of small intestine was freed from an adhesion to the suture on the uterus. Delay is most dangerous, if not fatal, in such a case. The surgeon has a natural objection to reopening the abdomen, and is tempted to delay and hope for the best, but the proper treatment is to harden one's heart and explore as soon as suspicions are aroused. The other four cases—in three of which I had performed the first operation myself, while in the fourth the first operation had been performed by one of my colleagues—were ovariectomy, pyosalpinx with terrible adhesions, pyosalpinx, and severe bleeding from an ovary. Profiting by my experience in the first case I lost no time in operating on these four, and they all recovered. I have never ceased to regret that I had not sufficient common sense to explore the abdomen of the first patient as soon as she looked ill and complained of pain, as, if I had done so, she would almost certainly have lived, as the adhesion was easily dealt with.

Not strapping the abdomen when a patient has a cough during the first fortnight or so after an operation.

I have regretted bitterly that I had not reinforced the stitches, or the recently united tissues after removal of stitches, by carefully applied strapping, when a patient has developed a cough after an operation. If the cough is violent the abdomen is strapped almost as a matter of routine, but it is important to remember that a patient who has a mild, fairly harmless cough may cough violently once or twice when she wakes up after several hours' sleep and finds some tenacious mucus in her throat, difficult to dislodge. I can only remember two cases in private practice in which patients have burst the wound open by coughing. I ought to have strapped the wound in both, and have regretted ever since that I did not do so. One patient died a fortnight later, the other recovered.

There are some cases in which I have had *no regrets*. In some of these I have told a patient that in my opinion no operation was necessary, and have later heard that she went on to someone else, who sent her into a nursing home immediately and operated the next morning. I find that I spend a good deal of my time in advising patients to avoid operations. Some of them are exceedingly grateful, but some go straight to another man. One case in which I was given most fulsome thanks may be worth a detailed account as showing how difficult it is to prophesy what a patient will do.

A man, whom we will call Mr. H., rang me up on the telephone and said, "What would you charge to operate on my wife?" I naturally said, "What is the matter with her?" He answered, "It is the womb." I said, "I am afraid that I cannot give an opinion without seeing your wife." He replied that he thought that I would be able to suggest a fee without seeing her, so I said, "If you telephoned to a bootmaker and asked how much he would charge to mend your boots, would he not say, 'Let me see your boots?'" "Doctor, there is something in what you say; I will bring my wife to-morrow." I examined her, a multipara of 54, some years after the menopause, with a very loose abdominal wall, backache, and dragging sensation, with several small fibroids and retroversion of the uterus. She had seen many gynaecologists in Germany, some of whom had advised operation while others had advised against it. The patient said that she wished to avoid an operation. I suggested that an abdominal belt might give her a great deal of comfort, and she said that she had had one which had done her a lot of good, but it was worn out. The husband said, "Doctor, you are a British sport. Before the war I used to say, 'Go to the Continent for an opinion,' but since the war I say, 'No, stick to your own men!'" No one has asked the questions that you have asked, no one has taken so much trouble, no one has suggested a belt. Doctor, I thank you, you are a British sport; we will go and get a belt." Two days later I met a medical friend who said, "You remember Mrs. H.?" I said, "Yes, she's going to try an abdominal belt." He said "No; she went on from you to Y, and then to Z, who put her straight into a nursing home and operated on her yesterday morning!"

TREATMENT OF ENCEPHALITIS LETHARGICA BY THE REMOVAL OF POSSIBLE ETIOLOGICAL FACTORS.

BY

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PART I, BY A. L. YATES.

SOME four years ago I began an investigation of the nasal ciliary mechanism, and found that the ciliated epithelium formed definite tracks which functioned in a backward direction so that mucus rolled over any particles introduced within the nose, and conveyed them backwards into the nasopharynx along certain definite paths.¹ This led to a further investigation of the ciliary and secretive mechanism, and the nasal mucous membrane in inflammatory states, and it was found that four groups of conditions could be observed—namely:

