OBSTETRICS ILLUSTRATED

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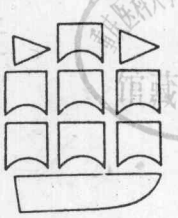
THIRD REPRINT



CHURCHILL LIVINGSTONE
EDINBURGH AND LONDON
1972

First Edition 1969

Revised Reprint 1970

Second Reprint 1971

Third Reprint 1972

ISBN 0 443 00627 X

PRINTED IN THE BRITISH COMMONWEALTH

PREFACE

It has been our object to produce a textbook which will be of use to the student both undergraduate and graduate. The provision of visual and other aids has become a necessity if the student is to find time to acquire his all-important practical experience; and it is hoped that by combining a concise and simple text with a very liberal use of illustrations, the information in these pages can be easily assimilated by the busy reader.

Most women have normal confinements, and modern obstetrics has become more and more the practice of preventive medicine. A large part of the book has been given to descriptions of normal physiology and the processes of normal labour, and to antenatal care and the treatment of those diseases which may complicate the antenatal period. Throughout we have tried to adopt a clinical approach and to emphasise the need for constant expectant care if abnormalities are to be avoided. However, as there is no abnormality which the obstetrician may safely assume to be as it were extinct, and as his surgical skill and judgment may be put to the test at any moment, we have described in detail the more common operations, and have referred briefly to some that are becoming obsolete.

We are indebted to many sources of information but have made no attempt to provide references or to indicate further reading on different subjects. We believe that if the student gains a clear understanding of principles he will be able by himself to extend his knowledge from the abundant and increasing literature.

We should like to express our thanks to Messrs. E. & S. Livingstone for their patient and helpful co-operation; to Mrs Elizabeth Callander for her painstaking work on the index; and to Mrs Gillian Skea whose secretarial efficiency made the months of work so easy and agreeable.

Glasgow
January 1969

M. M. Garrey
A. D. T. Govan
C. H. Hodge
R. Callander

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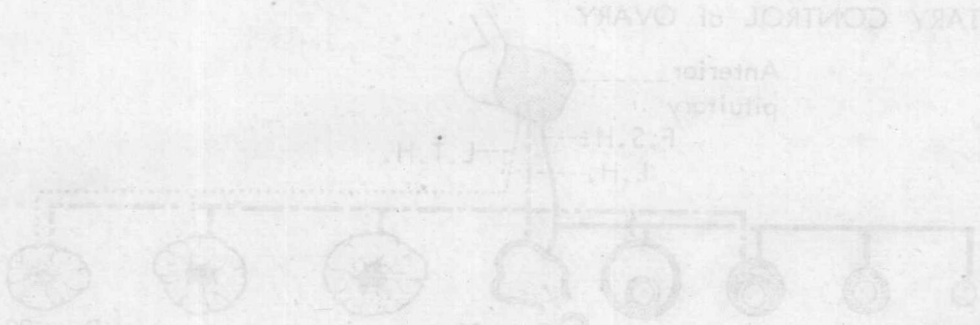
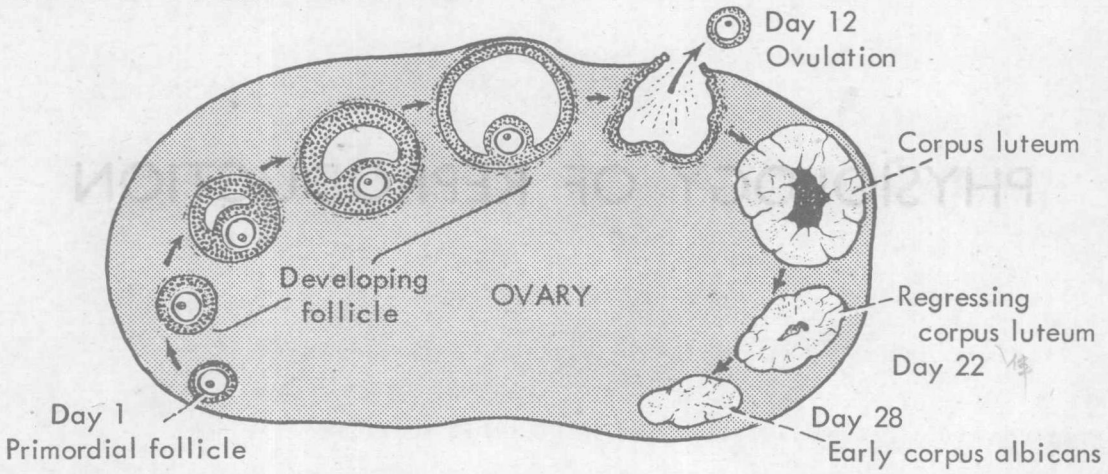
CHAPTER 1

