pressure inside the ducts. Kocher's incision was adopted; a vertical incision had been used at the first operation. The gall bladder was very large, the common bile duct was distended, no stone could be felt at first, but later, on feeling the third part of the duodenum, a large stone was felt evidently at the end of a very much elongated bile duct or pedunculated papilla. With some difficulty the pedunculated part of the duct was steadied with one hand while the stone was squeezed back into the duct with the other. In this way the need of opening the duodenum was avoided, and the stone then extracted from the first part of the common duct. In order to avoid recurrence, the ducts having been proved to be clear, the gall bladder was removed, and the common bile duct drained. The stone was the size of a filbert. The patient wrote on March 1st, 1920, stating that:

"Since my second operation there has been no looseness of bowels, and the appetite became very moderate. The motions are always uniformly stained dark-brown with bile. Unless the gall bladder has some beneficial secretion of its own—I have only heard of mucus—I think we should be better without it."

CASE II.—Cholecystostomy: Cholecystectomy: Choledochotomy.

Mrs. J., aged 52 years, was a patient of Dr. Talfourd Jones. After suffering some twenty years from symptoms of gall stones with intermittent attacks of jaundice and colic, she had been operated upon by a woman surgeon in March, 1916. Cholecystostomy was then performed and several stones removed from the gall bladder. The attacks continued. The second operation was performed in January, 1917, by the same surgeon, who then removed the gall bladder. The attacks continued. The patient had a slight attack of jaundice while she was still in the hospital. On several occasions she has been deeply jaundiced, and has suffered very severe colic. She has been very reluctant to consider another operation, but she found life intolerable, and at last consented to see me. A vertical incision had been adopted at the former operation.

She was admitted into Guy's Hospital in November, 1919. Kocher's incision. Six stones removed from the common bile duct, the stones serving as excellent guides to the dilated common bile duct, although the gall bladder had been previously removed. The patient made a good recovery, and has remained well since. It is probable that a larger and more suitable incision would have enabled the surgeon to find and remove the stones from the common bile-duct at the first or second operation.

CASE III.—Gall Stone in Neck of Gall Bladder: Cholecystectomy.

Mrs. A., aged 45, patient of Dr. Phillips, Croydon. She had had three children, and is a very active woman who eats very little owing to indigestion. She has never had a bilious attack, but often has slight attacks of diarrhoea. On the evening of November 7th, 1915, she ate a piece of unripe pear. At 1 a.m. on November 8th she was seized with violent abdominal pain, and did not sleep again. She got up and went into another room and lay on a bed there, but could not sleep. She was sick a good many times. She then went downstairs and lay before the gas fire, as she was so very cold and in much pain. She did not bring up anything but watery fluid, and later bile. Dr. Phillips saw her in the early morning, and thought she had intestinal colic due to the pear. The pulse and temperature were subnormal and she was cold. As she was very tender in the epigastrium, he wondered whether she had a perforated gastric ulcer, and got Dr. Male to see her. Dr. Male found that the tenderness and pain were then lower down towards the appendix, and he suggested an operation for (?) acute appendicitis. I saw her at 4 p.m. on November 8th, and felt two swellings, which Dr. Male and Dr. Phillips had also felt, in the right flank. Dr. Phillips thought that they might be scybala or a piece of pear, and found that they were movable. After getting the abdomen thoroughly relaxed, I was able to make out that the swelling was of the same size, shape, and attachments as the gall bladder, but it was lying very far back and a little lower down and farther out than usual. As I felt it the patient was seized with nausea and vomiting, and the consistence of the swelling seemed to vary. Once it seemed to consist of one lump, and another time of two. At the operation this was explained, for I clearly felt the fundus and at times also the bend of the neck of the gall bladder. I diagnosed gall stones impacted in the cystic duct, and advised an immediate operation, as the patient was so ill and would probably get worse. After some delay she was moved to a nursing home.

Operation.

Dr. Male gave the anaesthetic (November 8th, 1915). The gall bladder having been more definitely made out under the anaesthetic, a Kocher incision was made. The gall bladder was found. It was considerably enlarged, uniform in shape, and very oedematous. There was also some bloody fluid in the kidney pouch. A stone was felt impacted in the neck of the gall bladder. This was backed a good deal, but in view of the absence of stones in the common bile duct and the pendulous nature of the gall bladder, it was clearly safer to remove the latter, and this was done in the usual way, the raw area on the under surface of the liver being covered over with peritoneal flaps sewn with catgut. The abdominal wall was closed as usual, but a small tube was left at the inner and upper angle of the wound. She made a good, rapid, and complete recovery, and is now well, four and a half years later.

REFERENCE.

¹ *Collected Papers of the Mayo Clinic*, 1916, p. 274.

AIR-WAY INFECTIONS.

BY

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It is probable that in considering the mode of infection of the trachea and bronchial tubes sufficient attention is not paid to the normal protective mechanisms of these regions. At present methods of prophylaxis are directed mainly towards an internal immunity designed to lessen the severity of an infection when once it has taken place. It seems not improbable that an attempt to turn the natural mechanisms of prevention to account might be worth considering with the intention of actually preventing infection from occurring.

