in causing prolapse than a quicker delivery with a tear or episiotomy. The matter is still *sub judice*, but meanwhile there is nothing to suggest that forceps in the hands of the expert do any harm to the mother, and they may be instruments of good as well as of mercy.

Dangers of Forceps in Modern Practice

The greatest danger of forceps delivery at the present time is anaesthesia, and this danger has, if anything, increased with the introduction of modern anaesthetic agents whose safety depends on increasing skill on the part of the anaesthetist. As mentioned previously, there have been six maternal deaths associated with forceps delivery in the Liverpool Maternity Hospital during the 15 years preceding 1950. Three of these were the result of the inhalation of vomit during induction of general anaesthesia, and the fourth was due to the effect of an anaesthetic on a diseased heart. Since 1950 there have been more cases of inhalation asphyxia and pneumonia as a result of vomiting during induction or recovery from anaesthesia given for the purpose of the application of forceps. This risk is very great when labour has been prolonged, as it has in many cases in which forceps delivery is indicated. The other risk is third-stage and post-partum haemorrhage associated with depression of myometrial activity by the anaesthetic.

To recognize these risks, and to have them ever present in mind, is to reduce them to a minimum. They constitute the chief reasons for advocating the use of local analgesia for all easy low-forceps extractions.

Conclusion

There is danger in praising forceps too highly and in claiming too large a place for them; it might encourage their abuse. There is also danger in adopting an ostrich-like attitude and failing to recognize that times have changed, and are changing. It will not do to condemn forceps merely on the grounds that they represent interference with Nature, if it can be shown that their results improve on those achieved by Nature.

The fact that childbirth is a physiological process does not necessarily mean that it is a benign one. The reproductive function in all species is both dangerous and wasteful. Nature is not concerned with making reproduction safe for individual mothers or offspring; she expects losses, and for this reason provides a supply of potential offspring which is so bounteous as to offset them and ensure the continuance of the race.

The natural maternal and foetal mortality rates are unknown, but it is quite certain that they are much higher than those which obtain when the medical and nursing professions stand by ready to interfere judiciously with Nature. Obstetricians do well to leave childbirth to Nature only so long as she is efficient, but when she fails—as she often does—lives can be saved only by carefully planned and skilful intervention. Moreover, as the means and methods for intervention become safer, they can offer more and more to the individual than can Nature.

REFERENCES

- Assali, N. S., and Zacharias, L. F. (1947). *Amer. J. Obstet. Gynec.*, 54, 651.
Cox, L. W. (1950). *J. Obstet. Gynaec. Brit. Emp.*, 57, 197.
De Lee, J. B. (1920). *Amer. J. Obstet. Gynec.*, 1, 34.
Douglass, L. H., and Kaltreider, D. F. (1953). *Ibid.*, 65, 889.
Fraenkel, L. (1925). *Mösch. Geburtsch. Gynäk.*, 69, 356.
Frank, M. (1908). *Mösch. med. Wschr.*, 55, 363. Abstract in *J. Obstet. Gynaec. Brit. Emp.*, 1908, 13, 297.
Hamilton, J., Jeffcoate, T. N. A., and Lister, Ursula M. (1949). *J. Obstet. Gynaec. Brit. Emp.*, 56, 413.
Johnstone, R. W. (1952). *William Smellie*. Livingstone, Edinburgh and London.
Jones, E. Parry (1952). *Klelland's Forceps*. Butterworth Med. Publ., London.
Scott, W. A. (1940). *Amer. J. Obstet. Gynec.*, 39, 382.
Studdiford, W. E., and Salter, H. P. (1938). *Ibid.*, 35, 215.

"FAILED FORCEPS": A REVIEW OF 37 CASES

BY

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During the period January 1, 1948, to May 31, 1952, 37 cases of "failed forceps deliveries" were admitted to the Norfolk and Norwich Hospital. Of these patients 21 were primigravidae and 16 multiparae. This paper is based upon an analysis of these cases.

Maternal and Foetal Hazards

A study of the recent annual reports of nine hospitals shows the maternal mortality rate in "failed forceps" cases to be 2.0%, while the foetal loss is 36.2%. So far as the risk to the foetus is concerned these findings are in reasonable conformity with those in the present series as shown in Table I. It will be seen that seven infants were

TABLE I.—General Analysis of the Present Series

	No. of Cases	Maternal Morbidity	Foetus Dead on Admission	Still-births	Neonatal Deaths	Total Foetal Loss
Primiparae	21	6 (28.6%)	2	3	1	4 (19.1%)
Multiparae	16	4 (25.0%)	4	4	1	5 (31.2%)
Total ..	37	10 (27.0%)	6	7	2	9 (24.3%)

stillborn, while a further two died during the neonatal period, the total foetal loss being 24.3%, or 22.2% if correction is made for one case of hydrocephalus.

