and can therefore be disregarded. When such a comparison is made the results are qualitatively similar and give strong support to the evidence already described.

In the cases of hemophilia the odds are enormously against the difference being due solely to chance (one to more than 2,000,000,000) and in the case of color blindness, in spite of the smaller numbers one to more than 500.

Statistical evidence, therefore, strongly indicates the presence of sex-linked lethal factors in man. More complete evidence can be obtained only after an intensive study of several generations of prolific families has been made. The theoretical and practical importance of making such studies is so great that a start on them should be made at the earliest opportunity.

54 (1636)

Acidosis from capillary poisons.

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In a study of pathological conditions of the capillaries, and the effects of these conditions on the body as a whole, we have sought for some agents which produce widespread capillary damage. There is a considerable number of substances classed as capillary poisons. Some of these, for example histamine, produce functional changes, others, such as uranium and diphtheria toxin, produce structural changes. If the change produced results in a damage to the capillary wall, there should be a decrease in its permeability. The tissue cells supplied by the capillary would receive less blood and oxygen, with a resulting abnormal metabolism. It seemed to us that this effect might take the direction of an acidosis. The following figures, obtained from experiments on dogs, the Van Slyke apparatus being used for the alkali reserve determination, bear out this conception.

A study of the table shows that uranium, cantharidin, arsenic, and diphtheria toxin, which cause widespread capillary damage, bring about a definite acidosis. Podophyllotoxin and emetine,

C.c. of CO_2 Bound as Bicarbonates by 100 c.c. of Plasma.[1] Normal.	Effect Produced.	Agent Used.
58.0	24.0	Uranium
54.0	30.0	Cantharidin
57.0	43.0	Arsenic
57.0	53.0	Podophyllotoxin
65.0	65.0	Emetine
58.0	72.0	Hydrazin
58.0	111.0	Histamine
47.0	41.0	Ether and histamine
56.0	18.0	Diphtheria toxin
53.0	25.0	Sodium nitrite
54.0	12.0	Potassium cyanide
64.0	64.0	Morphine
58.0	70.0	Double nephrectomy
50.0	30.0	Uranium after double nephrectomy
54.0	54.0	Emetine, jugular vein
54.0	54.0	Emetine, intestinal vein

[1] In the table the time relationships are omitted. In some instances, for example in the cyanide experiment, the duration of the poisoning was a few hours. In others the duration was a number of days.

whose action is confined to the intestinal capillaries, cause no acidosis. Hydrazin, which is not classed as a capillary poison, but which produces changes confined to the liver, and comparable to those seen in phosphorus poisoning, causes no acidosis. Histamine, given by subcutaneous injection in repeated and eventually fatal doses caused an increase in alkali reserve, given intravenously to an animal sensitized by ether, it causes acidosis.

If our conception of the cause of the acidosis from these capillary poisons is correct, it should follow that other agents which interfere with the supply of oxygen to the tissues in other ways would also cause acidosis. This is indeed the case. Nitrites, which induce methaemoglobin formation, and cyanides, which prevent the utilization of oxygen by the tissues, bring about a marked acidosis. To show that a depression of the nervous system and respiratory center is not a factor, we have given a dog 2 grams of morphine during a period of 6 hours, with no resulting acidosis. A double nephrectomy in itself causes no acidosis. Uranium given to an animal with both kidneys removed, induces the same degree of acidosis as in an animal with the kidneys intact. Again in poisoning with emetine, with marked effects in

the intestinal capillaries, the blood from an intestinal vein is not different from that from the jugular vein.

We find therefore that marked damage to the liver and intestine fails to induce acidosis, and that the kidney also is not a necessary factor. We believe at present that the condition essential is an injury to the muscle capillaries.

55 (1637)

The glucose mobilization rate in hyperthyroidism.

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The work presented here is a preliminary report of some special investigations we have undertaken during the past twelve months at the Presbyterian Hospital in order to shed more light on the complex problem of hyperthyroidism. The decreased sugar tolerance, so frequently found in this condition, was taken as our point of departure. It occurred to us that the study of the respiratory quotient and the blood sugar at frequent intervals after glucose ingestion might give us a good deal of information as to how cases of Grave's disease utilize carbohydrate.

In brief, our procedure was as follows: the metabolism determinations were made with a 90-liter Tissot apparatus, using a Siebe-Gorman mask and Douglas valves. Samples of gas were taken over mercury in the usual way and were analyzed in duplicate in a Haldane gas analysis apparatus and in triplicate if the two analyses did not check satisfactorily. Previous to the use of the Haldane apparatus each day an analysis of outside air was made as a control. The usual technique was observed as to the preparation of the patient—14 to 16 hours fast and absolute rest for thirty to sixty minutes before the start of the determination.

After obtaining two basal periods each of ten minutes, blood was taken for a fasting blood sugar. The patient was then given a dose of glucose made as palatable as possible with a small amount of fruit juice. For the most part, a standard dose of 1.75 grams