The difference in activity in patients with and without malignant lesions is very highly significant and would occur by chance only one in 100,000 ($\chi^2 = 118$, $p = 0.00001$). There is no overlap between the benign and malignant groups, while between the suggested maximum for the normal patient of 30 units and the lower limit of the malignant cases at 100 units there were no readings.

Of the patients with no malignant lesion, 58 were premenopausal, 14 post-menopausal, and 21 were pregnant. Altogether there were three false-positive readings (3.2%), of which two were possibly related to trichomonas vaginitis infections, giving lower readings after treatment. This difficulty has also been reported by Kasdon *et al.* (1951) and Lawson (1959) with β-glucuronidase assay.

The 46 patients with proved gynaecological malignancy included 24 cases of squamous carcinoma, 2 cases of adenocarcinoma of the cervix, 12 cases of carcinoma of the corpus, and 8 other lesions (uterine and vaginal sarcoma, squamous carcinoma of the vagina, melanome ot the vagina, and one of squamous carcinoma of the vulva where the exudate was aspirated instead of vaginal fluid). In every case with an exfoliating lesion of the genital tract, including three cases of carcinoma-in-situ, the levels were above 100 units. The cases with carcinoma-in-situ had readings distributed at random in the malignant range.

Squamous cancer gave a range of 174–1,633 units (mean 579 units), while the adenocarcinoma range was 106–1,035 units (mean 489 units).

Biopsies of benign and malignant gynaecological tissues have also been studied after homogenization, and the results are consistent with the corresponding vaginal fluid findings.

Discussion

Despite the immense value of cytodiagnosis of early cancer of the uterus, two difficulties are inherent in the method—firstly, the experience of the technician and cytologist need to be of a high order, and, secondly, the certainty of diagnosis of corporeal cancer is not as great as that of the cervix. It is suggested that a biochemical test of vaginal-fluid-enzyme activity promises a simpler and more consistent test for screening, and in addition may provide useful evidence of the metabolic change in the cancerous and precancerous cell possibly at an ever earlier stage than histologically accepted carcinoma-in-situ. To date the 6-phosphogluconate activity promises to be a reliable enzyme test. The biochemical technique is not difficult, and it is estimated to cost no more than 5s. per test apart from capital expenditure on apparatus, as well as lending itself to possible automatic analysis. The possibilities of response to treatment and follow-up are also being studied as well as any relation to histological grading and clinical stage. The occasional case of the false positive, possibly related to trichomoniasis, will require additional study.

Summary

A new enzyme test as an aid in the diagnosis of gynaecological cancer is described using the increased activity of 6-phosphogluconate dehydrogenase in vaginal fluid.

In 93 non-malignant cases there were three false positives (3.2%).

In 46 malignant cases there were no false negatives.

The diagnosis of cancer appeared to be equally as effective in cases with corporeal adenocarcinoma and mesodermal tumours as with carcinoma of the cervix, including carcinoma-in-situ.

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CAESAREAN SECTION IN A PRIMITIVE COMMUNITY

BY

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There appears to be a widely held belief that caesarean section in a primitive community is to be avoided if at all possible, primarily because of the risks that the scar may rupture in a future pregnancy before the patient reaches hospital. In order to test the validity of this assumption a survey has been made of all cases of previous caesarean section admitted to an up-country hospital in Uganda during January, 1959, to June, 1961, inclusive. At the same time a survey has been made of all cases of caesarean section over the same period.

Locale

The town of Mbale, which is the provincial headquarters of the Eastern Province of Uganda, has an African population of 12,000 and is expanding fairly rapidly. The hospital, however, also serves all the area for 20 to 30 miles (32 to 48 km.) around, which includes four Government maternity centres staffed by locally trained African midwives, plus a couple of similar mission centres. The maternity centres are all situated in dense agricultural areas at some distance from the main roads. Consequently there may be quite a long delay in transferring patients to hospital, and in addition these patients are often already in a poor condition when they reach the maternity centres.

