tions have but proved the rule, for they were in persons in whom, on one ground or another, revaccination had *not* been done. Revaccination, I need scarcely say, requires that we should bring to its performance all the care and all the pains to ensure success which are given to a primary case; and this is almost tantamount to saying that it ought not to be left to be done at times of epidemics, and when people are under the influence of panics. What I have long endeavoured to urge as essential for complete protection is a thoroughly good vaccination in infancy, as the sheet-anchor, and a careful revaccination after puberty, so conducted as to give evidence that the lymph is absorbed, and repeated, if necessary, till that result is obtained. The revaccination should be done as systematically about sixteen years of age, as the primary vaccination is at six weeks or two months, and with this, when successful to the extent which I have stated, people may rest content.

CATARRHAL INFLAMMATION.*

By H. FRANKLIN PARSONS, M.D., Beckington.

HAVING been asked to contribute a paper to one of our branch meetings, I have thought that I might not altogether waste the time and patience of the members by bringing forward some general remarks upon catarrhal inflammation, with a comparison of the symptoms and effects of this lesion as it affects the various mucous membranes of the body. I am led to choose this subject, partly because catarrh is the commonest of morbid processes, so that even the youngest of us can boast of considerable experience in its treatment. Of the cases attended by me in general practice last year, I find that in more than one-fourth catarrh of one or other organ was the primary lesion, and in more than another eighth more or less of catarrh might be observed as a part or complication of the case; catarrh, therefore, being present in nearly half the cases. Moreover, not only is catarrh the most frequent of morbid processes, but it is one of the most amenable to treatment, even after due allowance has been made for its natural tendency towards recovery; hence it is, I think, quite as worthy the attention of those whose mission it is to cure disease as many maladies which would generally be considered more interesting, but which occur rarely, and when they do occur are beyond our power to cure.

Catarrh is well defined by Niemeyer as "Engorgement of the blood-vessels of a mucous membrane, accompanied by abnormal secretion, swelling, succulence of its tissues, and copious generation of young cells." The distinguishing feature of catarrhal, as compared with common inflammation, is that it tends to cell-multiplication rather than to exudation of fibrin; hence, although we find tough stringy masses of mucus, and swelling of the mucous membrane, in cases of catarrh, we never get the firmly attached false membranes, or chronic indurations which are commonly produced by inflammations of the ordinary fibro-plastic character. The alterations produced by catarrh are better studied in the living than in the dead body, as the elasticity of the mucous membrane often squeezes out the excess of blood from the vessels when the propelling power has ceased; so that we cannot, from the absence of hyperæmia *post mortem*, infer with certainty that there has been none during life. In coryza and catarrhal sore-throat—maladies of which we all, probably, have had experience in our own persons—we notice, first, a redness and swelling of the mucous membrane, the surface of which is covered with clear, glairy, salt-tasted mucus. The swelling of the mucous membrane causes a "stuffy" feeling, as if a foreign body were present, which we attempt to get rid of by blowing our nose, hawking, or making efforts at swallowing. There is also an increased sensitiveness of the mucous membrane; hence irritation, so slight as ordinarily to pass unnoticed, when exerted on the inflamed mucous membrane, produces convulsive reflex actions, as sneezing and coughing; these actions thus appearing, though no doubt fallaciously, to occur without any immediate exciting cause. The part also feels hot. After a few days, the secretion becomes looser, either watery or yellow, from a more copious development of mucus-corpuscles with granular contents, approaching pus-cells in character; the tenderness subsides, and the mucous membrane is seen (easily in the throat) to be less red, but relaxed and with dilated vessels. This condition usually soon passes off, but may remain, forming chronic catarrh; the redness assuming a brownish hue from deposition of pigment, and the discharge becoming profuse and puriform. Where, as in the mouth and pharynx, there are follicular glands, catarrh is apt to extend into them, causing an increased production of epithelial cells, which, being shed in sufficient quantity to plug the tubes, act as foreign bodies, and cause small round ulcers. The catarrhal process is the same in other

