The eight allelic Rh genes are designated (Wiener, 1949) by the symbols r , r' , r'' , r^v , R^0 , R^1 , R^2 , and R^z , respectively. As shown in the table, the capital "R" is used to represent these blood properties which contain the factor Rh_0 ; the small "r," on the other hand, implies the absence of factor Rh_0 . For verbal use, however, it is not necessary to say "large R" or "small r" as the case may be, because the qualifying subscripts and superscripts fully identify the symbols.

To avoid ambiguity, distinctive symbols are used for genes and agglutinogens; the gene symbols are printed in italics, have superscripts only, and the "h" is omitted. For example, "R-one," which is easy to say, clearly refers to a gene, and "R-H-one," which is also easy to say, clearly refers to an agglutinin or a blood type. The equivalent designation for this type in the Fisher-Race nomenclature would be "large C, large D, small e," which is neither easy to say nor easy to absorb, and in this nomenclature there are no distinctive symbols for genotypes and phenotypes. Phenotype Rh_2rh includes genotypes R^2r , R^2R^0 , and R^0r'' . In the Fisher-Race nomenclature, in this case for both phenotype and genotype the same symbol cDE/cde is used, and this is misleading if not incorrect, especially since no tests have been made for "little d" factor.

In 1943 I observed that there were bloods, especially among members of the Negroid race, which reacted weakly with one or more of the Rh antisera (Wiener, 1944). These bloods were said to contain "intermediate" Rh factors or Rh variants, and it was recognized that these weak reactions were due to some qualitative genetically determined difference in the agglutinin. It was pointed out that when these Rh variants are taken into account the postulated series of Rh allelic genes had to be extended considerably. If, as I postulated, these weak reactions are due to qualitative difference in the agglutinogens it should be possible to find new Rh antisera specific for these Rh variants. This expectation has been fulfilled in part through the work (Race *et al.*, 1948) on variants of the rh' (C) factor.

Some individuals of type Rh_1 have blood containing a variant of the rh' factor as shown by the weak reactions with anti- rh' serum. Among these the existence of an agglutinin Rh_1^w (CC^wDe) has been completely established, and potent and specific anti- rh^w (anti- C^w) sera are available to test for this variant (Callender and Race, 1946-7). In the papers of British workers the Rh_1^w agglutinin and its corresponding gene have been designated as C^wDe . If the policy that the designations for the genes and agglutinogens should fully define the serological reactions is to be continued then the correct symbol should be CC^wDe instead of C^wDe (Wiener and Gordon, 1949). With regard to other rh' variants—namely, bloods that react weakly with anti- rh' sera but are rh^w negative—specific antisera are not available and these are pooled together under the original symbol.

Of considerable practical importance are the variants of the Rh_0 factor (Wiener, 1944; Race *et al.*, 1948-9), because the Rh_0 factor is the one usually responsible for clinical complications. When mothers are sensitized to the Rh_0 factor, babies whose blood contains an Rh_0 variant have proved to be erythroblastotic; similarly, transfusion of blood containing an Rh_0 variant to a patient sensitized to the Rh_0 factor could give rise to a haemolytic reaction. Unfortunately, no sera have been obtained to date specific for the Rh_0 variants, which are still recognized primarily by their weaker reactions with Rh_0 antisera. Nevertheless, some distinctive designation for bloods containing Rh_0

variants seems desirable, and it is therefore proposed to use a capital Germanic $\mathbb{R}$ to indicate the presence of an Rh_0 variant, as shown in the Table. For oral use, however, the term " Rh_0 variant" is convenient, and is therefore retained.

It hardly seems necessary to point out once more the need for a single uniform Rh-Hr nomenclature, such as exists for the ABO and MN systems. To argue that duplicate nomenclatures are simpler and clearer than a single one is sheer nonsense. It is hoped that Sir Lionel Whitby, President of the International Society of Haematology, will appoint a fact-finding committee to investigate this matter. The appointment of such a committee now would give interested workers ample time to submit to its members evidence relating to this question. After the evidence had been digested a report could be submitted to the meeting, and published after it had been endorsed by the society.