Although no mother died as a result of this intervention, the maternal morbidity rate stood at the high figure of 27.0%. The remote prognosis for these patients may thus be less favourable than the immediate results suggest, since, as emphasized by Miller (1928), Claye (1931), Stacey (1931), and Feeney (1947), the sequelae of puerperal infection often persist for many years.

Duration of Labour

Table II shows that labour tended to be prolonged in these cases compared with normal vertex deliveries, this being most marked in primigravidae. In these patients the

TABLE II.—Duration of Labour in Failed Forceps Deliveries

	Total Cases	First Stage Over 24 Hours	Second Stage Over 2 Hours
Primiparae { Failed forceps* ..	19	12 (63.2%)	14 (73.7%)
{ Normal ..	185	36 (19.5%)	19 (10.3%)
Multiparae { Failed forceps* ..	11	2 (18.2%)	7 (63.6%)
{ Normal ..	215	22 (10.2%)	1 (0.5%)

* Excluding 6 caesarean sections and 1 case in which details were absent.

first stage lasted over 24 hours in 63.2% of cases, a finding that suggests that, in some cases at least, delivery may have been attempted for this reason alone. The second stage lasted more than two hours in 73.7% of primigravidae and 63.6% of multiparae. This, however, was mainly due to the time expended in transferring the patient to hospital.

Past Obstetric History in Multiparae

The past obstetric history in the 16 multiparae is summarized in Table III. It will be seen that a history of previous dystocia was given by eight patients (50%), while of eleven cases in which details regarding the size of

TABLE III.—*Analysis of Past Obstetric History in Multiparae*

Case No.	Parity	Past History	Maximum Past Weight	Present Weight
4	6	Normal	8 lb.	1b. oz.
6	1	Stillbirth. Cause unknown	6½ "	7 14
8	7	2 forceps deliveries	Unknown	7 8
11	4	Normal	10 3	10 3
13	8	Forceps with last	7½ lb.	6 8
16	1	" delivery	7½ "	8 1
17	9	Normal	Unknown	7 13
19	1	Forceps. Occipito-posterior	7½ lb.	7 8
20	1	Normal	Unknown	7 8
22	4	"	6½ lb.	6 4
25	4	"	9 "	10 12
27	1	Forceps delivery	8½ "	10 4
28	2	Both forceps. First stillborn	10 lb. (S.B.)	10 10
30	1	Normal	8½ "	10 5
33	2	First forceps. Stillborn	Unknown	9 11
37	3	Normal	11 lb.	9 8

former infants were available, in no fewer than seven the present infant was larger than its forerunners and was thus capable of causing difficulties not previously experienced.

Causes of Failure

As pointed out by previous writers on this subject (Phillips, 1926; Murray, 1927; Miller, 1928; Claye, 1931; Stacey, 1931; Feeney, 1947; Browne, 1949; Freeth, 1950), the three fundamental factors responsible for failure to deliver the patient are disproportion, incomplete cervical dilatation, and some malposition of the foetal head. That two or more of these factors may be present in one and the same case is shown in Table IV, where, for the sake of clarity, the main cause is emphasized.

TABLE IV.—*Causes of Failure to Deliver the Patient*

	No. of Cases	Cause Present			Type of Cause		
		Single	Multiple	None	Disproportion	Undilated Cervix	Malposition of Head
Primiparae ..	21	14	3	4	3	3 (2)	11 (2)
Multiparae ..	16	7	7	2	4	3 (5)	7 (4)
Total ..	37	21	10	6	7	6 (7)	18 (6)

The numbers in parentheses indicate subsidiary conditions.

In 18 cases some malposition of the foetal head—usually an occipito-transverse or occipito-posterior position—was the main reason for failure. In addition this feature was observed in a further six patients, although here it was not the main cause. Thus, in 64.9% of cases the foetal head was not in a suitable position for a straightforward forceps delivery. By contrast, disproportion was present in only seven cases—three primigravidae and four multiparae—an incidence of 18.9%. Incomplete cervical dilatation occupied a position mid-way between the two conditions already mentioned, being encountered as a main factor in six cases and as a subsidiary in a further seven, the total incidence being 35.1%.

It is interesting to note that these results compare closely with those observed in the much larger series reported by Freeth (1950), with the difference that malposition of the head was often observed in multiparae. This finding is also contrary to the views of Claye (1931), who was of the opinion that anterior rotation of the occiput almost invariably took place in these patients.