1. Those in which mucous secretion was excessive and the cilia active.
2. Those in which mucous secretion and the cilia remained active, and to the mucus was added serum and leucocytes, forming yellow muco-pus. In neither of these conditions was there any alteration in the staining power of the mucus, nor could the micro-organisms which were visible microscopically in the mucus be cultivated.
3. A condition in which the mucus became altered, apparently as a result of the action of the bacterial ferments, so that the mucus stained with aniline dyes, such as indigo-carmin. In this group cases were met with where the cilia were more than normally active, and where the mucus was conveyed backwards into the nasopharynx, causing in and around its path a chronic inflammation of the mucous membrane, and thus producing laryngitis, tracheitis, and oesophagitis. In another group of cases the cilia were less than normally active, and the altered mucus remained in the sinuses and in the nose. In Types 1, 2, and 3 an anterior nasal discharge appeared when mucus or muco-pus was greater in amount than the cilia could convey away into the nasopharynx.
4. In this group I found cases in which the cilia and mucous secretion were paralysed, so that the organisms which can often be obtained in pure culture from the interior of the sinus were present in a brownish watery solution containing the remains of leucocytes—that is to say, of water-soluble pus.

Certain cases in Group 4 showed the presence of toxic absorption and suffered from various complaints, such as periarticular rheumatism, neuritis, neurasthenia, skin complaints, and similar conditions. Other cases in this group showed no such signs of toxic absorption.

In order to determine the reason why some of the cases in this group had toxic absorption and others not, a solution of 0.4 per cent. indigo-carmin or 0.01 per cent. phenol-sulphonaphthalein was placed in the sinus. In the cases which showed signs of toxic absorption of nasal origin this dye appeared in the urine in from ten to fifteen minutes. In cases without toxic absorption, or in cases in which the sinuses were all relatively normal, or if swallowed, the dye did not appear in the urine.

Toxic absorption from the mucous membrane would therefore appear to be prevented in the early stages of inflammation by mucous secretion, and in the late stages by deposit of fibrous tissue.

The Nasal Condition in Encephalitis Lethargica.

Various writers on encephalitis lethargica have drawn attention to the presence of nasal and buccal discharge in practically all cases, and I found paralysis of the cilia and mucous secretion in fully developed cases in the posterior portion of the nose—that is to say, in the ethmoidal recess, the posterior ethmoidal sinuses, or the sphenoidal sinus—and that such inflammation tended to spread both forwards to the mucous membrane of the nose

and downwards to the mouth, causing an excess of mucous secretion in both these situations.³ The dye, if it could be placed in the affected area, appeared in the urine in about fifteen minutes.

This condition could be brought about either by a single acute nasal infection of the type known colloquially as influenza, in which it could be demonstrated that the mucous membrane of the nose passes in a few days, or even hours, from the normal to a condition of paralysis of the cilia and mucous secretion with toxic absorption, or by a chronic inflammation producing a like result in months or years. Cases of encephalitis lethargica give a history which will correspond either with an acute attack of influenza or a chronic type of nasal infection, but due regard is to be paid to the fact that both influenza and chronic rhinitis are very common conditions.

Dr. Stanley Barnes² made the suggestion that it was this permeability of the nasal mucous membrane which permitted the virus of encephalitis lethargica to enter the tissues and to reach the nervous system, probably by the perineural lymphatics. A critical review of this work appears in the *Bulletin of Hygiene*.⁴

Treatment of the Nasal Condition in Encephalitis Lethargica.

It was clear that if this hypothesis was correct any treatment which diminished the permeability of the mucous membrane to toxins would have the effect of diminishing the absorption of the virus of encephalitis lethargica into the tissues, but that it would have no effect upon any areas in the brain already destroyed by the virus, and therefore that the most that could be expected as a result of such treatment would be that in chronic cases recrudescences of the disease could be prevented, and in acute cases at best the damage to the brain could be limited to such areas of damage as had been total and had occurred before sinus treatment was adopted.

Method.

The nasal mucous membrane having been anaesthetized by spraying with 5 per cent. cocaine in 1 in 1,000 adrenaline, a cannula of a diameter of a millimetre or less and suitably curved is, under direct vision, passed over the middle turbinate and thus to the front of the sphenoidal sinus. On rotating the cannula gently the end can be felt to slip into the sphenoidal sinus; a syringe is then attached and by suction some of the contents withdrawn for cultivation. The sinus is then thoroughly washed out with saline. The posterior ethmoidal sinus can also in some cases be reached. In a certain number of cases even with full cocaineization it is not possible to pass a cannula between the middle turbinate and the septum; it is then necessary to pass the cannula beneath the middle turbinate and thus reach the sphenoid-ethmoidal recess. By this route the sphenoidal sinus can occasionally be reached, but this is not generally the case.