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FOETAL LOSS IN BREECH PRESENTATION: PRIMIGRAVIDAE AND MULTIGRAVIDAE COMPARED

BY

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There is a general impression that breech presentation in a woman who has already borne babies is a less serious matter than in a woman pregnant for the first time. Some doubt has been thrown on the accuracy of this impression by the published figures of foetal loss in breech delivery—for example, Peel and Clayton (1948), who presented a large collected series (Table I).

TABLE I.—The "Corrected" Foetal Mortality in Breech Presentation (the Combined Results from the Series of Six Separate Authors—Collected by Peel and Clayton (1948))

	Primigravidae	Multigravidae	Total Breech Deliveries
Combined figures	11.3% (738 cases)	9.8% (919 cases)	1,657 cases
Range in the individual series	5.3%–29%	2.2%–23.2%	

S.E. of the difference = 1.5; observed % difference = 1.5. Thus the difference in this large composite series is not significant.

It was decided to compare the results of primigravid and multigravid breech delivery obtained in St. Mary's Hospital, Manchester, and to study the factors leading to the foetal loss.

The material comprised 243 breech deliveries and extractions performed in 1947 and 1948. These two years were chosen because I was resident in the hospital, and delivered some of the cases, supervised others, and knew the conditions under which the remainder were delivered. It was a policy to admit to hospital for delivery all breech presentations seen at the clinic, both in primigravidae and multigravidae, and, as a rule, twin pregnancies were delivered in hospital rather than by the district service. Thus,

admission to hospital of multigravid breech presentations was not confined to the more complicated or difficult cases.

Technique of Delivery

The preferred technique was always conservative. Whenever possible, delivery was allowed to proceed by the natural forces until the child was hanging by the after-coming head: this was then delivered by the Mauriceau-Smellie-Veit manoeuvre or by forceps. Routine episiotomy was performed under local analgesia in primigravid cases. Intervention to bring down the arms was used only if they failed to deliver unassisted.

If the breech did not descend well owing to inertia or lack of co-operation on the part of the mother, groin traction during a contraction was used; the effectiveness of this can be judged by the fact that only three times in the 243 cases was breech extraction on a living baby resorted to with inertia as the indication. Only seven additional extractions were performed on living babies, and these were all for prolapsed cords—two in primigravidae and five in multigravidae. (Extraction in this connexion is meant to imply a formal operation and does not include cases in which intervention became necessary owing to extended arms in the course of a breech delivery.)

Results

The results, including all breech deliveries, are shown in Table II. A number of cases ending fatally for the

TABLE II.—“Uncorrected” Foetal Mortality for Breech Delivery* in St. Mary's Hospitals in 1947-8

	Primigravidae	Multigravidae	Total
Total breech deliveries ..	126	117	243
Babies surviving ..	96	74	170
Stillbirths and neonatal deaths ..	30	43	73

* No distinction is made between “breech delivery” and “breech extraction,” all vaginal deliveries starting labour with a breech presentation being included. Transverse lies and second twins are not included. Booked and non-booked cases are included.

TABLE III.—Cases to be Excluded from Table II in Calculating the “Corrected” Foetal Mortality

	Primigravidae	Multigravidae	Total
A. Cases in which breech presentation may have contributed to the loss of the baby, but is unlikely to have done so			
Prematurity ..	5	7	12
Death during labour but before delivery and where occult prolapse of the cord cannot be excluded ..	5	1	6
	10	8	18
B. Cases in which breech presentation could not have contributed to the loss of the baby			
Foetal abnormalities incompatible with life ..	5	9	14
Foetal death before labour:			
Unexplained ..	3	4	7
Toxaemia ..	1	3	4
Accidental haemorrhage ..	0	2	2
Erythroblastosis ..	0	3	3
Foetal death in labour but well before delivery began:			
Unexplained (but occult prolapse of cord could be excluded by intact membranes) ..	1	1	2
Toxaemia ..	2	0	2
Accidental haemorrhage ..	0	2	2
Placenta praevia ..	0	1	1
Diabetes ..	1	0	1
Neonatal death:			
Erythroblastosis ..	0	1	1
Otitis media ..	0	1	1
Locked twins ..	0	1	1
	13	28	41
Total exclusions ..	23	36	59