The people are of various tribes, but fall roughly into two main groups: the Southern Bantu with their small pelves, and the Nilotic or Northern tribes, who are generally of larger stature and seldom have difficulty in labour. The profusion of tribes is matched by the variety of languages, and this often leads to difficulty in obtaining a satisfactory history: certainly in cases of previous caesarean section it is only occasionally possible to find the reason why the operation was done and

almost never to obtain the weights of any previous babies.

As opposed to the feelings apparently existing in West Africa (St. Luke's Hospital, 1958), there is no strong prejudice here against being delivered by caesarean section. This is, however, a predominantly patriarchal society, and a woman may often refuse to give permission for caesarean section until the husband has been contacted and his consent obtained—at least two of the deaths in the succeeding series can be directly attributed to such delay.

Most of the people live outside the town as small cultivators, scattered around the rather hilly countryside. Few have any better means of transport than a bicycle, but there is a rapidly expanding taxi service, and each maternity centre has an ambulance at its disposal.

The Hospital

The maternity unit now consists of 32 beds, although for the first half of the period under review there were only half this number. There is a medical officer in overall charge of the unit, and for respectively 5 and 12 out of the 30 months under review this post was held by doctors who had the M.R.C.O.G. However, for the other 13 months less-experienced doctors were in charge, and, in addition, even during the other periods most of the caesarean sections were done by less-experienced obstetricians who were dealing with the emergency work "out of hours" (during such times the doctor in charge was always available, but came to the hospital only if the doctor on duty asked for help). It is therefore felt that the results presented may reasonably be taken as representative of the type of results likely to be obtained under the conditions existing in most small African hospitals, and may therefore be used as a basis for planning future treatment in such hospitals.

Now that the idea of delivery in hospital is rapidly becoming more widely accepted, a large proportion of the patients admitted will have visited the hospital or maternity centre at least once or twice during their pregnancy, but very few will have been more often than this. This is partly due to a reluctance of the patients to come more often when they are feeling perfectly well, and partly to overcrowding of the antenatal clinics because of a shortage of trained midwives.

One factor which can complicate cases is that the mothers have often taken native medicines which appear to contain some oxytocic principle. These certainly cause tonic uterine contraction and foetal distress, and may also be toxic to the mother.

Resuscitation of patients is always a problem, as there is rarely more than one pint (570 ml.), or at the most two pints (1.7 l.), of blood available for this purpose, and the relatives in the main show a great reluctance to act as donors. This factor certainly looms large in many of the cases of caesarean section where the patient died within 24 hours of operation.

Finally there is usually very great resistance to any suggestion of post-mortem examination, and this has meant that a definite diagnosis has not been possible in some of the cases of maternal death.

Cases Under Review

Table I shows the cases under review and also gives the mortality rates. Two cases of ruptured uterus following previous caesarean section are not included. The first of these patients died, but the other survived after a subtotal hysterectomy (details of these cases are given later).

TABLE I.—*Cases Under Review*

		Maternal Deaths
Total number of hospital deliveries	2,850	67 (2·4%)
First caesarean sections	137	15 (11%)
Repeat caesarean sections	38	1 (2·6%)
Previous caesarean sections now delivered vaginally	52	3 (5·7%)

This table does not include two cases of previous caesarean section admitted with the uterus already ruptured.

During the period under review 36 cases of ruptured uterus were admitted to the hospital, an incidence of 1 in 79.

Cases of First Caesarean Section

The indications for these 137 caesarean sections are shown in Table II. A few words of explanation about this list are necessary. The distinction between a high head in labour and a case of frank obstructed labour may be very difficult in borderline cases, but in the former category are included all cases in which the condition of the mother and the foetus was still satisfactory when the decision to operate was taken. The vast majority of the cases of obstructed labour were admitted already in this condition.

