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BIRTH CONTROL CONTRACEPTION AND THE SO-CALLED SAFE PERIOD*

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The steady decline in the birth rate of most Western communities during the past sixty years is generally ascribed in the main to the operation of intentional restriction of fertility. A falling marriage rate and an increasing age at marriage have both contributed to some extent, but statistical inquiry shows that these play a relatively insignificant part, and that the chief cause is to be found in the diminishing fertility among married women at all ages within the reproductive period. The influences thus combining to reduce the birth rate are usually attributed to a common cause—namely, the rising standard of living and the sociological forces which this calls into being.

There are three ways by which intentional family restriction can be attained: abstinence, abortion, and birth control, including contraception. Of the extent of the part played by abstinence it is impossible to speak definitely. Where there exist social and economic influences making for increasing restriction it is clear that this method must have a rising importance, but we may probably safely conclude that it can never play more than a relatively minor part. As having some bearing on this aspect of the question it is of interest to note that Raymond Pearl,¹ in his study of nearly 1,000 couples who admitted intentional attempts at limitation, found that only 2.2 per cent. adopted abstinence apart from the so-called "safe period," and there were none who admitted complete abstinence.

Intentional or Unlawful Abortion

While there is general agreement concerning the frequency of unlawful termination of pregnancy during the early months, the secrecy surrounding the practice makes the gathering of reliable statistics extremely difficult. Before we can attribute to abortion any part in the lowering of the birth rate we require evidence of a steady increase in the illicit practice over recent years. As gauged from the mortality rates the available data for England and Wales are so conflicting that it is impossible to arrive at any definite conclusions. On the one hand, there are the figures of the Registrar-General, which exhibit no appreciable trend since the year 1926, when the abortion death rate was for the first time made available for separate study in the general figures. On the other hand, there are the figures of the Ministry of Health, which are based upon the reports on individual maternal deaths received from medical officers of health. These show a steady rise in the percentage of the total puerperal death rate due to abortion from 10.5 in 1929 to 16 in 1933. It would seem to be significant that of the factors

responsible for maternal mortality abortion is the only one which exhibits this steady upward trend in the Ministry of Health reports.

The discrepancy in the evidence derived from these two separate sources is so great as to render impossible any conclusive statement regarding the part which unlawful abortion plays in the reduction of the birth rate. But on general grounds it is plausible to assume that the increasing urge to family restriction, which constitutes such a strong characteristic of modern social life, should express itself in a more frequent recourse to the practice of intentional interference with the unwanted pregnancy. There is no doubt that on the Continent—for example, in Germany—abortion has increased to an enormous extent, and that it has to be reckoned among the major influences making for the diminishing birth rates of the affected countries.

While we seem to be justified in assuming that the practice is less extensive in our own country there is, at the same time, both in the maternal mortality rates and in the experience of doctors generally, clear evidence of its widespread prevalence. It is notorious that the death rate from abortion is restricted almost entirely to the criminal type, and that the main causal factor of the fatalities is sepsis. Parish,² in a recent analysis of 1,000 successive cases of abortion, found a mortality of 3.7 per cent. in 374 following instrumental interference, as contrasted with a mortality of *nil* in 246 of the "spontaneous" type. This study was based upon hospital, and therefore selected, cases, and the differential mortality rates therein stated cannot be transferred to criminal and spontaneous cases in the country generally. They serve, however, to demonstrate in a striking manner the dominating part played by unlawful interference in the general death rate from abortion.

In this connexion we have alluded to the Ministry of Health returns, which exhibit a 52 per cent. rise in the death rate from this cause within a comparatively few years. If we accept the commonly agreed rate of abortion as 1 in 5 or 6 pregnancies the total annual number of abortions in England and Wales is in the neighbourhood of 100,000. If we admit the claim, which is often made, that the majority of abortions are the result of unlawful practices, we can readily realize how materially any appreciable percentage increase in their number would contribute towards an explanation of the reduction in the birth rate. These views are, in the present state of our knowledge, necessarily largely speculative. They indicate, however, that before we can estimate the part which contraception plays in intentional family limitation we cannot afford to disregard the potential influence of this much more sinister agency.

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Birth Control

I do not propose on this occasion to discuss the position of the doctor in relation to the principles underlying birth control. This I³ have attempted to do on a previous occasion, and I may be permitted to quote one paragraph from that article which conveys within brief compass my general views on this subject.