child, in which it is considered that the breech presentation was an unimportant factor in the fatal outcome, have been excluded from the analysis. A detailed list of these exclusions is submitted for critical examination (Table III), and the “corrected” mortality in the remainder is shown in Table IV. The cases of foetal death shown in Table IV are analysed to show the cause of the foetal loss (Table V).

TABLE IV.—“Corrected” Foetal Mortality for Breech Delivery

	Primigravidae	Multigravidae	Total
Total breech deliveries (excluding babies whose death was unconnected with breech delivery) ..	103	81	184
Babies surviving ..	96	74	170
Stillbirths and neonatal deaths ..	7	7	14
“Corrected” foetal loss ..	6.8%	8.6%	7.6%

TABLE V.—Factors Leading to the Foetal Loss in Table IV

	Primigravidae	Multigravidae	Total
Prolapsed cord ..	3 (2 booked 1 unbooked)	2 (1 booked 1 unbooked)	5
Disproportion:			
Contracted pelvis ..	2 (booked)	2 (1 booked 1 unbooked)	4
Large baby ..	0	1 (unbooked)	1
Unexplained death during delivery ..	2 (booked)	0	2
Delivery with no attendant ..	0	1 (booked)	1
Cervical dystocia ..	0	1 (booked)	1
	7	7	14

Table VI shows the incidence of and foetal loss from prolapsed cord in the period under review, and Table VII gives the incidence of caesarean section for breech presentation during the same time.

TABLE VI.—Incidence of Prolapsed Cord in Vertex and Breech Presentation

	Number of Cases		% Incidence	
	Vertex	Breech	Vertex	Breech
Primigravidae ..	14	5		4.7%
Multigravidae ..	6	11		13.4%
Total ..	20	16	0.5%	8.6%

The foetal loss due to prolapsed cord in breech presentation was 31%.

TABLE VII.—Caesarean Sections with Breech Presentation as the Deciding Factor

Principal Additional Indications	Primigravidae	Multigravidae	Total
Elderly primigravida ..	10*	0	10
Contracted pelvis ..	2	0	2
Bad obstetrical history ..	0	3	3
Inertia ..	1	0	1
	13	3	16

* Only 4 had this indication alone: the remaining 6 had contracted pelvis (2), fibroids, pre-eclampsia, accidental haemorrhage, or inertia as complicating factors.

Method of Analysis

It is thought that the figures give a fair comparison between primigravidae and multigravidae. There was no difference in the management of the two groups, either regarding the criteria for admission to hospital from the clinic or in the care shown at delivery. It is true that there is a higher incidence of dead babies in multigravidae attributable to complications (Table III B), but these are removed by the “correction.” This higher incidence, however, cannot be taken as an indication that only the more complicated breech cases were admitted to hospital, as all the patients in Table III B would have been admitted regardless of parity or presentation.

The tables are self-explanatory with regard to the method of "correction," but an explanation may be called for in connexion with those cases in Table III A which have been excluded from the "corrected" mortality. The largest premature baby that failed to survive was 4 lb. 10 oz. (2.1 kg.), but most babies of this group were barely viable. Although it is impossible to decide to what extent the breech delivery was a factor in the foetal loss in the premature labours, it is felt that these cases might be reasonably excluded from the "corrected" figures. In any case, these deaths are fairly equally distributed between the multigravidae and the primigravidae. It is also difficult to say to what extent the factor of occult prolapse of the cord might have been responsible for those foetal deaths occurring during labour, after the rupture of the membranes but before the onset of delivery. These cases have been classed arbitrarily under the heading of "Cases in which breech presentation may have contributed to the loss of the baby, but is unlikely to have done so," and excluded from the "corrected" figures. This exclusion actually favours the primigravidae in this series.

