of pulmonary tuberculosis they have of late held the field too exclusively.

Turning, then, to the symptomatology of the disease, we find that a toxæmic state, revealed in one form or another and in greatly varying degree, is to be regarded as a manifestation of active tuberculosis. Pulmonary tuberculosis, however, cannot be held responsible for every unexplained toxæmia, as the symptom complex of this condition is much the same whatever the source of infection, and the existence of localized infection such as sinusitis, tonsillar infections, oral sepsis, and bronchiectasis must be excluded.

The group of symptoms comprise malaise, lassitude, nervous instability, digestive disturbances, tachycardia, fever, and night-sweats. I propose to deal in some detail only with two of the more prominent of the symptoms of the toxæmic syndrome, both of which on accurate observation will be found to present certain features characteristic of tuberculosis. These are (a) fever, (b) tachycardia.

Fever.

The presence of fever as an indication of tuberculous toxæmia is in this connexion of the greatest value, but certain qualifications are necessary if we are to arrive at trustworthy conclusions. It is unfortunate that temperature records are often taken in so casual a manner as to be practically valueless. It is not necessary, I think, to assume that a rectal temperature record is the only reliable method, more especially in private practice. If certain simple precautions are taken oral temperature records are quite trustworthy, except in the case of mouth-breathers. The thermometer should be retained in the mouth at least seven minutes; the temperature should not be taken immediately after the patient returns indoors after exposure to cold wind nor after partaking of a hot meal. It is not sufficiently recognized that the maximum temperature period varies greatly in different persons; to ascertain this period in a given case it is necessary to take the temperature every two hours. The first recorded temperature for the day ought not to be taken, as is often the case, after the patient has got up and dressed, but as early as possible in the morning before rising. The normal diurnal variation in temperature is about 1.5° F. In a majority of healthy persons the average early morning temperature is approximately 97.2° to 97.4° F., rising to a maximum of 98.6° F. in the early afternoon. This normal average is maintained by an equilibrium between the forces governing heat production and heat dissipation, and the entry of toxins into the blood stream, from whatever source, disturbs this balance. While it is not usual to find much temperature elevation in early pulmonary tuberculosis, it may be found that the early morning temperature is 98° F. and the maximum record for the day 99.2° or 99.4° F. The necessity for a continuous temperature record extending over three or four weeks in any case of suspected early tuberculosis will become apparent when it is pointed out that the toxæmic state is by no means constant; it ebbs and flows. The continuous temperature record therefore gives a fair representation of the degree of toxæmia present.

In chlorosis there is sometimes a slight average increase of temperature, while the premenstrual rise must not be overlooked. In persons of highly strung nervous temperament there are sometimes quite noticeable variations in the temperature curve. It will thus be seen that the process of elimination may have to be thoroughly invoked to clear the ground. Are there, then, any very clear indications, when all this has been done, which may point the way to a tuberculous toxæmia as the responsible source of the fever? I think there are. My own experience has led me to attach much importance to an early morning temperature—taken before rising—which is consistently a little above the average mean. The effect of a definite amount of exercise may be noted; while in a healthy person there is always a temporary rise—sometimes considerable—after exercise, this is usually quite evanescent, and within half an hour or so the temperature returns to normal. This is not so in the case of a tuberculous person. The decline of the temperature to normal limits is delayed and it may remain elevated for two or three hours. Hence the value of post-exercise temperature records in suspicious cases. Then, too, extraneous conditions resulting in emotional disturbance, worry, and anxiety,

which in a healthy person have no appreciable effect on temperature, may cause considerable disturbance in a tuberculous person. These features may be said to be characteristic of the tuberculous process. It will be seen, therefore, that fever, though still to be regarded as one of the cardinal points of the toxæmia of tuberculosis, cannot be accepted without due consideration of the qualifications outlined above, especially if there is no supporting evidence in other directions. It must be noted, however, that the absence of fever does not necessarily rule out the possibility of the existence of pulmonary tuberculosis.

Tachycardia.

From time to time I have seen patients found to be suffering from early pulmonary tuberculosis who have referred to an irregular and rapid action of the heart coming on without any apparent reason, but on the whole it has not been my experience that the cardiac disturbances caused by tuberculous toxæmia are noticed subjectively by the patient.