"To a profession the measure of whose service is determined largely by the degree in which it maintains its sense of realism it is imperative that this question should be faced freely and frankly. It is a matter of common knowledge that birth control is employed by all classes in an increasing degree; it has come to be assumed by the people as their inalienable right to add to their families by choice and not by chance when the circumstances so demand it; the sanction of the 'Churches' is there to bless it in varying measure, and the profession of medicine itself has adopted it as an important element of its economic creed. It is true that no one of these circumstances is of itself a justification of the principles of birth control; nevertheless, by emphasizing the extent to which the practice has become corporate in the life of the people they demonstrate that the time has come for the profession to reflect carefully whether in its duty to the individual and its larger duty to the State it dare refuse to take an active part in guiding a movement which, in its extent and the rapidity of its growth, is exerting, and is destined in increasing measure to exert, a profound influence on the nation's health."

Whatever attitude as individuals we adopt towards the religious and ethical or the social and economic implications of the movement, we cannot, I believe, evade those aspects of the problem which have a bearing on personal and public health. There is, I know, wide difference of view in the ranks of the profession on these matters. At one extreme there are those who, on medical grounds, regard with disfavour all artificial measures directed to the limitation of fertility, and who maintain that the attitude of the profession should be one of unqualified opposition. At the other extreme there are those who consider that in birth control we possess a means which is capable of elevating social health and increasing racial vigour. Between these two there is a considerable group of medical men who regard the practice of birth control as a matter of individual predilection as much beyond the concern of the doctor as the mode of expenditure of the family income.

There is ample evidence that the community in general has accepted birth control as an essential and legitimate element of its economic creed, and that it is demanding, and regards itself as entitled to receive, from medical men guidance and help on matters on which the profession alone can be expected to pronounce with authority. It may justly be urged that a demand carrying such sanction and such impulsion must in the end dictate the policy of the profession in its capacity as the servant of the public. In the meantime it is becoming increasingly recognized that contraception is a valuable addition to the instruments of preventive medicine. In 1930 the Ministry of Health empowered local authorities to make provision for contraceptive information being given to married women suffering from conditions in which the strain of pregnancy or childbirth is apt to endanger health or life. This State acceptance of the part that birth control is capable of playing in the sphere of public health is a powerful commentary on the strength which the movement has achieved for itself in modern times.

In this place I shall address myself to those who have accepted birth control as a procedure which comes within the purview of medical practice, and I shall attempt to outline the present state of our knowledge on some of the more important technical aspects of the question.

The Safe Period

Fresh public and medical interest has been evoked within recent years by the method of preventing conception which is based upon the so-called sterile period of the menstrual cycle. Many persons, both lay and medical, have long believed in the existence of a "safe period." But in the absence of certain knowledge regarding such essential matters as the phase of the cycle in which ovulation normally occurs and the survival period of ova and sperm cells, these beliefs have hitherto had little sanction in science. Within recent years, however, much new information has been obtained, and we are now able to bring the views on this subject to the test of experience and experiment.

The most potent argument directed in the past against the existence of a safe period has been the belief that, even if ovulation is regarded as a phenomenon of regular periodicity, the time during which ova and spermatozoa are capable of survival in the genital canal is so considerable as to vitiate any attempt to define the fertile period. This uncertainty has applied more especially to the fate of the sperm cells; some writers have claimed that these can remain fertile in the upper genital tract for several weeks. Recent research, however, indicates that whilst infertile spermatozoa may retain their morphological characters in the tubes unchanged for a considerable period, thus giving a false appearance of survival, their actual fertility does not extend beyond at the most forty-eight hours after ejaculation. The work of Crew⁴ and others has demonstrated that in mammals with scrotal testicles the difference between the temperatures of the testis and the female genital tract is a factor of some importance in restricting the survival of the male cells. In so far as the ovum is concerned, there would now seem to be incontrovertible evidence that if unfertilized it undergoes degeneration within a relatively few hours after dehiscence.

TIMING OF OVULATION

A further important addition to our recent knowledge relates to the timing of ovulation. Since the pioneer investigations of Ludwig Fraenkel, who first showed from ovaries studied at operation that ovulation precedes menstruation, evidence of a conclusive kind has narrowed the date of ovulation in women and the higher apes to a more or less defined phase in the centre of the cycle. Wilfred Shaw describes ovulation, in a 4-weekly cycle, as occurring on the 14th day, Schroeder the 14th to the 16th day, Ruge the 8th to the 14th day, and Halban and Köhler the 8th to the 18th day.

