hyperaemia by warming the leg up in any way; the worst cases occurred among those who, against instructions, had put their feet by a fire as soon as they took off their boots. The damage caused by the wet and chill leads to stagnation of the circulation and then hyperaemia, with oozing of fluid from the capillaries and diminished vitality of nerves, skin, and muscle; in severe cases irreparable loss of function may result, but in the milder cases the tingling, pains, and oedema subside in one or two weeks. The hyperaemic stage may last many weeks with sometimes intense hyperaesthesia, but in most of my cases full recovery occurred within 6 weeks. In some men there had been a lifelong tendency to cold hands or feet; and in the worst cases lasting sequelae, including hyperhidrosis and extreme sensitivity to cold, may persist.

As a rule immersion for periods of many days is necessary to produce symptoms, as has been the case with numbers of men torpedoed at sea and remaining afloat for a long time in open boats; but sometimes minor degrees follow shorter periods. This occurred, for example, in the case of an officer who fell into the sea during the glider landings in Sicily and had to stand in the water hidden under a cliff for about 10 hours, after which he walked some 18 miles in a hot sun; later his feet swelled and became anaesthetic—symptoms which still persisted when I saw him 8 days later.

No specific treatment was given, but strict avoidance of any artificial heat, as by hot-water bottles, was essential, and cooling by fans has often been adopted. Careful Buerger's exercises seemed to do good.

Anxiety States

In the fighting in North Africa, as in other theatres, many acute anxiety states and conditions of severe physical exhaustion or terror occurred, as well as gross sensory and motor manifestations of hysteria. Few things in the future may be of more far-reaching importance than the development of personnel selection and the attempt to prevent psychological breakdowns under stress and strain. How far the art of selection of men and women may go in education, industry, or social life no one can foretell, but war psychiatry has certainly shown the way in its insistence upon the testing of a man's personality and intelligence, as well as his physique, before choosing him for any special appointment.

To me, however, it was almost more remarkable to see, not how many men broke down in battle, but how much the human mind and body were able to stand without collapse. A soldier lay under a truck with his friend while being bombed; his friend crawled half out to look around, and when, a little later, the first man pulled him back, his head had completely disappeared. Is it surprising that the survivor developed an intense hysterical blindness?

Most breakdowns at or near the battle-front occurred in the psychologically predisposed, and it should therefore be possible to some extent to detect the mentally unfit by careful selection before they get so far. War is teaching us more and more just how much we are able to select and judge in advance, and just how near the real thing methods of trial and training have got to be before we can eliminate early the psychologically unfit.

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The *Housing Manual*, 1944 (H.M. Stationery Office; 2s.), which has been prepared by the Ministry of Health and the Ministry of Works and sent to all local authorities in England and Wales, gives technical guidance to local authorities, architects, builders, manufacturers, and others on the lay-out, planning, construction, and equipment of permanent houses to be built under the Government short-term housing programme covering the first two years after the end of the war in Europe. In the light of this technical guidance local authorities will now prepare their own plans. In general, the standards recommended are those proposed by the Design of Dwellings Subcommittee of the Minister of Health's Central Housing Advisory Committee (the Dudley Report). The ground covered in detail by the manual includes: Site planning and lay-out, plans of houses and flats, plans for special occupants—e.g., old people—efficiency in building, new materials and methods, services and equipment. The great majority of houses built by local authorities under the short-term programme are likely to be of the three-bedroom type.