PHYSIOLOGY OF REPRODUCTION



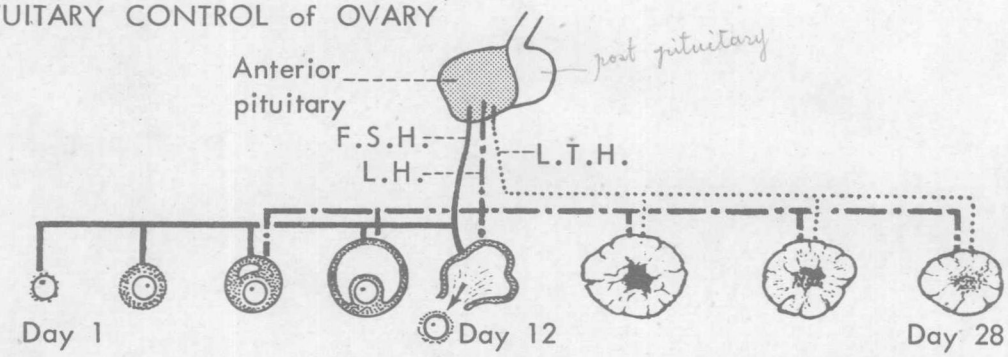
OVULATION AND MENSTRUATION

CYCLICAL OVARIAN CHANGES



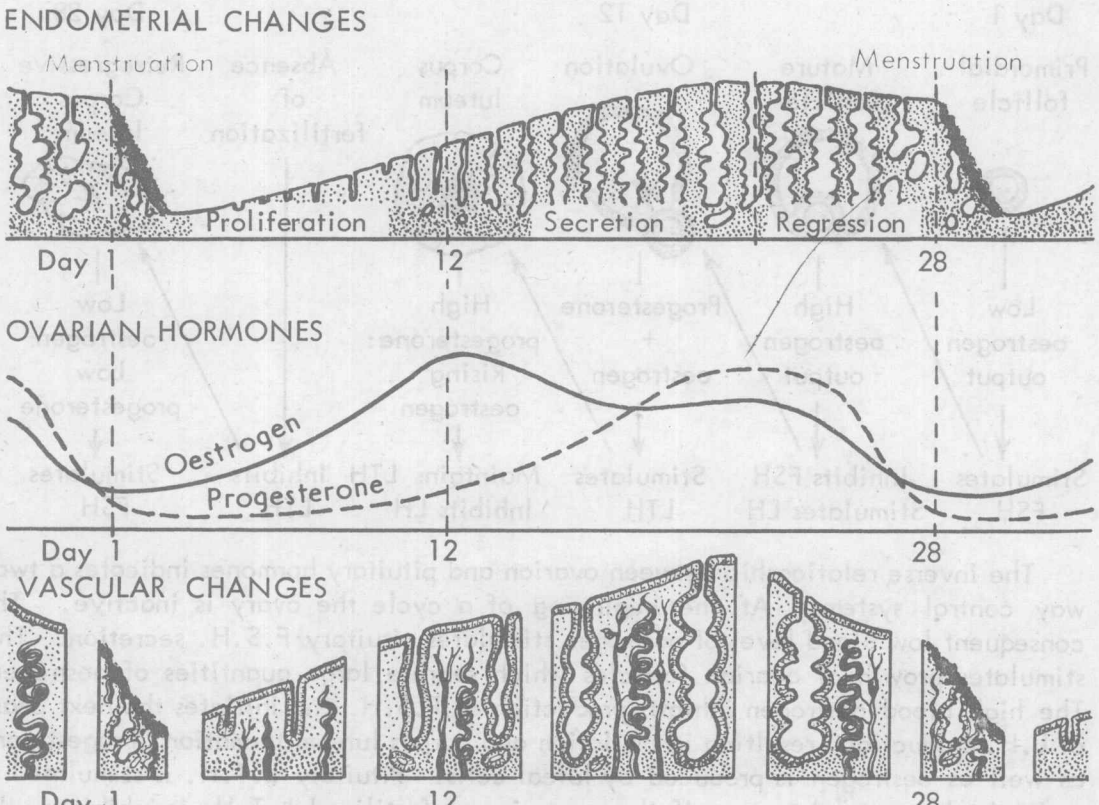
During the normal 28 day cycle a sequence of changes occurs in the ovary aimed at the production of a mature ovum, capable of being fertilized. This sequence also controls the quantity and quality of steroids necessary for the preparation of the uterus for reception of the ovum.

