before the tear extends into the rectum is largely a matter of luck, unless the obstetrician can take active steps to limit the damage.

I suggest that, if he can strengthen the weak spot in the circle and can ensure that the perineum shall tear so far and no farther, he may make it possible for the extra room still required to be obtained by the resumption of the ordinary process of stretching. Acting on this idea I have for the past seven or eight years practised perineorrhaphy as a preventive rather than a reparative measure.

At the first sign of the perineum giving way I reinforce it by putting in a series of sutures of silkworm-gut—from three to five in number, according to the amount of room in each patient between the fourchette and the anal sphincter—starting at the level of the perineal tear and proceeding

from before backwards. The needle carrying each stitch is inserted about an inch to the left of the central line of the perineum, passes between the scalp of the foetus and the deep surface of the

FIG. 1.—Showing sutures inserted and tied in loops, which gradually become tighter as anus is approached.

FIG. 2.—Showing birth of head; sutures are now taut, preventing any further splitting of perineum.

FIG. 3.—Showing analogy of the loosened shoelace.

perineum, and is made to emerge again through the skin an inch to the right of the central line. By using a long needle and taking in a wide area on each side of the central line a good purchase for the sutures is secured.

Now comes the most important part—the tying of the stitches. The accoucheur has to decide in advance how far he is prepared to allow the perineum to split. The uppermost stitch is tied loosely enough to allow that amount of splitting, but not sufficiently loose to allow more; the next stitch must be a little less loose, and so on until the last one, just in front of the anus, is reached—this is tied firmly. We now have a sort of lattice-work of sutures which may be compared to the laces of a shoe after they have been loosened to allow the foot to be withdrawn.

As the head advances the stitches become taut; if they have been properly tied they should take the strain more or less simultaneously. If the top stitch is too tightly tied it will cut through the perineal tissue until the strain is taken by the sutures below. No single stitch would avail to hold in check a severe rupture of the perineum; it is the combination of a number of sutures all taking the strain together that saves the situation.

Several colleagues of mine have objected that the stitches must inevitably cut through. I can only urge sceptics to try this method for themselves. They will be surprised to find how well the stitches hold. So far I have not encountered a case in which there has been any serious cutting through.

In tying the sutures I do not use reef knots, for after the child is born the sutures have to be drawn tight to bring together the edges of the torn perineum. A double turn is sufficient* to fix the suture (already sticky from its passage through the perineal tissue) in the state of looseness temporarily desired, or it may be tied in a bow, which can be pulled apart later. Another alternative is to take a single turn and clamp the half-knot with pressure forceps.

Naturally the greatest care has to be taken to prevent too great and sudden a strain being put upon the now reinforced perineum. The use of midwifery forceps helps to control and steady the advance of the foetus's head. In occipito-anterior positions the forefinger should be inserted to steer the baby's eyes, nose, and mouth safely past the upper stitches. Taking this precaution I have never experienced any difficulty in preventing damage to the face.

* Since writing the above I have had a case in which the double turn was not sufficient to fix the suture as desired: the suture was subjected to a sudden and violent strain and began to slip, and a reef knot had to be made to save the perineum. I should therefore in future prefer the third method as the safest—that is, taking a single turn and clamping the half-knot with pressure forceps.

After the birth of the placenta it only takes a moment to draw the series of loops tight and to bring into exact apposition again the edges of the perineal tear. The sutures below the tear, having served their purpose, are snipped with scissors and pulled out.

It seems hardly necessary to warn the accoucheur that the stitches should be inserted *between* the pains, and that the needle must not be put in *too* deep; I happen to know of a case in which the doctor, trying this method for the first time, anchored the baby's scalp to the perineum.

As regards the value of these experiments, I must confess that I have not had enough cases to dogmatize. Rupture of the perineum is fortunately a relatively rare complication. The procedure described above is, at any rate, harmless, if proper precautions against sepsis are

taken, and the favourable results which I have experienced in every case in which I have employed it during a number of years encourage me to think that even in the worst cases it may, if rightly used,

prevent a tear from extending through the internal sphincter into the rectum. I think I may claim for it that it limits the damage and acts as a brake.

The description of this method is published in the hope that others will take the opportunity of testing its value and improving the technique. Hitherto I have only tried interrupted sutures; very probably the use of a single continuous suture (following more exactly the analogy of the loosened shoelace) would be simpler and equally effective.

THE RELATIONSHIP OF PLASMA CHOLESTEROL AND BASAL METABOLISM.