TABLE II.—*Indications for Caesarean Section*

High head in labour	37	Prolapsed cord	5
Obstructed labour	25	Incoordinate uterine action	4
Placenta praevia	20	Breech presentation	3
Shoulder presentation	17	Toxaemia	1
Failed forceps	13	Miscellaneous	6
Face or brow presentation	6		

Most of the cases of shoulder presentation were admitted with the baby already dead; in many of such cases, however, the shoulder is impacted in the pelvic brim and the lower uterine segment is excessively thinned out, so that caesarean section may appear safer than a destructive operation on the foetus, especially for the less-experienced obstetrician.

The number of cases of "failed forceps" requiring caesarean section is high, but for some time it was the policy that if the obstetrician was uncertain whether there was absolute cephalo-pelvic disproportion he would attempt forceps delivery in the operating-theatre, with everything ready for immediate caesarean section should the attempt be unsuccessful.

The parity of these patients was: nil in 53 cases, one in 25, two in 17, three to five in 31, and over five in 11. In arriving at these figures, which in view of the difficulty in history-taking must be approximate, only full-term deliveries have been included, for abortions are quite common and many women either forget or are too ashamed to mention them in detail. In many cases, although the mother has had vaginal deliveries previously, she may have no live children, as the stillbirth and infant mortality rates are uncomfortably high.

The maternal mortality rate of 11% for these cases is of course appallingly high. However, closer inspection shows that 9 out of the 15 maternal deaths occurred within 12 hours of the operation, four of the patients having major degrees of placenta praevia and the other five being cases of advanced obstructed labour in which the mother's condition was extremely poor before the operation. (It is hoped in a later paper to compare the relative results of delivery by caesarean section in this type of case with delivery by craniotomy and vaginal extraction.) All these patients would certainly have died

without operative intervention, and their deaths were really due to failure of resuscitation.

Of the remaining six deaths, three occurred in the first week. The first two were definite post-operative complications (one patient had a paralytic ileus, the other acute dilatation of the stomach), while the third had a transient ileus from which she recovered, to die later from a pyrexia of unknown origin which had been present since her admission in labour. The first of the three more remote deaths was from post-operative sepsis in an apparently clean case in which operation had been undertaken for a transverse lie. The second of these patients had a very stormy post-operative course throughout, with malaria, ileus, and fever, and eventually died on the twelfth day after a straightforward caesarean section for a brow presentation in a mother whose pre-operative condition had apparently been quite satisfactory. The third death was believed to have been due to acute dysentery.

Thus out of a total of 15 deaths only four, or possibly five, can be said to have been due to complications arising from caesarean section.

The foetal results from these operations were: 91 survivors, 26 known intrauterine deaths, 14 other stillbirths, and 8 neonatal deaths.

The known intrauterine deaths comprised cases of impacted shoulder presentation or cases where the head had impacted above the pelvic brim; for in many such cases an abdominal approach is felt to be safer than to risk rupturing the uterus by attempting vaginal delivery with the aid of a destructive operation.

Repeat Caesarean Sections

The single death which occurred in this series of 38 cases was in a patient having her fourth lower-segment operation, in which the great vascularity caused considerable difficulty both in extraction of the baby and in obtaining haemostasis. The mother, who had been delivered of a live baby, died two hours after completion of the operation (which had included sterilization), presumably as a result of her heavy loss of blood.

There were 32 surviving infants from 29 of these operations (one case of twins and one of triplets), with three known intrauterine foetal deaths, four other stillbirths, and two neonatal deaths.

Three of these cases showed incomplete rupture of the uterine scar at operation, but in all of them a live baby was delivered and the post-operative course was quite uncomplicated.

Previous Caesarean Sections Not Repeated

Two patients who had had a previous caesarean section were admitted with rupture of the uterus. The first, a para-3, had the caesarean section for her second child, and her third child had been delivered alive after a normal labour. Her present baby was of course dead, but the mother made a good recovery after a subtotal hysterectomy. The other patient was a para-4 who had had two normal deliveries first, then two lower-segment caesarean sections. On this occasion she was unfortunately kept in a maternity centre in labour for 24 hours before being transferred to hospital. By this time her general condition was very poor, and although the operation was restricted to extraction of the dead foetus and repair of the ruptured scar all attempts at resuscitation failed, and the mother died 24 hours post-operatively.