PITUITARY CONTROL of OVARY



The ovarian changes are to a great extent under the control of the anterior pituitary which produces certainly two and possibly three gonadotrophins - follicle stimulating hormone (F.S.H.) which initiates follicle growth; luteinizing hormone (L.H.) which transforms the lining granulosal cells into luteal cells after escape of the ovum; and possibly a luteotrophic hormone (L.T.H.) responsible for growth and maintenance of the corpus luteum.

OVULATION AND MENSTRUATION

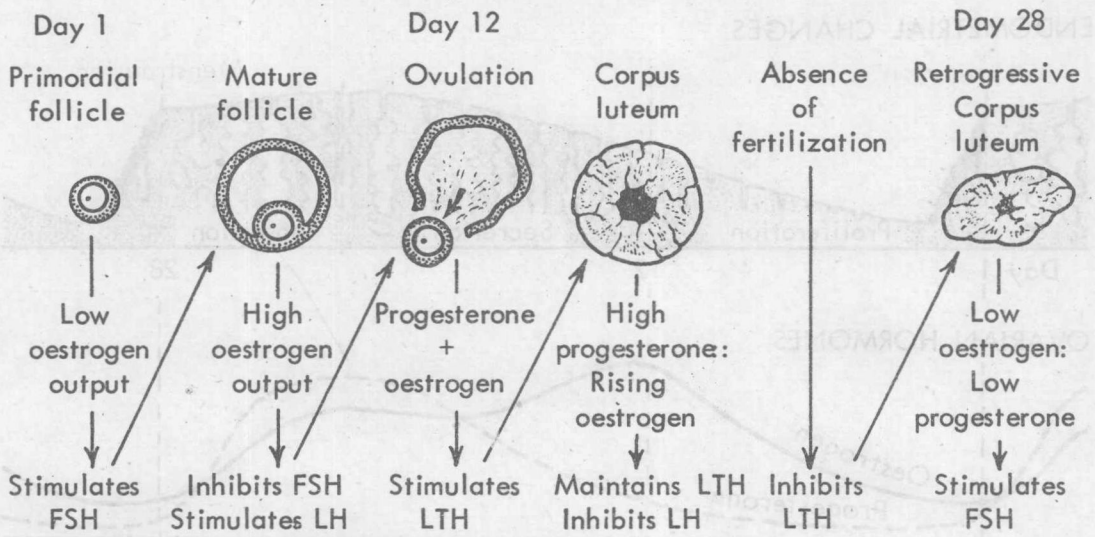


PROLIFERATIVE PHASE - Stimulated by oestrogen, the endometrium is reconstructed. Glands are straight and do not secrete.

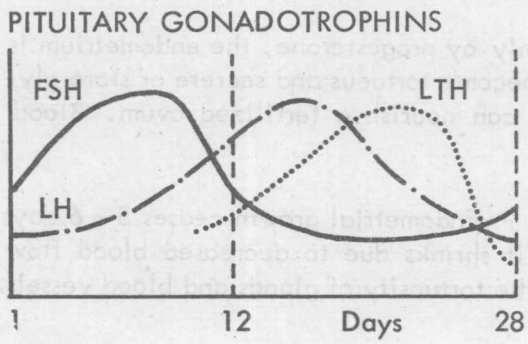
SECRETORY PHASE - Stimulated mainly by progesterone, the endometrium is highly vascularized. Glands enlarge and become tortuous and secrete or store glycogen, mucin and other substances which can nourish a fertilized ovum. Blood vessels become more coiled.

