from the soil (Manson), or from bad rice, etc. Hamilton Wright believes it to be an intoxication due to products formed by a large bacillus living in the duodenum; Daniels suggests that it is due to a protozoan, the parasite being conveyed probably by lice.

We have recently obtained several monkeys suffering from a disease which in some respects bears a considerable resemblance to beri-beri. The animals were evidently very ill, in most of them there was considerable oedema of the face and genitals, much like renal dropsy, but the urine never contained any albumen, and the knee-jerks were either increased, or diminished, or absent. They all died, and the only constant lesion found was congestion of the kidneys, which showed cloudy swelling of the renal epithelium, and in scattered areas haemorrhages into the convoluted tubes with denudation of their lining epithelium, and congestion of the glomerular vessels. Hyaline casts were constantly found in the urine, which in some of the animals contained highly refractile cells of an unknown nature (? protozoa). Attempts to infect healthy monkeys from the sick were not very successful, the condition of marked oedema was never obtained, but in two animals the eyelids became puffy, they became weak and ill, and the knee-jerks were exaggerated. These results suggested that possibly in beri-beri an infective organism exists, protozoan in nature, and eliminated in the urine, by which the infection may be conveyed.

We therefore fed monkeys with the urine of cases of beri-beri occurring at the Seamen's Hospital, Royal Albert Dock. These experiments unfortunately were vitiated by the presence of tuberculosis in some of the animals, but in two which were free from tubercle a condition of illness, emaciation, puffiness, cyanosis, weakness of hind legs, and alteration of the knee-jerks seemed to result from the feeding with urine.

We also examined the urine of cases of beri-beri at the Seamen's Hospital. The urine in the acute stage is generally concentrated and high-coloured, and deposits urates. Centrifugalized, the deposit constantly shows hyaline and granular casts more or less abundantly. Small refractile spherical bodies are also present, measuring 2 to 3 μ in diameter, apparently having a thick capsule, enclosing hyaline contents. These do not give the reactions for fat with osmic acid and Sudan III, but may be products of degeneration (? "myelin bodies"). Other cells also occur; these measure 20 μ in diameter, are globular, and contain a cytoplasm studded with very refractile granules and having a single nucleus. A third form of cell may be met with, 30 μ in diameter, enclosed within a thick capsule, and containing a finely granular oval nucleus with rounded nucleolus. Both the last two varieties of cells stain faintly with neutral red, methylene blue, and methyl green in physiological salt solution in wet specimens, but if smears be made and dried they seem to disintegrate and cannot be found. These cells either are peculiar degenerate cells or possibly are protozoa.

We have also examined a number of kidneys obtained from cases of acute beri-beri, kindly forwarded to us by Dr. McDougall of Singapore, to whom we would tender our best thanks. Sections of these kidneys show changes similar to those met with in the monkeys' kidneys, but in a more intense form—namely, congestion of the glomerular vessels and haemorrhages into the glomeruli, scattered patches of haemorrhages into the tubuli recti and convoluted tubules, with denudation of epithelium in these areas, and much widespread cloudy swelling of the renal epithelium. We believe that these changes have not been described before.

In conclusion, as a working hypothesis, we would suggest that beri-beri is a protozoan infection, that the infecting agent is eliminated in the urine, and that the urine is the source of infection.

ARTHRITIS AND ERYTHEMA NODOSUM.

By J. ODERY SYMES, M.D., D.P.H. (Lond.),

PHYSICIAN TO THE BRISTOL GENERAL HOSPITAL.

THE generally-accepted view with regard to the arthritis which sometimes accompanies erythema nodosum is that it is a true acute articular rheumatism. This view is founded on the fact that endocarditis develops or is found to be present in a large proportion of the cases. Mackenzie collected records of 108 cases of erythema nodosum (90

females and 18 males), and 15.7 per cent. showed definite arthritis, and a further 15.7 per cent. complained of rheumatic pains; 21.3 per cent. of the total had or developed signs of endocarditis. Goodhart and Still found that of 29 cases of erythema nodosum, 19 were rheumatic, 5 were not rheumatic, and in 5 the history was not inquired into.