Tachycardia is of frequent occurrence in early tuberculosis—Fishberg puts it at 60 per cent. of incipient cases; it is hardly ever a subjective symptom. Like fever it is of toxic origin and appears to be the result of excessive stimulation of the sympathetic nervous system. The instability of the pulse in pulmonary tuberculosis would appear to result from a combination of vagus and sympathetic stimulation. Pottenger, who supports this view, considers that tachycardia as such is not a particular characteristic of active tuberculosis. In his opinion it is not regularly present unless the patient is in a depressed state, or has been over-exerting himself. This, I am inclined to think, does not fully represent the case. It is now, I believe, generally accepted that a pulse rate out of all proportion to any febrile condition present is a very common and reliable symptom of early tuberculosis in an active state, and further that the pulse rate may be notably increased on the slightest excitement or even after a fit of coughing. Another well marked characteristic is that, just as in the case of fever due to tuberculous toxæmia the fall of temperature is considerably delayed after exercise, so it is found that the increased pulse rate after exercise falls much more slowly than in health. I have repeatedly seen cases in which there has been persistent tachycardia, not referable to any cardiac abnormality or hyperthyroidism—a condition which is always to be borne in mind in the differential diagnosis—and in which the true diagnosis was only revealed by a sharp hæmoptysis. The physical signs in the chest in such cases may for a long time show no evidence of anything abnormal.

It has to be recognized, however, that pulmonary tuberculosis may masquerade as an affection of any of the great systems of the body with no signs or symptoms in any way directly referable to the lungs.

In none of the types of cases under discussion is it assumed that assistance can be sought by the presence of cough, sputum, hæmoptysis, pleurisy, or indeed any direct overt symptom. In such early cases radiography is of doubtful value and the complement fixation test is at times rather a blind guide. The key to the diagnosis is to be found more commonly in the history of the present illness, and inquiry cannot be too minute or painstaking.

OBSERVATIONS ON A CASE OF MYASTHENIA GRAVIS.

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THE following case, of a man in whom symptoms of this rare condition developed while he was serving in the army in the late war, and some six years before he attended this hospital as an out-patient, seems of sufficient interest to warrant publication.

The patient, a man 43 years of age, a painter by trade, first came under observation as an out-patient on December 13th, 1922, when he was complaining of muscular weakness and exhaustion and inability to swallow properly.

Clinical History.

The patient joined the army as an A.I. man in 1914. In 1916 he began to develop pain and weakness in the left shoulder and arm so that he was unable to lift things. His head began to feel heavy, and the muscles of the neck became so weak that he had difficulty in holding it up straight and it drooped downwards on to the thorax. He could not brace back his shoulders, which became rounded. His legs began to feel weak and heavy, and he was tired after a short walk. Shortly after this he had difficulty in articulation and he began to stammer. The upper eyelids began to droop and he developed a squint in the right eye which caused double vision. The lower jaw became weak, he had difficulty in chewing hard foods, and at the end of the day he was unable to close his mouth and the jaw drooped down, saliva dribbling from the mouth. Sometimes he had to hold his lower jaw up with his hand to enable him to masticate properly. In addition he complained of general weakness and unusual fatigue. He noticed that the quieter he was and the less he exerted himself the better and stronger he felt; thus at the beginning of the day the above symptoms were slight, but as the day wore on, especially if he had been exerting himself, they began to appear and reached their maximum intensity in the evening.

The symptoms used to disappear almost completely for intervals of a few weeks, during which he appeared to be quite normal, and then returned again, and a diagnosis of neurasthenia was made by the army doctors. Since that time the symptoms have become more marked, and in addition the patient developed difficulty in swallowing, the food regurgitated through his nose, and his voice became nasal. He had attacks of dyspnoea, especially during a fit of coughing. His legs became weak and he tended to fall.

Clinical Examination.

The striking thing is the facies, which is one of great fatigue or exhaustion, superimposed on a somnolent mask-like expression. The photograph shows the bilateral ptosis, the right external strabismus, the drooping of the jaw, and the general expression of exhaustion. The speech is normal in the early part of the day, but after much talking it becomes stammering and nasal in quality, those syllables which require complete closure of the nasopharynx by the elevation of the soft palate being pronounced with the greatest difficulty. The intellect and memory are normal and there are no emotional changes.

Attitude.—The body is bent somewhat forward, the head bowed down, the jaw droops, the lower lip sags down, and saliva dribbles from the angles of the mouth; the shoulders are rounded owing to weakness of the muscles which brace back the shoulders.

Muscular System.—No atrophy. The muscles are hypertonic and in a state of irritability. The patient states that he has experienced "twitchings" in certain muscles, especially after fatigue, particularly in the left masseter, lower eyelids, muscles of nape of neck, and in the thigh muscles. All the muscles show the myasthenic phenomenon—that is, at first the movement is performed perfectly,

but after being repeated it rapidly becomes slower and slower, and the extent of movement becomes diminished and is accompanied by severe pain; finally the muscle fails completely and after resting for a variable period recovery takes place; movement can then be resumed and the same cycle is gone through again. A curious phenomenon is seen towards the end of the voluntary contractions and is best observed in the masseter in the movements of opening and closing the mouth—namely, at the end of the last contraction the muscle passes momentarily into a state of painful spasm in which it cannot be voluntarily relaxed, and then it suddenly relaxes finally and completely, and passes into a state of paralysis. Thus the patient complains that, after chewing anything hard, his jaw soon becomes tightly clinched for an instant during which he cannot open it, and then it falls down "like a dead weight."