organs, but, of course, the symptoms produced by it vary according to the functions of the organ affected. Similar redness, swelling, and mucous or muco-purulent secretion may be seen on the conjunctiva, and on the mucous coats of the rectum and vagina, by means of the speculum, or when the organs are prolapsed; and similar appearances are recorded by Dr. Beaumont as having been seen during an attack of acute indigestion in the stomach of Alexis St. Martin—than whom it would be difficult to find a better example of a man who had fame thrust upon him. When the catarrh is intense, and the inflamed surface large, as the lining membrane of the air-tubes, stomach, or intestines, there is fever. This is ushered in by shiverings, which are often repeated throughout the acute stage, so that the fever has a remittent character, occasionally becoming very high, especially in acute bronchitis and gastro-intestinal catarrh in children. The same uneasy stuffy feeling, before spoken of, is present elsewhere: in bronchial catarrh, as a tickling just above the sternum, or a sense of oppression about its centre; in gastric catarrh, as nausea or a feeling of weight and fullness, or even pain in the epigastrium; in catarrh of the intestines, as a constant feeling as if a motion were about to pass, and needed an effort of the will to restrain it—which feeling, when the lower bowel is affected, is especially severe, constituting tenesmus; in vesical catarrh, as a constant desire to pass urine. Acute pain, however, is not usually a prominent symptom of catarrh.

Hyperæsthesia of the inflamed surface occurs elsewhere as well as in the nose; hence sources of irritation, so slight as ordinarily to pass unnoticed, suffice to give rise to reflex contractions of the muscles by which a viscus is emptied, when the mucous membrane lining it is affected with catarrh. Thus, when the air-passages are affected, we have cough; when the stomach, vomiting; when the intestines, diarrhoea; when the bladder, inability to retain more than a small quantity of urine; when the uterus, bearing-down pains. It is worthy of remark that, although catarrh increases the sensitiveness to pain, yet when an organ of special sense is affected, its special endowments are impaired or lost. Thus, aural catarrh causes deafness; catarrhal ophthalmia, weakness of sight, with chromatic aberration, due to the film of mucus on the cornea; coryza prevents the appreciation of odours and of those sensations midway between taste and smell, termed savours, which take an important place among the pleasures of the table; while patients with a foul tongue (*i.e.*, one affected with catarrh), complain that they can taste nothing that they eat.

The secretion—at first mucous, afterwards generally muco-purulent—forms the sputa coughed up in bronchitis, and the leucorrhœal discharge in catarrh of the uterus and vagina; in catarrh of the stomach and bladder, being mixed with the normal contents of those viscera, it induces in them putrefactive changes: causing, in the first case, putrid eructations and evacuations; in the other, ammoniacal ropy urine, with phosphatic sediment, owing to decomposition of the urea into carbonate of ammonia. In catarrhal diarrhoea the mucus is voided more or less mixed with feces, and often with a little blood, and is described by anxious mothers as "slime and corruption." It is to be borne in mind that a perfectly healthy mucous membrane does not secrete mucus. The swelling of the mucous membrane, together with the mucus on its surface, produce a narrowing of the canal which the membrane lines; this narrowing, although in the larger passages merely producing slight inconvenience, in the smaller tubes may suspend the function of the organ, or even, as in the case of laryngitis or capillary bronchitis, endanger life. Thus a common cause of deafness is catarrh, extending from the pharynx up the Eustachian tube to the tympanum, and preventing the communication between that cavity and the outer air, which is necessary for hearing; while the commonest form of jaundice—that occurring, together with gastric catarrh, to form what is popularly termed a "bilious attack"—is to be attributed, not so much to congestion of the liver, as to catarrh extending from the duodenum up the narrow ductus choledochus, the channel of which being occluded, retention of bile ensues. While on this subject, allow me to notice what appears to me the probable solution of the much debated question of the action of mercury on the liver. On the one hand, it is clearly proved by the experiments of Dr. Hughes Bennett and the Committee of the Association, that the administration of mercury to healthy dogs has no effect in increasing the flow of bile, and therefore it is very unlikely to have any such action on the human frame. On the other hand, every practitioner meets with cases such as I have mentioned above, with jaundice, light-coloured offensive stools, pain or feeling of weight in the epigastrium and right hypochondrium, foul tongue, and loss of appetite, etc., which are cured after taking a few doses of calomel or blue pill; the bile reappearing in the stools, and the jaundice disappearing. Now, in these cases, the jaundice occurs, not because the bile is not formed, but because, being formed and not excreted, it is reabsorbed; hence, if mercury did cause an increased

