marked. The depressor substance can be removed from secretin solutions by means of alcohol, as described by Bayliss and Starling; such preparations cause little or no fall of blood pressure, but give a good secretion of pancreatic juice, and an increased flow of lymph, as is shown in Experiment 4.

Experiment 4.

Dog anaesthetized with morphine and A.C.E. mixture. Cannulae in thoracic duct and pancreatic duct. Dog quiet throughout the experiment.

Time.	Lymph.	Pancreatic Juice.	Remarks.
	c.cm.	c.cm.	
3.40 to 3.50	1.0	—	
3.50 to 4.0	0.9	—	
4.0 to 4.10	2.0	0.5	
4.10 to 4.20	2.3	1.7	
4.20 to 4.30	2.7	1.4	
4.30 to 4.40	2.7	1.0	

4.0 to 4.8 injected 50 c.cm. secretin free from depressor substance; very slight fall in blood pressure.

It seems clear that the lymphagogue action of secretin solutions (after tying the portal lymphatics) is due, not to the depressor substance which they contain, but to secretin itself. And since secretin has a specific action on the secretion of the pancreatic juice, but has, so far as is known, no action on the intestines, it is natural to suppose that the increased lymph-flow produced by secretin also has its origin in the pancreas. This view is supported by the close relation already described as existing between the secretion of pancreatic juice and the flow of lymph. This relation between the lymph-flow and the secretion of pancreatic juice is, moreover, strictly analogous to that shown to exist between the flow of bile and the formation of lymph. I conclude, therefore, that the increased flow of lymph from the thoracic duct consequent on the injection of secretin (after ligation of the portal lymphatics) is derived entirely from the pancreas.

This lymph might be formed by the pancreas in one of two ways. On the one hand, May has shown that secretin causes vaso-dilatation of the pancreas, lasting as long as juice is being secreted; it is possible, therefore, that the lymph might be the result of increased filtration, although I have shown that this does not occur in the submaxillary gland under similar conditions. On the other hand, it is possible that the lymph is formed as a result of metabolic changes in the pancreas accompanying the secretion of the pancreatic juice; if so, the pancreas resembles the liver and salivary glands in that its secretory activity invariably causes an increased formation of lymph, due to the rapid formation of metabolic products, and their entrance into the lymph spaces. On the whole, the evidence is in favour of the second explanation.

SUMMARY AND CONCLUSIONS.

1. The injection of secretin or ileum extract causes an increased flow of lymph from the thoracic duct. This has been previously shown by Falloise and by myself.
2. After ligation of the portal lymphatics secretin still causes an increased flow of lymph, whereas ileum extract has no effect.
3. The increased lymph-flow produced by secretin is not caused by the depressor substance, but by secretin itself.
4. There is a close relation between the secretion of pancreatic juice and the increased flow of lymph. The lymph is derived entirely from the pancreas, and is probably formed as a result of metabolic changes occurring in the pancreas during the secretion of juice.

I wish to express my thanks to Professor Starling for his kindness in allowing me to work in his laboratory.

It is my duty to state that this research formed part of my work as scholar of the British Medical Association; the expenses of the research were defrayed by a grant from the Royal Society.

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MEDICAL STUDENTS IN PORTUGAL.—The total number of medical students in Portugal is 584, distributed as follows in the three medical schools of that country: Lisbon Medico-Chirurgical School, 246; Oporto Medico-Chirurgical School, 209; University of Coimbra, 129.

A PRELIMINARY NOTE ON THE BACTERIOLOGICAL FINDINGS IN SEVEN CASES OF ENLARGED PROSTATE.

BY

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NEARLY all observers are decided that the initial change in enlargement of the prostate gland lies in the glandular tissue. There is not, however, the same unanimity concerning the cause and mode of production of the increase.

Three main opinions are held:

1. That the growth is really a neoplasm.
2. That the increase is due to a fibrosis constricting the ducts near the urethra, and causing a retention of the gland products. The fibrosis is suggested to be the result of a chronic inflammatory process, possibly gonorrhoeal in origin.
3. That the increase is due to an inflammation of the gland tissue, which produces blocking of the ducts by a desquamation of the cells. This inflammation is said to be brought about by an extension of septic organisms from the bladder.

In consequence of these divergent views, it is thought that the following brief investigation will be of general interest.

TECHNIQUE.

Microscopy.—Microscopical examination has been made of each prostate gland. The sections have been stained with haemalum and eosin, and also with van Gieson's picro-fuchsin stain, so as to definitely determine the amount of fibrous tissue present. Lastly, sections were stained by Gram's method so as to demonstrate whether micro-organisms were present in the specimens which were examined.

BACTERIOLOGY.

Urine.—The urine was drawn off into a modified Erlenmeyer flask, with special bacteriological precautions, about thirty-six hours before the prostatectomy was performed. Ten cubic centimetres of the urine were then incubated for twenty-four hours in a large flask of broth. A complete bacteriological investigation was then made from this flask.