In addition to this case there were three other maternal deaths among these 54 patients. One patient arrived in a shocked condition with an obstructed shoulder presentation, having previously had two normal deliveries before a lower-segment caesarean section for placenta praevia. A difficult decapitation operation was carried out and the delivery completed, but all attempts at resuscitation of the mother failed and she died three hours after delivery. The second patient died 14 hours after a fairly easy forceps delivery, and death here was attributed to an overdose of native medicine, although in retrospect one cannot rule out the possibility of a ruptured uterus. The third patient had a severe post-partum haemorrhage in the ward one hour after completion of normal delivery of a live child, and died before she could be resuscitated. Once again no post-mortem examination was allowed.

The number of vaginal deliveries which had occurred since the last caesarean section was none in 38 cases, 1 in 10 cases, 2 in 2 cases, and more than 2 in 4 cases. Of those having their first delivery after previous caesarean section no fewer than 20 had had full-term vaginal deliveries prior to their caesarean section, so that there were in fact only 18 cases out of these 54 who had not previously proved themselves capable of vaginal delivery.

Sixty-nine patients had had one previous caesarean section, 20 had had two, two had had three, and one had had four; thus 23 had had more than one previous caesarean section, and in 14 of these a repeat caesarean section was done.

There were eight patients who were delivered vaginally after having had more than one previous caesarean section. One had a very premature breech delivery and one had a premature infant born before arrival in hospital and came in with a retained placenta (there were six of these cases amongst the 54 vaginal deliveries following previous caesarean sections). Four delivered as spontaneous vertex presentations, the babies weighing 6 lb. 8½ oz., 6 lb. 13 oz., 7 lb. 2 oz., and 7 lb. 13 oz. (2,960 g., 3,090 g., 3,230 g., and 3,540 g.) respectively. while the other two were delivered with forceps after manual rotation of the vertex, one being a live birth, the other a stillbirth. The final case was that of the ruptured uterus, the patient dying, as already described.

The foetal results in patients who had had previous caesarean sections and who were now delivered vaginally as vertex presentations are given in Table III.

TABLE III.—*Foetal Results in Cases of Previous Caesarean Section*

	Spontaneous Delivery	Forceps Delivery
Surviving infants	37	8
Known intrauterine deaths	2	1
Stillbirths	0	3
Neonatal deaths	1	0

The incidence of two complete uterine ruptures among 92 cases of previous caesarean section—that is, 1 in 46—may be compared with the overall hospital incidence of ruptured uterus over the period under review, which was 1 in 79. Careful inquiry has been made at the maternity centres, and no case is known of a woman who had had a previous caesarean section dying before she could reach hospital. In this type of community it is highly unlikely that such an event could occur without reports of it reaching the local midwife.

Discussion

Before considering any conclusions to be drawn from the cases investigated here it must be stressed that the standards are those of a comparatively primitive community, and cannot be applied to work in more highly developed communities. The aim in such poorer countries must of course be to attain the same high standard of obstetric practice as in countries like Britain. This is a matter of finance and of education, and until such advances are feasible it is necessary for the obstetrician to decide for himself how to tackle the difficulties with which he is faced.

Trillat has assessed the incidence of subsequent rupture of weak lower-segment scars as only 0.4%. However, the Makerere College Medical School's maternity report for 1956–8 inclusive shows that at Mulago Hospital, Kampala, the incidence of uterine rupture in cases of previous caesarean section was 6.3%, although the mortality was only 0.7%. (This mortality represents 11.5% of the cases of rupture after previous caesarean section, and may be compared with the 42.5% mortality in cases of spontaneous and traumatic uterine rupture.) The Mulago figures correspond to the figures in the present series (6.2% complete or incomplete rupture), but there were in fact only two cases (1.2%) in which the rupture affected the course of the case. It is therefore felt that the danger of future rupture of the scar should not act as any great deterrent when a doctor, in this type of environment, has to decide whether or not to submit a given case to caesarean section. It appears that a woman who has had a previous caesarean section, particularly if she has thereby produced a live baby, will almost certainly come back to hospital early in her next labour. On the other hand, if she has had a difficult forceps delivery with a stillborn child at the end there is a much greater danger of her attempting to push out the next, possibly larger, baby at home, with the risk of her uterus rupturing.

