of hospitalization and isolation will need revision. It should not be assumed from this that I am in favour of abolishing fever hospital treatment for clinical scarlet fever, but rather that accommodation should be provided also for acute pharyngitis caused by the same organism.

I wish to express my thanks to Dr. F. Griffith for his co-operation in this work and his help and advice in the composition of this paper.

REFERENCE

Glover, J. A., and Griffith, F. (1930). *Lancet*, 2, 815.

VITAMIN E IN THE TREATMENT OF HABITUAL ABORTION*

BY

DAVID CURRIE, Ch.M., F.R.C.S., M.C.O.G.

Honorary Surgeon, Leeds Maternity Hospital

During the past few years the importance of the vitamins in the maintenance of the growing embryo has been repeatedly demonstrated. In 1922 Evans and Bishop discovered that rats when given a fairly normal diet failed to reproduce unless certain essential foodstuffs were present, while in all other respects they were normal. The females exhibited oestrus and even conceived, but they failed to deliver the young: either the foetus died *in utero* and was reabsorbed or the uterus aborted.

The Missing Factor

Other observers, working independently, came to similar conclusions. The essential missing factor was found in fresh green vegetables—for example, lettuces—but the most abundant yield was obtained from the embryo of seeds, especially the germ of wheat. Sure (1924) called this essential factor vitamin E. This vitamin is supplied for clinical purposes in wheat-germ oil, and animals deprived of it show definite defects in their ability to reproduce. The males suffer irreparable damage to the germinal epithelium of the testes, and whereas the sex glands in the female are unaffected, the vitamin deficiency leads to the death of the foetus, with subsequent abortion or reabsorption (Evans and Burr, 1927).

Vogt-Möller (1933) of Copenhagen first made use of the vitamins as a therapeutic agent in cases of sterility and abortion in domestic animals, and his results were such that he was tempted to apply the method as a means of cure in habitual abortion in women. He reported a series of nineteen patients treated with a preparation of wheat-germ oil called "fertilan," sixteen of whom gave birth to living children.

If we are correct in assuming that the vitamin has such an important action in aiding the growth of the foetus it is difficult to explain why women taking the varied and sufficient diet of to-day need any addition of an essential accessory food factor. It may be that those women who abort possess a personal idiosyncrasy; possibly, in them, the developing embryo demands a greater concentration of the vitamin, or perhaps they are unable to absorb the necessary amount from the normal diet.

Treatment with Wheat-germ Oil

It was Vogt-Möller's paper and the offer of wheat-germ oil from Glaxo Laboratories Ltd. that encouraged

me to treat habitual abortion with vitamin E, and the results obtained show similar satisfying figures to those published by Watson and Tew (1936) and Miles M'Gonigle (1935). Watson in his paper has pointed out that vitamin E bears more resemblance as regards clinical features, physiological properties, and clinical significance to the luteal hormone (progesterin) than to other hormones. This is a point of interest, because other observers (Johnson, Krohn, and Kane) have achieved satisfactory results in the treatment of habitual abortion with the use of the luteal hormone, and as James Young (1937) has pointed out it may be that the work of the vitamin is completed when the placenta is fully developed. Until recently it was the accepted view that the action of the corpus luteum ceased about the middle of pregnancy, and this statement was substantiated by the fact that women did not necessarily abort if the ovaries were removed after the twelfth week. We now know that the amount of luteal hormone continues to increase during pregnancy even though the corpus luteum diminishes in size, and it is believed that the hormone is supplied by the placenta during the later months and that a deficiency of it leads to toxic conditions such as albuminuria, eclampsia, and accidental haemorrhage. At present I am attempting to cure these conditions by the injection of Schering's proluton.

If this hypothesis be true, then vitamin E is only essential during the early months of pregnancy, and by reason of the aid it gives in the formation of the placenta it provides for the supply of luteal hormone in the later months.