PROSTATE GLANDS.

As soon as the tumours were removed the surface of each furthest removed from the urethra was burnt with a red hot flat knife. Sections were then made into the interior of the gland with bacteriologically sterile instruments. In every case we were most careful to avoid the tissue in the immediate neighbourhood of the urethra.

Blood agar and agar plates were inoculated either with small pieces of the gland rubbed over the surface of the media, or platinum loops of the fluid, which is present in the prostates, were used in a similar manner. A complete bacteriological investigation was then carried out in those cases in which colonies appeared on the surface of the agar.

We wish to draw attention to the fact that although we used a medium of blood agar in each case for the examination of the prostatic tumours, we failed to isolate gonococci.

CASE I.

S. J. S., aged 65. Frequent micturition for seven months; catheter passed for similar period; 6 oz. of residual urine; history of gonorrhoea doubtful. Urine: 1007, neutral. Parts removed: Small adenoma. Microscopy: Cystic myo-adenomatous tissue; extensive round-celled infiltration present; no micro-organisms seen. Bacteriology of tumour: Pure cultures of the staphylococcus albus; gelatine media were liquefied on the third day.

CASE II.

F. W. F., aged 66. Catheter passed four years ago for an attack of retention; frequent micturition at present time; 3 oz. of residual urine. Urine: Acid and clear. Parts removed: Weight, 34 grams; twin tumour type, with the urethra enclosed; "capsule" well marked. Microscopy: Fibro-adenomatous tissue; extensive round-celled infiltration present; no micro-organisms seen. Bacteriology:—Urine: Two strains of bacillus coli isolated. Prostate: One strain of bacillus coli isolated. Serum test: Patient's serum was found to cause marked agglutination of the strain of bacillus coli isolated from the prostate gland in the dilutions of 1 in 10 and 1 in 20, but no reaction with dilution of 1 in 50.

CASE III.

R. P., aged 63. No history of gonorrhoea; retention nine days; catheter two days. Urine: Neutral, contained blood. Parts removed: Weight, 28 grams; horse-shoe type of tumour with the urethra enclosed; "capsule" well marked. Microscopy: Fibro-adenomatous tissue; extensive round-celled infiltrations present; no micro-organisms seen. Bacteriology:—Urine: A pseudo-diphtheria bacillus. Prostate: Pure culture of the staphylococcus albus; neutral red jelly was decolourized and liquefied at the end of two days' growth. Serum test: Patient's serum was found to cause marked agglutination of the staphylococcus isolated from the prostate gland in the dilution of 1 in 20, but no reaction took place with a dilution of 1 in 50.

CASE IV.

R. I., aged 75. Two months' frequent micturition; fourteen days' retention, for which the catheter was passed three times during the twenty-four hours. Urine: 1020, alkaline; contained blood, and pus, and crystals of oxalate of lime. Parts removed: Weight, 147 grams; twin tumour type with the urethra enclosed; "capsule" well marked. Microscopy: Spheroidal-celled carcinoma. Bacteriology: Blood agar and agar media were inoculated with the fluid from the interior of the gland. Result: Sterile. Urine: Not tested bacteriologically.

CASE V.

J. H., aged 74. Difficulty of micturition eight months; much pain and almost hourly micturition on admission; retention for four days, catheter for a similar period. Urine: Slightly acid, contained pus and albumen. Parts removed: Weight, 100 grams; horse-shoe type of tumour; urethra enclosed; "capsule" well marked. Microscopy: Fibro-adenomatous tissue; very extensive round-celled infiltration present, especially around the ducts; no micro-organisms seen. Bacteriology: Pure culture of the staphylococcus albus; gelatine media were completely liquefied at the end of four days' growth; urine was not examined.

CASE VI.

G. S., aged 64. Difficulty of micturition three months; retention requiring catheter four days. Urine: Result of examination is not stated in notes. Parts removed: Weight, 64 grams; twin tumour with urethra enclosed; "capsule" well marked. Microscopy: Fibro-adenomatous tissue; extensive round-celled infiltration present; large numbers of very short and stout bacilli with rounded ends, which do not stain by Gram, present in sections of the gland. Bacteriology: Pure culture of a bacillus coli isolated from the gland; diplococci, which stained by Gram, were present in the original culture, but were lost in plating; urine not examined.

CASE VII.

D. C., aged 75. No history of gonorrhoea. Six years' difficulty of micturition, requiring catheter at times; one month complete retention. Urine, acid. Parts removed: Weight, 105 grams; twin tumour type with urethra enclosed; "capsule" distinct. Microscopy: Adenomatous hypertrophy; extensive round-celled infiltration present; no micro-organisms seen. Bacteriology:—Urine: Pure culture of a bacillus coli was isolated from the urine. Prostate gland: Sterile; film preparations were also made from the milky fluid present in the interior of the gland and stained by Gram; no micro-organisms were seen; large numbers of mononuclear cells and a few polymorphonuclear cells were found.