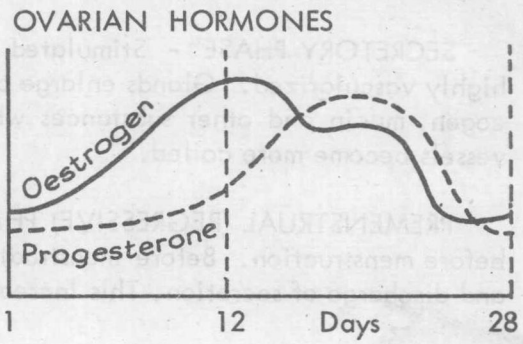
PREMENSTRUAL (REGRESSIVE) PHASE - Endometrial growth ceases 5 - 6 days before menstruation. Before menstruation it shrinks due to decreased blood flow and discharge of secretion. This increases the tortuosity of glands and blood vessels.

OVULATION AND MENSTRUATION

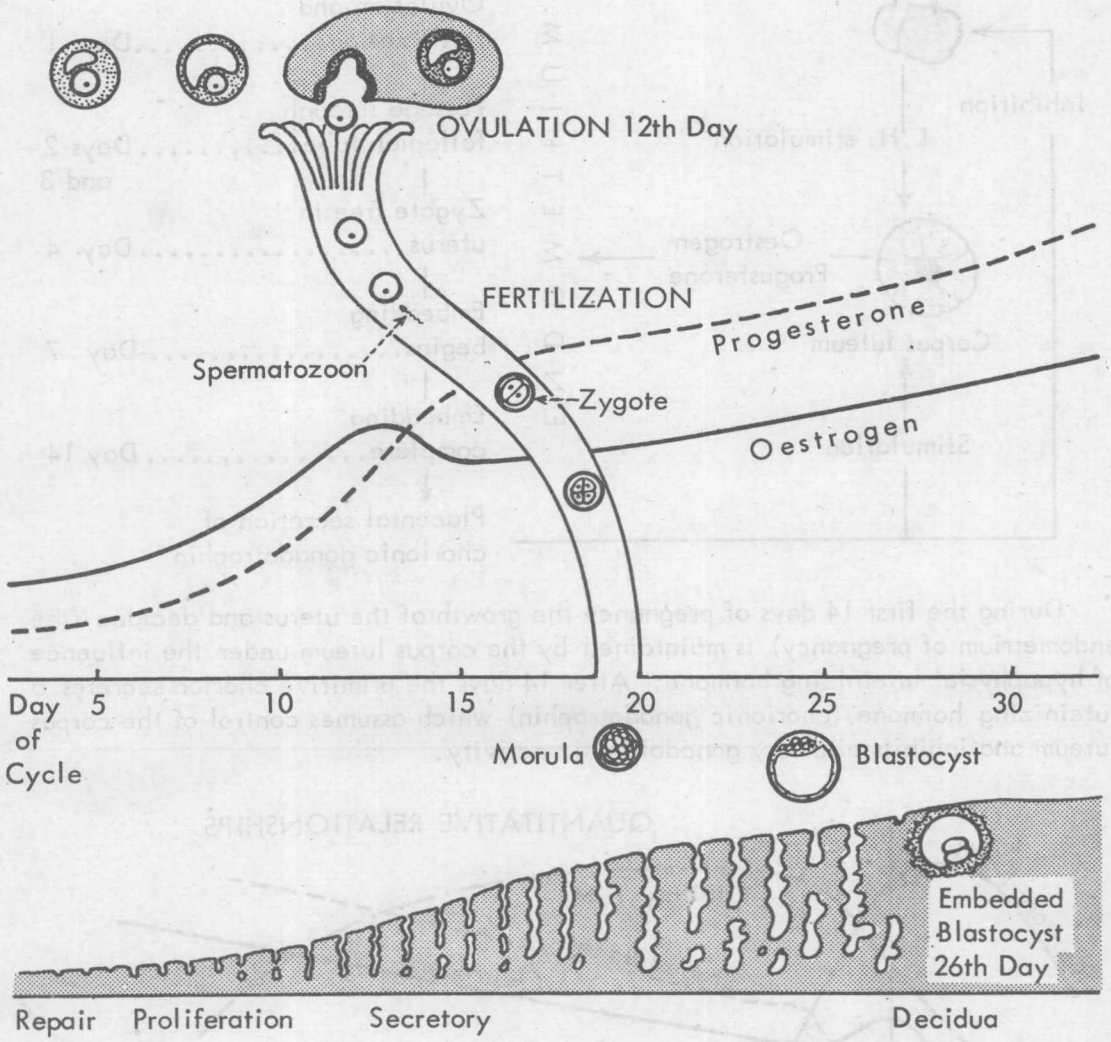


The inverse relationship between ovarian and pituitary hormones indicates a two-way control system. At the beginning of a cycle the ovary is inactive. The consequent low blood level of oestrogen stimulates pituitary F.S.H. secretion. This stimulates growth of ovarian follicles which secrete large quantities of oestrogen. The high blood oestrogen inhibits production of F.S.H. and initiates