sulphathiazole ointment to form a fairly stiff paste. The formula for this ointment is:—

Powdered Sulphathiazole	25 g.
Ethyl aminobenzoate	3 g.
Eucalyptol	0.5 c.c.

Add equal parts of petrolatum and lanolin to make 100 g.

This paste is packed into pockets, well under loose gum margins and into the interdental spaces back and front. When the packing is complete it can be sealed into place by drying the gums and teeth and painting over with Portex Medicated Plastic Skin. For the next three or four days the dressing of the previous day should be removed, the mouth well rinsed with peroxide and then with warm water that has boiled and been allowed to cool. A new dressing is applied and sealed in as before. After three or four days it is sufficient to apply the treatment on alternate days until the condition has cleared. A steady and progressive improvement should be noticeable from the first dressing.

The systemic treatment is as follows:—An initial dose of 4 g. of sulphathiazole, and thereafter 1 g. every four hours for seven days. While

taking these tablets patients must be warned not to eat cheese, onions or eggs and not to take Epsom salts. They must drink plenty of water, and must adhere rigidly to punctuality in taking the dose every four hours, even to being awakened during the night strictly on time.

I do not wish to make any extravagant claims for this treatment; but I do claim that it has given, and is giving good results, even in most virulent cases.

As yet we have insufficient data for an accurate evaluation of local sulphonamide therapy. Much of that which we have is based on the presence or absence of pain, the healing agent, the state of the tissues and so on. These are not easy to analyse. Then again, other drugs may be used at the same time, and all this makes accurate evaluation difficult. There is still experimental work to be done to determine the precise healing effects of the sulphonamides, and dosage in local application needs much more accurate definition, for we are hardly beyond an empirical stage. It is quite possible, as Sinclair and Barker pointed out early in the history of sulphonamide therapy, that an excessive dose of the drug may delay rather than promote healing.

TOXAEMIA OF PREGNANCY

being

Observations on the Prognosis, Maternal and Foetal, in Pre-Eclampsia and Eclampsia
Made Over a Period of Twenty Years in the Same General Practice.

By L. N. JACKSON, M.C. D.M. (Oxford)

By pre-eclampsia is meant a toxæmia usually, though not invariably, manifesting itself in the latter half of pregnancy and characterised clinically by a more than physiological rise in the blood pressure, the presence of albumen in the urine and the appearance of oedema, "renal" in distribution.

The incidence of pre-eclampsia clearly varies in different localities, the average figure usually given for the British Isles being in the region of 3 per cent. In a series of 1,267 consecutive pregnancies seen in this practice during the past 20 years pre-eclampsia was noted 40 times; once in each of 33 patients, twice in three, and once in a patient who had had eclampsia with two previous pregnancies.

The figure 1,267 comprises 1,014 labours attended by one or another partner of the practice, together with 253 cases confined by district midwives after ante-natal examination by a member of the firm. The incidence of pre-eclampsia in this series is thus approximately 3.2 per cent. In this same series the

incidence of eclampsia was only three, in two of which there was a history of a previous attack. This tallies reasonably well with the usual textbook figure for eclampsia of 1 per 580 pregnancies and is almost certainly accurate, since eclampsia could scarcely escape the notice of a Gamp, still less of a district midwife, and would certainly be referred to a doctor.

Analysis of 40 Cases of Pre-eclampsia

All these cases were treated *secundum artem* as soon as diagnosed and of them 22 occurred in primigravidae, 18 in multiparae. Pre-eclampsia was seldom observed among the younger mothers, the average age of the whole group being nearly 30 and of the primigravidae, 29.

Seventeen patients were 30 years old or more at the time of their first attack. The youngest patient was 21, the oldest 42. Though twins are relatively common in this county pre-eclampsia associated with twins occurred only once in this series.

In 20 cases pre-eclampsia was not diagnosed until the ninth month of pregnancy; all these went to term or nearly so; medical induction at the 39th week was done in two cases; two foetuses, one the second of twins, were stillborn.

In three cases pre-eclampsia was diagnosed during the eighth month of pregnancy; in none of these was induction performed; two foetuses were born macerated, one at term and the other at the 38th week.

In 11 cases the diagnosis was made during the seventh month; seven of these did not go to full term; three were surgically induced, one during the seventh month, one at 37 weeks and one at 38 weeks; there were four stillbirths only one of which occurred after induction.

In four cases the diagnosis was made during the sixth month; none of these carried to term; only one was (medically) induced at 37 weeks; there were three stillbirths.

In two cases the diagnosis was made at the fifth month; both were induced, one surgically at the eighth month, the other medically at 39 weeks; neither foetus was stillborn.

