well recognised that the essential sanitary requirement for the prevention of cholera spread here is a very free supply of fresh water, especially at the most crowded Melas, in very dry years, and when the disease is unusually prevalent elsewhere in India.

There was, however, another climatic feature which almost certainly helped in the development of the cholera of 1892. It was not only one of the driest, it was one of the hottest seasons on record.¹⁸ It is significant that cholera broke out on March 22nd, and that the period, 21st to 27th, was the hottest portion of the hottest March on record.¹⁹ Yet this does not mean very much after all, for the fairs have commonly lasted till April 12th, on which date the air temperature in other years must often have been as high as on March 22nd, 1892. On the other hand, it is readily conceivable that the unusually powerful heat rays may have worked to great advantage on the slow and shallow current of the sacred pool in 1892. In one of the other cholera years (1867) the weather appears to have been cooler than ordinary at the time of the outbreak (April); but in 1879 the mean air temperature at Roorkee for the month of April was 3° above the average.²⁰ Besides 1892 there have been only two Aprils (1875 and 1880) at all hotter than this. On the whole the temperature factor in the origin of the Hardwar cholera outbreaks appears to be of decidedly secondary importance to those affecting the cleanliness of the water.

I have left till last an important consideration—that of the varying prevalence of cholera at the time of the fair among the general population of India, whence the pilgrims are drawn. The cholera mortality of March, 1892, was the highest on record for that month;²¹ it was specially high in Bengal. For 1867 the records are incomplete, but it is known that the disease was widely diffused in the country about Hardwar for months before the great Mela.²² In the early part of 1879 cholera mortality was distinctly less than ordinary.²³ It is noteworthy that the spread from Hardwar in this year was very much milder than in the other two epidemic years. Excessive general prevalence at the time of the great fair must mean an increased introduction, or at least a greater certainty of introduction,²⁴ of the virus into the sacred water at Hardwar. The same thing is brought about also by the increase in the proportion of bathers, absolute or relative, which has been already discussed. And the question arises whether this may not explain in some measure the origin of epidemics here. But if so it must be in quite small measure, for nothing but the local reproduction of the organism will suffice to explain its wonderfully rapid general diffusion here. And in the laboratory the growth of a microbe depends much more on the character of the culture medium and on the original quality of the organism than on the quantity sown. Excessive prevalence elsewhere means not only increased chances of planting the microbe at Hardwar; it means the sowing of an unusually active organism, one more likely to thrive and multiply. In this way it may increase the tendency to outbreaks at Hardwar. While the effect of excessive crowding of bathers may also be explained in another way, the greater fouling of the water may render it an exceptionally favourable culture material.²⁵ There is substantial

evidence²⁶ that cholera mortality in India increases with the shrinkage of tanks and other surface water-supplies; and the water of the tanks as it runs low has the same fouling influences at work in minor degree (the stirring up of the mud from the bottom and the direct pollution by the washing of clothes and bathing of the people) seen superlatively at the great fairs. And the suitability of liquid mud for cholera growth is possibly seen also in the enormous mortality attained in Berar when the great thirst of the black cotton soil is appeased by heavy rains, and when the whole country is “converted into a deep, tenacious mud.” The vast importance of the culture material at Hardwar is seen in the fact that the cholera which spreads from the fairs is not that which is carried to them. Developing under special conditions in a place where the disease naturally has but a feeble existence,²⁷ the virus acquires powers of resistance well in advance of those possessed by ordinary Indian cholera. The new growth spreads rapidly and certainly over country where cholera is comparatively seldom seen,²⁸ and is credited with having been the origin of a European pandemic.²⁹ The influence of the condition of the culture medium is seen also in the fact that cholera may often be carried to the fairs and fail to spread there.³⁰ That the spread depends on the quality of the specialised local product rather than on its quantity is suggested also by the observation that the result in 1892 from the dispersal of 70,000 pilgrims was at least similar in magnitude³¹ to that in 1867 from the scattering of probably a million people;³² and Surgeon-General Cuningham, in his report on the epidemic of 1879,³³ notes that there was “no relation between the number of pilgrims and the extent of the disease in different districts.” To sum up, there is substantial evidence to support the following suggestions: (1) the fouling of the sacred water by exceptionally large proportion of bathers to the quantity of water available may render it a very favourable medium for cholera development, and so determine the origin of far-reaching epidemics; while (2) the growth of the organism at Hardwar may be assisted by unusually hot weather; (3) virulent cholera elsewhere in India being effective rather in the character than in the quantity of the virus carried to Hardwar.