the next phase of L.H. production, resulting in ovulation and corpus luteum formation. Progesterone as well as oestrogen is produced by luteal cells. Pituitary L.T.H. is stimulated to maintain the corpus luteum. If the ovum is not fertilized L.T.H. is inhibited, the corpus luteum regresses, oestrogen and progesterone production falls, menstruation occurs and F.S.H. is stimulated to start the next cycle.



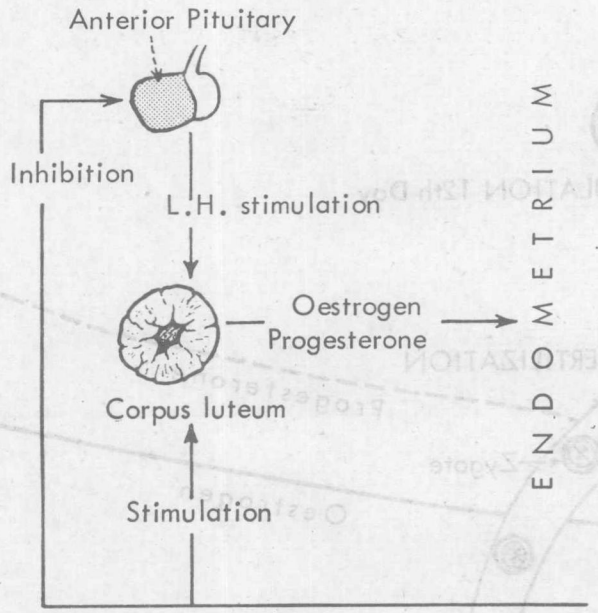


FERTILIZATION AND NIDATION



After fertilization in the fallopian tube the zygote (fertilized ovum) divides repeatedly to form a solid sphere of cells - the Morula. It reaches the uterine cavity by the 7th day after ovulation and is fully embedded by the 14th day after ovulation.

