15% or less of his own work of breathing. Whereas I agree that the vaporizer might well be modified to possess bigger ports and pathways, the matter is not quite as alarming as has been made out.—I am, etc.,

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[2] Chang, J., Macartney, H. H., and Graves, H. B., *Can. Anaesth. Soc. J.*, 1957, **4**, 187.
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Angiokeratoma Corporis Diffusum

SIR,—The account of three cases of angiokeratoma corporis diffusum by Dr. J. R. Colley and his colleagues (*Journal*, May 31, p. 1266) prompts me to report another case of this rare disease.

A 38-year-old man was admitted under Dr. Michael Ashby at the Whittington Hospital in December, 1956. In 1938 he had been an in-patient at the Middlesex Hospital, where a diagnosis of cerebellar neoplasm was made on account of ataxia, diplopia, and vertigo. At that time he showed nystagmus to the right and bilateral papilloedema. In 1956 he presented the picture of the nephrotic syndrome in addition to the signs in the C.N.S. which had persisted over the 18 years. He also showed multiple small angiomata in the skin of his trunk and limbs, together with a macroglossia. He was hypertensive (B.P. 170/110) and showed poor renal function. His urea clearance was 23% of normal, and the urine contained protein++ together with red blood cells and granular casts. Blood urea was 45 mg. per 100 ml. The diagnosis then was angiomata of skin, angioma of brain-stem, and ? Type II nephritis.

Over the next year his renal function deteriorated. The blood urea rose to 280 mg., and an intravenous pyelogram prior to this failed to demonstrate any excretion of the dye. He was re-admitted in coma in November, 1957, having signs of a spastic paraplegia, and died 11 days later.

Necropsy revealed no more in the brain than a large right-sided occipital blood clot. In the kidneys there was the naked-eye appearance of chronic nephritis, which was reported on histologically as showing nephritis repens with severe secondary hypertensive changes and ischaemic fibrosis.

No mention was made of the renal changes described by Dr. Colley and his colleagues. Nevertheless, in view of (1) the angiomata in the skin, (2) the chronic renal failure, and (3) the intracranial bleeding, I would regard this patient as being another case of angiokeratoma corporis diffusum.—I am, etc.,

London, W.C.1. B. H. BASS.

SIR,—Dr. J. R. Colley and his colleagues (*Journal*, May 31, p. 1266) have drawn attention to the interesting renal lesions found in cases of angiokeratoma corporis diffusum. They mention the occasional occurrence of similar glomerular epithelial cell "ballooning" in the nephrotic syndrome and in certain lipid-storage diseases, but they are not able satisfactorily to associate these changes with the other features of the disease. I believe it may be possible to add to existing knowledge of the pathogenesis of the kidney lesion in angiokeratoma corporis diffusum by contrasting the glomerular and tubular effects with those found in rats treated with deoxycortone acetate and excess salt.

Animals treated in this way develop glomerular enlargement, with progressively severe epithelial cell "ballooning" closely resembling that seen in angiokeratoma. Continued treatment with deoxycortone acetate leads eventually to apparent sudden glomerular disintegration, fibrinoid necrosis of the tuft centre, and related fibrinoid arteriolar necrosis. At the same time the systolic blood pressure reaches high levels. The evolution of these lesions depends, *inter alia*, upon the administration of excess sodium in diet or drinking-water. The development of the glomerular lesions is retarded by inadequate deoxycortone acetate or by inadequate salt. The appearance of glomerular and arteriolar fibrinoid can be prevented by the exhibition of hypotensive drugs (unpublished personal observations), but for this purpose it is not necessary to employ frequent doses or to prevent fluctuating systolic blood pressure.

By analogy with these observations, and on the basis of their similar renal histology, I suggest that prolonged deficient sweating in angiokeratoma corporis diffusum leads to electrolyte retention; that directly or (more probably) indirectly "ballooning" of glomerular epithelial cells and vacuolation of tubular cells develop; and that the resulting electrolyte disturbance leads to systolic hypertension, which may clearly terminate by transition to the malignant phase. Although this hypothesis provides a basis for the explanation of the renal changes and of the clinical behaviour of the cases described by Dr. Colley and his colleagues, the ultimate explanation of the action of electrolyte retention is unlikely to be simple. Thus deoxycortone acetate produces gross renal changes but relatively slight disturbance of the serum electrolyte levels. 9 α-fluorocortisol, on the other hand, may cause very great changes in serum electrolytes without apparently altering renal structure. The explanation may lie in changes in total body electrolyte content similar to those demonstrated by Knowlton and Loeb.[1]

Nevertheless, the analogy between angiokeratoma corporis diffusum and the excess deoxycortone acetate syndrome in rats is sufficiently close to allow certain predictions to be made, which may be confirmed or refuted by the clinical study of further cases. First, and most important, it is suggested that the evolution of hypertension in angiokeratoma may be prevented by salt restriction. Second, the vacuolation of renal cells is unlikely to be influenced by treatment with hypotensive drugs; but these drugs, even in intermittent doses, may suppress the development of hypertensive histological changes. Third, the investigation of total-body electrolyte content in angiokeratoma (and in other cases of generalized sweating disturbances) is likely to reveal an abnormal electrolyte balance. Fourth, and more speculatively, hypertension may prove to be a frequent cause of death in other instances of defective sweating.

Clearly these observations do not accord with the suggestion that Case 3 had no skin lesions, or with the previously reported finding of deposits of a doubly refractile material in many sites other than the kidney. However, the data about Case 3 are incomplete, and the presence of general cellular deposits in the rat given cortexone has not been excluded. On clinical, chemical, and histological grounds there remain enough common characteristics to make the comparison worth while.—I am, etc.,

Edinburgh. D. L. GARDNER.

REFERENCE

[1] Knowlton, A. I., and Loeb, E. N., *J. clin. Invest.*, 1957, **36**, 1295.

Diabetes Mellitus

SIR,—Dr. A. G. Freeman's very interesting paper on the symptoms and clinical aspects of diabetes mellitus (*Journal*, May 17, p. 1149) reminds me of a case of diabetes mellitus which I saw in 1939 presenting as painful dysphagia.

A female patient, 35 years old, went in September, 1939, to the out-patient department of a London teaching hospital, complaining of painful dysphagia of several days' duration. After examination she was given another appointment for oesophagoscopy. Before this could be carried out I was called in because of her dyspnoea, and found her in diabetic precoma. Her dysphagia, which was apparently caused by dehydration, disappeared as soon as her diabetes was controlled. Though she had had increased thirst for some weeks, she did not mention it when she attended the hospital.

—I am, etc.,

Harrow-Weald, Middlesex. A. LETCHNER.

Pulseless Disease

SIR,—Your annotation on pulseless disease (*Journal*, May 24, p. 1228) mentions that the L.E. cell has not been reported in this condition. It may be of interest that we have found numerous L.E. cells in a recent case of Dr. Charles Baker's. The patient was a young woman of 21 who also had aortic incompetence and a falsely positive Wassermann reaction—findings which until recently might have been attributed to syphilis.

This case of the pulseless syndrome was one of three that were discussed at a recent meeting of the Cardiac Society at Leeds. Only one of these patients proved to