These writers describe the timing of ovulation in terms of the interval in days from the first day of the preceding menstruation. Ogino⁵ was the first to suggest that ovulation is best described in reference to the next menstruation, with which it is more physiologically related. His studies lead him to postulate ovulation as occurring between the 12th and the 16th day before the next period. Most of these investigations have been based upon the appearances found in the ovaries at differing stages of the cycle. Allen, Pratt, Newell, and Bland⁶ have added a more precise chapter to this study by hunting for ova in the material removed by irrigation of the tubes at forty abdominal sections. In twenty-six such cases studied between the 12th and 16th days after the onset of menstruation they found five ova; one at the 14th day, three at the 15th, and one at the 16th. No ova were obtained outside these limits.

These investigations on human material have been confirmed by studies carried out in the higher apes. Thus Hartman⁷ reported fifty-five cases of pregnancy in

Macacus rhesus, in each of which conception resulted from an isolated and recorded coitus. On the average, conception was found to be on the 13th day, in the majority of cases between the 12th and 15th. With the exception of one fertile coitus on the 19th, fertilization did not take place outside the 10th to 17th days. Hartman⁸ has obtained confirmatory evidence by rectal palpation of the monkey ovary and noting the day of collapse of the ripe follicle, an observation which can be made with precision in these animals. In 106 cases it was thus determined that ovulation was restricted to the interval between the 9th and the 18th day, except in one instance, when it occurred on the 20th day. In all except four cases ovulation took place between the 9th and 16th days. As Hartman says, it is thus obvious that the monkey has a sterile and a fertile period. A further point of some possible significance in its bearing on the human problem is that in individual animals there was evidence that ovulation was repeated on approximately the same day of the cycle.

UTERINE MUSCLE BEHAVIOUR AND OVULATION

Knaus⁹ claims, by a method devised for testing the variations in the reactivity of the uterine muscle to posterior pituitary extract at different stages in the cycle, to have determined with accuracy the time of ovulation in women. This method relies on the observation, made with a small bag introduced into the uterus and connected outside with a manometer and recording needle, that within twenty-four hours after ovulation, when the uterus comes under the influence of the corpus luteum, the spontaneous contractions cease, and the uterine wall becomes flaccid and sluggish or completely insensitive to the action of posterior pituitary. This state persists in an infertile cycle till the day before menstruation, when there is a recovery of the ordinary spontaneous and rhythmic contractions and of the response to pituitary which characterize the uterus during the pre-ovulatory period of the cycle.

By carrying out day-to-day records of these uterine changes during the menstrual cycle Knaus claims to have shown that in women with a normal reproductive physiology and a 28-day cycle ovulation always occurs on the 14th day. In a 26-day cycle it occurs on the 12th day, and in a 30-day cycle on the 16th day. In other words, the length of the cycle determines the day of ovulation, which is so timed as to leave the post-ovulation or luteal period constant at fourteen days. In this way Knaus was led to the conclusion, previously arrived at by Ogino, that ovulation is to be estimated backwards from the next menstruation. Whilst Ogino's observations allow of an interval varying from twelve to sixteen days, Knaus postulates a constant 14-day period. Allowing one day for ovulation and two days for the maximum survival period of the sperm cells, Knaus thus describes the fertile period of the cycle of sexually normal women as lasting for three days. As there are occasions even in health when ovulation may be one day early or one day late he advises that in practice the fertile period be regarded as consisting of five days: 3 days before + day of ovulation + 1 day after.

Before any reliance can be placed upon the method it is essential that the woman should, by careful observation over a year, have determined her own type and the extent of any variation in it. Thus, if there is no variation from the 28-day cycle ovulation occurs regularly on the 14th day precisely. If the cycle varies between 28 and 30 days the estimate must make allowance for ovulation between the 14th and the 16th days inclusive, and so on. As the normal rhythm may be affected by childbirth or miscarriage it is desirable that a new estimate

over four successive periods should be made after such an event to determine whether a revision of the plan is necessary. A similar distortion of the normal rhythm may happen after febrile and debilitating diseases, severe physical or psychic trauma, or any drastic alteration in the ordinary routine of living, such as prolonged travel in strange climates, etc. Knaus claims to have confirmed these findings by a study of the cycles of fifty women, and he and others have published evidence from the marital history of large numbers of couples to prove the reliability of the sterile period which he lays down.