Electrical Reactions.—The reaction described by Jolly was obtained—that is, the muscles responded readily to the first few stimuli with the faradic current, then the contractions rapidly diminished in extent and ceased after a few minutes in spite of the continuance of the stimulus. After a period of rest, this myasthenic reaction was obtainable again; but this exhaustion of the muscles was not brought about by galvanism.

The superficial and deep reflexes are all exaggerated. The knee-jerk shows an alteration in type, the contraction appeared to be a summation of a series of superimposed small contractions. It was not possible to tire out the knee-jerks by repeated tapping of the patellar tendon for five minutes, though after the attempt the patient made the remark that he "felt as though he had just done a ten-mile walk." After this test the quadriceps muscle was observed to be in a state of coarse fibrillary tremor which the patient states is identical with that previously experienced in other muscles. Knee clonus is present. The pupils are equal and react to light and accommodation, and the fundi are normal. The right eye shows a permanent external strabismus, more marked in the evening, due to paresis of the internal rectus. Coarse lateral nystagmoid movements are present in both eyes. Deglutition, especially of solids, is difficult when the patient is fatigued, and regurgitation through the nose then occurs. The palatal reflex is sluggish. There is no change in the organic reflexes. No sensory alterations in the nervous system are found. The blood Wassermann reaction is negative. Clinical and radiological examination of the thorax reveals no enlargement of the thymus gland, which is said to occur sometimes in this disease.

Treatment.

A prolonged course of treatment with strychnine alternating with pituitrin (hypodermically), thymic and thyroid extracts orally, was given, as recommended by those who suggest that myasthenia gravis may possibly be associated with disturbances in the endocrine system, but little improvement was noted. Most benefit appeared to result from absolute rest and the avoidance of all fatigue.

HAEMORRHAGE FROM THE LARGE BOWEL CAUSED BY AN ADHERENT APPENDIX EPIPLOICA.

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In the *British Journal of Surgery* (July, 1922) Mr. Duncan C. L. Fitzwilliams recorded a case of a hernia involving an appendix epiploica, which became strangulated in a hernial sac, giving rise to urgent symptoms, but without the classical features of a strangulated hernia. Within the last year two somewhat similar cases were referred to me; the symptoms resembled subacute strangulation of a hernia, recurring at intervals, followed by the passage, after each attack, of a quantity of bright blood by the rectum.

The first patient was 54 years of age, and the possibility of a growth of the lower bowel was entertained by his medical attendant. The second patient was about 30 years of age, and the diagnosis was obscure, the presence of a polypus or adenoma of the lower bowel being suggested. In neither case were haemorrhoids present, nor did examination reveal any growth of the lower bowel, so far as could be ascertained by the finger or the sigmoidoscope.

In the first patient there was a hernia on the left side, which troubled him by coming down only occasionally, so that he did not wear a truss. In the second case the hernia was on the right side, and again was apparently of such a nature that he did not trouble to wear a truss. The symptoms in each case were very similar. The onset was

with a fairly severe pain in the lower part of the abdomen, followed by vomiting and by colicky pains for a short time. Within sixteen to twenty-four hours bright blood was passed per rectum, beginning with anything up to two ounces; it ceased in the next thirty-six hours. In each case the attacks came on while the patient was engaged in somewhat laborious work.

The diagnosis of a partial strangulation of the large bowel, of the Richter type, was given without much difficulty in the first case, where the hernia was on the left side, the bleeding following on the congestion of that part of the pelvic colon which had been partly strangulated and had escaped back into the abdomen. The second case was a little more obscure until a bismuth enema had been given. This showed plainly that the pelvic colon was lying right across the abdomen and appeared to be fixed near the region of the internal ring on the right side. A similar diagnosis was therefore made.

At operation in each case it was noted that an appendix epiploica of the pelvic colon was fastened to the fundus of the hernial sac; the neck of the sac was not unduly wide. There can be no doubt that the fixation of the appendix epiploica from time to time dragged a part of the pelvic colon into the sac, causing a partial strangulation of this viscus after the manner of Richter's hernia, giving rise to haemorrhage from that part of the bowel, after its escape, by rupture of some of the congested vessels consequent upon the reaction of the bowel. Radical cure of the hernia with removal of the offending appendices epiploicae entirely removed the repeated attacks of partial strangulation and the loss of blood from the lower bowel.