Treatment consists of giving a vaccine in increasing doses and of washing out the sinuses again if the patient ceases to improve. Improvement on washing out the sinuses is often marked, generally after a few days, but the patients tend to relapse, and on the average the washing out must be repeated every month or six weeks. In addition to the above the patient uses a douche consisting of menthol 2 grains, eucalyptol 20 minims, and liquid paraffin to 4 ounces. A medicine dropper full is injected into each nostril three times a day while lying on the back with the head thrown well back.

Relative Value of Various Treatments Used.

It is difficult to arrive at a conclusion as to whether the washing out of the sinuses or the use of vaccines produces the greater effect, but many patients have stated that the most marked improvement has followed the washing out. It appears to be doubtful whether an autogenous vaccine produces more effect than simple protein shock, but an autogenous vaccine has been given in all patients who were the subject of this investigation. In those who gave a history of chronic and intense rhinitis for some years bacteriological examination showed either the bacillus of Friedländer or the pneumococcus; in those in which encephalitis lethargica followed an acute or influenzal rhinitis the *Staphylococcus aureus* alone or together with the pneumococcus was generally found.

The postural deformity of encephalitis lethargica has apparently some bearing on the course of the more chronic forms of the disease, for patients in whom the postural deformity is not dealt with by remedial exercises appear to reach a stage in which, although the mental symptoms,

etc., have ceased, the patient still has a Parkinsonian gait and posture.

For a year all patients have been taught exercises, which they do in their own homes, or, in the more severe cases, under the guidance of a masseuse; these exercises have effected a marked improvement in their condition, both in preventing the ready fatigue from which these patients suffer, and in enabling them to get rid of the difficulty in balancing which is such a marked feature in many, so much so that it has seemed that in the patients in whom imbalance was most marked the faulty position of the labyrinth relative to the remainder of the body was a factor in the production of symptoms. The exercises, in addition, train to the highest point of efficiency such nervous structures as remain undamaged, and thus reduce the deformity caused by a deficient action of the areas of the brain which have been destroyed.

PART II, BY G. EDEN.

The diagnosis of many cases of epidemic encephalitis in the acute stage is often very difficult, and in the less severe cases of a chronic nature must be a matter of opinion, as, up to the present, we have no means of absolute proof of the correctness of the diagnosis. But there can be little doubt in those cases in which Parkinsonian symptoms develop, either after an acute febrile illness with gross disturbance of sleep, paresis of an ocular muscle, diplopia, or loss of accommodation and retention of the light reflex.

Though the Parkinsonian form of encephalitis lethargica is the most liable to be progressive and the most resistant to treatment, our description of the results of washing out the sinuses in the chronic cases has been limited to cases of this type. One advantage of this limitation is that almost all the patients had previously had several, if not all, of the many treatments usually advocated for the sequelae of encephalitis—for example, tonics, belladonna, massage, hyoscine, protein shock, etc. The only essential difference in our treatment has been the washing out of the sinuses, and the regular use of nasal antiseptics, but the majority had weekly doses of an autogenous vaccine prepared from the organisms found in the sinuses. The washing out was repeated in many cases, a return of drowsiness, headache, and apathy being the usual indications.

Striking and immediate improvements were often observed as a result of the first washing out, and patients generally volunteered the statement that the washing out of the sinuses caused greater improvements than the use of vaccines. The fact that almost any new treatment for encephalitis often produces a short temporary improvement has not been lost sight of, and the writing of this paper has been delayed until the effects of washing out the sinuses had been observed for a period of at least three months in any one case; in the majority of instances cases have been observed for over a year after treatment was begun.

It is not claimed that this is a cure, but it appears to us to be a remedial measure of great value in association with drug treatment; where drugs alone have been useless, a washing out, followed by the same drugs, often produced a good effect.