CRITICISM OF THE OGINO-KNAUS METHOD

There would thus seem to be strong evidence, from both biological and clinical sources, for the existence in women of a safe period at each end of the menstrual cycle, and for a fertile phase that is restricted to its central stage. The more this evidence is sought for along lines of scientific precision the more it tends to dispose of the opinion which has hitherto dominated our outlook on these questions, that in women ovulation and therefore conception may occur at any stage of the cycle. It has been frequently urged that because sex relationships are tolerated at any stage of the cycle in women there is not the same physiological necessity for cyclic ovulation as exists in those lower animals in which coitus is restricted to the phase corresponding with ovulation. At first sight this argument seems plausible. We have, however, to place against it the now well-established fact that the latter phase of the cycle is in woman related quite as definitely to the appearance and growth of the corpus luteum as it is in the lower animals, and that this, in itself, necessarily connotes a cycle for ovulation so timed as to allow this luteal rhythm. This is further to be correlated with the biological observation that an active corpus luteum is necessary for the embedding and early development of the fertilized ovum.

At the same time the experimental basis of Knaus's contention has met with much criticism. The investigations of Hartman in apes, whose general sex physiology closely resembles the human in those respects which have been subjected to scientific comparison, are strongly opposed to Knaus's views in that they reveal a wide variability in the day of ovulation (from the 9th to the 20th day after the onset of menstruation) which is independent of total cycle length. Further, some workers have questioned the validity of the experimental work by which Knaus claims to have determined with precision the timing of human ovulation. Thus Chassar Moir,¹⁰ working in the obstetrical and gynaecological department of the British Post-Graduate Medical School, has shown that the individual variations in behaviour of the uterine muscle at different stages of the menstrual cycle, both in regard to its spontaneous contractions and in its response to posterior pituitary, are so great that any method based upon observations of this kind cannot be used as an exact test for the time of ovulation.

Against this criticism of detail the supporters of the method based upon a fertile period estimated backwards from the expected menstruation—the Ogino-Knaus, or the OK method as it has been somewhat quaintly termed—have advanced much general evidence of a confirmatory nature. Recently Latz¹¹ has recorded the results of a study of 114 couples who, employing the safe period, had 4,702 sterile intercourses over a total period of 1,128 cycles. In his method Latz advises the addition of one prohibited day before, and two prohibited days after, the five days postulated by Knaus. It may be legitimate to surmise that by thus shortening the "safe period" at each end Latz is still further restricting the risk of conception occurring from an ovulation outside the period

stipulated by Knaus. At the same time, even this curtailment of the "safe" period does not dispose of the risk of conception when intercourse coincides with the extremes of the wide ovulatory interval which our comparative studies lead us to associate with the human cycle.

It is thus difficult to reconcile the clinical with the biological data. It is conceivable that the discrepancy may be explained by the fact that ova dehisced at the limits of the ovulatory period are rendered sterile because of their escape at a time unsuitable for their subsequent growth. It may be the case, for example, that an ovum escaping at the 20th day of a 28-day cycle is thwarted because sufficient time is not allowed for full development of the corpus luteum and of the changes which this induces in the uterus before embedding can take place. Conversely, an ovum dehisced at, say, the 8th day may, even if it is fertilized, be unable to survive over the fourteen days or thereabouts which must elapse before the endometrium is ready for embedding.

From the practical standpoint we may briefly summarize by stating that there now exists evidence to suggest that if certain criteria are rigidly observed in each individual case birth control based on the safe period can be employed with a reasonable measure of certainty. The conditions which require to be fulfilled in each case are:

1. The menstrual cycle to be observed over a minimum period of eight months (Latz). Any variability in type beyond a maximum of ten days renders the scheme unavailable. Knaus has prepared a small menstruation calendar for this purpose which can be obtained in this country from H. K. Lewis & Co. Ltd., 136, Gower Street, London, W.C.1.

2. The fertile period extends from the 19th to the 12th day before the first day of the next period where the cycle is constant from month to month (Latz).

3. Where any variation in type exists the difference in days between the minimum and maximum cycles occurring during the eight months observed is added to the beginning of the fertile period as based upon the maximum cycle.

4. Adjustments may be required after childbirth or abortion, after physical or psychic shocks, after febrile and debilitating diseases, and after any drastic alteration in the routine ways of life.