These latter details were unknown to me three years ago when I began treating cases of habitual abortion with wheat-germ oil, and the majority of the cases here described have had no treatment other than vitamin E, save for the addition of vitamins A and D and calcium which were given to a small number of patients. Each case was examined for such accepted causes of abortion as fibroids, retroversion, torn cervix, syphilis, and other general diseases, and on only two occasions was the blood Wassermann reaction found to be positive. One capsule containing three minims of the oil extract was given daily from the first attendance until the day of delivery.

Results

Over fifty women have been given wheat-germ oil during pregnancy, but since habitual abortion implies that more than one pregnancy has failed to go to term I have included in Table I only those patients who have experienced more than one abortion. Having allowed for this we find that thirty-seven women who had had collectively 130 pregnancies gave birth to only sixteen viable children. Under treatment these women produced thirty-seven living children. Two of them aborted; there were two sets of twins; and four children died in hospital from prematurity.

The appearance of albuminuria of pregnancy to a severe degree was a new problem that arose during treatment. Five patients showed gross signs of toxæmia, in one it was necessary to induce labour by puncture of the membranes, and in two Caesarean section was carried out. Similar complications are now being treated by the injection of proluton.

Table I shows the results in detail. It will be noticed that in the great majority of cases treatment was not instituted until after the twelfth week of pregnancy—that is, until the placenta was fully formed—and yet the

* Read at a joint meeting of the Sections of Obstetrics and Gynaecology, and Nutrition at the Annual Meeting of the British Medical Association, Belfast, 1937.

TABLE I.—*Habitual Abortion*

Case No.	Age	No of Abortions	Complications	Time of Occurrence of Abortion in Weeks	Children Born Alive at Term	Results	Remarks	Treatment Instituted
1	26	5	—	22—28	—	Alive 34	—	Wk. 20th
2	30	5	—	12—18	1	Abort. 15	—	5th
3	26	5	—	8—32	—	Alive FT	—	19th
4	38	5	—	8—16	—	Twins 32, 1 Died	—	13th
5	33	5	—	28—30	2	Alive 32	—	21st
6	31	5	—	8—28	1	Alive FT	—	26th
7	36	5	Albuminuria	12—20	—	Alive 38	Punct. Memb.	6th
8	33	4	Threat. Ab. 18	12—28	1	Alive FT	—	14th
9	29	4	Albuminuria	5—36	—	Alive FT	—	16th
10	25	3	—	24—28	—	Alive FT	—	26th
11	29	3	Albuminuria	8—16	—	Died FT	C.S.	14th
12	33	3	—	12—32	—	Alive 38	—	15th
13	32	3	—	24—28	1	Alive FT	—	22nd
14	36	3	—	12	—	Alive FT	C.S.	8th
15	25	3	—	24—32	1	Alive FT	—	22nd
16	36	3	Threat. Ab. 22	24—32	—	Alive FT	—	17th
17	34	3	—	18—32	1	Alive FT	—	22nd
18	26	3	Albuminuria	18—32	—	Alive 39	—	22nd
19	33	3	—	8—32	1	Alive FT	—	26th
20	31	3	—	5—36	3	Alive FT	—	14th
21	27	3	—	28	—	Alive 38	—	23rd
22	38	3	—	12	—	Alive FT	—	19th
23	30	3	—	12—16	—	Abort. 23	—	7th
24	35	3	—	8—24	—	Alive FT	—	11th
25	26	2	—	8—28	—	Alive FT	Forceps	18th
26	28	2	—	14—16	1	Alive FT	—	23rd
27	26	2	—	28—30	—	Alive FT	—	23rd
28	32	2	—	16	1	Alive 36	—	14th
29	30	2	Albuminuria	28—34	—	Alive FT	—	22nd
30	41	2	—	14—36	—	Alive FT	Forceps	24th
31	34	2	—	12	—	Died 33	Breech	22nd
32	29	2	—	10	1	Alive FT	—	15th
33	36	2	—	12—16	—	Alive FT	—	16th
34	40	2	—	20	1	Alive FT	—	8th
35	22	2	—	12	—	Alive FT	—	22nd
36	33	2	—	7—12	—	Alive FT	—	15th
37	23	2	—	12—16	—	Twins 36, 1 died	—	14th

Previous pregnancies, 130 ; Viable children, 16.