Thus foetal mortality was 11 out of 40, more than 25 per cent. Nine foetuses were born macerated; another non-viable, survived only a few minutes; the eleventh, the second of twins, a footling and very small, was virtually stillborn.

It is significant that of the six patients showing subsequent persistent morbidity, no less than five had more than one attack of toxæmia.

Maternal Mortality and Morbidity

Among these 36 pre-eclampsics there was no immediate mortality and it has been possible to follow up all but three of them over periods ranging from one to nineteen years. Judged by the ordinary clinical standards required for life insurance, including estimation of the blood pressure and examination of the urine, 22 of these women seem to be physically none the worse for the experience of one or more attacks of pre-eclampsia and show no evidence of a persistent or progressive renal lesion. Five others who have left the neighbourhood are reliably reported to be alive and well. Six only show persistent subsequent morbidity.

Case I.—A multip seven, aged 39 when first attended during her eighth pregnancy in 1935, gave a history strongly suggestive of pre-eclampsia with her fifth pregnancy which ended in a still birth. During her eighth pregnancy signs of pre-eclampsia were noted at the seventh month; there was oedema of the legs, albuminuria in considerable quantity and hypertension (220/140). About the same time foetal movements ceased. Surgical

PREGNANCY

	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>Fourth</i>	<i>Fifth</i>	<i>Sixth</i>
Case 1	Miscarriage.	Pre-eclampsia with live birth.	—	—	—	—
Case 2	Pre-eclampsia with live birth.	Miscarriage.	Pre-eclampsia with live birth.	Miscarriage.	—	—
Case 3	Normal.	Normal.	Miscarriage.	Pre-eclampsia with live birth.	Miscarriage.	Normal.

The well-recognised association between pre-eclampsia and miscarriage was noted in three cases:

Recurrent Toxaemia

Although four only of these 37 patients were attended by one or another partner in this practice for toxæmia recurring in a subsequent pregnancy, a follow-up revealed the fact that recurrent pre-eclampsia occurred in a total of seven patients; an eighth had pre-eclampsia with her third pregnancy after having eclampsia with her first two. (This case is discussed under the heading of eclampsia.) Five patients had two attacks each; a sixth had three attacks; a seventh four attacks.

induction resulted in the delivery of a small macerated foetus. Three years later she became pregnant for the ninth and last time. During the final month of this pregnancy a cloud of albumen appeared in the urine and the blood pressure was 150/100. She was delivered at term of a live child. Thus, her first four pregnancies were normal and so were her sixth and seventh; with her fifth (probably), and with her eighth and ninth (certainly), she was toxæmic. Eight years after her final pregnancy her blood pressure was 165/109, but the urine was of "good" specific gravity and free from albumen. She looked and felt well and was (and is) leading an active life. She should probably be regarded primarily as a case of essential hypertension.

Case II.—A primigravida, aged 27, when first attended in 1929, developed signs of pre-eclampsia at the eighth month. Despite treatment, intermittent albuminuria persisted to term when she spontaneously delivered herself of a macerated foetus. There was no further pregnancy. Nine years later she began to show evidence of myocardial failure. Sixteen years after her attack of pre-eclampsia her blood pressure was 190/90 and she had auricular fibrillation with oedema of legs. The urine was of low specific gravity but free from albumen and she remains a "cardiac" invalid. Unfortunately there is no record of her medical condition before pregnancy.

Case III.—A multip one, aged 34, when first attended during her second pregnancy in 1927, developed pre-eclampsia with this and again with her third pregnancy. The first pregnancy was normal. The first attack of toxæmia (second pregnancy) was mild. She went to term and was delivered of a live child. The second attack (third pregnancy) resulted in the spontaneous delivery of a macerated foetus at the seventh month. There were no further pregnancies. Eleven years after her second attack of pre-eclampsia she developed thyrotoxicosis which was treated surgically. One year after thyroidectomy and 12 years after her second attack of toxæmia the blood pressure was 185/95 and the urine showed a haze of albumen. Her general condition is poor.

Case IV.—A multip two, age unrecorded, first seen during the third pregnancy in 1935 had a history of a normal first pregnancy but of pre-eclampsia with her second. At the end of her third pregnancy she developed pre-eclampsia again and was delivered near to term of a live child. Hypertension (170/95) persisted at any rate for several weeks. She left the neighbourhood and no further follow-up was possible but she was reported alive and well four years later.

Case V.—A multip 2, aged 22, had had two normal pregnancies when first seen during her third pregnancy in 1937. At the 38th week she showed signs of toxæmia and spontaneously delivered herself somewhat prematurely of a healthy child. There was no further pregnancy. Nine years later the urine was normal but the blood pressure 150/80. She was pale and dyspnoeic on exertion.