The incidence of caesarean section with breech presentation as the indication has a bearing on the figures for foetal loss, and, as is seen in Table VII, the number performed in primigravidae exceeds those in multigravidae (13 to 3), so that this factor should improve the primigravid foetal mortality.

Influence in Primigravidae and Multigravidae of Various Factors Causing Foetal Loss

The consideration of these factors is the main object of this paper, as the mortality figures alone are based on too few cases to carry much weight in the proposed comparison.

Prolapsed Cord

It must be stated at once that during the period under review the incidence of prolapsed cord in breech presentation was unusually high. Seeley (1949) found from the literature, and from his own large series, that the incidence of this complication in breech presentation was about 3% (or six times that found in vertex presentation): in the present series the incidence was 8.6% (or about 17 times that observed in vertex presentations during the same period) (Table VI). Nevertheless, bearing in mind that the foetal mortality following this complication was reasonably low in the present series—namely, 31%—it is fair to conclude that cord complications are an important factor in the foetal loss associated with breech presentations delivered under competent supervision.

Neither antenatal care nor obstetrical skill can prevent prolapsed cords, although mismanagement antenatally or intra partum may predispose to this complication (for example, by the too frequent use of artificial rupture of the membranes or by bringing down a leg carelessly or too often). Foetal lives may be saved, however, by a vaginal examination after the membranes rupture and by skilful obstetrics after the cord has prolapsed. Thus the only way of avoiding this cause of foetal loss in breech presentation is by avoiding that presentation, by external version, as soon as it is recognized.

The incidence of prolapsed cord is greater among multigravidae than among primigravidae (in this series it is 13.4% as against 4.7% (Table VI), although the actual numbers are too small for a test of significance), so here is one factor which adversely affects the figures for the foetal loss associated with breech presentation in multigravidae.

Disproportion: Contracted Pelvis

Babies were lost in three different ways:

1.—*Delivery Deliberately Attempted in the Presence of a Contracted Brim.*—This was done twice—once in a primigravida on account of her youth, and once in a multigravida, a history of previous large babies delivered by the vertex favouring this decision, although her diagonal conjugate was known to be only 4½ in. (11.4 cm.). Both deliveries were made with qualms beforehand and regrets afterwards.

2.—*The Contracted Brim was Not Detected Antenatally.*—This occurred in one primigravida, who in a later labour safely delivered a large baby by the vertex. The presence of a contracted brim was confirmed by x-ray examination after delivery.

3.—*A Case with a Known Contracted Pelvis went into Labour Prematurely with a Breech Presentation and was Admitted Too Late for Caesarean Section.*—The well-recognized danger to the foetus from even a minor degree of contraction of the brim is amply illustrated by these cases, as also is the importance of a careful examination of the pelvis where breech delivery is contemplated. An obstetrical history of large babies delivered by the vertex is worthless as an indication of the adequacy of the pelvis for breech delivery. Support is given for the routine use of radiology to measure the pelvis in all cases before considering breech delivery, a procedure now widely practised. X-ray equipment was not available in St. Mary's Hospital at this time, so that radiological assessment of the pelvis was not used extensively, but the case which was missed by clinical methods of estimation might have been saved from the unsatisfactory result had radiographs been taken before delivery.

To sum up, then, these foetal losses should have been largely avoidable, except in the case admitted too late for caesarean section. Where, however, babies are lost through disproportion it is more likely to be in multigravidae, as it is in this group that disproportion will be more easily overlooked through undue reliance on the obstetrical history, or because labour may be too advanced on admission to do anything but deliver vaginally.

Contraction of the bony outlet has not been discussed, as it did not occur in our series, but, rare though it is, when present it will be almost as lethal as disproportion at the brim.

