Physiological Bases of GYNECOLOGY and OBSTETRICS

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Intended for busy gynecologists and obstetricians who lack the time to make a detailed study of the large literature on the subject and to read detailed monographs. Much of the work described in these lectures is new so it will tend to bring every reader up to date in these fields.

The author has simplified his materials so as to present only those details which are useful--and yet they are not oversimplified so that the reader feels that he is being "talked down to."

Each chapter is presented as an individual lecture. The introduction and conclusion to each contribute to its overall effectiveness. Readers will be delighted with the informal and easy flowing text and they are certain to be richer after reading it.

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A Monograph in

AMERICAN LECTURES IN GYNECOLOGY
AND OBSTETRICS

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FOREWORD

GYNECOTOKOLOGY is the name used in Montevideo for the two words, gynecology and obstetrics. It is used as a means of expressing simply with one word the two medical sub-specialties. These are sometimes considered as separate entities, but more often they are taught and practiced in North America, as elsewhere, as a single subject. The etymology of the word is sound. *Gyne* means "female"; *toko* means "pertaining to birth"; *ology* means the "study of things." It is a word that is useful for one who practices gynecology and obstetrics and is, in fact, a gynecotokologist.

The lectures contained in this volume are part of a larger course given on the post-graduate level for physicians at the Facultad de Medicina de Montevideo. They were supplemented by demonstrations and conferences. This training lasts four years. It is offered to individuals who aspire to an appointment at the Associate Professor level on the Faculty. Of the number who compete, very few will be successful. The studies include appointment, or adscripción, in one of the basic medical sciences, and study in special courses in all of them. For this reason, the candidates are called Adscriptos. The Seccion Fisiológia Obstétrica, organized under the Clinica Obstétrica with Prof. dr. J. Infantozzi as director, and the Instituto de Ciencias Fisiológicas with Prof. dr. D. Bennati as director,

sponsored this part of the course for Adscriptos in obstetrics and gynecology.

The reader will note that these lectures are almost synoptic in form. They contain few references to individual workers, and there is no bibliography. They are intended for busy gynecotokologists who lack the time to make a detailed study of the large literature on the subject and to read detailed monographs. With the exception of the lectures on the ovarian circulation, treatment of all of these topics is considered in detail in the author's monograph, *Physiology of the Uterus,* 2nd edition, published by Paul B. Hoeber, New York, 1949. Much of the work described in these lectures is new and has been reported in the literature since publication of that book. Nevertheless, critical discussions of all these topics, except that of the ovary, are considered in that publication. Detailed description of the work on the ovarian circulation will be found in a chapter on this subject in the *Proceedings of the Laurentian Hormone Conference,* for 1949.

S. R. M. R.

INTRODUCTORY COMMENTS

Professor Rodriguez Lopez; Professor Infantozzi; Professor Crottogini; Professor Stábile; Professor Alvarez; Señoras y señores doctores:

I sincerely thank you for your generous introduction. I thank you most earnestly for the kind and hospitable way in which you have taken me in as one of you. It is indeed a rare privilege for any man to be so graciously received.

I express my deep and special thanks to those among you who, acting with all good will, made possible this honor which I now hold, that of Profesor visitante on the Facultad de Medicina de Montevideo. The list of distinguished scientists and scholars who have preceded me is most impressive. I accept this responsibility willingly but with the knowledge that it is a heavy one indeed.

The course of lectures, demonstrations, and discussions on the physiological bases of gynecotokology which we are now starting is built around my particular interests. It is for this reason that I was invited to come here. The way in which the curriculum has been arranged is dictated by practical considerations. It is necessary that the laboratory part of the course for the Adscriptos be arranged according to the time, the material and the facilities that are available. This, in turn, governs the order in which the lectures must be given. I beg you, therefore, to forgive the absence of a logical order, but to accept the situation as a matter of necessity.

With these remarks I now begin the course of study which brings me nearly seven thousand miles. I have come to the beautiful shores of W. H. Hudson's historic *Purple Land* of the Banda Oriental. I find that there live here today a generous and hospitable people who demonstrate daily their right to be proud of a rich past and a purposeful present. The future cannot promise less!

S. R. M. R.

ACKNOWLEDGMENTS

THE author is deeply indebted to a number of individuals on the Facultad de Medicina de Montevideo. The lectures would not have been given had it not been for the primary interest and efforts of Prof. dr. Roberto Caldeyro Barcia and Prof. dr. Hermógenes Alvarez. Prof. dr. Washington Buño was most active and helpful in facilitating this course of studies.