The respiratory passages from the anterior nares to the infundibula are so constructed by their plications and subdivisions and by their moist and sticky surface to take up the particles of dirt and bacterial organisms that may enter in the inspired air. Such foreign matter as may get right through into the alveoli is carried away into the body by the lymphatic system; but for dealing with that which settles in the air-ways—and this is the enormous bulk—we have, in all except the very smallest tubes, two essential mechanisms: they are the mucous secretion and the ciliary action of the mucous membrane.

The value of the mechanical self-cleansing process due to the sweeping action of the cilia is self-evident. Whilst the cilia are acting effectively any bacterial organisms deposited on the surface will be swept along and not allowed time to affect the underlying cells, for a stationary state would be necessary before invasion of the epithelium could occur. The sweeping-up function culminates in cough and expectoration of the offending matter.

As regards the protective functions of the mucoid matter lining the mucosa of the air tubes, apart from its capacity for maintaining an even supply of moisture so essential for ciliary action, there is experimental evidence that this type of substance protects the tissues in various parts of the body against the action of ferments. For instance, in the alimentary tract, Bayliss,¹ quoting Klug, states that it is the mucin which protects the alimentary canal from the action of its own digestive juices; this it apparently does by adsorbing the excess of enzymes. Now it is probable that the damage to the wall of the air passages that may follow the implantation on it of pathogenic organisms is in part effected by ferment action, the ferments being derived from the infecting organisms, either from their living or dead bodies. Apart from a direct breach in the epithelial wall from ferment action, there is also the probability of the absorption of toxic bodies if these lie directly on the epithelial surface. With the exception quoted below, I do not know of any experimental evidence on this latter point, although the same probabilities exist as in the case of ferment action, but it can be shown by staining experiments that large molecular bodies do not easily pass through a layer of mucilage. It follows that the action of bacterial ferments and toxins on the epithelial cells is likely to be inhibited by a free supply of mucus.

In the various examples of the "carrier" state we find the body protected from the action of pathogenic organisms, not by a true immunity of the internal type—for these patients are often not immune and may suffer reinfection—but apparently by the mucous environment of the bacteria. In these "carrier" conditions, if we except urinary tract infections, which are not properly to be considered in this class, we find the bacteria bedded in a mass of mucus: The typhoid bacillus in the gall bladder, the dysentery bacillus in the mucous crypts of the large bowel, the gonococcus in the prostate, the meningococcus in the nasopharynx, and the diphtheria bacillus in the muco-purulent discharge of chronic rhinitis. All these instances suggest that the body obtains protection from bacterial invasion in this manner.

I have shown elsewhere,² using bacteria embedded in mucilage of tragacanth, that the animal organism could be protected against the highly toxic Shiga's bacillus. The organism remained alive in the body for months, leading neither to the production of toxic symptoms nor to the production in the host of antibodies directed against the infecting bacillus.

This point of view of course is not new, but it seems probable that more might be done, both prophylactically and therapeutically, if closer attention were paid to the normal mechanisms of body protection.

REFERENCES.

¹Bayliss, *Nature of Enzyme Action, Monographs of Biochemistry*; Longmans, Green and Co., p. 130. ²Beuhaus, *Journ. of Path. and Bact.* (in the press).

LOEWI'S ADRENALIN MYDRIASIS AS A SIGN OF PANCREATIC INSUFFICIENCY.

BY

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LATE ACTING MAJOR R.A.M.C., T.F.

SERVICE in the army has hitherto prevented me from publishing these notes, which were made in 1914. The cases, which were under the care of Dr. Murray in the Manchester Royal Infirmary, were, clinically, almost identical.

CASE I.

A man, aged 63, was admitted on October 26th, 1914, complaining of jaundice and intense pruritus all over the body. He stated that he had had dyspepsia for several years, had been a heavy beer and whisky drinker, and was very constipated. He first noticed jaundice and pruritus five weeks previous to admission, and for some months his stools had been gradually becoming lighter in colour. He had had no pain whatever over the liver or gall bladder.

Condition on Examination.

The skin, mucous membranes, and sclerotics were all extremely yellow. Emaciation was not marked until later, but the patient said that he had become weaker. The abdomen was distended and there was some ascites. No peristalsis was visible and no distended superficial veins were seen. The right lower border of the liver could be felt $3\frac{1}{2}$ in. below the costal margin. The gall bladder was distended, tense, and tender; it extended down to the level of the umbilicus. The patient vomited once or twice soon after admission. The stools were soft, unformed, almost pure white in colour. The urine showed bile present, no albumin, no sugar, reaction neutral, specific gravity 1008.

After-History.

On November 2nd, 1914, two drops of adrenalin chloride solution (1 in 1,000) were dropped into one eye. After one hour there was no reaction, the pupils remaining exactly equal. The reaction was again negative on November 6th and on November 9th. The patient had free haemorrhage from the bowels and died on November 10th.