Bombay.

ON VAGINAL HYSTERECTOMY.

BY F. A. PURCELL, M.D., M.CH. EDIN.,
SURGEON TO THE CANCER HOSPITAL, BROMPTON.

THE three cases I am about to record are examples of a large class of cases of malignant disease of the os and neck, or lower third section of the organ, that come under observation, in which a mass of cauliflower epitheliomatous growth occupies the cavity of the vagina and discharges a foul and copious sanguineo-purulent fluid, at times a flooding supervening, all tending to lower the patient's general health and strength. The mass of growth may either press on to the rectum, causing pain in the back and hips and difficulty in relieving the bowels, or it may press anteriorly on to the bladder, giving rise to the troubles suffered in consequence and being most distressing to the patient. The patient will present a pale, exsanguinated, and anxious look, and there are many who, if they think that they have not passed the time of the menopause, will attribute much of their pains and discharges to its

deposited in the waters of the river-god, and partly from the washing of the clothes and bodies of the bathers.”—Government of India Sanitary Report for 1867.

¹⁸ Indian Medical Gazette, 1894, p. 329 et seq.

²⁷ The average annual cholera mortality of twenty-seven years in the Saharanpur District, in which Hardwar is situate, is only 0.25 per 1000.

²⁸ Each of these epidemics spread rapidly over the Punjab (including its most immune tracts), Sind, and Cashmere.

²⁹ Macnamara in Davidson's Hygiene and Diseases of Warm Climates.

³⁰ Isolated cases of cholera are not uncommon at the fairs; the vibrio was detected in the water of the sacred pool in 1891; and in 1872 there was a localised outbreak confined to a single band of pilgrims who left their mark on the places they passed through.

³¹ The mortality figures of the two years are not strictly comparable, owing to the imperfect registration of the earlier year.

³² The estimate of the number present on the great bathing day made at the time is nearly as large as that of the total attendance of the whole period of the fair (see Bellevue's History of Cholera in India, p. 518).

³³ Government of India Sanitary Report for 1879, p. 118.

¹⁸ “Higher day temperatures were noted in March, 1892, over the whole of the interior of India than have been observed during the previous twenty-five years, and the month is hence the hottest March on record.”—Government of India Monthly Weather Review, March, 1892, p. 82. The highest temperature registered at Roorkee was 102.2° F., just one degree higher than the highest recorded in March of any other year.

¹⁹ I know of no evidence to show that heat in India, however excessive, is ever in itself other than stimulant to cholera development.

²⁰ Monthly mean air temperatures have been recorded at Roorkee since 1866. The variations from average of the three cholera years are:—1867: March (about) + 0.6°; April (about) - 2.2°. 1879: March - 1.1°; April + 3°. 1892: March + 1.7°; April + 5.1°.

²¹ The total cholera mortality of British India in March, 1892, was 46,089, the next highest record being in 1891—viz., 33,986,—the average for the fifteen years 1879-93 being 18,066. Out of the total of 46,089 deaths 31,235 happened in Bengal.

²² See Bellevue's “History of Cholera in India,” p. 425.

²³ The mortality for March was 11,800, for April 29,324, the average for the fifteen years 1879-93 being 36,980.

²⁴ The great fair occurs near the height of the Bengal cholera season and when the mortality is rapidly on the increase in other directions, so that seldom can the disease fail entirely to be carried to these gatherings.

