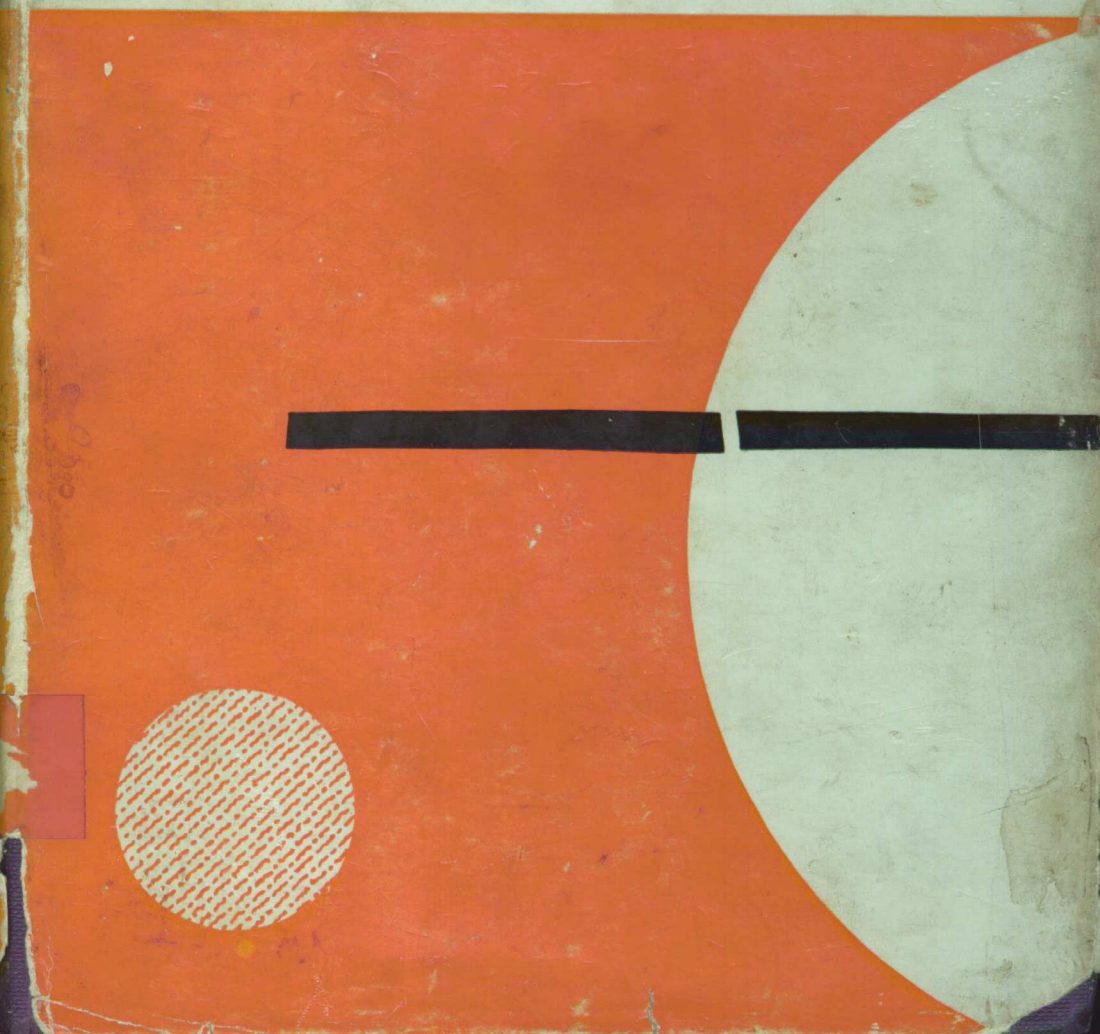
B. E. FINCH / HUGH GREEN

Contraception

through the ages



Today one tends to think of contraception as a modern custom, but its many methods are, in fact, merely scientifically perfected developments of those which existed as long ago as the time of the Pharaohs of Ancient Egypt. The authors trace the history of modes of contraception from these early times to the present day; they describe primitive methods which varied from pessaries of crocodile dung and draughts of quicksilver to incantations, superstitions and physical mutilation. They examine the concepts of Ancient Greek and medieval scientists and show how unsafe and inaccurate methods gradually improved with greater scientific knowledge, until the advent of the contraceptive sheath. Its invention has been attributed to a certain Dr. Condom, a physician at the court of Charles II, who wished to reduce the number of the King's illegitimate children. Casanova refers to it in his diaries as 'The English riding-coat'.

After overcoming legal opposition in the 19th century, contraceptive aids have now developed into flourishing industries. All the latest advances in birth control are fully discussed in these pages, and a section is devoted to oral contraceptives which have only recently been perfected after many years of intensive research. Methods of manufacture are described as well as the contribution of large combines such as London Rubber Industries and W. J. Rendell Ltd.