Disproportion: Large Baby

The disproportion due to the large baby (and this has lost us one baby weighing 11 lb. 4 oz. (5.1 kg.) in a non-booked case) is not easy to avoid, because it is so notoriously difficult to assess the weight of a baby in utero. Fortunately it is rare, but this makes it more likely to be overlooked. The importance of the big baby is shown by Mohler (1932), for of 27 breech babies weighing more than 8 lb. (3.6 kg.) 30% were lost. A superficially attractive solution to this is to attempt to recognize the really large baby and perform induction of labour in cases in which the estimate of the baby's size is reasonably certain. Sometimes this is carried to an extreme by inducing all breech labours before term: this is inviting complications such as prolapsed cord or the loss of an occasional premature baby through cervical dystocia (see below), and seems to be a rather unnecessary interference with labours which might otherwise be normal.

Another method of approach to the big-baby problem is to perform caesarean section. This has been advocated by Marshall (1949), who suggested abdominal delivery for

breech presentation if the estimated weight of the foetus exceeds 7 lb. (3.2 kg.) with a doubtful pelvis, or exceeds 9 lb. (4.1 kg.) with normal pelvic measurements. It is difficult to escape the conclusion that under such a regime many caesarean sections may be performed unnecessarily, and that often a baby whose weight exceeds the stated maximum will be allowed to deliver vaginally.

In connexion with the big-baby factor in foetal loss, multigravidae are again at a disadvantage, for they have, on the average, larger babies than primigravidae.

Unexplained Death During Delivery

It is in this group that we should expect to find the cases which were lost owing to the resistance of the maternal soft parts, and therefore that the primigravida would fare worse than her multigravid sister in the matter of breech delivery. It is so. Two primigravidae but no multigravidae lost their babies. One of the babies was shown at necropsy to have had a subarachnoid haemorrhage and a tentorial tear: this delivery had been uneventful. The other baby had a rather precipitate delivery, but there was no post-mortem examination.

The use of an episiotomy for primigravidae (or even in multigravidae should there be difficulty) and careful controlled delivery should make these deaths reasonably infrequent. Where the after-coming head does not emerge from the vagina with moderate jaw-and-shoulder traction, the application of forceps is probably the least damaging and most easily controlled method of delivery. It is significant that in the two cases mentioned above no difficulty was experienced in delivery—quite the contrary in the case which unfortunately delivered precipitately. Lack of control of the head at delivery is probably as dangerous as mere pressure from the more resistant soft parts of the primigravid parturient.

In breech delivery under home conditions the primigravida would offer a much more difficult problem, for the resistance of the soft parts is often surprising. Rough handling due to anxiety and the absence of quickly available forceps or anaesthesia would considerably increase the primigravid foetal loss.

Delivery With No Attendant

This is likely to happen only in a multigravida. The baby lost in this series might have died in any event, as it weighed only 4 lb. 4 oz. (1.9 kg.), but the trauma it had received in the ambulance on the way to hospital must have added considerably to its chances of dying.

There was another patient who had a history of three previous stillborn babies due to very rapid delivery with the breech presenting: she was never able to get help before the baby was born, as her labours lasted only about an hour. This patient was seen for the first time, antenatally, with her fourth breech presentation, too late in pregnancy for external version to succeed. We finally achieved a live baby by keeping her in hospital for the last two weeks of pregnancy; she delivered in two hours.

Cervical Dystocia

It is the premature baby which is most likely to die from this cause. These babies have relatively large heads for the size of their bodies: the body slips through the undilated cervix and this then clamps down round the neck. It is a condition more often seen in the primigravida, although in our series the one example was in a multigravida.

It is stressed again that comparison is being made only between cases delivered under good hospital conditions. The reason for the relatively high multigravid breech mortality is now apparent. Most of these factors leading to loss of foetal life are as likely to occur in the multigravida as in the woman bearing her first baby. Perhaps, as in prolapsed cord, disproportion at the brim, and delivery without an attendant, they are more likely to do so. The possibility of foetal loss due to the resistance of the maternal soft tissues is greater in the primigravida, but this should be reduced to a low figure in good hands.