My own experience of six years in the medical outpatient department has been that the signs or a history of chorea, endocarditis, or arthritis are not found in more than 10 per cent. of all cases of erythema nodosum.

Other points in favour of erythema nodosum being a rheumatic manifestation are: The age-incidence of the two diseases (rheumatic fever and erythema nodosum) are practically identical, the majority of cases (63.2 per cent. of 125 cases of erythema nodosum, 55.8 per cent. of 193 cases of rheumatic fever) occurring in the second and third decades of life; the incidence of disease is, too, in both cases heaviest upon girls between the ages of 10 and 15 years. There is some evidence to show that both diseases occasionally occur in epidemic form, and may be infectious, and they have in common such symptoms as various forms of erythema, arthritis, tonsillitis, and endocarditis.

Erythema nodosum differs, however, from rheumatic fever in that it much more commonly attacks females than males (of 125 cases of erythema nodosum, 36 were males and 89 females). It is most prevalent in the last and the first two quarters of the year, whilst acute rheumatism in Bristol is most prevalent in the third quarter. A long prodromal period of malaise, comparative freedom from the risk of recurrence, slight constitutional disturbance during the pyrexial period, and the presence of phlyctenulae in the eyes, are characteristics of erythema nodosum. To these differences I wish to add another—namely, that the arthritis of erythema nodosum may differ entirely from that met with in rheumatic fever, and that this arthritis and the accompanying pyrexia and rash are little influenced by the administration of salicylates. In illustration of this last point I would quote the following three cases:

CASE I.

Mrs. W., aged 63, had suffered from erythema nodosum when 5 years old. With the exception of an attack of influenza when 50 years of age, which was followed by neuritis, and which had left her with an irregular action of the heart, her health had been good. On August 10th, 1906, she left for a holiday at the seaside, and for the first fortnight of her stay suffered from lassitude and pains about the limbs and trunk.

About August 24th there was fever, with dry, coated tongue, the joint pains became worse, and by August 28th the articulations were distinctly red and swollen, and a rash was noted on the arms and legs. She returned home, and was seen by me on September 2nd. The temperature when the patient was first seen was 101°, and, in spite of large doses of salicylate of soda and aspirin, pushed until tinnitus and delirium were produced, it remained between 100° and 102° for ten days. The joints affected were those of the wrists, ankles, fingers, and knees, and there was slight stiffness in the temporo-maxillary joints. Contrary to the condition generally seen in rheumatic fever there was much redness and puffiness of the joints, the overlying skin pitting as it does in gout. Although there was a sensation of stiffness the joints were not painful, even on movement. They did not resume their natural appearance for ten days. The rash of erythema nodosum was present on the arms and legs, and fresh crops of nodules appeared from time to time, lasting in all for five weeks. During the first week there was profuse sweating, and a sudaminal rash appeared on the trunk. There was oedema of the legs. There was no cardiac bruit or dilatation of the ventricles. The pulse-rate at no time reached a hundred beats per minute. Beyond some stiffness in the joints and slight pyrexia when aspirin was withdrawn, recovery was uninterrupted. In the early weeks of the illness there had been a pricking sensation in the conjunctivae, nose, and throat. This attack differed from acute rheumatic fever in that it did not yield readily to salicylates, also in the nature of the arthritis, which was painless, and accompanied by much reddening and oedema of the skin. There was never grave constitutional disturbance, but early in the illness there was slight bronchitis.

CASE II.