Method of Delivery in Hospital

This aspect of failed forceps deliveries, which was fully described by Freeth (1950), is summarized in Table V. Craniotomy was necessary in two cases only (5.4%). In one the foetus was hydrocephalic, while in the other, in which disproportion was present, the foetal heart sounds disappeared shortly after admission. This low incidence of destructive operations—Stacey (1931) gave the proportion

of cases thus delivered as 25%—together with the fact that caesarean section was carried out in six cases (16.2%), supports the prevailing view that the indications for section in cases of this nature could well be broadened.

Of the remaining 29 cases, 6 (16.2%) delivered themselves spontaneously after time had been allowed for full cervical dilatation to occur. A forceps delivery was necessary in 23 patients (62.2%). In this latter group seven of the deliveries were classed as "easy low forceps," the presenting part being on the pelvic floor and the occiput anterior. Thus in a total of 13 cases (35.1%) delivery ultimately presented no special problem, the original difficulty encountered in the attempted extraction having disappeared.

TABLE V.—*Methods of Delivery in Hospital*

	Spontaneous	Forceps				Caes. Section	Caes. Hyst.	Craniotomy
		Low	And Rotation	As O.P.	Total			
Primiparae	3	5	8	2	15	2	—	1
Multiparae	3	2	6	—	8	3	1	1
Total	6	7	14	2	23	5	1	2

Discussion

Taking into account the three main causes of failed forceps deliveries, it is evident that the incidence of these cases could best be reduced by timely recognition of disproportion, incomplete cervical dilatation, and malpositions of the foetal head.

Disproportion.—In most cases this abnormality can be recognized during the antenatal period. Although even in a primigravida the fact that the foetal head fails to engage at or near term is not necessarily indicative of disproportion, this must always be excluded. In every such case, therefore, clinical pelvimetry, supported if necessary by radiological assessment of the pelvis, should be carried out. This policy is the one generally followed in primigravidae. In multiparae the possibility of disproportion is often overlooked. To a large extent this is due to the belief that in these patients engagement of the foetal head before the onset of labour is the exception rather than the rule. Whatever the truth of this view, the fact remains that in some of these patients disproportion is present. This is shown in Tables III and IV, which suggest that stricter antenatal assessment is necessary in multiparae, especially with regard to the relationship between the size of the present infant and that of its predecessor. Recognition of disproportion after the onset of labour, although even more vital, is often more difficult. It is usually agreed that once the lowest bony part of the head has descended to the level of the ischial spines engagement has taken place. Although this is true in most cases, such a finding may be misleading either if excessive moulding has occurred or if the pelvis is abnormally shallow. At other times the presence of a large caput obscures the actual bony level of the foetal head. For these reasons it is safer to determine whether or not any portion of the head can be palpated above the symphysis pubis, it being taken that should any be felt delivery will be dangerous (Browne, 1949).

Incomplete Cervical Dilatation.—Although in theory full cervical dilatation can be present when a rim of cervix is still palpable, in practice this is rarely the case. It is therefore safest to assume that so long as any portion of the cervix can be felt on vaginal examination full cervical dilatation has not yet been reached. To attempt a forceps delivery under such conditions would be unwise. This rule should apply as rigidly to multiparae as to primigravidae. Although in the former patients the cervix is often reputed to be soft and easily dilatable this is not always so, the residual rim of cervix on occasion proving an effective bar to delivery. At other times delivery may only succeed at the expense of a dangerous cervical laceration. If indications to terminate labour arise before full dilatation,

incision or manual stretching of the cervix has been recommended (Browne, 1949). These procedures, however, have a limited application and are fraught with hazard. In such cases, therefore, it is probably wiser to transfer the patient to hospital.

Malpositions of the Foetal Head.—Since, as has been pointed out by Freeth (1950), it is unwise to assume that the occiput is necessarily anterior, it is essential to determine the position of the foetal head before applying the forceps. For this it is usually recommended that an ear be sought or, failing this, that the nape of the neck be identified (Browne, 1949). These measures, although possessing a high degree of accuracy, have the disadvantage that full anaesthesia is necessary for their proper application. This objection no longer obtains if use is made of the suture lines to determine the position of the occiput. These landmarks can easily be reached in most patients, and with practice a high degree of accuracy in their identification may be obtained. Late in labour caput formation may obscure these features to some extent, though in all but exceptional cases they can usually be made out with time and patience. If doubt still exists a good case can be made for examination under anaesthesia, the whole hand being passed into the vagina. Such a measure should, however, in no way commit the obstetrician to immediate delivery if the position of the head or the state of the cervix implies that this course would be unsafe.

