some of her housework. The best result was obtained in Case 2 (coronary sclerosis, angina pectoris). Before the operation the patient could walk only a few yards without being stopped by pain. He is now back at full heavy work, with little or no pain.

We think it fair to say that the two deaths from cerebral haemorrhage were secondary to the hypertension, which is not affected by the operation. The cardiac symptoms were improved in both, in one greatly. Of the remaining five cases two were failures, the others successful in varying degree, in one with return to full activity. When it is recalled that all seemed to be hopeless cases, in which every other form of treatment had failed, we feel that the measure of success attained has been gratifying. The two failures, however, show that further investigation is required in order to work out more clearly the indications for the operation.

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RESULTS OF ANTE-NATAL ADMINISTRATION OF QUININE*

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Although the idea of giving small doses of quinine during the last few weeks of pregnancy is by no means new, the literature on the subject is scanty. I have been able to find only two papers in the English literature which give results and figures showing the effect on labour, although several others mention the method and claim certain advantages for it.

Mitchell¹ described results of giving quin. sulph., 1½ grains t.d.s., during the last three weeks of pregnancy to a series of 400 cases spread over seven years. He made strong claims for the advantages of the method, which I quote verbatim:

"(a) The general health is improved.

"(b) Labour is made easier and shorter.

"(c) Uterine retraction is uniformly good.

"(d) There is no increased tendency to premature labour, precipitate labour, retained placenta, perineal laceration, or after-pains."

The author gave no detailed figures, but said that in "straightforward cases" duration of labour averaged six hours in primiparae and three in multiparae. The length of labour was calculated from the onset of pain severe enough "to make the patient hold on to a chair."

Buddee² used a similar method at Queen Charlotte's in 100 cases. He gave details of the labours compared with controls. He found no support for Mitchell's claims, with the exception of a possible benefit to the patient's general health. It is noteworthy that whereas Mitchell referred only to "straightforward cases," the only cases excluded by Buddee were those of albuminuria and gross disproportion.

Such great disparity between the only two series of cases published calls for further inquiry. If Mitchell's claims can be confirmed we have at our disposal a simple method of reducing the great dangers of everyday obstetrics—namely, the abuse of forceps, haemorrhage, and sepsis.

It appears to me that, in order to test the action of quinine on the uterus from the clinical point of view, it is necessary first of all to observe its effect on a series of cases which appeared normal during the ante-natal period. This should give an idea of the effect on the uterine action under conditions which are as near as possible to standard. If any beneficial result can be shown one may then consider the possible uses of the method in abnormal cases. But the inclusion of abnormal cases in the first series introduces so many varying factors that it becomes impossible to decide what part, if any, the quinine is playing.

Material Reviewed and Results

This short paper gives the results of the ante-natal use of quinine in fifty consecutive normal primiparae, with controls. By "normal" I mean cases which showed no abnormality whatever during the ante-natal period. Thus I have excluded all patients below the age of 18 and above 30, all cases where the head was not engaged by the thirty-eighth week of pregnancy, and also cases of albuminuria, heart disease, or other complications of pregnancy. All patients were given quinine bihydrochloride, 2 grains t.d.s., in tablet form, from the thirty-sixth week of pregnancy onwards. The results obtained are shown below.

Onset and Duration of Labour.—The figures are taken from fifty cases in which labour started after the thirty-

* A paper read before the Midland Obstetrical and Gynaecological Society, May 20th, 1935.

eighth week. In addition, two cases in the quinine group and eleven in the controls started before this time; details of these labours are not included in the results. I am sure that the incidence of premature labour in the control group is abnormally high, because after the thirty-eighth week the time of onset of labour was approximately equal in both groups. Only one case—a control—went more than two weeks over the calculated date of labour. The other results are shown in the tables.

	Time	Quinine	Control
Stage 1:	Under 12 hours ...	33 (66 %)	20 (40 %)
	12 to 24 hours ...	12 (24 %)	21 (42 %)
	24 to 36 hours ...	3 (6 %)	6 (12 %)
	Over 36 hours ...	2 (4 %)	3 (6 %)
Stage 2:	Under 1 hour ...	34 (68 %)	20 (40 %)
	1 to 2 hours ...	12 (24 %)	21 (42 %)
	Over 2 hours ...	4 (8 %)	9 (18 %)
Stage 3:	Under 1/2 hour ...	45 (90 %)	47 (94 %)
	1/2 to 1 hour ...	5 (10 %)	3 (6 %)
	Over 1 hour ...	—	—

It will be seen that in 66 per cent. of the quinine cases the first stage of labour lasted under twelve hours, as compared with only 40 per cent. of the controls. In the longer first stages controls predominate. The second stage shows similar results—namely, 68 per cent. of quinine cases were under one hour in this stage, compared with 40 per cent. of controls, which again are in excess in the long second stages. In the third stage the results are very slightly in favour of the controls.