Contraceptive Measures

It has been computed that at least 80 per cent. of all women menstruate regularly enough to be able to make use of the above methods. There are many, however, for whom they are not available. The establishment of the menstrual criteria before the scheme becomes operative demands a longer period of delay than is often possible for the woman who desires immediate protection either for social or economic reasons, or for the doctor who is prescribing infertility in the medical interests of his patient. Furthermore, the continued care and trouble are such as we can hardly expect to find in the average type of woman who solicits advice at the birth control centre. For these reasons birth control based upon the Ogino-Knaus principle must in general be regarded as a luxury for those who are socially more favoured.

For a large proportion of those who desire adequate protection, or for whom protection is medically prescribed, the employment of contraception is generally the only alternative available. The recognition of this widespread need is expressed in the rapid increase, during the past few years, in the number of clinics for the dissemination of advice, in the increasing literature, both lay and medical, which is devoted to the subject, and in the multitude

and the variety of the commercial contrivances with which the market is deluged. There is ground for the belief, however, that many of the methods and materials that are in extensive use are not only ineffective but may be a source of danger to the public health. It is well established that some of the drugs employed are irritating and, in the opinion of many gynaecologists, capable of producing serious and lasting disease in the female genital tract. There is ample justification for the view that, apart from the question of the adequacy of the different contraceptives in common use, there is urgent reason on hygienic grounds for the whole subject being brought under the scrutiny and supervision of the responsible medical authorities. The Bill recently introduced into the House of Lords by Lord Dawson had this as its main objective.

Within recent years articles have from time to time appeared in the medical journals on this aspect of the subject, and the Birth Control Investigation Committee in this country and the National Committee on Maternal Health in New York have subsidized, and published the results of, extensive researches into the chemistry and physics of contraceptives. These serve to show that much fundamental work is needed before we can claim to possess the knowledge required for the establishment of contraception on lines which are capable of being applied with certainty by the participants, and of being recommended with confidence by the medical profession.

The dangers associated with contraceptives apply more especially to those whose action is based upon the introduction of drugs into the vagina, usually in the form of suppositories or douches. Materials of this class are employed extensively because they possess the great advantage of simplicity. So far as I know there has been no adequate study of their relative effectiveness, though the opinion generally held is that, in their nature and the uncertainty associated with their mode of introduction, they are less reliable than purely mechanical contraceptives.

Among the mechanical methods the chief are the check pessary used by the woman and the sheath used by the man. These constitute the procedures most commonly employed at birth control clinics, and, in regard to their value, we now possess a considerable body of evidence which has been gathered by various clinics. The check pessaries in most common use are based upon the Mensinga, or Dutch pattern, which acts by occlusion of the vagina, and the French or cervical cap pattern, which is fitted over the cervix. In general, it may be stated that the vaginal pessary is the more easy to fit and the less likely to be disengaged by intercourse; for these reasons it is the more favoured. These pessaries must be fitted under medical supervision, and their success depends upon the care and intelligence which the woman is able and willing to devote to their continued use. To increase their efficiency a lubricant ointment and the douche are often simultaneously recommended. The sheath for the man is not generally so acceptable in the practice of the clinic as the pessary for the woman. The man is not so amenable, on the average, to the regime demanded, and the expense entailed is often prohibitive. Further, there is the considerable risk associated with defects in the rubber due to imperfections in the manufacture or to drying through age.

While these methods are capable of conferring a high measure of success (from 90 to 95 per cent.)¹² when properly and consistently used, in practice there are many circumstances which render their actual effectiveness partial and often poor. The chief reasons for failure are found in the fact that the method becomes irksome and even unacceptable, and the women tend to discontinue their attendance at the clinic. It has been estimated

that from 40 to 80 per cent. fail to take advantage of the supervisory control thus offered to them.

It is apparent that, despite the many and various procedures in use, we are still far from possessing the ideal contraceptive. By reason of the purpose it is intended to subserve and the varying conditions that govern its use, a contraceptive should be cheap, safe, efficient, and simple in application. It is in the interest of the public that the procedure should be under the guidance of the medical profession, but we cannot expect that contraception will become generally available and acceptable until some method is discovered that is freed from the restraints implied in the need for constant medical supervision that are inherent in the best of our existing practices.