The frequency with which patients relapse, and the fact that these relapses are improved or prevented by one or more washings out, suggests that the absorption of toxins is interfered with, and to a great extent prevented, by disinfection of the nasal mucous membrane. The usual results of washing out the sinuses has been almost immediate improvement in the patients' symptoms. They feel brighter, find themselves capable of doing more for themselves in their homes, become less rigid, and the face becomes less mask-like. There has seldom been any marked improvement in the mental condition of the chronic cases. The following are typical of the results obtained in many chronic cases.

Case 1.—A woman, aged 23; an extreme case with well marked Parkinsonian symptoms. Two years earlier she had had an acute illness with great drowsiness, and diplopia followed by rigidity of all limbs. A year ago she was considered a hopeless case by several competent authorities; for six months she had been unable to feed herself, and for over a year had not been out of bed.

Four days after a washing out she was able to feed herself slowly and with difficulty, and three weeks later she walked out of hospital. Her expression was less wooden, though all muscles were still spastic.

Case 2.—A woman, aged 19, with a history of acute febrile illness eighteen months earlier, with extreme insomnia, sialorrhoea, and marked alteration in character. She had a well marked Parkinsonian mask. All movements were slow and stiffly performed. She improved in all respects after the sinuses were washed out. She regained normal sleep, salivation decreased, and her expression was less wooden.

Case 3.—A woman, aged 23, who two years and nine months earlier had an acute illness; she was unconscious for twelve weeks. When first seen she had much salivation, was very lethargic, had a mask-like appearance, and was said to have violent fits of temper. She was discharged from hospital after a washing out; a month later she was much improved in appearance, both mentally and physically. Her bad temper became less obvious, the salivation was cured, and her whole outlook on life seemed altered.

Case 4.—A woman aged 23. A very advanced case dating back two years. It would be difficult to imagine greater rigidity of all muscles. She was unable to stand or to feed herself and could hardly speak. She had seen twenty-eight medical men before she came to us. A washing out caused a rapid and definite change in her condition. Four months after discharge from hospital she could walk two miles a day—doing the distance in less than an hour—could feed herself, and read aloud for an hour at a time.

Case 5.—A male, aged 24, in March, 1923, had an acute febrile illness lasting three weeks, with severe insomnia, diplopia, and delirium; no diagnosis was made at that time. Seen in August, 1925, he had a definite Parkinsonian mask, and some rigidity of the right arm. His brother stated that he had altered in character very considerably. After the first washing out he expressed himself as feeling much better. Concentration, which had been much impaired, began to return, the face became less mask-like, and the arm less rigid. In October, 1925, he stated that he was free from symptoms and that mental power had been completely regained; he returned to research work of a very intricate nature.

Case 6.—A woman, aged 32, gave a history of eighteen months' illness, starting with fever, diplopia, and drowsiness. She had the Parkinsonian mask, left ptosis, marked tremor of the right hand and arm, which were useless for all practical purposes. After a washing out she was discharged; a month later she was much improved, the tremor had almost ceased, the grip was good, and her expression was brighter.

In addition to these cases one patient recovered to a great extent, but had a severe relapse six months after discontinuing treatment. Another patient of feeble physique and in a very advanced state made no appreciable progress. Five out-patients, all of whom are improving, are unanimous in ascribing the change to the washing out, and are most emphatic on this point.

We have also had many patients under similar treatment suffering from the cardinal symptoms of encephalitis with the exception of a mask, but the absence of this renders the diagnosis incapable of proof. For the most part they have been less advanced cases, and the improvement after washing out has been considerably more marked than that which has occurred in the majority of patients described above.

We have had little opportunity of treating cases in the acute stage, and none of them has developed a mask.

Acute Cases.

1. A woman, aged 34, was sent to hospital as a case of encephalitis with a four weeks' history of extreme drowsiness and diplopia. She was washed out twice; when seen six months later she said she felt perfectly well, and was bright and cheerful in appearance. She had no tremors, mask, or spasticity of limbs, and vision was normal, but she owned to being more irritable than before her illness.

2. A woman, aged 20, gave a history of three weeks of pyrexia and sleeping "nearly all the time." There were no other symptoms, but she was sent to hospital as a case of encephalitis in the midst of an epidemic. She was discharged ten days later, after a washing out, and is now back at her work, apparently completely cured.