Post-mortem Examination.

The jaundice was found to be due to carcinoma of the bile ducts with secondary growths in the liver. Suppurative cholangitis was also present. The gall bladder was greatly distended with serous fluid, but it contained no gall stones. The pancreas was nowhere invaded by the new growth, nor were there any secondary deposits in it, the gland itself being quite healthy.

CASE II.

A man, aged 42, was readmitted to the infirmary about October 1st, 1914, complaining of jaundice. He had had "dyspepsia" during September and October, 1913, and influenza during the early part of that year. At Easter, 1914, he first noticed jaundice, accompanied by severe pruritus. His stools had been clay-coloured for some time. He was admitted on May 26th, 1914, refused operation, and was discharged June 23rd, 1914, "condition unchanged."

Condition on Examination.

The skin, mucous membranes, and sclerotics were very deeply pigmented with bile; he was worn and emaciated, the pruritus was much less than formerly, but there was great tenderness over the gall bladder and attacks of pain round the region of the umbilicus. The gall bladder was distended, and could be felt 3 to 4 inches below the right costal margin. The liver was not enlarged. There was a history of several attacks of epistaxis. No ascites was present, and no distended superficial veins were visible.

After-History.

On October 10th, 1914, two drops of adrenalin chloride solution (1 in 1,000) were dropped into one eye. After one hour there was marked dilatation of the pupil of that eye. On October 28th, and also on November 1st, the test was repeated, with marked positive reaction (dilatation of pupil) on each occasion.

A few days before his death exaggerated peristalsis of the walls of the stomach became visible through the abdominal wall. At the same time, owing to the progressive emaciation, a hard mass became palpable in the region of the head of the pancreas. The stools were clay-coloured; the urine

mahogany-coloured, neutral, specific gravity 1009; bile was present, but no albumin nor sugar. X-ray examination on June 16th, 1914, and also later, had shown no gall stones nor other evidence of disease of the gall bladder. The patient began to vomit everything he took by mouth, became very depressed and stuporous, and died on November 4th.

Post-mortem Examination.

There was found to be malignant disease of the head of the pancreas, which invaded the duodenum and common bile duct. There were metastases in the liver, and obstruction and dilatation of the common bile duct and bile passages. The growth in the pancreas caused stenosis of the duodenum, with secondary dilatation and hypertrophy of the stomach and upper part of the duodenum.

It will be noted that in Case I, in which the pancreas was completely free from disease and quite efficient, Loewi's reaction was completely negative on three separate occasions, whereas in Case II, in which the pancreas was almost completely disorganized, the reaction was markedly positive, also on three separate occasions.

VAGASTHENIA.

BY

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MAJOR R.A.M.C.(R.).

ALL medical practitioners who, as officers or civilians, have been occupied with troops during the war, and those who are still engaged in treating returned soldiers or as members of Pensions Medical Boards, have been, and still are, constantly confronted with the letters D.A.H. My observation leads me to believe that the ideas held as to the meaning of these letters are not very distinct or informative. Broadly and literally, they indicate a condition of increased frequency, slowing or irregularity of the heart beat, or a combination of any two of these. Since these alterations of rhythm occur in many pathological and physiological states, which may depend on disordered function arising outside the heart itself or in the intrinsic structure of that organ, it seems to me that it is desirable to find a phraseology which will not only be less cumbersome but which will bear also some relation to the particular condition that is met with. It is a reflection on the medical profession that its members should so readily follow the Army fashion—neither dignified nor scientific—of labelling things by initial letters. The letters P.U.O., however useful a purpose they may have served until the discovery of a definite disease, which we now know as trench fever, are gradually falling into disuse, and I suggest that their brothers, D.A.H. and V.D.H., should accompany them into the war museum, not again to emerge.

Clinical Characters.

Although the term "D.A.H." may be applied to any of the conditions enumerated above, it is used in the vast majority of cases to signify a symptom group which has been described for many years past as irritable heart or soldier's heart, and it would have been as well to retain these names until we could decide upon a more scientific one. Notwithstanding the divergent views as to the cause of this malady, it has come to be recognized as a definite clinical entity, presenting a well defined and easily determined syndrome, marked by increased frequency of the heart's action, early exhaustion, shortness of breath, dizziness, and frequently precordial pain; less often there is precordial hyperaesthesia. These symptoms are common to all cases of myocardial exhaustion, and it is necessary that we should be able to exclude all forms of structural heart disease before arriving at a definite diagnosis. Murmurs may be and often are present to increase the difficulty of deciding. What are the points, then, which will help us? First and foremost, in my opinion, is the absence of cardiac enlargement; secondly, the rhythm, although much increased in rate, is always regular; the inception of a new rhythm, such as auricular flutter, auricular fibrillation, or extra systoles, never occurs. Murmurs are always systolic in time and soft in character, and are variable—that is to say, they are not always present and alter with the position of the patient, sometimes being audible when he is standing, at others when