It would appear, therefore, that the prime deterrent to the doctor contemplating caesarean section in this type of setting lies in the primary mortality, although, as has been pointed out, the figures in this series exaggerate the extent of this risk if the mother is fit when the operation is done. My own opinion is that prolonged trials of labour with the head still high, and especially the trial of high forceps, should be condemned as completely in primitive communities as they have been in Britain. Antibiotics have certainly reduced the 26.5% mortality rate of Holland's (1921) 1911–20 failed forceps series, but it is still true that such procedures greatly increase the risk to the mother and also produce very poor foetal survival rates.

Modern British teaching does not rule so dogmatically as the American teaching that " once a caesarean always a caesarean." However, it is taught that if a woman has had one such operation for disproportion the operation should be repeated in any subsequent pregnancies. As Donald (1959) points out, subsequent babies tend to be larger for the same period of gestation, and if a patient was incapable of delivering herself whilst the uterus was still intact it hardly seems reasonable to expect a uterus with a scar in it to perform better.

Rendle Short (1960) has stated that at Mulago Hospital the dictum about always doing a repeat caesarean section is not followed, since 50% of their cases with previous caesarean sections subsequently deliver normally. In the present series repeat caesarean section gave the best maternal results, with very little to choose on the question of foetal survival rates between this procedure and vaginal delivery. While, therefore, certainly not advocating that caesarean section should always be repeated, it is maintained that Donald's dictum about previous caesarean sections for cephalopelvic disproportion does apply even in primitive communities. It therefore follows that the idea of a trial of labour in patients who have had previous caesarean section should be abandoned, while no woman who has had more than one previous caesarean section should be allowed to attempt to deliver vaginally. The fact that three of the five cases of rupture of the scar in this series occurred in patients who had had more than one previous section should serve to emphasize this point.

Summary

A review is presented of 137 cases of first caesarean section and of 92 patients who had had previous caesarean section.

In the latter class there were five cases (6.2%) of complete or incomplete rupture of the scar, but in only two of these was the course of the case adversely affected.

It is claimed that the risk of future rupture of the caesarean scar in patients in a primitive community is overestimated, and a plea is made for the abandonment of trial of high forceps in such communities.

My thanks are due to Dr. M. Tolley, Dr. J. Anderson, and Dr. W. H. D. Scotland, one or other of whom was in overall charge of all the patients in the first 28 months of the 30 months covered in this series, and also to the duty medical officers who carried out so many of the treatments. I also thank the Director of Medical Services, Uganda, for permission to publish.

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In his review of the work carried out by the World Health Organization in the European Region Dr. Paul van de Calseyde, Regional Director for Europe, told the W.H.O. Regional Committee for Europe at its session in Warsaw from September 11 to 14 that during the last year 19 conferences or symposia were organized by the Regional Office. Themes included radiation protection, mental health and the family, statistics, tuberculosis, communicable eye disease, malaria, the nurse in mental health practice, training doctors for work in the community, and national sanitation programmes. There were 31 international training courses covering subjects such as anaesthesiology, public health administration, rehabilitation, rural health, sanitary engineering, medical administration, social paediatrics, and radiation medicine. The Regional Office helped 28 European countries with 109 individual projects, among them cancer control, tuberculosis epidemiology and control, postgraduate training in psychiatry, drug addiction, nursing education, V.D. control, production of vaccines, water supplies, and sewage disposal. The European Office continued to be of service to other areas of the world: the number of overseas fellows increased from 217 to 307. For the first time in history the directors of schools of tropical medicine in Europe met to discuss training needs, especially Africa's, and to seek means of improving and expanding teaching facilities in tropical areas.