HORMONAL RELATIONSHIPS IN EARLY PREGNANCY



Ovulation and fertilization..... Day 1

Passage through fallopian tube..... Days 2 and 3

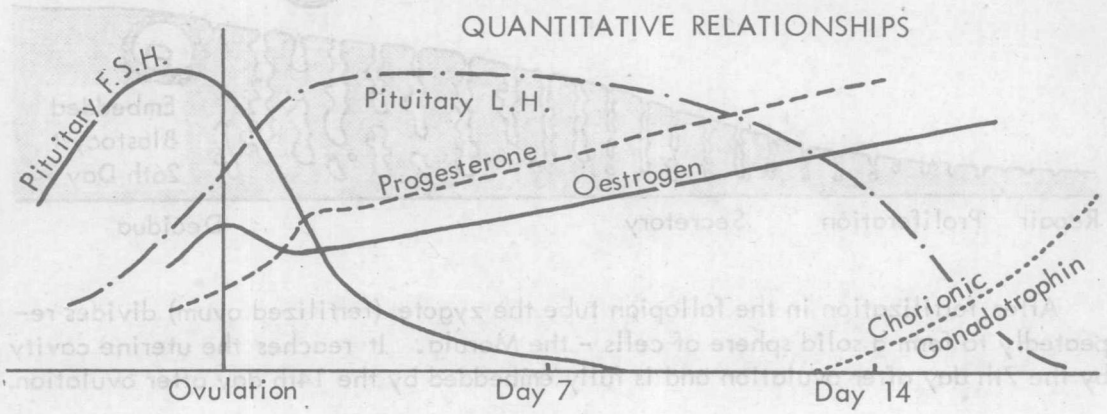
Zygote free in uterus..... Day 4

Embedding begins..... Day 7

Embedding complete..... Day 14

Placental secretion of chorionic gonadotrophin

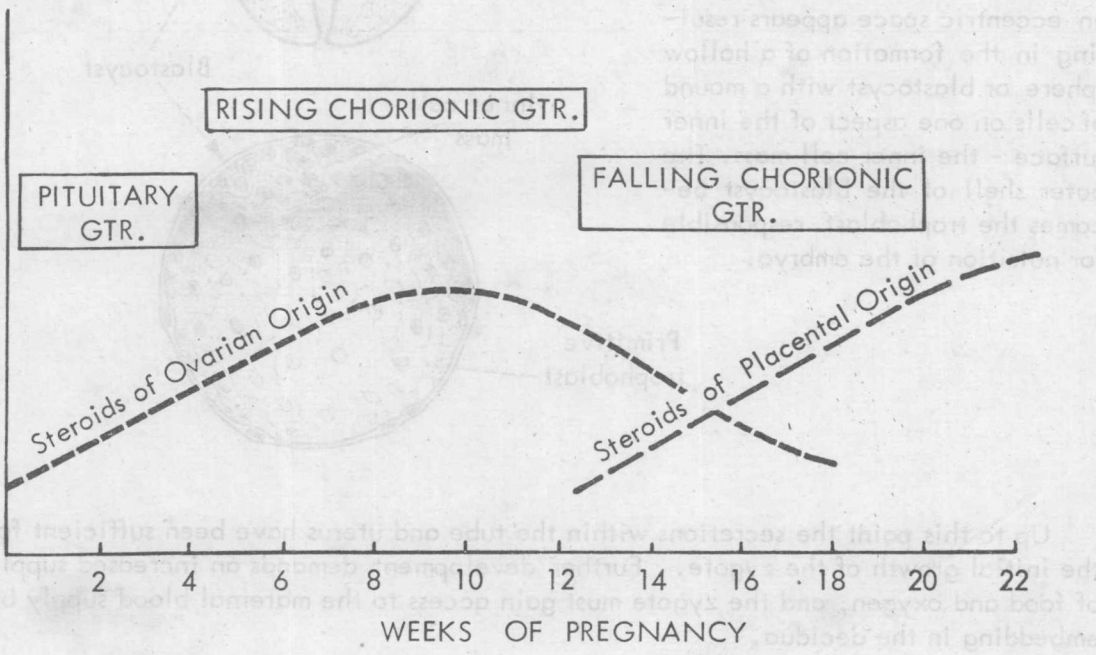
During the first 14 days of pregnancy the growth of the uterus and decidua (the endometrium of pregnancy) is maintained by the corpus luteum under the influence of hypophysial luteinizing hormone. After 14 days the primitive chorion secretes a luteinizing hormone (chorionic gonadotrophin) which assumes control of the corpus luteum and inhibits pituitary gonadotrophic activity.