* Read before the Bath and Bristol Branch.

secretion of bile, it would only aggravate instead of benefiting the case. The beneficial action of mercury, besides its purgative effect, seems to me to be exerted on the mucous membrane of the bile-ducts; as the catarrh is subdued, the swelling subsides, and the pent-up bile overcomes the obstruction and enters the bowel; the accumulation causing its appearance in the fæces in even larger quantity than the normal continuous flow. The curative effect of mercury is seen on other mucous membranes affected with catarrh, especially those of the alimentary canal; in conjunction with small doses of opium, it is one of the commonest and most successful prescriptions for catarrhal diarrhoea; it is also often useful in gastric catarrh, and it was formerly thought indispensable in the treatment of bronchitis and laryngitis.

A commonly observed tendency of catarrhal inflammation is for it to attack several tracts of mucous membrane at the same time. Thus a patient whom I lately saw had at the same time catarrhal ophthalmia, bronchial and gastric catarrh, and slight albuminuria, which, as he soon recovered, probably depended on catarrh of the renal tubules. A combination of bronchial and gastric catarrh with some pyrexia of the remittent character before mentioned, forms the very frequent complaint popularly but incorrectly called influenza—a term which should be restricted to the epidemic disorder. Gastric and oral catarrh so frequently coexist that a coated tongue is looked upon as a sign of a foul stomach, which it generally is, although in the commencement of gastric catarrh the tongue is sometimes clean when first seen, becoming white by next day; while the tongue is very foul in cases of catarrh of the mouth, fauces, and pharynx, where the stomach is nearly or quite unaffected. This sympathy between different mucous membranes is to be attributed partly to the inflammation spreading by continuity of texture, and partly to community of cause, whether this be an external irritation or an intrinsic derangement of the system.

The causes of catarrh may be thus classified.—

1. First, and perhaps most frequent; is direct irritation; the most frequent irritants to the conjunctiva and respiratory tract of mucous membrane being cold air, very hot air, and foreign matters, as grit and dust; to the alimentary canal, the common irritant is improper food, either indigestible in quality or excessive in quantity, the undigested residue becoming putrid and acrid.

2. Chilling of the skin, especially from wet feet, seems to cause catarrh apart from the local irritant action of cold, by inducing congestion of the internal parts of the body.

3. Catarrh, as aforesaid, is often propagated from one mucous membrane to another.

4. Many constitutional diseases, as measles, enteric fever, syphilis, and influenza, are accompanied by catarrhal affections of particular mucous membranes, especially the respiratory.

5. A varying amount of catarrh of a part very often accompanies organic disease of that part; the permanent disease acting either as a local irritant, or by inducing congestion; thus chronic gastric catarrh usually accompanies ulcer and cancer of the stomach, and emphysema is often complicated with bronchitis.

Lastly, congestion of an organ from obstruction to the return of blood, causes catarrh; thus we have diarrhoea with portal obstruction, and bronchitis when the pulmonary circulation is impeded by disease of the mitral valve.

Since in a healthy subject catarrh tends to quick recovery when the cause producing it is removed, the persistence of catarrh in a chronic form shows either that the original cause or some other irritant is still in operation, or else that there is a deficiency of reparative power either in the part or in the whole system. The relaxation of tissue and of the blood-vessels produced by repeated attacks of catarrh, is favourable to the development of the chronic form; so, also, is a watery condition of the blood; and especially so that general deficiency of the tissues in plastic power which is termed the scrofulous diathesis. Chronic catarrh, in its turn, is very liable to acute exacerbations.

In the treatment of acute catarrh, it is to be borne in mind that the disease tends to get well of itself, if not prevented by the persistence of the cause; where this cause is still present, but removable, as foreign matter in the eye, or undigested and putrefying food in the primæ viæ, our first efforts must be directed to get rid of it, and in every case we must watch that no fresh irritant gains access to the suffering organ. If the inflammation tend to increase, or if it be situated in a part essential to life, it becomes our duty to endeavour to diminish it, for which purpose we often seek to produce a derivation of blood from the affected part by augmenting excretion in some other organ, particularly the skin and bowels. Of antiphlogistics, the local action of cold in the form of ice, where it is applicable, as in acute catarrh of the throat and stomach, is of much benefit in many cases. Certain drugs have also a reputation as antiphlogistics; of these, mercury has been mentioned before; antimony and the neutral salts appear to act favourably by