3. A man, aged 35, was admitted with six days' history of unexplained fever, severe insomnia, tremor and spasticity of hands, and feet in position of tetany, fixed expression, and irrational speech. Two days after a washing out the temperature fell to normal, his mind became clearer, and the limbs which had been spastic became looser. The expression returned to his face, and he was able to get up two weeks after admission.

The total number of cases treated has been 64, and of these 45 have had a Parkinsonian mask.

CONCLUSIONS.

1. It is suggested that the infection in encephalitis lethargica is a symbiotic process, that in the first place the nasal mucous membrane is damaged by one of the catarrhal group of organisms, and that subsequently the virus of

encephalitis is inhaled, passes through the damaged mucous membrane, and thus enters the tissues, reaching the brain possibly by the perineural lymphatics.

2. In support of this there is a fair amount of evidence that for the transmission of the disease from one individual to another the virus of encephalitis lethargica must fall on mucous membrane previously altered by inflammation of such a character that its power of absorption of fluids in contact with it is greatly increased.

3. The initial damage to the nasal mucous membrane is generally remediable by treatment, and if remedied it would appear that the virus of encephalitis cannot pass into the tissues, and patients become more susceptible to treatment by drugs.

4. Nasal treatment aims, not at curing encephalitis lethargica, but at preventing admission of fresh virus into the tissues.

5. In those cases where actual destruction has occurred in the central nervous system (a system in which regeneration is impossible) the most that can be claimed for washing out the nasal sinuses is that further irreparable damage is hindered, and in many cases appears to be prevented.

6. The Parkinsonian gait and posture is rarely completely removed without the use of remedial exercises.

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APPARENTLY COMPLETE RECOVERY FROM ENCEPHALITIS LETHARGICA OF THE BULBAR TYPE.

BY

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NOTWITHSTANDING the large number of cases on record, knowledge of encephalitis lethargica is too recent to permit neglect of any clinical material which might serve to illustrate points of diagnostic or prognostic importance. The following case, which was of a very severe type, recovered without any special treatment, and will be found to present some interesting features.

A man, aged 33, was admitted to the Eastern Hospital, London, on April 3rd, 1926. There was a history of two days' illness, which was suddenly ushered in by severe headache with nocturnal delirium. Vomiting and constipation were also complained of, and his medical attendant regarded the case as one of influenza. His condition on admission was as follows. Tongue lightly coated; fauces congested with a collection of mucus in the pharynx; left side of the face immobile; pupils contracted, but no strabismus. He could answer questions rationally, but cerebration was delayed. No pain was complained of, but he had some difficulty in deglutition. The knee-jerk was exaggerated on the right side, and right ankle clonus could be elicited. Babinski's and Kernig's signs were not present. Examination of the heart and lungs revealed nothing abnormal. The bladder was distended, and 38 ounces of urine were drawn off by catheter. The temperature was normal. The symptoms became more marked the next day, with ptosis, inability to swallow, stertorous breathing, and complete unconsciousness. The cerebro-spinal fluid was under slightly raised pressure. The optic discs were pale and sharply defined. Nasal feeding was resorted to. By 10 p.m. the patient appeared to be in *extremis*. Rectal saline with 4 per cent. glucose was ordered.

Throughout the night the patient's condition remained so grave that recovery seemed to be out of the question. He began to improve the next day (April 5th); he became partially conscious, and was able to protrude the tongue, though not to speak. There was incontinence of both urine and faeces. The Parkinsonian facies was very obvious, and the arms were crossed on the chest and paralysed, the right completely; temperature 99.8°. Fibrillary twitching in the muscles of both legs and pharyngeal paresis developed later in the day, followed by an epileptiform seizure of ten minutes' duration.

The next day (April 6th), when ankle clonus was elicited on both sides, clonus was sustained for some seconds on the left side after removal of the stimulus. The temperature was 100.6°. Progress was uninterrupted and rapid, till by April 12th all paralyses had passed off. He had apparently made a complete recovery, and was discharged on May 20th.

The diagnosis of the case presented considerable difficulty at the outset. A consulting neurologist, who saw the