YELLOW FEVER: PRELIMINARY NOTE.

I have had the opportunity, since the above was written, of examining films containing the virus of yellow fever. Dr. Edward Hindle, whose very successful work with this dangerous disease is well known, kindly sent me films of the blood, liver, and spleen from four rhesus monkeys infected with yellow fever, and later blood films from one bitten by infected mosquitos, from the first to the last day of illness. I would here express my heartiest thanks to Dr. Hindle.

In these films, when stained with Giemsa, I have found certain minute bodies which closely correspond with those I have already described from other filterable diseases. On microscopic examination a large number of very faintly stained bodies were found lying in the space between the tissue cells or corpuscles. At first glance they were regarded as probably minute precipitates of stain, but on closer and more prolonged examination they were found to have definite form and shape. In the majority of cases they were minute round or oval bodies, stained a faint red colour with Giemsa, irregularly arranged, of somewhat unequal size, and unequal depth of stain. Most of them were single, many arranged in pairs, and a few in lines. The individual particle may have a distinct flagellum-like process, others have a bud- or spike-like projection, giving the organism the appearance of a comma. Rarely filaments are seen connecting two, three, or four together, as was noted in other virus diseases.

These minute bodies were never found in dense groups or compact clumps as one so commonly sees in the Rickettsias, but they were fairly equally distributed in the blood serum. They were very numerous in the liver and spleen, but were fewer though quite distinctive in the blood. It was particularly noticed that many of them were in pairs, like minute diplococci—or, as I call them, diplogloboid bodies—and in the blood I regarded these as especially suggestive. When examined with dark-ground illumination these minute bodies shone out very brilliantly.

Mr. Merlin, who has confirmed these findings, has kindly taken the following measurements. In the liver and spleen their size varied from 0.9μ to 0.17μ ; intermediate sizes being 0.39 , 0.28 , and 0.22μ . The average size of the most numerous form was about 0.3 to 0.25μ . In the blood faintly stained bodies varied from 0.5 to 0.17μ ; the other grades being 0.3 , 0.24 , and 0.17μ in diameter.

"The variations in size," Mr. Merlin remarks, "approximate to the bodies in the vaccinia virus, except that the smallest in the latter only reached 0.21μ , whilst in the yellow fever preparations the most minute are 0.17μ or even slightly less in diameter."

The question naturally arises, What are these bodies, and with what may they be confused? They are quite easily seen with $1/3$ inch objective and dark-ground illumination, and are very fairly uniformly distributed in all parts of the films in which the corpuscles are not too close together. They could not, in my opinion, be confused with the contents of cells, or the granules from a neutrophile leucocyte which has been ruptured in spreading; but it may be very difficult to differentiate them from debris from stain.

All the filter-passing bodies that I have examined require fairly deep staining with Giemsa to render them at all conspicuous, and prolonged staining with Giemsa tends to the production of some debris, however carefully it is carried out.

In films of vaccinia, etc., we have to deal with almost a pure culture of the virus bodies, whilst yellow fever is the first disease in which I have looked for such bodies in the blood or organs. Notwithstanding these difficulties I am of opinion, after spending considerable time on the examination of them, that these very minute bodies, with such definite characteristics, are not artefacts or debris from stain. I have made controls by spreading films of normal blood on the same slides, and subjecting them to precisely the same fixing and staining.

I think it will be found that these bodies, if not the virus, may have some connexion with it.

DISTEMPER IN DOGS.

Sir Charles Martin and Professor J. C. G. Ledingham kindly sent me some unstained films labelled "distemper,"

and a piece of spleen from distemper in dog. I found in the former, and, after staining films from the spleen, in the latter, bodies which were very like those previously described. They were very numerous in films made from the spleen. They were on the whole somewhat smaller than those met with in vaccinia.

Much further work, however, must be undertaken before one can definitely express an opinion on the exact nature of such minute bodies.

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A CASE OF CARDIAC SYPHILIS WITH VENTRICULAR ANEURYSMS.

BY

HAROLD COOKSON, M.D., B.Sc., M.R.C.P.,

CLINICAL ASSISTANT, NATIONAL HEART HOSPITAL; LATE MEDICAL REGISTRAR, MIDDLESEX HOSPITAL.

An unusual cardiac condition, the result of syphilitic processes, is here recorded.

The patient, a woman of 43, was admitted to University College Hospital in April, 1927, with a history of breathlessness on exertion for two years, epigastric pain on exertion for three months, and oedema of the legs for five days. A diagnosis of aortic syphilis with aortic incompetence was made. An electro-cardiogram taken at this time is reproduced in Fig. 1; it shows normal rhythm,

FIG. 1.—Time marks = $1/5$ sec.

sinus tachycardia, slight left ventricular predominance, and the T wave just negative in lead 1. The patient was treated with antisyphilitic drugs (sulfarsenol, novarsenobillon, bismuth, and iodides) for one month, and was discharged considerably improved.

Four months later she was admitted to the Middlesex Hospital in a very distressed condition. She was orthopnoic, cyanosed, and had oedema of the feet; she complained of epigastric pain, and vomited continuously. Sino-auricular rhythm with many extra-systoles was present, the rate being about 70. The heart was enlarged (apex beat in the fifth space five inches from the middle line); no murmurs were audible. Shortly after admission auricular fibrillation occurred, the ventricular rate being at first about 140. This was reduced by digitalis in the course of three days to 100, but the patient's condition got worse; vomiting was more frequent, and epigastric pain was still complained of. Death occurred suddenly five days after admission, while the patient was trying to defaecate.