Sterilization

In conclusion, some mention must be made of the limitations that surround the use of contraception in preventive medicine. I have referred on a previous page to birth control as prescribed for women who suffer from disease of the kidneys, heart, lungs, etc., and whose health is liable to be endangered by child-bearing or child-birth. In some such cases contraception is of value when

it is carried out with strict attention to the necessary safeguards. At the same time, where the medical state is so grave as to demand complete protection against the risks incidental to child-bearing, contraception may not be capable of providing the absolute assurance that is required. As has been previously noted, even with constant medical supervision contraception is attended with a risk of failure that varies from 5 to 10 per cent. In such cases the security required by the urgency of the medical indications is only to be obtained by sterilization or by the application to the ovaries of sterilizing doses of x rays.

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TREATMENT OF MYASTHENIA GRAVIS

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The treatment of myasthenia gravis was for a long time on an unsatisfactory empirical basis. The reasons for this were twofold. In the first place the natural remissions of the disease were too readily ascribed to the results of beneficial therapy; while, secondly, the nature of the pathological upset was unknown and variously considered to be of neural, muscular, or humoral origin. The first real advance arising out of empirical methods was made by Edgeworth,^{1,2} who in 1930 reported on the effects of ephedrine.³ She was herself a sufferer from myasthenia gravis, and she noticed a steady improvement over three years. Glycine and ephedrine in combination were tried by Boothby³ in 1934, and he concluded that with this treatment "most patients improved sufficiently to permit them to return to work."

The resemblance of the abnormal muscular fatigability in myasthenia gravis to curare poisoning had suggested the myoneural junction as the seat of the pathological process, and Walker⁴ in 1934 drew attention to the effect of physostigmine salicylate, given by hypodermic injection, in remedying this fatigue. The toxic effect of physostigmine prohibited large dosage, but the use of prostigmin, a less toxic analogue of physostigmine, was attended by dramatic results. This work has been confirmed by Pritchard,⁵ Laurent,⁶ and others, and attention has been focused on the myoneural junction.

Dale and Feldberg⁷ have shown that normal transmission of excitation from motor nerve endings to the voluntary muscle fibres is concerned with the liberation of acetylcholine. In myasthenia gravis there may be insufficient liberation, or increased destruction by choline esterase, or the threshold value may be altered by other factors, as Briscoe⁸ suggests. Feldberg and Vartiainen,⁹ working on the superior cervical ganglion of the cat, found that eserine (physostigmine) strongly sensitizes the ganglion cells to injections of acetylcholine, and that potassium ions had a similar but much smaller effect. Eserine

was from sixteen to forty times more powerful than potassium in this respect. These considerations indicated the probable mode of action of physostigmine and prostigmin in myasthenia, and also led Laurent and Walther¹⁰ to investigate the action of potassium chloride given by mouth. They found a demonstrable improvement with large doses of potassium chloride and a useful adjuvant action to prostigmin in small repeated doses.

The following cases of myasthenia gravis were investigated as to the effects of prostigmin, potassium chloride, and physostigmine on their condition.

Clinical Cases

CASE I

A married woman aged 32 was admitted to hospital on July 8th, 1935, complaining of difficulty in speaking and swallowing and that her eyes crossed. The family history was negative, and the previous history was uneventful, except for dysmenorrhoea. For many years she had suffered from attacks of trembling, which came on every few weeks and during which her "inside" and hands used to shake. These attacks were also accompanied by sweating, usually occurred when she was worried, and lasted some hours. Two years ago she noticed that the right eye "would become crossed," and she saw double on looking to the right. She obtained spectacles from an optician, and these seemed to help her until four to six months ago, when the left lid began to droop, and she had her glasses changed, but without any effect on either eye.

During the past few months she noticed an irritation in the throat, which made her cough. For about six weeks she had had difficulty in swallowing, and this had gradually increased. It was not accompanied by any pain, and the difficulty was associated with solids rather than with liquids. At times the food had regurgitated through her nose. Her voice had recently altered and had become quiet, and since she had had the difficulty in swallowing she noticed she was slightly deaf, more so on the left side. For some time the patient had found that she tired very readily, and was unable to carry a shopping bag or walk as far as formerly, and that, whilst eating, her "mouth became tired" and food regurgitated through her nose. After resting, however, the feeling of fatigue passed off, and she was able to resume what she had been doing for a short period before tiring began.

CLINICAL EXAMINATION

On admission the patient was thin, pale, and rather depressed. There was a well-marked left-sided ptosis,