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In a communication in 1922 Epstein and Lande¹ endeavoured to demonstrate the existence of an inverse relationship between the blood cholesterol and the basal metabolic rate. Such a correlation was suggested by the fact that in sub-acute and chronic parenchymatous nephritis the basal metabolism is subnormal, while the blood cholesterol is increased above normal. Epstein believes that this disease is really a metabolic disorder involving a hypothyroidism, and that the renal manifestations are only a part of the picture.

In support of this thesis Epstein and Lande have determined the blood cholesterol and basal metabolism in a number of cases of hyperthyroidism, in which they maintain that the same inverse relationship of these two factors also holds good. Their figures, however, hardly warrant the conclusions they have drawn. The colorimetric method they used for estimating the total cholesterol of whole blood, as has been repeatedly proved,^{2,3} is open to serious objection, but, perhaps, a more important criticism is the use of the total cholesterol of whole blood as a significant value. They ignore the fact that the total figure includes the cholesterol of the corpuscles, which is in the "free" form only, and which is remarkably constant in health and disease; and also the fact that the plasma cholesterol exists both in "free" and in combined form as ester. The ratio

TABLE I.

Case No.	Age.	Basal Metabolic Rate.	Respiratory Quotient.	Percentage Cholesterol in Plasma.			Percentage of Total Cholesterol as Ester.
				Free.	Ester.	Total.	
Women.							
1	13	+43.7	0.80	0.0418	0.0802	0.1220	65.9
2	37	+74.7	0.79	0.0374	lost		
3	55	+22.85	0.75	0.0249	0.1885	0.2154	87.5
4	21	+37.4	0.74	0.0442	0.0280	0.0722	38.8
5	13	—	—	0.0490	0.0417	0.0907	46.0
6	26	+26.8	1.04	0.0491	0.1213	0.1704	71.2
7	60	+60.8	0.9	0.0962	0.0466	0.1428	32.6
8	23	+68.2	0.76	0.0259	0.0461	0.0720	64.05
9	39	+64.4	0.78	0.0422	0.1163	0.1585	73.6
10	50	+29.7	0.79	0.0447	0.0440	0.0887	49.6
11	37	+45.9	0.68	0.1239	0.1069	0.2308	46.3
12	42	+57.9	0.81	0.0476	0.0523	0.1005	52.0
		+58.7	0.74	0.0278	0.0329	0.0307	9.5
Mean				0.0505	0.0729		
Normal ⁵	{	Mean	...	0.0541	0.096		
		Limits of variation		0.0205	0.0544		
				to 0.0914	to 0.1402		
Men.							
13	47	+33.5	0.79	0.0028	0.1631	0.1659	98.2
14	42	+81.4	0.70	0.0446	0.0996	0.1442	69.0
		+74.5	0.73	0.0519	0.0731	0.1250	58.4
		+63.0	0.80	0.0497	0.073	0.1230	59.6
		+46.8	0.85	0.0764	0.0222	0.0966	22.9
Mean				0.045	0.0859		
Normal ⁵	{	Mean	...	0.0524	0.1193		
		Limits of variation		0.0049	0.0546		
				to 0.0819	to 0.1451		

of these two forms of cholesterol in the plasma is subject to almost unexplained variations, and from a metabolic point of view the two forms cannot be considered as so identical that they can be estimated and considered as one substance.

Furthermore, they explain such figures as do not quite fit in with their thesis by assuming that in long-standing cases of hyperthyroidism there can be an "exhaustion of lipid," an expression which is meaningless to us, and also that at the climacteric the blood cholesterol is apt to be raised; for neither of these assumptions is there any definite foundation. Luden⁴ also investigated, in a similar manner, a case of myxoedema, with and without thyroid administra-

tion, and reported the same inverse relationship between blood cholesterol and basal metabolic rate.

Epstein's views as to the nature of subacute parenchymatous nephritis (so-called nephrosis) are now well known, and the many changes in the body metabolism in this condition have led to the increasing acceptance of the view that it is a metabolic disorder, the renal changes being secondary. His method of treatment by high protein feeding and thyroid administration is also based on this hypothesis. The results reported by Epstein and Lande are important as a basis for these theories, and we have thought it worth while to investigate the matter further.