Conclusions and Summary

An attempt has been made to determine the causes and assess the dangers, both to the mother and to the foetus, of "failed forceps deliveries."

The importance of these emergencies lies mainly in the fact that they represent a small subgroup of that category of deliveries loosely termed "difficult forceps" in which essentially the same conditions and the same dangers exist. Thus, as Fletcher Shaw (1928) pointed out, for every case in which failure occurs there must be many in which delivery is accomplished only after prolonged and dangerous traction, often through an incompletely dilated cervix.

The amount of maternal disability and foetal loss in these cases must be considerable. In consequence, every effort should be made to reduce the extent of this hazardous intervention.

Thirty-seven cases of "failed forceps deliveries" admitted to the Norfolk and Norwich Hospital are reviewed.

In over half of the multiparae consideration of the past obstetric history might have provided grounds for suspecting dystocia.

The causes of failure at the initial attempt at delivery were malpositions of the foetal head, incomplete cervical dilatation, and disproportion. This last factor, however, was not a common finding in the present series.

In a considerable proportion of cases (35.1%) delivery ultimately presented no particular problems.

Suggestions for the earlier recognition of the causes of failure have been discussed.

REFERENCES

- Browne, F. J. (1949). *British Medical Journal*, 2, 975.
 Claye, A. M. (1931). *Practitioner*, 126, 611.
 Feeney, J. K. (1947). *Irish J. med. Sci.*, 6S, 190.
 Fletcher Shaw, Sir William (1928). *British Medical Journal*, 2, 188.
 Freeth, H. D. (1950). *Ibid.*, 2, 18.
 Miller, D. (1928). *Ibid.*, 2, 183.
 Murray, E. Farquhar (1927). *Clin. J.*, 56, 488.
 Phillips, L. (1926). *Lancet*, 1, 113.
 Stacey, J. E. (1931). *British Medical Journal*, 2, 1073.

SICKLE-CELL ANAEMIA IN THE ACCRA DISTRICT OF THE GOLD COAST*

A REVIEW OF TWENTY CASES

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It has been found impossible, in reviewing the literature, to assess the incidence of sickle-cell anaemia either in America or in Africa. The incidence of sickle-cell anaemia to the sickle-cell trait has been reported in America to vary from 1:2 (approximately) (Winsor and Burch, 1945) to 1:71 (Switzer and Fouché, 1948), with many intervening estimates. These figures show great disparity, but they do prove that sickle-cell anaemia is relatively common in America when it is remembered that approximately 900,000 negroes in the United States exhibit the trait (Beacham *et al.*, 1950).

On the other hand, the majority of writers in Africa regard sickle-cell anaemia as rare, in spite of the fact that the incidence of the trait in the African native may be more than double that of the American negro (Gelfand, 1944; Murray-Lyon, 1944; Beet, 1947; Robertson and Findlay, 1947; Mackey, 1949; Raper, 1950; Lehmann, 1951; Jelliffe and Humphreys, 1952; *British Medical Journal*, 1952). Smith (1943), however, estimated the incidence of the anaemia to the trait to be 1:5 in Nigeria, and Lambotte-Legrand (1951) stated that 6% of trait-positive Africans in Leopoldville suffered from sickle-cell anaemia. Foy *et al.* (1951), in Kenya, did not describe any cases, but stated that there were four cases of sickle-cell anaemia in the 13 trait-positive Africans examined, and concluded that the anaemia was commonest among infants and newborn babies. This statement, however, requires confirmation, as it has been shown that the neonate may be protected against sickle-cell anaemia (Watson, 1948; Edington, 1952), and there are only three reports in the literature of sickle-cell anaemia occurring under the age of 4 months (Cohen *et al.*, 1947; Frazier and Rice, 1950; Heldrich, 1951). Thus the part that the sickling phenomenon plays in the morbidity and mortality rates of the African native has still to be assessed.

I have diagnosed sickle-cell anaemia in 33 instances. Only one examination was possible in 13 patients, however, and these are consequently not considered in this review.

The following investigations were employed to discover those who were suffering from sickle-cell anaemia. (1) One patient was discovered on routine surveys of the population in which 2,255 Africans were examined and questioned. The findings are shown in Table I. It is not intended to discuss these surveys in detail. (2) Patients in the Gold Coast Hospital in whom a sickling test had been requested and found positive were examined. Of 60 sickling-positive patients investigated four were considered to be suffering from sickle-cell anaemia. (3) Patients in the Gold Coast Hospital showing many target cells in the peripheral blood smear on which routine differential counts were being performed

*This paper is based on part of a thesis submitted for the degree of M.D. of the University of Glasgow.