ANALGESIA IN LABOUR

A RECORD OF 102 CASES TREATED WITH PETHIDINE

BY

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It is now nearly a century since Simpson discovered the use of chloroform as an anaesthetic and advocated it as an analgesic in labour. At that time there was a public outcry against any drug being used for the relief of labour pains, and it was only, one might say, by a Royal Warrant, that chloroform was accepted as an analgesic in labour. Times have changed, and there is now a growing tendency in this country for the expectant mother almost to demand that her doctor arrange that she should not feel pain during her delivery. In the United States of America this public demand has been so great that the use of analgesics in labour has been considered one of the causes of the high maternal mortality and morbidity rates from which that country suffered some years ago, as uterine contractions were interfered with to such an extent that operative deliveries were very often required. Since Simpson's advocacy of chloroform many other drugs have been tried, and up to now, though each has had its advocates, none has been found acceptable to all authorities; this is because the ideal analgesic has not yet been discovered. In 1906 Gauss, in Freiburg, advocated "twilight sleep,"—with a combination of morphine and hyoscine—and, though this was widely used for a number of years, reports of its apparent bad effect on the baby came from different sources, and for this reason it fell into partial disuse. We doubt, however, if all the allegations against twilight sleep are true, for it is common knowledge that not every baby cries immediately it is delivered; but, if twilight sleep was used and the babe was a little difficult to bring round after birth, this was immediately attributed to the analgesic. Series of cases have been reported from Edinburgh (Johnstone, 1917; Haultain, 1920-1; Greenwood and Hirschman, 1922) and elsewhere (*Proc. roy. Soc. Med.*, 1918) of excellent results with twilight sleep in the accomplishment of amnesia and analgesia without any really bad effect on the baby. As with many other treatments, there is a right and many a wrong way of administration, and if the correct rules as formulated by Gauss are observed, then the results, in our opinion, are good, whereas if they are departed from accidents may occur, and with twilight sleep it is the baby who may suffer. There is little doubt that if twilight sleep is employed properly it is a most useful and safe analgesic in the long tedious labour.

Nearly 20 years after Gauss's discovery Gwathmey (Gwathmey *et al.*, 1923) described his synergistic method, but though it has its advocates it has never found much favour in this country. In 1924 a barbiturate—somniafene (Cleisz, 1924)—was first tried in labour as an analgesic, and since that time a large number of derivatives of barbituric acid have been used, especially in the United States of America (Gould and Hirst, 1935), and each separate hospital and clinic which was visited there in 1939 seemed to be enthusiastic over its own special barbiturate, or combination; but this enthusiasm was usually confined to its sponsors, and was not shared by other hospitals.

Conditions for the Ideal Analgesic

A most comprehensive treatise on the relief of pain in labour was read before the eleventh British Congress of Obstetrics and Gynaecology by Sturrock (1939), showing, as well as does this short preamble, that the ideal analgesic in labour has still to make its appearance. That being so, one is always on the look out for any new preparation that might fulfil the conditions essential for the ideal analgesic. These conditions might be summarized as follows:

1. That the analgesic does not endanger the life of the mother or have any harmful effect upon her.
2. That it does not harm the child.

3. That the strength of the uterine pains are not diminished by its administration and that labour is not delayed by its use.
4. That there is no effect on the expected co-operation of the patient in the second stage of labour, and that operative intervention is not increased by its use.
5. That the third stage of labour is not prolonged after its use, nor is there any undue tendency to post-partum haemorrhage.
6. That the analgesic is easy to give and that no risks are associated with its administration.
7. That the analgesic is always successful in its action.

This standard is indeed a high one, but the perfect analgesic should fulfil all these conditions.

It was with great interest, therefore, that we learnt that a new analgesic had been discovered in 1939—namely, pethidine hydrochloride—and that it was found by various scientific workers to have an analgesic effect comparable to morphine and also to have a spasmolytic and sedative effect as well. On account of these properties there seemed to be a good chance that this analgesic might prove to be of great value during labour and might even approach the ideal. It was thus with some gratification that we were afforded liberal supplies of pethidine hydrochloride with which to carry out a preliminary investigation on its action in labour.

It would be superfluous to go into the chemistry and pharmacology of pethidine, as this has already been done adequately by Gallen and Prescott (1944), who also published their results in a series of 150 obstetrical cases; and Spitzer (1944) recorded his results in a series of 80 cases, the drug being given entirely by mouth in his series, whereas it was administered chiefly intramuscularly in the former. Previous to this, several observers in America (Gilbert and Dixon, 1943; Roby and Schumann, 1943; Schumann, 1944) had reported promising results of its analgesic action in labour; but as it is only by means of different series of results published by several observers that the full value of a drug can be assessed, we make no apology for adding a further account of the use of pethidine in 102 cases in which it was given intramuscularly during labour.