G. S., a married man, aged 36, attended the Bristol General Hospital on April 3rd, 1905, complaining of pains in both knees and in the left elbow. The pains were of five or six weeks' duration and were worse when in bed. The joints were swollen, painful and stiff, and suggestive of gonorrhoeal rheumatism, or of rheumatoid arthritis. Seven years previously he had a slight attack of rheumatism, but not of such a nature as to keep him home from work. Twelve months previously he had gonorrhoea, the discharge appeared again

recently, and recurred again whilst he was attending the hospital for his arthritis. Three weeks ago he had otitis media. There was no cardiac bruit. Over both arms extending as high as the shoulders there was the rash of erythema nodosum and this persisted for four weeks. There was no rash on the legs or thighs. The treatment adopted was administration of aspirin and hot air baths for the affected joints. Later, full length electrical baths, massage, blisters, salol, iodides, tonics were tried, but the arthritis was not relieved sufficiently to enable the patient to resume work until the expiration of four months. At the end of eight months he had made a complete recovery, but the urine still showed a few pus cells and prostatic threads. After the patient had been attending for six months Mr. Walker reported that he was suffering from retinitis. Except for the presence of erythema nodosum and of retinitis I should have had no hesitation in classifying this as a case of gonorrhoeal rheumatism.

CASE III.

C. T., a married woman, aged 50, attended as an out-patient and was admitted to the hospital on December 9th, 1905. About a fortnight before admission she had suffered from chilliness, sore throat, pains in the limbs, and a rash on the arms and legs. Owing to the pains she had kept in bed. On admission the temperature was 100.4° F. There was no history of previous rheumatic affection. The rash of erythema nodosum was thickly covering the extensor surfaces of the thighs and legs, and the ulnar and extensor surfaces of the arms, extending for a short distance above the elbows. There were pains and stiffness in both elbows, ankles, and knees, and in the carpo-metacarpal joints. There were no objective signs of arthritis, and the pains were better when the patient was in bed. The axillae were much pigmented and the trunk freckled. At the heart's apex there was a soft blowing systolic bruit conducted outwards. The legs were oedematous, and there was slight albuminuria. A few rhonchi were heard over the lungs. Examination of the blood showed: Haemoglobin, 80 per cent.; red cells, 4,250,000; white cells, 20,000. A differential count showed:

Finely granular oxyphile leucocytes...	74 per cent.
Coarsely " " " "	1 "
Large hyaline " " " "	7 "
Lymphocytes " " " "	18 "

—a result similar to what one would expect to find in acute rheumatism. The highest temperature recorded was 102.4° F., but under large doses of salicylate of soda it fell to normal in three days. During a brief attack of delirium tremens the drug was discontinued for a few days, and the temperature rose again. A fortnight after admission the rash had disappeared and the temperature was normal. There was still a cardiac bruit, and pain and stiffness in the joints persisted. Her convalescence was very slow, but when discharged to the convalescent home on January 25th, 1906, there was no cardiac bruit and very little stiffness in the limbs. This attack differed from typical rheumatic fever in the absence of sweating and of objective joint symptoms, and in the persistent nature of the pains and stiffness in the joints.

These 3 cases illustrate the fact that not only is it difficult in a large proportion of cases of erythema nodosum to recognize any rheumatic taint, but that even when arthritis is present it may differ very markedly from that found in acute rheumatic fever.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL.

A NOTE ON INTERSTITIAL PANCREATITIS IN ITS
RELATION TO SPRUE.

THE discovery of the association of pancreatic catarrh or of the more advanced condition, interstitial pancreatitis, in cases on which I have been consulted with regard to treatment, after they had been diagnosed as sprue by well-known physicians devoting special attention to tropical diseases, is, I think, worth noting.

I have operated on several of these cases beneficially by draining the bile ducts either by cholecystotomy, or, what is better, cholecystenterostomy, in which the drainage is of a more permanent character.

This preliminary note I hope to supplement later, after my observations are more complete, by a more extended reference to cases. The subject is also noted briefly in a work on the pancreas, now in the press, by Dr. Cammidge and myself.