loosening the secretion, and the same virtue is claimed for the alkalies, which certainly have the power of rendering mucus less viscid when added to it out of the body. In catarrh of the primæ viæ, alkalies and antacids are generally of benefit, and the expectorant action of ammonia is probably due to its passing off by the lungs, and acting on the mucus in the bronchial tubes on its way. The irritability of the mucous membrane often needs to be allayed by sedatives; the surest generally being opium. Should the catarrh, instead of passing clean away, become chronic, local astringents are of the greatest use, and among them nitrate of silver, sulphate of zinc, alum, and tannin are the chief. Nitrate of silver is often of marked use in the chronic gastric catarrh accompanying organic disease of the stomach. At the same time, it is to be borne in mind that the fact of a catarrh passing into a chronic state, unless due to persistence of irritation, shows that something is amiss with the constitution; hence our aim must be to improve the general health, and this will usually be best effected by tonics, especially iron; and in the scrofulous, cod-liver oil. Prophylactic treatment against catarrh consists: 1, in avoiding sources of irritation, as cold, errors in diet, etc.; 2, in keeping the body in the highest attainable state of vigour; 3, where it can be borne, in a gradual process of inuring the body to cold, of which process a cold bath every morning, begun in the summer, is the safest, pleasantest, and most efficacious form.

TWO CASES OF HYDROPHOBIA TREATED BY HYDRATE OF CHLORAL.

By HENRY W. T. ELLIS, M.R.C.S. Eng., L.R.C.P. Ed.,
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On Tuesday, the 18th of this month (April), I was sent for to visit Albert P., aged 7 years, who, three weeks previously, had been bitten in the face by a stray dog, one of the bites involving the inner canthus and conjunctiva of the right eye. I was told that he had complained the day before of being poorly; his parents, however, looked upon the attack as a slight febrile one from cold, and took no further notice than to give him an aperient. His anxious and frightened expression of countenance at once powerfully struck me; and, upon finding that he dreaded the sight of any fluid, and could not be got to swallow it, the fact was quite evident that I had to deal with a case of rabies, this characteristic symptom, denoting an affection of the oesophageal branch of the eighth pair, being so well marked. His pulse was quick; the tongue was covered with white fur. He was restless and fidgety, and refused food as well as drink; and, on attempting to make him swallow a little tea, the effort brought on a violent spasmodic constriction of the throat; even the sight of the cup excited agitation and aversion, but he did not complain of much pain in the bitten parts. Knowing the inefficiency of all treatment in this frightful disease, I determined upon trying the hydrate of chloral, at any rate in the hope that it would in a measure control the violence and excitement that might, in the next stage, be expected to follow; and in this I am happy to say I was not disappointed, for it certainly mitigated the symptoms very considerably. The remedy was administered in doses of a teaspoonful of the syrup, diluted with a little water, every two hours, and subsequently every hour. Of course, considerable difficulty was experienced in the effort to swallow; but it is believed that most of it was got into the stomach. In the way of progress, the disease, notwithstanding, went on unchecked. On the second day, the sense of touch was most painfully excited by the slightest application of the finger to the face, even the teaspoon coming into contact with the lip produced a catch in the respiration, showing, I presume, that the recurrent nerve was affected. The pupils became widely dilated; the tongue more thickly coated; there was a continual desire to be walking about, which apparently produced some relief, the lungs evidently not being much oppressed. On the third day, the little sufferer talked almost incessantly, often incoherently, but there was little tendency to violence or vicious impulse. The hydrophobic slaver, thick and tenacious, began to accumulate, and, when it was not got rid of by spitting, occasional vomiting took place, which relieved for a short time. He, however, gradually became weaker and unable to eject it, sinking from apnoea at 4 A.M. on the fourth day after the characteristic symptom was developed.

The other case to which I was called on the following day, was in a little girl, Alice Mary M., aged 5 years, bitten at the same time in various parts of the face and head. The symptoms and treatment were nearly identical; but, on the third day, there was for a short period, at 2 P.M., some violence, controlled, however, entirely by the chloral hydrate, which had been rather neglected. During this time, the poor little creature screamed out loudly, and said that her parents were kill-