It will be seen that in the greater number of these observations the tumours removed from the prostates showed unmistakable signs of infection by micro-organisms, and that in some instances the infecting organisms were the same as those found in the urine. To a certain extent, therefore, the results lend support to the view that the initial lesion in prostatic enlargement may in certain cases be a septic infection from the bladder. At the same time, it is difficult to accept the view that all such enlargements are due to such a cause, as this would involve the septic infection of a large proportion of bladders in individuals above the age of 50 years.

REMARKS ON A CASE OF GUMMATA OF THE HEART:

DEATH FROM HEART-BLOCK: RHYTHMICAL CONTRACTION OF THE AURICLES DURING THE LONG PAUSES.*

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THE case I am going to bring before you may fairly be called a rare one, inasmuch as I have not met with a similar one during five-and-twenty years' observation. I should not, however, bring it to your notice simply on account of its rarity, for that would be the best evidence of its small practical utility. It is because the combination of circumstances present in this case teaches important lessons both in general pathology and in the more recent physiology and

pathology of the heart, which have been so greatly advanced during the past ten or fifteen years, that it seems to me worth while to go rather more fully than usual into details.

History and Symptoms.

The patient was a married woman aged 32, admitted into the General Hospital, Nottingham, on August 24th, 1904. She was an actress, but had been unable to follow her profession for several months on account of breathlessness and fainting attacks. From the age of about 14 until 23 she had been a professional swimmer, and had been accustomed to give exhibitions of diving, during which she held her breath for long periods. Nine years ago she was compelled to give up this occupation on account of breathlessness, palpitation, and other cardiac symptoms. A year ago she was in the Liverpool Royal Infirmary with some obscure cardiac condition.

There was no dropsy, and the patient was able to lie flat in bed. The urine was free from albumen. The apex beat was in the fifth interspace, $5\frac{1}{2}$ in. from the middle line, but was not easily defined by palpation, except when the heart was acting regularly, and then the beat was forcible. There was a slight mitral systolic murmur, audible at the apex, and not propagated in any direction. A faint diastolic murmur was heard at the bottom of the sternum, and also at the apex.

The action of the heart was sometimes regular, with a speed of eighty to ninety beats a minute, but more frequently very irregular. Upon several occasions, on many different days, the heart was observed to beat at the rate of 84 per minute for a variable period, and then stop for five to fifteen seconds. During this interval, on auscultation over the right heart and over the pulmonary area, the auricles could be heard to continue beating. There was no second sound, no pulse could be felt at the wrist, and no cardiac impulse at the praecordia. The face became very pale; the patient had a slight convulsion affecting the face, arms, and legs; the eyes were turned upwards and to the left; a few deep inspirations (four or five) were taken, and the whole heart resumed regular and somewhat violent action. At the same moment the face flushed and consciousness returned. Occasionally the heart acted regularly for several hours, and during this period there was no dyspnoea and no distress of any kind. During the "attacks" or "fits" the patient described her feelings as those of a nightmare. She was unable to move, and thought she was dead. These fits were always associated with the cessation of the proper and complete action of the heart, and recurred sometimes two or three times an hour; at other times every two or three minutes for many hours together. On September 4th the whole heart would beat regularly at the rate of 80 to 90 per minute for 9 or 10 beats, then cease for ten seconds or longer, during which time the right auricle could be heard beating for eight or nine times, and no pulse could be felt at the wrist. The patient died in one of these attacks on the morning of September 7th.

It was not clear whether the sounds audible during the apparent cessation of the heart's action were due to the simultaneous contraction of both auricles, or whether the right contracted alone. Probably both contracted; but the left was small compared with the greatly-enlarged right auricle, and it would not receive much blood while the right ventricle remained inactive, and while the pulmonary circulation was only carried on by the right auricle.

I ought also to state that cardiac remedies were most carefully and persistently tried. Neither digitalis nor strophanthus produced more than temporary benefit, and then seemed to do harm. Most relief was obtained by hypodermic injections of strychnine and by alcohol.

Morbid Anatomy.

The necropsy was performed on the morning of September 8th. The left lung was retracted, and a large portion of the heart was uncovered. The pericardium was not adherent, and contained no excess of fluid. There was a slight excess of fat on the surface of the heart. The right auricle was very greatly distended with recent blood clot, and the walls were hypertrophied. The tricuspid valve admitted four fingers. The right ventricle was moderately distended with clot, the cavity was greatly dilated, and the walls moderately hypertrophied.

There was a large, ill-defined, thickened mass in the upper part of the anterior wall of the right ventricle, involving the auriculo-ventricular septum.

A smooth bulging of the endocardium was noticed on the interventricular septum just below the pulmonary valves, and another in the wall of the pulmonary artery

* Read before the Nottingham Medico-Chirurgical Society.