Under treatment : 25 full term, 1 died ; 3 38 weeks ; 1 39 weeks ; 2 36 weeks, 1 died (twin) ; 1 34 weeks ; 1 33 weeks, 1 died ; 2 32 weeks, 1 died (twin) ; 2 abortions.

results show sufficient success for some credit to be ascribed to the use of the vitamin, even after complete placentation. I wish to emphasize this point because, as I have mentioned before, some observers consider that the vitamin is of value only in the early months. Naturally, some of these women might have gone to term unaided, as did two who failed to return until they were in labour.

Wheat-germ oil has also been given with success in cases of threatened abortion. Fifteen of these have been so

TABLE II.—*Threatened Abortion*

Case No.	Age	Para	History	Week of Loss	Length of Treatment	Result
1	38	2	1 12 weeks	16	20 weeks	FT
2	23	2	1 12 weeks	24	17 "	FT
3	22	2	1 12 weeks	30	4 "	FT
4	31	3	2 NFT	26	6 "	(WR—) 38 weeks
5	31	6	1-4 NFT 5 Placenta praevia	24	9 "	38 weeks
6	28	1	Albuminuria	32	6 "	36
7	20	1		38	4 "	FT
8	22	1		6	13 days	FT
9	28	1		31	8 weeks	FT
10	18	2		26	3 "	FT
11	38	5	1-4 NFT	24	13 "	FT
12	35	2	1 NFT	12	24 "	FT
13	27	2	1 32 weeks	19	4 "	Vesicular mole
14	31	3	1 24 weeks—died ..	28	8 "	FT
15	22	1	2 28 weeks—alive ..	29	2 "	FT

Under treatment : 11 full term ; 2 38 weeks ; 1 36 weeks ; 1 vesicular mole

treated and fourteen taken successfully to term (Table II). Along with the administration of the vitamin the other recognized methods of treatment were used.

Conclusion

In conclusion may I say that in vitamin E we appear to have a means of treating a most distressing condition with some hope of success. Up to the present the amount of vitamin and the length of time it should be administered are open to discussion, but until further observations are made it would appear safer to give it throughout the whole of the pregnancy in a dose of not less than three minims of the oil extract daily.

REFERENCES

- Evans, H. M., and Bishop, K. S. (1922). *Science*, **56**, 650 ; and *Amer. J. Physiol.* (1922-3), **63**, 396.
 — and Burr, G. O. (1927). *Mem. Univ. Calif.*, **8**.
 M'Gonigle, G. C. M. (1935). *Ann. Rep. M.O.H., Stockton-on-Tees*, p. 50.
 Sure, B. (1924). *J. biol. Chem.*, **58**, 681.
 Vogt-Möller, P. (1933). *Acta Obstet. Gynec. scand.*, **13**, 219.
 Watson, E. M., and Tew, W. P. (1936). *Amer. J. Obstet. Gynec.*, **31**, 352.
 Young, James (1937). *British Medical Journal*, **1**, 953.

The Field Studies Department of the Institute of Sociology is organizing a winter school of sociology and civics to take place from January 1 to 8. In addition to a course of general lectures on sociological subjects by specialists there will be a systematic study of field work methods. Kensington will be taken as the area for such studies, and visits will be paid to a large number of historic, social, and economic institutions. The natural features of the borough, its history, population, housing, industry, health, and recreation will be surveyed. The school is intended to meet the needs of members of the teaching profession, social workers, and others interested in local history and modern social developments. Particulars may be had from the Institute of Sociology, 35, Gordon Square, W.C.1.