²⁵ The bathing pool at the Kumbh Mela in 1891 is thus described: “As the bathing went on the clear stream became a muddy one, and the water collected from any part of it smelt in a few hours offensively, and the micro-organisms developed from it were legion.”—Brit. Med. Jour., 1894, vol. i., p. 361. Of the pool in 1867 it is said: “The water within this space was during the whole time thick and dirty, partly from the ashes of the dead brought by surviving relatives to be

cause; others, in whom the periods are still maintained, will perhaps seek advice sooner for the discharge complained of; but how numerous are the women, married or unmarried, whose attention is called to their unfortunate condition for the first time "then" by the examining surgeon or by a casual examination by their own medical man, shortly before being sent to a specialist or recommended to go to some hospital for further advice. It is not unusual to find a woman really ignorant of her state when the malady has reached the stage of deep excavation of the uterus and infiltration along the broad ligaments, with fixation of the organ from malignant disease, rendering her condition such that non-surgical interference is the only course to be advised, and although it may seem marvellous that such a state of things should exist unbeknown to the patient, yet such is the fact. It is in these border-line cases, so frequently met with, that it becomes a very serious question as to which is the best course of treatment to advise. In many instances I would most strenuously recommend that the patient be severely left alone so far as operative interference is concerned, only alleviation of the suffering being attempted by the exhibition of drugs; the vagina should be kept as sweet as possible by medicated douches or simple irrigation, and attention should be paid to the bowels, the patient being put in the best condition to cope with the advance of the disease, until death releases her from her sufferings. When operative interference suggests itself the question arises, What operation will best meet the case? and this will be answered by the condition found on examination. The first consideration is the amount of mobility of the uterus. If it is not mobile, it may be assumed that the disease has already extended or infiltrated along either or both of the broad ligaments; these should be critically examined, which is more easily done through the rectum, and possibly under an anæsthetic if the patient be nervous or cannot bear slight pain. If the broad ligaments are free from extension of the disease, then supra-vaginal amputation will suggest itself. I have treated cases by chloride of zinc paste; this treatment cannot be carried out in this class of cases, because invariably when supra-vaginal amputation is performed the peritoneum is of a necessity opened, which in itself would debar the preparing and excavating of a cavity in the fundus for the insertion of the chloride of zinc plug of cotton wool. This treatment must be reserved for those cases where the disease originated in the neck or fundus of the uterus, and in which the disease has not eroded the os, and where the mucous membrane of the vagina is intact. In all cases, before deciding on any operative interference, it is necessary to examine the vaginal mucous membrane, for if the disease has spread to the mucous membrane the deeper submucous tissues have already become infected and recurrence of the disease is bound to follow, and it is a contra-indication to removal by partial or total methods. In these border-line cases, when the growth is found to occupy the vagina the finger may be able to pass round the mass, and though the growth is found to emanate from either one lip of the os, or usually, as it does, from the neck, it may be observed that the fornices of the vagina and the mucous membrane around are free and therefore present a favourable prognosis, and operation may be justifiable. Before, then, deciding on total removal it is well to postpone its being undertaken until all the steps of supra-vaginal amputation have been performed and the uterus has been divided off at the internal os. Of a necessity the peritoneum will have been opened both behind and before, and the bladder stripped up. The portion then removed I have invariably handed over to our pathologist, Mr. Plimmer, or, if he was not present, to one of my colleagues, to examine. If it should turn out that the upper surface seems to be normal and free from disease, it is assumed that the stump of the uterus is also free and that we have got beyond the disease. In this case one stops short of doing more, but in case there should be even the smallest doubt of disease showing on the cut surface there must be no hesitation in then completing the entire removal of the organ. During the removal of the part by supra-vaginal amputation the lower uterine arteries of a necessity are divided and clamped and afterwards tied, which is the first stage towards total extirpation. If proceeding to total removal the fundus of the uterus is seized, usually on its anterior surface, with a pair or more of vulsellum forceps, and by drawing on the fundus ante flexion is produced and the fundus is coaxed down and delivered to view; it may so happen that retroflexion may be the more easy to do, when the posterior surface of the uterus is to be seized and the uterus is