The Bearing of these Conclusions on the Management of Breech Cases

Breech presentation should be avoided wherever possible in multigravidae as well as in primigravidae. If any given obstetrician favours version under anaesthesia for the one, he should do so for the other under the same conditions. It is not proposed to argue the pros and cons of external version under anaesthesia. Figures help little, for the foetal mortality attributable to version under anaesthesia varies with the operator—his choice of case, the force he uses, and his readiness to retire defeated. Reported mortalities for the manoeuvre vary from 1.7% (Peel and Clayton, 1948) to 13% (Wrigley, 1934), though the latter figure may include deaths other than those attributable to the version itself. It is merely argued that the multigravida and the primigravida should be treated alike in this respect.

Where breech delivery is inevitable, the pelvis should be estimated by radiographs, as well as by vaginal examination, even in multigravidae. This should eliminate tragedy due to a contracted brim being overlooked. It also overcomes the difficulty that the diagonal conjugate is only a rough measure of the obstetrical capacity of the inlet. It is stressed again that an obstetrical history of successful delivery of large babies by the vertex is no guarantee that the pelvis is suitable for breech delivery.

All breech cases should be admitted to hospital for delivery, which should be conducted, or at least supervised, by competent obstetricians. There is no place for complacency in the management of multigravid breech presentation, which is sometimes considered to be a case to be handed over to a junior houseman; in fact, it is still officially regarded by some authorities as a district midwife's delivery.

Summary

Published figures do not support the general impression that breech presentation in a multigravida is a less serious matter than in a primigravida when delivered under good hospital conditions.

A series of 243 consecutive breech deliveries and extractions performed in St. Mary's Hospitals, Manchester, was analysed to make a comparison between the results obtained in multigravidae and those in primigravidae, and to study the factors involved in the foetal loss.

The factors found to be concerned in the foetal loss were prolapsed cord, disproportion at the brim (contracted brim or large baby), delivery without an attendant, and soft-tissue dystocia.

The factors referred to operate more often in multigravidae than in primigravidae, with the exception of the resistance of the maternal soft parts. This explains the fact that both in this series and in the literature the foetal mortalities in the two groups are roughly similar, for the foetal losses due to resistance of maternal soft parts should be reduced to a very low figure by competent obstetricians.

Multigravidae with breech presentations should receive just as much obstetrical care as primigravidae. Version (if favoured by a particular obstetrician) is at least as strongly indicated in

the one as in the other. The pelvis should be carefully estimated in both, and all breech presentations should be delivered in hospital under responsible supervision.

I gratefully acknowledge the help and advice given to me by Dr. J. W. A. Hunter and Professor W. I. C. Morris in the preparation of this paper.

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LABIAL DIPHThERIA

REPORT ON 46 CASES AMONG BRITISH PRISONERS OF WAR IN THE FAR EAST

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Labial diphtheria is something of a curiosity, and I confess to having obtained a "literature" only after a fairly extensive examination of British and American publications. How often the lips became implicated in pre-antitoxin days is difficult to assess, though Bretonneau (1821) refers to his colleague Dr. Guersant, physician to the Hospital for Children, as having "frequently observed the pellicular affection of the vermilion part of the lips." Certainly, with the advent of diphtheria antitoxin as a therapeutic agent a labial localization became rare. As instance, Goodall (1928) reports that he "has twice seen membrane on the tongue, three times on the lips, twice on the floor of the mouth, and once on the gums." Top (1941) records only one case with labial membrane in his series of 6,011 patients with diphtheria, while Rolleston (1925) seemingly did not observe such a localization among 3,000 cases of diphtheria.

