market before they go to the extent of introducing them to the workers. It is to be borne in mind that it is not logical to say that because a particular preparation stood up to the laboratory tests it must, *ipso facto*, be an excellent cream as a barrier against dermatitis-producing substances.

Summary

Means of testing the efficiency of barrier creams have been described of both a qualitative and a quantitative character. It has been shown that there are a number of simple tests which can give rough evaluations of the value of these preparations.

Where a more quantitative assessment is desired the apparatus and methods described in the paper are put forward as means which enable the assessments to be made in a more precise manner.

It is to be stressed, however, that the final arbiter of quality must rest on the clinical testing of the creams.

AN AID TO THE MEASUREMENT OF VENOUS FILLING IN THE NECK IN CONGESTIVE HEART FAILURE

BY

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Clinicians a hundred years ago were aware that the jugular veins became engorged when the heart failed, but the phenomenon attracted no special attention. It was left to Lewis (1930), of our generation, to point out the practical value of this sign in diagnosis. It is due to his wise insistence that inspection of neck veins now takes its place alongside cardiac auscultation as a routine part of clinical examination.

Lewis indicated that a rough but adequate estimate of venous pressure (i.e., pressure within the right auricle) could be made by noting the vertical height of the blood column in the external jugular veins above the "zero level" represented by the "angle of Ludwig." The angle does not, of course, correspond anatomically to the vena cava opening, which lies behind the right sternal border at the level of the third interspace, but it is convenient for measurement and in practice suitable. Examination of a number of normal subjects confirms Lewis's statement that venous filling extends to an average height of 2 cm. below the horizontal plane of the angle when the subject is supine, but with increasing inclination of the trunk the zero level approaches this plane. As patients with congestive failure will seldom be examined in the recumbent position the error is likely to be small and the vertical height of the blood column above the angle can be taken as a true measure of the increased venous pressure.

Absolute measurements of venous blood pressure can be made, but even the newest and neatest instrument, called by its designers (Winsor and Burch, 1943) a "phlebomanometer," suffers the inevitable disadvantage that a needle has to be introduced into a vein. Measurement of intra-auricular pressure by cardiac catheterization will hardly be claimed as a bedside manoeuvre even by the greatest enthusiast. The state of the neck veins therefore remains the clinician's principal guide to venous pressure.

It is the usual practice to measure increased venous filling with one horizontal and one vertical ruler; accurate measurements by this means, however, demand an unusually skilled eye, and experience shows that two persons attempting the same measurement seldom agree; the record of day-to-day readings in the same patient therefore loses much of its value. On the other hand, if comparable measurements can be made there is much to be learned from serial records, in particular as an index of the response of congestive failure to treatment. For example, in a case where digitalization is achieved by the intravenous route a record of venous pressure over a period of an hour may be most illuminating.

A simple measuring instrument (Fig. 1) which eliminates the personal errors inherent in the ruler method has been designed. It consists of a vertical pillar graduated in centimetres and millimetres, with a pointed rubber-covered base: sliding on the

pillar is a horizontal arm which by means of a rack-and-pinion can be raised or lowered on turning a wheel. The arm, which is accurately maintained at a right-angle to the pillar, bears upon its upper surface a small spirit-level.

To make a measurement (Fig. 2) one hand holds the instrument by the knob at the top of the column and the pointed base is placed upon the manubrio-sternal angle; the other hand, by rotating the wheel, raises or lowers the arm until its lower edge is aligned with the level of the top of the blood column in the vein, at the same time maintaining the bubble in the spirit-level at the central mark. The instrument is then lifted and the height of the arm read off the scale on the pillar; this necessarily represents the vertical height of the blood column above the sternal angle irrespective of the angle of inclination of the patient.

The actual measurement can be made single-handed in a few moments. There can, however, be no economizing on time spent in identifying the level of venous filling. Lewis himself advised that the neck should be examined in a "thoughtful manner." Experience confirms the soundness of this counsel. A measurement made after a cursory inspection is likely to be entirely false. The pitfalls which may ensnare the careless are many, but once recognized they can be by-passed and measurements made with confidence.

Without wishing to stress the difficulties unduly, it may be helpful to indicate briefly the common sources of error. The level to which the veins are filled may be obvious, but in a fat patient or where the veins in their upper course run deeply

FIG. 1.—Diagram of the instrument.