HORMONAL RELATIONSHIPS IN EARLY PREGNANCY

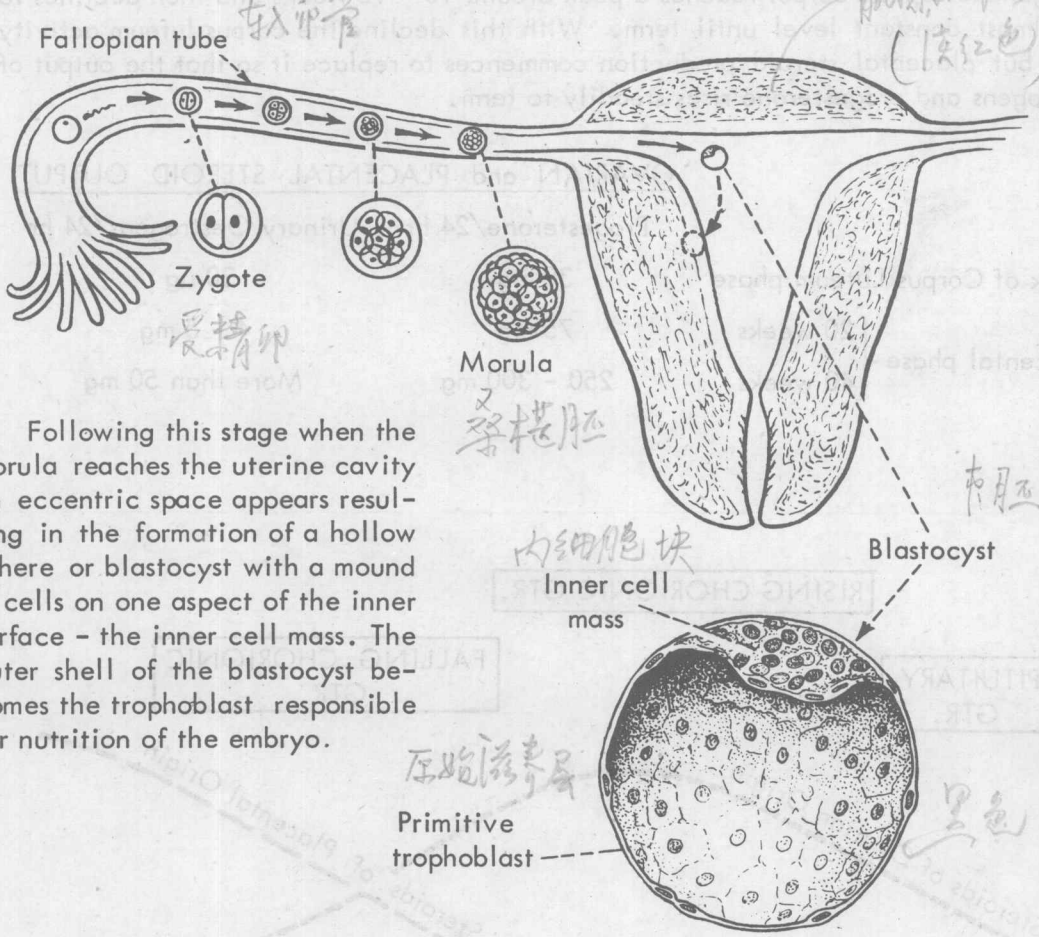
Under the influence of placental luteinizing hormone the corpus luteum continues to grow and secret steroids for the maintenance of uterine decidual growth. Chorionic gonadotrophin output reaches a peak around 10 - 12 weeks and then declines to an almost constant level until term. With this decline the corpus luteum activity fails but placental steroid production commences to replace it so that the output of oestrogens and progesterone rises steadily to term.

	OVARIAN and PLACENTAL STEROID OUTPUT	
	Progesterone/24 hr	Urinary Oestrogens/24 hr
Peak of Corpus Luteum phase	30 mg	30 ug
Placental phase — 20 weeks	75 mg	4 - 5 mg
Placental phase — 40 weeks	250 - 300 mg	More than 50 mg



DEVELOPMENT OF THE EMBRYO

While still in the fallopian tube the fertilized ovum divides repeatedly to form a round mass of cells - the morula.