In this series 91 of the women were primigravidae and 11 multiparae, all having been admitted under our charge during a period of eight months; each was observed carefully by one of us, who made notes regarding the strength of the pains and the dilatation of the cervix, and decided when pethidine injections should be started and when further doses were required. After labour each case was assessed not only by a consideration of the observations made but also by conversation with the patient, so as to discover her evaluation and appreciation of the drug.

Dosage of Pethidine Hydrochloride

The first dose of 100 mg. was usually given intramuscularly when the os was 3 to 4 fingers dilated and the pains were coming on about every four to five minutes. The second dose of 100 mg., when required, was given 45 to 60 minutes later. In all, 44 cases received one injection and 40 two injections. A third injection of 100 mg. was necessary two hours later in 10 cases, and a fourth after another two hours in 2 cases. Pethidine was combined with hyoscine—gr. 1/150 with the first injection and gr. 1/450 with each succeeding injection in 6 cases.

Effect on the Mother

Of the primiparous patients 66 had normal spontaneous labours, whereas 22 babies were delivered by forceps and 4 by the breech (Table I). This would seem to be a high forceps rate (21.6%), but it can be explained by the fact that the patients were primigravidae, and also that the hospital where the investigation was carried out

TABLE I.—*Deliveries*

Primiparae (91)			Multiparae (11)		
Spont.	Forceps	Breech	Spont.	Forceps	Breech
66	22*	4*	10	1	Nil

* One patient was delivered of twins.

takes practically all the emergency and difficult cases from the vicinity, and therefore the average forceps rate for all cases is always inclined to be high (13.6% for 1941). Among these 22 cases the forceps were indicated for occipito-posterior positions in 9 cases, for contracted pelvis in 3 cases, and for deep transverse arrest of

the head in 1 case. In 4 cases forceps were applied to lift the head over the perineum, and in 5 for maternal or foetal distress. Among the multiparae 10 had normal deliveries and 1 was delivered by forceps for an occipito-posterior position.

In only 2 cases did the mother present any abnormality after delivery; 1 had a slight post-partum haemorrhage, and 1 suffered from marked tachycardia, which came on 30 minutes after labour and lasted for several hours. The latter patient had 4 doses of pethidine, the final dose being given 4½ hours before a difficult forceps delivery for an occipito-posterior position. There was no maternal mortality, and none of the patients suffered any toxic effects from the injections either during labour or subsequently. Thus it can be stated that, from this series, conditions 1 and 5 for an ideal analgesic, mentioned above, have been fulfilled, but that the fulfilment of condition 4 is doubtful.

Effect on Child

As regards the effect on the infant, there were no stillbirths in the 103 babies born (Table II). In only 4 cases was there any marked asphyxia: in two of them the asphyxia could be accounted for by a difficult forceps delivery, in one to eclampsia and a forceps delivery, and in another to the cord being held tightly round the baby's neck; all these babies responded to treatment and survived without giving any further cause for anxiety. In 22 cases the child did not cry immediately on delivery but responded in a few minutes; in only 8 of these cases was there no other possible reason found for the slight oligopnoea. None of these babies gave any cause for anxiety at birth or later. Thus it can be stated quite definitely from this series of cases, which includes many complications that might have caused asphyxia and possibly stillbirth, that pethidine had no deleterious effect on the infant; condition 2 was therefore fulfilled.

TABLE II.—*Effect on Babies*

Cried on Delivery	Sl. Oligo: noea	Asphyxia	Total	Mortality
77 (1 set of twins)	22	4	103	Nil

Effect on Labour Pains

With regard to its effect on labour pains, the administration of pethidine would seem definitely to have hastened delivery in 33 cases (Table III), the average time from the first dose to delivery in these