coaxed down in the posterior fornix. One cannot be wedged to either method, but should act according to the most expeditious plan that presents itself. The tube, round ligament, and remainder of the broad ligament on one side are transfixed with silk ligatures and tied; one end of the ligature is allowed to remain long and the other end is cut short, a pair of pressure forceps being applied near the ligature on the uterine side before the part is divided off. The second side is treated in the same way, when the uterus, being freed, is removed. The parts are douched out with warm boric acid solution, and any bleeding point that may show itself is caught and tied; the parts are then dried and the toilet is completed. I usually insert a glass drainage-tube and around this pack the vagina with a long strip of iodoform gauze, and after a wash-up if necessary the patient is removed to her bed. The position during operation is the lithotomy one, maintained by means of Clover's crutch, the buttocks being brought well over the edge of the table. Ether is employed as the anæsthetic; the time occupied is usually from forty to forty-five minutes. If the patient has passed the time of the menopause, although the ovaries may present themselves, I have in most of my cases allowed them to remain; I have observed that they form a buffer to the coming down of the bowel, and therefore it is advantageous to leave them. If in a younger woman I could be persuaded that they, if left, would cause no ulterior inconvenience I would be inclined to leave them with the same object as I have stated; however, if I have found an ovary cystic and much enlarged, I have removed it. After operation I usually give an anodyne, and guard during the first twelve hours against sickness from the anæsthetic or threatened collapse by giving, if necessary, some brandy in warm water. On the morning of the third day, or at least twenty-four hours after the operation, the vaginal packing and drainage-tube are removed, the parts are then irrigated with a warm solution of boric acid, and the vagina glass drain is reinstated and gauze packing plugged in, but not so firmly as before. At the end of the next twenty-four hours, if no discharge be noticed on the perineal pad, the glass drain may be altogether withdrawn and a strip of iodoform gauze alone inserted. About the fourth or fifth day possibly a discharge of pus will be noticed on the perineal pad. I say possibly, for in some cases pus is not formed; in case it is, I insert a red-rubber large-sized drain. Douching is continued night and morning. The ligatures come away between the tenth and twentieth days. A soft rubber catheter is kept in the bladder, having been inserted at the time of the operation and utilised as long as any dressings are applied. About the morning of the third day I generally give a saline aperient, and if the abdomen should be at all tympanic, or the patient should suffer from flatulency, turpentine fomentations are applied, and possibly a turpentine enema is administered. The most critical period is about the fourth day, and in my experience if that day is passed favourably the patient makes an uninterrupted recovery, after which she must run her chance of recurrence. The risk of these operations, especially in such far advanced cases, is danger of damaging the bladder, as disease encroaches on its wall and weakens it, so that a rent is apt to be made into the viscus. In such a mishap it is necessary to keep the catheter in the bladder and await the healing and closing in of the vault of the vagina, when the fistula will be found in the vaginal cavity and may be healed by means of the cauterly or nitrate of silver; these means failing, then only it will have to be treated by the usual operation for a vesico-vaginal fistula. We have tried vaginal bags to catch the urine when the fistula cannot be dealt with. The risk of damage to the ureters I only mention in order that the accident may be avoided.

In Dr. James Braithwaite's paper on the Micro-organism of Cancer, published in THE LANCET of June 29th, 1895, he states that out of a very large Jewish population in Leeds, in not one Jewess has he ever met with cancer of the genital organs, whereas it is extremely common amongst the Christian women, the inference being (assuming the existence of a micro-organism as the cause of cancer) that it is introduced or not introduced by the husband, according to his faith. On microscopic examination of the secretion frequently contained within the prepuce some spores were found, and also two minute loops of mycelium identical in appearance with that which he describes. If it should prove (after Dr. Braithwaite) from this discovery of his, that this micro-organism is the real explanation of the cause of malignant growth, then he sums up in No. 3 answer to the question he lays down—viz., It is possible

that we may have to return to a certain Mosaic rite in order to save our wives from uterine cancer, unless the daily use of soap will do away with this necessity. I for one tender my greatest appreciation and thanks to Dr. Braithwaite for his very suggestive paper. It will be seen that in the first and third of these cases recurrence had taken place after a previous operation where removal of the os through the neck had been performed, and that the second was a primary case.

