

Indian Medical Gazette.

DECEMBER.

HÆMOGLOBINURIA.

HÆMOGLOBIN is found in the urine under many varying conditions: it occurs as the result of exposure to cold or of fatigue, or the ingestion of poison; after severe haemorrhage in the course of infectious diseases, and also during pregnancy. It is the outstanding feature of two diseases, *viz.*, blackwater fever and what, for want of a better name, is called paroxysmal hæmoglobinuria. It is in this last-named disease that the march of events which terminates in hæmoglobinuria has been most carefully studied.

The paroxysm follows great fatigue sometimes; more often it is excited by chilling of the body-surface. After a cold bath the patient remains pale, begins to shiver, complains of pain in the loins, and may suffer from urticaria. Soon after this the urine is found to contain hæmoglobin, epithelial casts, granular masses, and a few erythrocytes. After a few hours the patient feels better and his urine becomes again normal. Should the attack be a very slight one there may be only slight albuminuria.

The blood-findings remind one of those of an acute infection: increase in the number of polymorphonuclear cells; less lymphocytes; eosinophilia later, with phagocytosis.

It is now generally known that the hæmoglobin passes from the blood through the convoluted tubules and the loop of Henle, the glomeruli taking no part in its removal.

The paroxysm is so easily excited, and comes and goes so rapidly that at first "nervous influence" was alleged to be the cause of it, and, doubtless, this term gave satisfaction—if not to the physician, at least to the patient whose nerves were held to be at fault. But experiment has shown that such very active agents as amyl nitrite, pilocarpin, adrenalin, pituitrin, and hirudin, have no more effect in exciting a paroxysm than has such a gross mechanical method of interfering with the circulation as compression of the femoral artery; therefore nervous influence has been deposed from its pedestal.

So far back as 1905 Donath and Landsteiner discovered, and Widal and Rostaine confirmed the fact, that, if the blood of persons suffering from paroxysmal hæmoglobinuria be drawn, prevented from coagulating, and kept at a low temperature for some time, and then heated to blood-heat, the erythrocytes will become dissolved in many cases. The explanation of the Donath-Landsteiner phenomenon that is now generally accepted is that in the blood of the patient there is present a hæmolysin for his own erythrocytes. This hæmolysin unites with the erythrocytes only when the surrounding medium is at a temperature well below the normal temperature of the body. When the temperature of the serum, in which the now amboceptor-laden erythrocytes lie, is brought to normal the complement of the serum combines with them and they are dissolved. A slight fall in the temperature of the surrounding medium will cause a slight amount of the auto-hæmolytic amboceptor to be anchored by a few erythrocytes, which will then be dissolved—their hæmoglobin passing out into the medium: this is the most feasible explanation of the ruby-tinted serum that is found soon after the outset of a paroxysm.

But the phenomenon does not always occur if the patient's blood be treated as above described. This is mainly due to the great decrease in complement which most observers have found to occur during the paroxysm: also it is in part due to the fact that the chilling of the blood injures its complement. However, the phenomenon may easily be elicited if the erythrocytes, which have become amboceptor-laden by being kept at a temperature near freezing point for some time, be washed with cold salt solution to rid them of serum, and then at blood-heat be mixed with complement, preferably derived from the fresh serum of a healthy man. Had Barratt and Yorke adopted this method of procedure in 1909, when they studied black-water fever, it is possible that they might not have made the sweeping statement that that disease is not due to a hæmolysinæmia.

The union of the amboceptor with the erythrocytes is in the case of paroxysmal hæmoglobinuria by no means firm. It tends to become rapidly dissociated as soon as blood-heat is reached, and this fact is held to explain why so little intravascular hæmolysis takes place after

a paroxysm has been excited by chilling of the body-surface.

The question as to whether or no the erythrocytes of the haemoglobinuric patient are more resistant than those of healthy persons to the haemolytic action of saponin, carbon dioxide, acetic acid, etc., has not yet been settled, but the weight of evidence appears to be in favour of their possessing greater power of resistance. Nor is it yet settled what treatment gives the best results in paroxysmal haemoglobinuria and black-water fever. Obviously from the above we should try to increase the resistance of the patient's erythrocytes: this can be done by the administration of calcium—especially intravenously, as, amongst others, McCay and Sutherland have experimentally shown. This means of treatment should be aided by hypertonic saline solution injected intravenously, and, it may be, by the administration of cholesterol, to counteract the haemolysin present. But in addition to these measures we must use antisyphilitic treatment when we have to deal with a case of paroxysmal haemoglobinuria; for statistics show that most of, if not all, such cases have the luetic taint.

NOTICE.

SPECIAL NUMBER OF THE "INDIAN MEDICAL GAZETTE."

WITH reference to the Special Number of the INDIAN MEDICAL GAZETTE announced in our September and November issues, the Editor gives notice that (1) contributions are open from *all* classes of medical men in India and the tropics, and (2) that the papers should reach the Editor, (P. O. Box 54 Calcutta), on or before 31st December 1916.

Current Topics.

INDIAN MEDICAL SERVICE.

WE have received the following announcement from the Under-Secretary of State for India:—

In view of the present great need for experienced officers in the Indian Medical Service the Secretary of State for India has approved a proposal of the Government of India to retain in their appointments, when it is considered desirable in the public interest, colonels of the Indian Medical Service after they have completed the ordinary period of tenure or would in ordinary

circumstances be placed on the retired list. In order, however, to obviate the block in promotion which would thereby occur, such officers are regarded as supernumerary in their rank and promotions are being made in succession.

For similar reasons the following special arrangements have also been made in the case of lieutenant-colonels who, under the terms of the Royal Warrant governing promotion in the Indian Medical Service, may be specially selected for increased pay for ability and merit. The number of officers eligible for this increase of pay is at present fixed at 41. Among such of these as retire in any one year four extra pensions of £100 per annum are distributable, subject to certain conditions. Retirements being suspended during the war, the Secretary of State for India has decided as a measure of relief: (1) That, provided there are a sufficient number of applicants who satisfy the required conditions, these four extra pensions, which would otherwise lapse, shall be allotted in each year, but that payment of the extra pensions shall be held over until the allottees have actually retired; and (2) that such recipients shall be regarded as supernumerary on the list of 41 selected lieutenant-colonels, and that promotions to the list shall be made in their place.

MEDICAL WORK IN MESOPOTAMIA.

LIEUTENANT-GENERAL SIR P. H. N. LAKE, K.C.B., K.C.M.G., in a despatch from Basra, makes the following remarks:—

The energy and devotion to duty shown by the personnel of the Medical Services deserve commendation. Overworked and undermanned as they were during the advance in January—for the greater portion of the medical organisation then in the country had been shut up in Kut, and the medical units of the III and VII Divisions had only begun to arrive—they did their utmost with the means at their disposal to alleviate the sufferings of the sick and wounded. With the arrival in February of the first river hospital ship *Sikkim*, and a steady increase in personnel, their power of dealing with the situation was considerably improved, as the action on March 8th showed.

No report on the Medical Services would be complete without reference to the splendid services rendered by Mr. T. A. Chalmers of Assam, who brought out, and himself drove, his specially designed motor boat *Ariel*. He spent his whole time, frequently under fire, in conveying sick and wounded between collecting stations, field ambulances, and river hospital craft, in a manner which no other boat in our possession could have imitated.

THE CAUSE OF SEX.

THERE is perhaps no process in life which excites more general interest than the causation of sex. It is generally believed that the sex is not established until after fertilization, and popular superstition in many communities abounds in methods of securing the desired