TABLE III.—*Acceleration of Labour (33 Cases)*

Primiparae	25	Multiparae	8
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being 2.6 hours. The clinical explanation for this effect seemed to be that the "edge" was taken off the pains, thus allowing them to be more effective and the patient to co-operate more easily in the second stage of labour; these were the statements that we obtained from interrogation of many of the patients, given quite on their own initiative without any prompting or suggestions by us. To these views of the patients themselves might be added another—namely, that the injections seemed in many cases to relieve spasm of the cervix and to enhance uterine polarity. The cervix therefore dilated more easily and the uterine contractions seemed to be accentuated, but were not so painful. On the other hand, the pains stopped in 9 cases, and in some of these did not return for several hours, the patient having apparently gone completely out of labour, even when she had evidently been in good labour previously. This was probably due to pethidine being given before the os was dilated sufficiently (2 to 3 fingers), but it is interesting to note as well that 6 out of the 9 cases had some abnormality present: 1 was a breech, 2 were occipito-posterior positions, 2 had contracted pelvis, and 1 was a case of twins. Therefore there might have been some disharmony of uterine action, as tends to happen in such cases. On the other hand, such abnormalities occurred in successful cases when pethidine was given with the cervix slightly more dilated, and the uterine contractions were not interfered with in any way. In a few cases uterine contractions did not seem to be affected by the drug, although in most there was some improvement in the efficacy of uterine action. Thus condition 3 is not invariably fulfilled, although it usually is, especially when no abnormality is present.

Analgesic Effect

The analgesic effect of pethidine was assessed under four separate headings:

(i) *Good*.—The result was considered good if pain was relieved, the contractions regular and efficient, dilatation of the cervix quick, and the patient rested well (usually slept) between the pains. (Amnesia was not an expected result with pethidine alone, and though it was obtained in some cases it was not considered as an essential to be achieved.)

(ii) *Satisfactory*.—The analgesia was considered satisfactory if the strength of the contractions was not interfered with, the cervix

dilated normally, and the patient rested well between pains which were bearable.

(iii) *Poor*.—Analgesia was considered poor when only slight analgesia was obtained and there was little rest between pains.

(iv) *Unsatisfactory*.—The result was considered to be unsatisfactory when the drug gave no benefit at all or caused the uterine contractions to cease.

Under these headings (Table IV) 47 results were considered to be good, 33 satisfactory, 11 poor, and 11 unsatisfactory. Thus 78.4% were definitely benefited by pethidine, and in 46.1% the result achieved was really good. Of the 47 cases classed as "good," 41 had spontaneous deliveries, 4 had occipito-posterior positions, 1 was a breech, and 1 a face presentation; only 4 of these patients required forceps. Among the 33 "satisfactory" cases 22 were spontaneous, 6 had occipito-posterior positions; 1 was a breech presentation; 1 had eclampsia; 1 had a contracted pelvis, and there was one set of twins; forceps were used in 10 cases. Among the 11 "poor" cases 8 were spontaneous, 1 had an occipito-posterior position, and 3 were delivered by the forceps. In the "unsatisfactory" cases, as previously detailed, 6 were normal.

TABLE IV.—Analgesic Effect on Mother

	Cases	Prim.	Mult.	Spont.	Abnormal
Good	47	40	7	42	5
Satisfactory ..	33	30	3	22	11
Poor	11	11	0	8	3
Unsatisfactory ..	11	10	1	5	6

Dosage Required

With regard to dosage the figures in Table V would seem to show that one injection of pethidine is very often sufficient to produce a good result, but if it does not then a second injection, given about an hour later, is usually all that is required. Of the "good" and "satisfactory" cases 72 required only two injections at the most; on the other hand, in cases in which, for some reason or other, labour is slow, the effect may be continued by third and fourth injections.

TABLE V.—Number of Injections Given

	Good				Satisfactory				Poor				Unsatisfactory			
No. of Injections	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Cases	20	21	6	—	17	13	2	1	3	6	1	1	6	4	1	—

Hyoscine and Pethidine Combination

Of the six cases which received hyoscine in addition, to try to produce a degree of amnesia as well as analgesia, two were classed as "good," one as "satisfactory," one as "poor," and two as "unsatisfactory." These cases were treated fairly early in the investigation, and as very little benefit seemed to result from the addition of hyoscine its use was not continued. Possibly, however, we were wrong in not giving hyoscine a more extended trial, as, theoretically, the addition of hyoscine should increase the benefit, and, as will be shown later, pethidine and hyoscine together would seem to be very efficacious in producing amnesia for Caesarean section performed under local anaesthesia.