CASE 1.—A married woman aged fifty, mother of two children, had had good confinements; eight months previously she was first troubled with a white discharge from the vagina. In September, 1894, she was admitted into the Chelsea Hospital for Women under the care of Dr. Duncan, who operated and amputated the os. She was admitted into the Cancer Hospital on Dec. 3rd, 1894, and stated that since the previous operation she had had a continual bloody discharge. On examination the vagina was found to be long, and recurrence of malignant disease of the stump extending up the uterine canal was felt. The mucous membrane of the vagina posteriorly was diseased. The patient was of a more or less happy disposition, and was fairly well nourished. On the 8th I performed vaginal hysterectomy. The mucous membrane was incised well clear of the disease. Some of the ligatures came away on the tenth day after operation, and the last ligature on the twenty-second day; she made a good recovery and was discharged. I saw her six months afterwards and found a slight recurrence in the extreme vault. This I treated with iodine, what I call an iodine bath—that is, fixing the speculum firmly applied against the vault and then pouring sufficient liniment iodi down the speculum to cover the disease, which takes about half an ounce, and this is kept in contact for about five minutes and then run off and the parts dried. This has been frequently repeated at intervals of a week, and it has certainly done good. This case is an example of recurrence from previous implication of the mucous membrane.

CASE 2.—A married woman aged forty-five years was the mother of nine children, the last one born seven years ago; her labours had been natural. The patient was recommended by Dr. Fitzgerald of Harrow-road, and was admitted to the Cancer Hospital on May 6th, 1895. She had been troubled with a discharge for the previous two months, and had suffered from bearing-down pain and a dragging in the legs. She was always tired and everything seemed a trouble. She was pale and of a placid disposition. On examination the vagina was found to be occupied by a large mass of epitheliomatous disease; the finger was with difficulty got round and the vaginal mucous membrane was felt to be smooth and apparently not infiltrated; high up in the neck anteriorly a boss was felt pressing forward; the uterus was fairly movable. Vaginal hysterectomy was performed on May 11th. The disease was very extensive, and was first removed by working with scissors from before backwards through the neck; there was no bleeding. The parts were then freely douched out with carbolic solution and the further steps for total removal followed; the ovaries were allowed to remain. The specimen when opened showed extensive disease and had near the fundus a cancerous nodule. The patient made a good recovery.

CASE 3.—The patient had been a widow for twelve years and was mother of six children. She was admitted to the Cancer Hospital on April 25th, 1895, and complained of a purulent discharge, which was sometimes bloody. On examination the vagina was found to be occupied by a fungating cauliflower mass; the vaginal walls were not implicated, the fornices were high up, the uterus was movable, and the broad ligaments were free. Eight years previously she had been admitted into Middlesex Hospital, where the neck was amputated for disease of the os. On May 11th I performed vaginal hysterectomy. The diseased mass was first removed, and some difficulty was experienced in incising the mucous membrane. The operation of total removal was completed; the ovaries were left. Convalescence was somewhat protracted, but the patient made a good recovery and was discharged.

These three specimens I had the pleasure of exhibiting at the British Gynaecological Society's meeting on the 11th inst. Manchester-square, W.

THE Gaskell medal and prize in mental and nervous diseases at the Royal Bethlem Hospital has been awarded after examination to Mr. George W. F. Maughan, M.B., C.M. Edin.

A FEW WORDS ON SOME COMMON FORMS OF REFLEXES OF NASAL ORIGIN.¹

By ADOLPH BRONNER M.D. HEIDL.,

SURGEON TO THE BRADFORD EYE AND EAR HOSPITAL, AND LARYNGOLOGIST TO THE BRADFORD INFIRMARY.