Haemorrhage.—There was no case of severe post-partum haemorrhage in either series, and no marked difference in the amount of blood lost. Pituitrin was necessary in four cases in the quinine series, and in six of the controls.

	Quinine	Control
Under 10 oz. ...	32 (64 %)	29 (58 %)
10 to 20 oz. ...	7 (14 %)	7 (14 %)
Over 20 oz. ...	6 (12 %)	6 (12 %)
Not noted ...	5 (10 %)	8 (16 %)
Pituitrin ...	4 (8 %)	6 (12 %)

Lacerations were almost equal in incidence.

	Quinine	Control
First degree ...	13 (26 %)	13 (26 %)
Second degree ...	4 (8 %)	6 (12 %)
Third degree ...	—	—

Puerperium.—In the quinine series four cases were morbid according to the B.M.A. standard. One of these was due to pyelitis. There were two morbid cases in the controls. None of these cases needed special treatment. **Stillbirths:** None in either series. **Forceps:** One in quinine series for foetal distress.

Conclusions

Although it is admittedly dangerous to draw conclusions from a small series of cases, certain salient facts do emerge from this investigation.

1. The tendency to onset of premature labour is, if anything, diminished by the ante-natal administration of quinine.
 2. The first and second stages of labour are accelerated without damage to mother or child. Inertia is not entirely abolished.
 3. The absence of cases of retained placenta or severe post-partum haemorrhage in both series makes it impossible to decide whether the incidence of these conditions is reduced or not. A much larger series of cases would be needed to prove this point. Bearing in mind the increased activity of the uterine muscle during the first and second stages of labour, one would expect a similar increase during the third stage.
 4. There is no evidence of any direct influence on involution and the puerperium. Here again a larger number of cases is required.
- The results suggest that the uterine action is strengthened by giving small doses of quinine during the

last month of pregnancy. If we accept this fact the method is surely to be recommended as a routine for use in normal, and especially in abnormal, cases, for there are few if any conditions in obstetrics where good uterine contractions are not a valuable factor. A method which helps to secure these, and which is simple and safe enough for use in domestic practice, appears to me to deserve more attention than it has had up to the present time.

In conclusion I wish to thank my colleagues on the staff of the Birmingham Maternity Hospital, who have kindly allowed me to use their cases in preparing this paper, and also the members of the resident medical staff for their help in collecting the figures.

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FURTHER EXPERIENCE OF THE USE OF QUININE IN NORMAL LABOUR

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Over five years ago one of us (D. A. M.) published a paper¹ entitled "Use of Quinine in Normal Labour." The method used owed its origin to Dr. Philip Jones of Coleford, in Somerset, and consisted in the giving of a quinine salt in small doses (1½ to 2 grains thrice daily) for a period of two or three weeks prior to the expected date of labour. At the time this paper appeared Dr. Jones and the author (D. A. M.) had observed, and carefully followed up, something over 400 cases in general practice. The beauty of the method lay in its simplicity.

During the past five years it has been shown by letters to the medical journals, by discussions in medical societies, by the thesis of one of us (H. N. B.) accepted for the degree of D.M., and by personal correspondence, that the method has attracted wide attention both in this country and abroad. Some criticisms have been fairly, and some unfairly, made, and the time seems ripe to reply to our critics and to produce further support for the original claims.

Re-examination of Claims

We propose to discuss seriatim the four claims that were originally made for the method in the paper published in the *British Medical Journal* in 1930. We do this in the light of more recent experience, paying due regard to any criticisms that may have been put forward.

1. "The General Health of the Patients is Improved"

We hardly feel obliged to support this claim. The undeniable tonic action of quinine in small doses should alone be sufficient argument. There is, however, stronger evidence submitted in the correspondence of Green-Armytage,² Gair Johnston,³ and others in the *Journal*. Apart from this, we have noted since the earliest days of the investigation (some twelve years ago) that many patients liable to dyspepsia and heartburn in the later months of pregnancy are cured of these symptoms by the prescription of quinine. At first this was rather puzzling, as it was not realized how many of these patients were suffering from hypochlorhydria, and the tendency was to treat them—unsuccessfully—with bismuth and alkalis. If it should be argued that the improvement is due to the few minims of acid used to dissolve the quinine in the original prescription, we shall not feel inclined to dispute the point.