FIG. 2.—The instrument in use.

this is not the case. On the other hand, in a thin subject the veins may be easily visible throughout their course and some difficulty be experienced. Lewis advised that the vein should be obstructed at the base of the neck by light finger-pressure and the level noted to which the blood column fell on release.

This may be helpful, but in my experience the best clue is the level of venous pulsation at the top of the blood column. On close scrutiny this can usually be ascertained. For example, in a case with congestive failure the blood column may appear to end at the posterior border of the sterno-mastoid muscle owing to pressure of the bulging muscle-belly, whereas the level of venous filling is in fact higher, as indicated by the presence of venous pulsation. Individual veins may be full because they are obstructed by muscle pressure at the root of the neck; contracting platysma, on the other hand, will obliterate the vein. Both difficulties are quickly resolved by altering the position of the head and by proper relaxation of the neck. Permanent venous obstruction is most commonly due to thyroid enlargement and, less commonly, to lymph nodes, mediastinal tumours, thrombosis of the vein, etc. Obstructed veins do not pulsate, and show no variation with change in the patient's position; unequal filling of various veins examined is a clear indication of obstruction. Deformities of the thoracic skeleton, such as severe kypho-scoliosis with increased depth of chest, will cause inaccurate measurement if the patient is semi-recumbent; in more erect positions the error becomes progressively less.

With these possible difficulties in mind it is advisable, on the first occasion at least, to make the examination and measurement according to a set routine. The patient should recline upon an adjustable back-rest, with one vertically placed pillow supporting the head and shoulders. Oblique illumination is helpful, as shadows upon full veins and areas of venous pulsation facilitate their recognition.

The external jugular veins, being largely superficial in their course, are the easiest to observe, but where they are visible other veins, such as the anterior jugular, may be used to confirm the level of venous filling. The minimal level (i.e., in inspiration) should first be identified with the patient lying midway between the vertical and the horizontal. A measurement is taken and confirmed by examination of the veins on the other side; if there is a discrepancy a mistake has been made. After this, by adjusting the back-rest, the head and shoulders should first be raised and then lowered below the original position and further measurements made; these should all closely agree, and the average figure can then be accepted as the measure of venous pressure.

The instrument can be obtained from Messrs. Chas. F. Thackray, Ltd., Park Street, Leeds.

REFERENCES

- Lewis, T. (1930). *British Medical Journal*, 1, 849.
Winsor, T., and Burch, G. E. (1943). *J. Amer. med. Ass.*, 123, 91.

Medical Memoranda

Kidney Tumours in a Child and her Grandmother

The occurrence of an embryonal tumour of the kidney in a child 2½ years old and of a hypernephroma in her grandmother, aged 67, must be rare enough to be worth recording.

CASE REPORT

The Child.—Jean X., aged 2½, was seen in January, 1944, giving a history of slight haematuria two months previously. Examination showed a tumour occupying the whole left side of the abdomen and reaching across the midline anteriorly and to within two finger-breadths of the pubis. A diagnosis of Wilms's tumour was made and a pre-operative course of deep x-ray therapy was started. A maximum tumour dose of 3,150 r in 22 days was given to the left abdomen (B.J.). The mass regressed to one-third of its original size, and nephrectomy was performed (Mr. C. C. Holman) on Feb. 22. The tumour measured 12×11×8 cm. Macroscopically normal kidney structure was seen at the upper pole of the mass, which contained large cystic areas. The pathological report (Dr. H. I. Coombs) on the specimen was as follows: "The histology has been profoundly changed by the radiation, but numbers of small tubules and structures containing invaginations of stroma suggesting primitive glomeruli can be seen. These are separated by dense fibrotic stroma, but scattered foci of more primitive 'mesenchymal' tissue characteristic of a Wilms's tumour are also present."

The child made an uneventful recovery, and a post-operative course of deep x rays to the abdomen and mediastinum followed, 1,700 r being administered in 21 days. Apart from whooping-cough in November, 1944, she was well until February, 1945, when

mediastinal metastases were shown on an x-ray film. These disappeared with further x-ray treatment. The child's condition improved temporarily. She died on July 21, 1945, eighteen months from the beginning of treatment.