Rundle (1929) allows that buccal lesions may very rarely be the first sign of diphtheria, but points out that involvement of the buccal mucous membrane, the tongue, and the lips most commonly arises from failure to arrest the spread of the membrane in late severe faucial diphtheria. Cases of this latter order are probably more common than the literature would suggest, for Reiche (1914) records 49 examples of lesions of the lips among 7,314 fatal cases of diphtheria in Hamburg. Instances in which labial membrane has occurred as a separate and distinct localization are certainly much less frequent, although Anderson (1943) has reported a labio-faucial infection and van der Molen (1935) a naso-labial case. The last-mentioned patient, a boy of 3 years, presented membrane on both upper and lower lips, on the tip of the tongue, and in the nostrils. The throat was normal and cultures of the lips yielded diphtheria bacilli.

The most infrequent event of all has been the development of labial membrane unassociated with involvement of either the nose or the throat. Indeed, two American observers, Lavender and Squires (1938), meeting a case of pure labial diphtheria unassociated with involvement of nose or throat in a coloured girl aged 10 years, and believing theirs to be the first recorded instance of this localization, assert that in the literature no mention can be found of cases in which diphtheria involved the lips and buccal membrane alone, with repeated negative clinical signs in the nose and throat. However, a prior claim certainly exists, as

represented by the striking case instanced by Tomb (1925) of diphtheritic stomatitis with membrane on the tongue, lips, and cheek but not on the fauces.

These cases, while in no way purporting to represent a complete survey of the literature of labial diphtheria, suffice to emphasize the rarity of this localization and to allow the conclusion that membrane may appear on the lips in the following circumstances: (1) as a direct extension of membrane in late severe faucial diphtheria; (2) as a very occasional accompaniment of nasal or faucial diphtheria; and (3) as an exceptional phenomenon in the absence of diphtheritic infection of the nose and throat.

The Cases

This paper relates to a group of 46 cases of labial diphtheria observed among British prisoners of war in a Japanese prison camp on Singapore Island during the period February 15, 1942, to February 15, 1943, and constituting part of an extensive epidemic of 940 cases of diphtheria, both respiratory and non-respiratory. In 24 instances no focus of diphtheria other than the lips seemed to exist. In four of the early examples negative cultures were obtained from the nose and throat. Thereafter shortage of material and pressure of work on our limited laboratory facilities, already fully extended, compelled us to refrain from taking such cultures provided the throat and nose were clinically clear. An associated localization was present in 22 patients, the second focus being an anterior nasal rhinitis in three, faucial diphtheria in eight, naso-faucial diphtheria in four, and a coexisting cutaneous diphtheritic lesion in seven.

The Predisposing Lesion

The key to the occurrence of the labial affection lay, beyond all question, in the existence in every case of a definite, specific predisposing lesion. This lesion, which was present for days or even weeks before the advent of the diphtheritic disease, comprised the highly characteristic cheilosis, maceration, and fissuring at the corners of the mouth first brought to the notice of the medical profession as a probable deficiency state by Stannus (1912, 1913) under the name "angular stomatitis" and finally differentiated as an expression of riboflavin deficiency by Sebrell and Butler (1938). The labial manifestations of hypo-riboflavinosis were of extreme frequency and often considerable severity among the prisoners. Severe cases not infrequently showed some heaping up of sodden, macerated, whitish epithelium at the corners of the mouth, but this bore no real resemblance to a true labial membrane and did not give rise to confusion.

Slight trauma to the lip in the presence of an existing faucial infection is considered by Anderson (1943) to be the predisposing factor in his case of labio-faucial diphtheria, and he expresses surprise that labial membrane is not more often seen. In view of the apparent readiness with which lesions of the lips became infected in my series and how widespread are minor lesions of the lips—minor trauma, impetigo, herpes labialis, and the like—in normal practice, it is indeed remarkable that labial membrane has long remained a curiosity.

Bacteriology

In the circumstances prevailing in a Japanese prisoner-of-war camp complete bacteriological finality was not possible. Single cultures for the *Corynebacterium diphtheriae* were taken from the lips in 25 cases, and 19 of these proved