Case VI.—A pre-eclamptic primigravida, aged 25, when first seen in 1931 at the request of her own doctor, was delivered by forceps of a macerated foetus at the 39th week. She had three subsequent pregnancies but was not attended by a member of this firm. Pre-eclampsia recurred in all these subsequent pregnancies. The second and fourth terminated at the seventh month; the third, like the first, went almost to term. Despite hospital

treatment with these last three pregnancies all four ended in still births. At the age of 38 her urine is normal and blood pressure 145/110.

Eclampsia

The difference between pre-eclampsia and eclampsia is possibly merely one of degree; the clinical criterion of difference being the onset of convulsions in a patient showing previous evidence of pre-eclampsia which has not responded adequately to treatment, or possibly there is a constitutional eclamptic factor in these patients. If the immediate and remote maternal prognosis in pre-eclampsia has been good, the same cannot be said of the three cases of eclampsia which have occurred in this series.

Case I.—Mrs. C., Multip 1, aged 37, when first seen during her second pregnancy in 1925 with a history of difficult labour, eclampsia, and stillbirth nine years before, showed slight albuminuria at the 38th week. A week later she went into labour and delivered herself of a healthy male infant. During the third stage of this labour she had one slight fit and one further fit only after delivery of the placenta. She recovered and had one subsequent pregnancy three years later during which albuminuria appeared at the 37th week. A week later she went into labour and delivered herself of a macerated foetus. Thus, she has eclampsia twice and pre-eclampsia once with two out of three children stillborn. Hypertension persisted and she died in 1944—19 years after her second eclamptic pregnancy—of a massive cerebral haemorrhage.

Case II.—Mrs. H., a primigravida, aged 26, when first seen in 1943, began to show a rise in blood pressure at the second month (140/90). Albuminuria appeared at the sixth month and oedema at the 37th week. The onset of a slight premature labour was heralded by two fits and repeated fits occurred during the first stage. High forceps were applied and a stillborn infant was delivered with difficulty. Post partum there were three slight fits followed by a day of coma and then improvement. Eight months later albuminuria and hypertension (155/95) were still present. Three months later petechiae appeared on the buttocks and thighs. Seventeen months later she complained of breathlessness on exertion, morning headache, and nausea and occasional puffiness of eyelids; there was oedema of ankles at night. The heart was enlarged, the blood pressure 180/110 and the urine, of low specific gravity, contained heavy cloud of albumen. She was referred to Dr. Horace Evans. Nineteen months after her attack of eclampsia he reported that her condition was deteriorating rapidly. There was gross anaemia (Hb 52 per cent) and a high blood-ure-

(180 mgs per cent), indicating a severe degree of renal failure presumably due to chronic bilateral nephritis. The condition was complicated by the presence of a tuberculous cavity in the left upper lobe and though she temporarily benefited from blood transfusions her expectation of life is to be measured only in months.

Case III.—Mrs. M., multip 1, aged 41 when first seen during her second pregnancy in 1934, had a history of eclampsia and a live child delivered by Caesarian section eleven years previously. During her second pregnancy she showed hypertension (160/90) at the second month which persisted and increased. Albumen also appeared at the second month and increased in quantity. Oedema of both legs was noted at the fifth month. At 5½ months the urine became smoky and scanty. At the 6th month the patient complained of headache, became drowsy, and had two fits. Surgical induction was performed and a non-viable foetus, which, however, survived a few minutes, was delivered. Oedema rapidly subsided and the blood pressure fell from 210/120 to 180/110. There were no further pregnancies. This patient had eclampsia twice and one stillbirth. Nine years after the second attack of eclampsia she looked and felt well and the urine was normal, but there was persistent hypertension (210/120 at the age of 50).

Thus, of three eclamptics, one is dead, another dying, and the third markedly hypertensive. Among these three patients a total of six labours, five of which were eclamptic and one pre-eclamptic, produced only two live births.

Summary and Conclusions

1. The incidence of pre-eclampsia and eclampsia in a general practice over a period of 20 years has been investigated and recorded.
2. In a series of 1,267 consecutive confinements, pre-eclampsia was noted 40 times and eclampsia 3 times.
3. All three eclamptics and 33 pre-eclamptics have been followed up over periods ranging from one to nineteen years.
4. Foetal mortality in these conditions, the recurrence of toxæmias of this type in subsequent pregnancies and the association between toxæmia and miscarriage have been noted.
5. Maternal mortality and morbidity following (a) pre-eclampsia and (b) eclampsia are discussed and contrasted.

Thanks are due to my wife, Dr. Margaret Hadfield Jackson, and to my partner, Dr. Norman Sawyer, for much helpful, if painful criticism.