The post-mortem findings were as follows (Bland-Sutton Institute of Pathology): The heart weighed 19 oz., and in

the pericardial sac were 19 oz. of straw-coloured fluid. The parietal layer of pericardium was adherent to the left lung, and the visceral layer was covered with organized fibrin, especially at the base of the heart. The myocardium was pale and slightly softened. Three cavities, or aneurysmal dilatations (Fig. 2), occupied the posterior part of the base of the left ventricle; their diameters were $1\frac{1}{2}$, $1\frac{1}{2}$, and $1\frac{1}{2}$ in. Their ventricular surface was covered with rough injected granulation tissue; externally they were covered by the area of greatest pericardial thickening. On section the walls of the aneurysms were found to consist of fibrous tissue containing considerable deposits of calcium. All the valves were normal. The aorta showed only very slight atheroma, and the coronary arteries were patent except for a branch of the circumflex division of the left coronary, which was obstructed as it crossed one of the aneurysmal pouches. The other organs showed chronic venous congestion only. Microscopic section of the aneurysmal walls showed necrotic tissue bounded by dense fibrous tissue, the last infiltrated with plasma cells and lymphocytes, the plasma cells predominating. The vessels surrounding the degenerated area showed marked obliterative changes, and in some cases the lumen was occluded.

Comment.

Aneurysm of the ventricle is not an uncommon finding; it nearly always follows cardiac infarction resulting from atheroma and thrombosis of the coronary arteries. Syphilitic aneurysms of the ventricle are rare. The site of election for an aneurysm which is the result of an

FIG. 2.—Showing the left ventricle opened. The anterior wall has been reflected to the left; the three aneurysms lie in the posterior wall at the base. The wall of the lowest pouch has been incised to show layers of calcified tissue.

infarct is at or near the apex of the left ventricle; syphilitic aneurysm of the ventricle, judging from the few cases published, seems to be commoner near the base. Morris¹ records one occupying the same site as those in the case herewith described. McFie and Ingram² relate the case of a native boy of the Gold Coast who fell dead; he had two aneurysms near the apex of the left ventricle, one of which had ruptured; in the interventricular septum

just below the aortic valve was a mass of 10 mm. diameter, which appeared macroscopically and microscopically to be a gumma; it is presumed that the aneurysms were of syphilitic origin. A similar heart in which a gumma and an aneurysm were found is recorded by Young³; the aneurysm was at the base of the left ventricle.

In the present case the walls of the aneurysms were composed of fibrous tissue of great thickness and density, and in them were considerable deposits of calcium. It must be concluded, there-

fore, that the condition had been present for a long time—probably many years. During this time a slow replacement of muscle tissue would be taking place with the gradual development of heart failure. The pericardial effusion was no doubt the last straw which increased the cardiac burden beyond endurance.

I am indebted to Sir Thomas Lewis for the electro-cardiogram, and for details of the patient's condition when in University College Hospital; and to Dr. G. E. Beaumont for permission to use the findings when she was admitted under him at the Middlesex Hospital.

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THE PROBLEMS PRESENTED BY SCHOOL PREVENTIVE MEDICINE IN RURAL AREAS.*

BY

A. C. T. PERKINS, M.C., M.D., D.P.H.,

ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH, WEST SUFFOLK COUNTY COUNCIL.

THE problems presented by school preventive medicine in rural areas, though not differing fundamentally from those arising in urban districts, are to a large extent modified owing to the scattered nature of a country population. Moreover, solutions which have been found satisfactory in large centres of population are in many cases totally impracticable when applied to country districts.

The district dealt with in this study is a typical rural area in which about 75 per cent. of the population are engaged in agricultural pursuits, and live for the most part in scattered villages and hamlets. The population at the census of 1921 was returned as 108,982, with a density of approximately 280 per square mile as compared with 588 for England and Wales as a whole. In the whole of the administrative county there are only four towns with a

population exceeding 3,000. Leaving out these four towns, there are left in the rural areas proper approximately 9,392 children distributed in 139 village schools, making an average attendance of 67 per school.

The medical staff concerned in administering the county school medical service consists of a school medical officer, who is also county medical officer of health, one assistant school medical officer, one dental surgeon, one dental attendant, and four school nurses. All of these officers are whole-time and also employed in other public health duties in the county. This staff, as I shall show, is totally inadequate for the work which confronts it, but nevertheless it probably represents a fair average of that which is to be found in any similar district. No use is made of private practitioners in respect of the school medical service, though their services are to some extent made use of in other departments of the county's public health activities.

Two medical inspections are carried out at each school yearly. The first of these is the routine inspection, at which the age groups laid down by the Board of Education are examined. In addition, those children marked for "re-inspection" are also seen. These are children in whom some defect requiring treatment or observation has been noted at a previous inspection. At the second visit these "re-inspections" are again reviewed.

Whenever a defect requiring treatment is found, except in such minor conditions as impetigo, etc., the initial

* This paper is an abridgement of the winning essay submitted in competition for the Hempson Prize of the British Medical Association, 1929.