The Grandmother.—Jane X., aged 67, is the paternal grandmother of Jean. She was first seen in January, 1946, suffering from profuse haematuria. She said she had had similar haematuria three years and five years previously. Examination showed a large mass in the right loin extending nearly to the midline anteriorly and to below the level of the umbilicus. Nephrectomy was performed by one of us (A. R. B.) on Feb. 8, 1946. Convalescence was uneventful, and she left hospital on Feb. 26. The pathological report (Dr. R. M. Heggie) was: "Histologically the tumour submitted presents the classical features of a hypernephroma showing the characteristic large cells and delicate vascular stroma. The arrangement of the epithelium is of the solid type." When last seen, early in July, there was no sign of recurrence and she was doing her housework.

COMMENT

Without inferring any significance in the occurrence of these relatively rare tumours in child and grandparent, one cannot help wondering whether Nicholson's assertion (see Stanford Cade's *Malignant Disease and its Treatment by Radium*, 1940, p. 910) that "Wilms's tumours . . . are malformed kidneys" does not find substantiation in these cases. It seems also worth mentioning that but for the follow-up clinics held at this hospital and the National Radium Commission registration cards this coincidence would not have been found, as the most persistent history-taking in the case of the elder patient did not provide any information of kidney disease in the family.

We are indebted to Mr. C. C. Holman for permission to mention the first case, and to Drs. H. I. Coombs and R. M. Heggie for the pathological reports.

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A Case of Refractory Anaemia

Cases of pernicious anaemia which are refractory to parenteral liver therapy are occasionally encountered and have been classified by Davidson *et al.* (1943). A year after the introduction by Davis *et al.* (1943) of proteolysed liver for the oral treatment of megalocytic anaemias Davis and Davidson (1944) reported on its effectiveness in the treatment of refractory anaemias, particularly those with megaloblastic erythropoiesis. The following case illustrates how a typical Addisonian pernicious anaemia was treated successfully with oral proteolysed liver when it had failed to respond to parenteral liver extracts.

CASE REPORT

A married woman aged 68 was first seen at the Nelson Hospital on April 24, 1945, having suffered from breathlessness, palpitation, and swelling of the ankles for five months. On examination she showed the usual manifestations of severe anaemia, and her blood picture was typical of pernicious anaemia: haemoglobin, 40%; red cells, 1,670,000 per c.mm.; colour index, 1.2; white cells, 5,400 per c.mm.; a blood film showed anisocytosis, megalocytosis, and poikilocytosis. She was referred back to her own doctor, who gave her intramuscular injections of "hepatab" 2 ml. three times a week for six months and then every ten days until she returned a year later. Her condition improved at first but was followed by a gradual deterioration. The only blood count during this period (on May 19) showed no response to the liver.

She was seen again on May 16, 1946, having felt progressively worse since the previous Christmas, and was admitted three days later. On examination she presented the characteristic clinical picture of pernicious anaemia, with brown pigmentation, jaundice, smooth tongue, enlarged liver, and palpable spleen, and with congestive heart failure superadded. A full blood count on May 20 showed: red cells, 950,000 per c.mm.; haemoglobin, 25%; colour index, 1.3; reticulocytes, 3%; a blood film showed marked anisocytosis and poikilocytosis, with a few normoblasts, macrocytes, and ghost cells.

Urine examination revealed no abnormal deposit or organisms. There was no free acid in the fasting gastric juice or after injection of histamine. Red cell fragility, normal. Van den Bergh reaction: direct, negative; indirect, 4 mg. per 100 ml. The specimen obtained on sternal puncture was not rich in cellular material, but the primitive red cells were of megaloblastic type. Hippuric acid test: 35% excreted after two hours (normal, 50%). The fat content of the dried faeces was normal. A barium meal followed by screening showed a normal stomach and duodenal cap. No occult blood was present in the stools, and the Wassermann reaction was negative.

To check the potency of her previous liver injections the patient was given "anahaemin" 2 ml. intramuscularly on May 20, but there was no reticulocyte response. On May 24 the treatment was changed to one tablespoonful of proteolysed liver by mouth and marmite daily. Her clinical condition improved satisfactorily, and she was discharged five weeks after the commencement of treatment. The evening temperature ranged between 100° and 102° F. (37.8° and 38.9° C.) during the first week after admission, 99° and 100° F. (37.2° and 37.8° C.) during the second week, and was normal after the third week. Her blood counts showed marked and rapid progress; after the first three weeks of treatment the haemoglobin