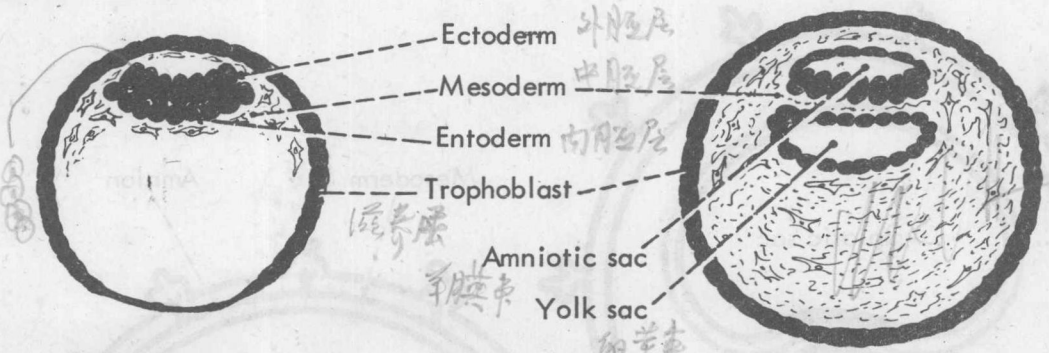


Following this stage when the morula reaches the uterine cavity an eccentric space appears resulting in the formation of a hollow sphere or blastocyst with a mound of cells on one aspect of the inner surface - the inner cell mass. The outer shell of the blastocyst becomes the trophoblast responsible for nutrition of the embryo.

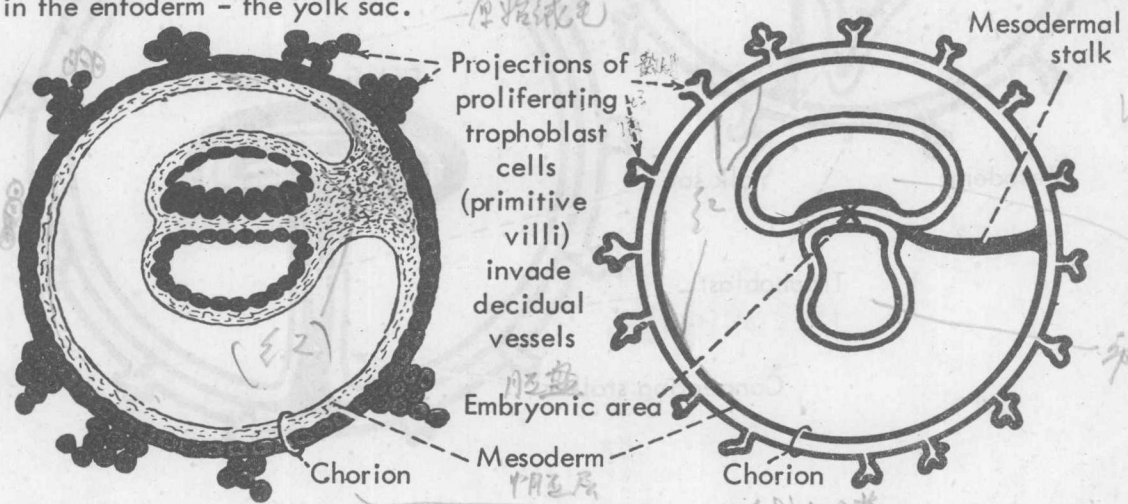
Up to this point the secretions within the tube and uterus have been sufficient for the initial growth of the zygote. Further development demands an increased supply of food and oxygen, and the zygote must gain access to the maternal blood supply by embedding in the decidua.

DEVELOPMENT OF THE EMBRYO

The inner cell mass differentiates and forms two distinct masses, the outer or ectodermal layer and the inner or entodermal. A further differentiation produces a third layer, the mesoderm, between these two. This grows outwards and eventually lines the blastocyst. The combination of trophoblast and primitive mesoderm is termed the chorion.



Two small cavities appear, one in the ectoderm forming the amniotic sac, the other in the entoderm - the yolk sac.



The two small spheres, covered by mesoderm, move into the middle of the blastocyst cavity, the mesoderm forming the connecting stalk. The two opposing layers of ectoderm and entoderm together with the interposed mesoderm are destined to form the actual embryo. Expansion of the amniotic sac takes place.