Two types of patient were investigated: cases with hyperthyroidism, and cases with hypothyroidism, the latter type both during treatment with thyroid preparations and without such treatment. The basal metabolism was estimated, using a Douglas bag; according to the accepted method. The blood for analysis was taken immediately after the filling of the Douglas bag by the patient, when he was in a "fasting" condition—that is, he had had no food for fourteen hours. The plasma was separated, and the "free" and ester cholesterol estimated by the digitonin method, using the procedure which we have described in detail elsewhere.⁵

Before proceeding to discuss our results it is important to set out certain considerations. We have shown in a study of the cholesterol content of normal human plasma that the variations in cholesterol content are so considerable that an average figure for the normal plasma cholesterol is devoid of meaning, unless the normal limits of variations are taken into account.⁵ A single individual, however, tends to keep, in fasting state, a more or less constant level of cholesterol content of his plasma.⁶ Consequently it is by no means easy to demonstrate hypercholesterolaemia or hypocholesterolaemia of small degree, except, perhaps, for an individual the cholesterol content of whose plasma, under normal conditions, is known.

Furthermore, the level of the plasma cholesterol can be affected by feeding, and though this alteration is by no means necessarily in the sense of a hypercholesterolaemia—the change being sometimes in the opposite direction—this result of feeding should be avoided by examining whenever possible the plasma of subjects when in the "fasting" condition.⁶

RESULTS.

In Table I we present the results of estimations in cases of exophthalmic goitre. In the case of one of the men and one of the women more than one investigation was made. These two cases are particularly interesting in that the plasma cholesterol shows wide variation bearing no relationship to the basal metabolic rate at the time of observation. Taken as a whole the cholesterol figures yield an average a little lower than we have found in normal

TABLE II.—Showing Results in Four Cases of Hypothyroidism.

Case and Date.	Basal Metabolic Rate.	Respiratory Quotient.	Percentage Cholesterol in Plasma.			Percentage of Total Cholesterol as Ester.	Treatment.
			Free.	Ester.	Total.		
J. B., aged 56; Myxoedema.							
February 26, 1927	-18.4	0.99	0.0919	0.2179	0.3098	70.0	Nil.
March 5, 1927	-14.65	0.59	0.0691	0.1744	0.2435	71.6	After 0.2 mg. thyroxin daily.
March 12, ,,	- 7.5	0.83	0.0542	0.0633	0.1175	53.9	After 0.4 mg. thyroxin daily.
March 29, ,,	- 9.1	1.18	0.0408	0.0874	0.1282	68.2	After 15 grains thyroid gland daily.
G. D., aged 42; Myxoedema.							
January 14, 1926	- 7.1	0.94	0.0785	0.2021	0.2807	72.2	After increasing doses of thyroid gland from 9 grains to 15 grains a day.
January 25, ,,	+13.4	0.74	0.0609	0.1137	0.1746	65.1	
A. M., aged 62; Myxoedema.							
April 12, 1926	+ 2.1	0.94	0.0857	0.1935	0.2792	69.3	After 12 grains thyroid gland daily.
April 19, ,,	+15.1	0.66	0.0931	0.1769	0.2700	65.5	
A. C., aged 24; Cretin.							
April 24, 1926	+42.9	1.18	0.0657	0.1416	0.2073	68.4	After 15 grains thyroid gland daily.
April 29, ,,	+10.2	1.09	0.0528	0.1167	0.1695	68.8	Thyroid omitted since April 24th.
May 4, ,,	+10.8	0.97	0.0562	0.1099	0.1661	62.2	Ditto.

individuals, but nevertheless the figures are practically all within the normal limits of variation.

It seems reasonable to conclude from our figures that, in cases where the basal metabolic rate is above the normal, an inverse relationship between the basal metabolism and the plasma cholesterol does not exist, either as regards free, or ester, or total cholesterol.

In Table II are given the results of the investigation of four cases of hypothyroidism, three being cases of myxoedema and one a cretin who had had thyroid treatment for twenty years. The most fully investigated case was that of J. B., who presented a classical picture of myxoedema. Here, definitely, the increase of basal metabolic rate called forth by the administration of thyroxin or of thyroid gland led to a lowering of the plasma cholesterol, most noticeably in the case of the ester cholesterol. G. D. gave a very similar result; but A. M., who was examined after administration of thyroid gland for a somewhat shorter period, did not show the same effect. In the case of A. C. the estimations were first made while the patient was taking thyroid, a treatment he had been having regularly for twenty years. Thyroid administration was then omitted during the rest of the experiment. The alteration of cholesterol level is, in this case, only of relatively small degree, and in an opposite direction from that suggested by hypothesis. However, this case is perhaps not entirely comparable with the cases of myxoedema, for it is not certain that after such long-continued thyroid administration omission of this treatment would lead to a sharp effect.

CONCLUSIONS.

We do not find that cases of hyperthyroidism provide any support for Epstein's theory that the blood cholesterol is inversely proportional to the basal metabolic rate.

As regards the cases of hypothyroidism there does appear to be some such relationship, and the cholesterol of the plasma is certainly above normal in the untreated cases of myxoedema.