A GREAT deal has been written on nasal reflexes. As far back as 1565 we find that Botallus records cases in which the scent of flowers brought on pain in the head and difficulty in breathing. Van Helmont in 1577 describes some typical cases of hay fever. Bostock² was himself subject to hay fever. No great importance was, however, attached to this subject until 1871, when Voltolini³ published several cases of asthma in which nasal polypi were found, and where the removal of the polypi cured the asthma. Fraenkel, Lennox Browne, and others soon followed suit, and proved that the cases recorded by Voltolini were by no means uncommon. In 1881 Hack of Freiburg published his well-known book on Nasal Reflexes,⁴ in which he attempts to prove that not only asthma, but many other similar symptoms can be caused by intra-nasal irritation. He divides these reflex symptoms into four classes—(1) spastic, (2) sensory, (3) vaso-motor, and (4) secretory. Numerous cases are recorded of asthma, hay fever, megrim, supra-orbital neuralgia, swelling and redness of the nose, vertigo, epileptiform attacks, &c., which had been cured by intra-nasal treatment. Hack's theory was that these reflex symptoms were due to irritation of the terminal fibres of the fifth nerve, which irritation was caused by the swelling of the cavernous tissue of the mucous membrane of the turbinated bones, especially the anterior part of the lower turbinated bones. His idea was to remove this cavernous tissue by the galvano-cautery, and then any irritation of the nerves would be impossible. Experience, however, soon proved that this theory could not be quite correct. Then, in the first place, the destruction of the cavernous tissue did not always prevent a recurrence of the reflex symptoms. Secondly, in many cases artificial irritation of this part of the mucous membrane brought on the reflexes without causing any swelling of the cavernous tissue. Hack himself, in 1885⁵ practically abandons his theory. In 1882 Fraenkel, J. Mackenzie, and others opposed Hack's theory, and stated that the reflexes were caused by some irritation of the terminal fibres of the fifth nerve, due to changes in the mucous membrane of the turbinated bones or septum, but that the swelling of the cavernous tissue need not have anything whatever to do with the irritation. Lublinski,⁶ Heymann, and others think that the reflexes cannot occur unless there is a predisposing neurotic temperament. Boecker repudiates the reflex theory altogether, and states that the intra-nasal changes are mostly incidental complications or that they themselves form part of the symptoms of a central neurosis. In speaking of hay fever Morell Mackenzie⁷ said: "The causes of hay fever may be conveniently divided into the predisposing and the exciting. Race, temperament, occupation, education, mode of life, sex, heredity, and age are some of the predisposing causes." Mackenzie did not seem to believe in local treatment for the cure of hay fever. Everyday experience, however, proves that many cases of hay fever, though of course by no means all, are due to a reflex action originating in the nose. Woakes⁸ says that the reflexes are—(1) symptoms due to excitation of the sensory-motor nerve elements of the region implicated; and (2) those which involve vaso-motor nerves of the sympathetic system in relationship with the affected structures. As regards asthma, he thinks that it is due to irritation of or pressure on the nerve of Cotunnus, where it crosses the osseous part of the nasal septum. I myself am of opinion that we ought to divide nasal reflexes into two classes: (1) those cases in which there is some local irritation of the terminal fibres of the fifth nerve, due to nasal polypus, pressure of the mucous membrane of the turbinated bones on

¹ Abstract of a paper read before the Bradford Medico-Chirurgical Society, April, 1895.

² Transactions of the Royal Medical and Chirurgical Society, vol. x., 1819.

³ Anwendung der Galvanokaustik, &c.

⁴ Ueber eine Operative Radical Behandlung gewisser Formen von Migräne, Asthma, &c.

⁵ Berliner Klinische Wochenschrift, Nos. 21 and 22.

⁶ Deutsche Medicinische Zeitschrift, No. 41, 1886.

⁷ Hay Fever: its Etiology and Treatment, with an Appendix on Rose Cold. 1885.

⁸ Nasal Polypus, 1887.