General Conclusions

Summing up the facts obtained from the treatment of these 102 patients with pethidine, we can state that the ideal analgesic drug for labour has not yet been found, but that pethidine fulfils the conditions quoted comparatively well. It has apparently no harmful effect on either mother or child; there is no tendency to produce post-partum haemorrhage; and it usually does not retard uterine contractions—in fact, in one-third of the cases it seemed to enhance uterine action appreciably. It is not always successful in producing analgesia, but it did so in enough cases (78.4%) to make it a valuable drug to use in labour. Its administration involves no difficult routine, any slight deviation from which might be dangerous, as is so definitely the case with twilight sleep. It is possible that the forceps rate is slightly increased by its use.

In comparison with twilight sleep, analgesia is obtained in approximately the same number of cases as those quoted by observers of that form of treatment, but twilight sleep has the advantage in that it produces amnesia as well in a larger proportion of cases; the forceps rate is, however, higher with twilight sleep owing to the fact that the co-operation of the patient in the second stage of labour is not so satisfactory as with pethidine.

There is apparently no undue excitability under pethidine, such as may occur with twilight sleep or the barbiturates.

Premedication with Pethidine and Hyoscine

For a number of years one of us (W. F. T. H.) has been trying to find a really efficient drug or combination of drugs to employ in the premedication of a patient before carrying out a Caesarean section under local anaesthesia. Caesarean sections under local anaesthesia are associated with less risk than under a general anaesthetic, and for women suffering from cardiac lesions, pre-eclampsia, chest conditions, etc., it is certainly the ideal method. Under local anaesthesia the operation is as a rule most satisfactory provided the woman receives adequate premedication; but often patients awaiting a Caesarean section are very alert, being unduly excitable because of the immediate prospect of having a baby, and even strong doses of hypnotics and sedatives have not the usual effect. Premedication with morphine and hyoscine in the accepted dosage before an operation under local or spinal anaesthesia is contraindicated, as such a dose may have a bad effect on the baby, making it difficult to resuscitate, and in some cases might cause stillbirth. We considered, therefore, that pethidine and hyoscine should be given a trial in such cases, and up to now we have used it in 6 cases, with excellent results. 100 mg. of pethidine and 1/150 gr. of hyoscine are injected 45 minutes before the operation, and just before the patient is taken into the theatre she is given another 100 mg. of pethidine and 1/450 gr. of hyoscine. In all cases this premedication has acted well and analgesia and amnesia were perfect, the patient usually sleeping throughout the operation and remembering nothing about it when she woke up. In each case the baby cried as soon as it was delivered, and the uterus contracted down excellently, as it always does when local anaesthesia is being used alone. These cases may be just the "fortunate first" that often occur with any new therapy, but it would seem to be worth while to give this form of premedication an extended trial in such cases.

We desire to thank Messrs. Burroughs Wellcome for the supply of pethidine, and Messrs. Bayer Products Ltd. for the supply of dolantol—the two preparations used in this investigation. We also thank Sister Anderson and Sister Mackenzie, the day and the night labour ward sisters, for their great help and co-operation.

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SPONTANEOUS LOBECTOMY

BY

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During recent years it has become increasingly difficult to differentiate between a lung abscess and an empyema. There is no doubt that in many cases the infection is primarily in the lung tissue and only secondarily invades the pleural cavity. This has given rise to the term "pleuro-pulmonary abscess." In the following case the infection was so great that a complete upper-lobe lung slough became free in an empyema cavity.

Case Record

A man aged 43 was admitted to the General Infirmary at Leeds on Dec. 14, 1942, under the care of Mr. P. R. Allison. He gave the following history. On Oct. 17, 1942, he was seized with a sudden acute pain in the middle of the back while at work and rapidly developed a severe cough. He became so ill that he had to be taken home and put to bed. He was febrile, and on Oct. 20 was removed to a nursing home with a diagnosis of lobar pneumonia. A course of sulphapyridine was given: 2 g. stat. and 1 g. four-hourly