It is, however, important to note that the hypercholesterolaemia shown in these cases of myxoedema does not reach the level of hypercholesterolaemia so frequently found in subacute parenchymatous nephritis, where the increase of plasma cholesterol is quite out of proportion to the lowering of the basal metabolic rate, and this increase is often present in the later stages of the disease when the basal metabolic rate has become normal.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

A JAM JAR IN THE RECTUM.

THIS case seems to be a surgical curiosity, and the clinical details may therefore be of general interest.

A man, aged 55, who was admitted to the Northern Hospital, Liverpool, had suffered from a rectal prolapse for many years, which recently had become difficult to reduce. He was advised by his friends to try to reduce it by pressure with the bottom of a half-pound jam jar, and by some extraordinary mischance forced the jar up past the tuber ischii into the rectum. He attempted to remove the jar himself, but failed, and it was not until three days later that he visited his doctor. In the meanwhile the anal region had become very septic as the result of efforts at removal and pressure by the foreign body. His doctor, having tried unsuccessfully to extract the jar, sent the patient to hospital.

The house-surgeon made further attempts, and found that the anus was so stretched that it was possible to remove a quantity of dirty rags which had been pushed into the open end of the jar, which lay base up. Even with anaesthesia and the use of all the available forceps and retractors, it was impossible to extract it. I found that although the anus readily admitted the whole hand, and the jar was lying free above the tuber ischii on either side, yet its diameter was just too wide to allow it to come through in any plane. Probably the explanation as

to how it had been introduced was that, at the time, there was no oedema or inflammation of the rectal wall, and it could then only just be forced past the tuber ischii. The patient described how, once partially inserted, the jar "shot up" into the rectum. As the anus and rectum were in an extremely septic and oedematous condition with some oozing of blood from small lacerations it was obvious that whatever else might be required a temporary colostomy was essential. The patient, already under ether anaesthesia, was prepared for an abdominal operation.

Through a median subumbilical incision the pelvi-rectal junction was exposed. The gut wall was very congested and the jar was easily located in the upper rectum. The pelvic colon was examined with a view to ascertaining its mobility for the colostomy. An attempt to "milk" the jar down from above past the pelvic outlet failed, even with the aid of an assistant at the rectal end. It could not be manoeuvred past the ischial plane. After completely isolating the area with packs the jar was therefore extracted through a longitudinal incision in the lower pelvic colon, and the opening was closed transversely. Flapine was applied, and a corrugated rubber strip was placed close to the suture line for drainage purposes. A left inguinal colostomy was performed over a glass rod, and the incisions were closed. The jar measured 2½ in. in diameter at base and was 3 in. in height. The colostomy was opened in forty-eight hours, and the lower colon and rectum were treated with lavage from above, using hypertonic saline at first and later normal saline.

In three weeks' time the rectal condition had returned to the normal, and the external sphincter ani had regained excellent tone. As there had been severe inflammatory reaction in the rectal and perirectal tissues and consequent fibrosis the probable result would be the cure of the prolapse. An intraperitoneal plastic operation was performed a month and a half later to close the colostomy, the spur having been previously more or less obliterated with a Paul's enterotome.

The colostomy wound healed satisfactorily and the patient was discharged as cured. The rectal prolapse has not recurred and the bowels act normally.

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AN EXTERNAL TERATOMA.

THE accompanying photograph of an anatomical curiosity, the like of which is, fortunately, rarely seen, may be of interest.

The body is that of a full-time European female infant born on September 19th at 6.10 p.m. The child, which was well nourished, gave one or two gasping breaths and expired.

From below the left mamma there protruded an arm and shoulder, fully formed and developed. On examination a clavicle and part of a scapula could be felt. The arm and hand were perfectly normal in every respect, and the joints were articular. The left forearm of the body was composed of two radii and two ulnae with the hands complete. These two forearms were fused on their anterior surfaces. The humerus, although thicker in girth than

normal, was only single. The digits of this double hand were perfectly formed and tipped with nails. Lying laterally to the extra arm and shoulder below the left mamma was a cauliflower-like mass resembling two ears joined by their lobes. There was also a piece of tissue resembling a penis, but not penetrated by a urethra. Next to this was the heart, lying uncovered by pericardium and pulsating rhythmically. The left foot was everted in the position of talipes equino-varus.

The body weighed 8½ lb., and was well developed and nourished. The fusion of the two bodies does not seem to have impaired the development of either, despite the rather cramped quarters.

Unfortunately, I was unable to persuade the parents to allow me to do a dissection.

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