I have seen a considerable number of cases of chronic pancreatitis in Europeans who have returned invalided from India, Ceylon, and other tropical countries, and from information I have received from medical men practising in those countries I suspect diseases of the pancreas are frequently unrecognized.

It may be, and I think it is highly probable, that some of the cases diagnosed as sprue owe their origin to inflammatory disturbance of the pancreas, and in other cases the pancreatic disease forms an important complication requiring treatment.

A. W. MAYO ROBSON, D.Sc., F.R.C.S.

A CASE OF GONOCOCCAL PYAEMIA.

THE object in reporting this case is to put on record a cell count from a pleural effusion which I believe to be unusual.

The patient, a woman of 35, had suffered from joint pains and stiffness since Christmas; at Easter the pain, swelling, and tenderness of the joints had become much worse, and was associated with profuse sweating.

On April 7th the wrists and ankles were affected, contained fluid, and were very painful and tender. The skin was covered with miliaria, and showed also the remains of an eruption stated to have been chicken-pox. The pulse was 80, and the heart sounds were normal, but there was a pleural friction sound in the left axilla. The temperature was 102° F. There was some not very marked anaemia. No leucorrhoea.

April 30th. Signs of fluid at the right base. A rather densely-opalescent fluid was drawn off from the right base. Pus was drawn off from a tendon sheath on the right wrist. A film of the pus showed large numbers of typical gonococci. Films from the centrifugized deposit of the pleural fluid did not show any gonococci but the following count:

Eosinophile leucocytes (some of these appear to be uninuclear) ...	...	...	147
Mast cells ...	...	...	123
Endothelial cells ...	...	...	112
Lymphocytes ...	...	...	112
Polynuclear leucocytes ...	...	...	25

The fluid was aspirated and did not reaccumulate.

May 23rd. She had a singing aortic diastolic murmur and was getting very anaemic.

Blood Count.

Red corpuscles...	...	...	3,376,000
White cells ...	...	...	12,600
Haemoglobin ...	...	...	55 per cent.

Differential count of 400 cells:

Polynuclear leucocytes...	...	...	248
Lymphocytes ...	...	...	138
Mast cells ...	...	...	10
Eosinophile leucocytes...	...	...	4

June 4th. Systolic and diastolic murmurs in the aortic area: systolic mitral murmur. Complained of pain in the splenic area.

June 26th. Patient died. During the whole of this period the evening temperature varied from 102° F. to 104° F., the morning temperature from 99° F. to 100° F., and the anaemia and emaciation were progressive.

The autopsy showed ulcerative endocarditis of the aortic and mitral cusps. There were no adhesions at the right base. There was a large splenic infarct.

F. H. JACOB, M.D., M.R.C.P.,
Hon. Physician, the General Hospital, Nottingham.

HYPERTROPHIC CIRRHOSIS OF THE LIVER IN
AN INFANT.

SOME weeks ago I was asked to see an infant who had been "unable to swallow any food for two days." The child, aged three months, was emaciated and nearly comatose, and obviously had but a few more hours to live. The abdomen was distended by a greatly enlarged liver, which could be mapped out with ease; its sharp anterior edge extended from the anterior superior iliac spine on the right to the eighth or ninth rib on the left, crossing the middle line at the level of the umbilicus. A few hours later the child died, and I obtained permission to open the body. The liver was found to occupy about two-thirds of the abdominal cavity, the stomach and intestines being compressed and empty. The spleen I judged to be twice the normal size. The enlargement of the liver was perfectly uniform, so that the normal shape was quite unaltered. There were no adhesions, and no sign of peritonitis or other inflammatory trouble. In colour the liver was paler than normal, and when cut more resistant to the knife. I had no means, unfortunately, of ascertaining its weight. The lungs and heart were healthy, but the thoracic cavity was diminished in size by the upward push of the enlarged liver on the diaphragm. I excised a small piece of the liver, and sent it to Professor Hewlett, of King's College, who very kindly had sections prepared in his laboratory. Some of these he sent to me in due course, and stated