In addition, acknowledgment is gratefully made to the following individuals, each of whom aided the author in one or another very important way: Señor decano, Prof. dr. Mario Cassinoni; Prof. dr. Infantozzi; Prof. dr. Manuel Rodríguez Lopez; Prof. dr. Juan J. Crottogini; and Dr. Manuel Ambrusoni.

It is impossible for me to make fitting and personal acknowledgment to the many other individuals, non-medical as well as medical, who made my visit to Montevideo both pleasant and worthwhile. To these, I express my lasting and appreciative thanks.

S. R. M. R.

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LECTURE 1

PROBLEMS IN UTERINE PHYSIOLOGY AND THEIR INTERRELATIONS

In order to understand the physiological activity of an organ one has to consider the component parts of that activity. In so doing he develops interests that are increasingly specialized. These are removed from what may be called the primary and essential function of the organ as a whole.

This is well shown in the case of the uterus. All of us will agree that the primary function of the uterus is to provide a place for implantation and accommodation of a growing conceptus, or ovum, for the duration of gestation, and then to deliver at term an organism capable of existence separate from its mother.

As clinicians or as physiologists, we see many specialists, especially in my own country, who view uterine functions from very particular and sometimes, I venture to suggest, from very narrow points of view. We see some people whose primary interest is in the field of uterine vascularity and menstrual mechanisms; we see others who are specially concerned with morphological and functional characteristics of implantation, or in the responses of the endometrium to hormones.

On a still larger scale we know that some physicians practice obstetrics *or* gynecology, or some subdivision of these specialties almost as though interest in one field excludes interest in the other.

We could greatly extend this list without real benefit. Instead, I would like to stress my belief that *all uterine functions are inextricably related to each other.* If this be true, we see that anyone who would deal successfully with one aspect of uterine function would do well to consider that function at all times in relation to the others.

WAYS OF LOOKING AT UTERINE FUNCTIONS

The conventional way to think about uterine functions is to regard them as of fluctuating intensity during the menstrual or reproductive cycles. For example, we know how estrogen levels in the urine or blood vary during the menstrual cycle and pregnancy. We can all see in our minds' eye such things as pictures of endometrial growth and regression; the quantity, consistency and chemistry of cervical mucus; or the change in size, form, and function of the endometrial spiraled arterioles during the menstrual cycle. *What we do, therefore, is to construct in our minds a chart of individual quantitative and qualitative changes against the recurring background of sex and reproductive cycles.* We think in terms of *time* and *intensity* for individual functions.

This method of analysis has become more complex with every new series of discoveries. The impressions to be obtained from them tend to be less clear as we try to bring more and more of them into our mental field of vision. It is as though we tried to describe a piece of cloth by saying that there is a wavy brown thread, a wavy blue thread, an occasional red one, and, at certain intervals, a fine white line. The thing that is lacking in such a description is a conception of how these several threads are *integrated* to form a cloth of a given appearance and texture.

Just so with the uterus, we ought to consider the essential pattern of integration of the individual uterine func-

tions. Then, perhaps, we may gain a new perspective concerning the method by which the uterus contributes to human fertility, gestation, and the mechanism of parturition. I do not venture to suggest that a lasting statement can be made today. However, an attempt may prove interesting.

THE FUNCTION OF THE UTERUS AS A WHOLE

As I have said, we may all agree that the primary function of the uterus is to provide a place for implantation, to permit accommodation of the products of conception till term, and to provide a mechanism for parturition. These functions depend upon others of a more basic or fundamental character. It appears to me that there are three such broad, basic, fundamental mechanisms. These we will now discuss in general terms.

THE THREE BASIC PHYSIOLOGICAL MECHANISMS OF THE UTERUS

When we consider all the aspects of uterine physiology without regard for the sex or reproductive cycles, we note that the following stand out as of primary interest: 1) uterine growth; 2) uterine motility; and 3) uterine vascularity. *These three are interrelated and interdependent.* Frequently, one cannot distinguish where one leaves off and the other begins in fulfillment of the essential role of the uterus to provide the means for normal gestation and parturition. These three classes of mechanisms, motility, growth, and vascularity, constitute a triad of basic functions which fluctuate with variable intensities along the time axes of the sex and reproductive cycles. On what grounds may it be said that these three mechanisms are interrelated and interdependent?