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CONTRACEPTION THROUGH THE AGES

CONTRACEPTION
through the ages

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Illustrated

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FOREWORD

From time immemorial Man has been concerned about his offspring. To a great extent this has centred upon his having a sufficiently large family and anxiety when he failed to do so. For this reason, fertility, in the positive sense, has always been a generally approved pursuit. The opposite aim—family limitation or birth control—is widely supposed to be a much more recent preoccupation and it may therefore come as something of a surprise to many readers that advice on how to prevent pregnancy is also of great antiquity. True enough, as Dr. Finch and Mr. Green so clearly show, most of this has been of a magical, superstitious or otherwise wholly unscientific and ineffective character. It is also true that only comparatively recently has interest in birth control come to be regarded as respectable—even though there is good reason to believe that respectable people have, in fact, been practising it, with varying degrees of success, for a very long time.

The most important consequence of this development is that contraception is now considered to be a proper subject for scientific study and is indeed engaging some of the best scientific brains in the world. This is fortunate because, in the considered opinion of many, the uncontrolled population explosion which is occurring in many countries, as a result of the widespread dissemination of effective death control without accompanying birth control, presents the world with a more dangerous problem than that of nuclear war. The first fruits of this application of scientific methodology to contraception is the development of oral contraceptives which already afford the most effective—for all practical purposes, a hundred per cent—means of preventing unwanted pregnancies. Gratifying as this may be, it is doubtful if the existing agents can provide the solution to the problem of over-population in underdeveloped countries and so the search, now intensified, goes on, seeking for better, simpler and, above all, safer methods of family limitation.

FOREWORD

Scientific progress in this field is undoubtedly entering upon a new phase which seems likely to become spectacular within the not too distant future. Public interest in the whole problem is growing rapidly and it is rightly regarded as a fit subject for comment in newspapers and on the radio and television. It is, therefore, very timely that the interested reader should have available a survey of contraception, from the earliest epochs to the present day, and, in this volume, Dr. Finch and Mr. Green ably fill the need.

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PREFACE

The idea of contraception is not new and it has been shown that it has a history of some five thousand years. What we have attempted to demonstrate in this book is that modern science has taken ancient and unreliable methods and by the use of new techniques has produced acceptable and extremely efficient products which have helped man to conquer one of his greatest problems—that of over-population.

We have taken each method and have attempted to trace its earliest use and then follow the thread of development which has led to the scientist working in his laboratory. For let us make no mistake about it: contraception is today an accepted science, with its teams of workers led by highly qualified and extremely competent researchers in the fields of medicine and chemistry.

We wish to thank the historians, physicians and librarians who have aided in one way or another in the preparation of this book. Our cordial thanks are due to the various authorities who have given facilities in connection with the illustrations. The director of the British Museum has kindly permitted the reproduction of Plates 8 and 9. The director of the Wellcome Historical Medical Library has given facilities in regard to Plates 1, 5 and 6. We would also like to thank the director of the Wellcome Historical Medical Museum for permission to use Plates 2 and 3; the authorities of the National Pharmacological Institute in Rome also for Plate 3, and the Nordiska Museet och Skansen in Stockholm for Plate 10.

Our special thanks are due to Dr. G. M. Swyer, M.D., M.R.C.P., for his kind advice and help, and for his writing the Foreword. We wish to thank Dr. P. N. L. Poynter for his kind advice, and also the Librarians of the Pharmaceutical Society.

Especial thanks are due to the International Planned Parenthood Federation and their secretary Mrs. Rotha Peers for their kind permission to include tests for chemical spermicides in the appendices,

and Messrs. Rendells Limited for their support of the book.

We take the opportunity of expressing our appreciation to the various firms who have helped us with certain technical information. Most important of all, this book might never have been published if it had not been for the generosity of the London Rubber Industries Limited and the guidance of their Mr. N. Berry.

B. E. F.
H. G.

INTRODUCTION

The object of this work is best explained by its title, its aims and plans being to place before the reader a story of man's endeavour to limit his offspring. The story presented is something more than a record of contraceptive technique, it is rather a social history. Numerous points and aspects have been relegated to the background, and others, which seem to have played more important parts have been brought forward.

The whole character of a society may be conditioned by the methods of birth control it uses, and the happiness and progress of its people will depend to no little degree upon the control of its population growth and to the extent to which this is regulated. An attempt is made in this book to describe the influences exerted by contraception on society, for just as contraception has influenced society, so has society influenced contraception. For this reason, the social factors that entered into the making of contraceptive technique have received consideration.

The advancement of contraception as a science was promoted by increasing resort to experiment and the use of instrumental devices. These play an important part in the story and are worthy of greater emphasis than is usually accorded them. All these methods were closely interrelated, and they represented many phases of the improvement of contraceptive technique. Attention has also been given to the consequent methodological confusion of the middle and later ages. The story relates primarily to those lands which were major centres of scientific achievement, but reference is also made to special interests in other countries.

Any expression of opinions in this work have been purposely avoided.

Chapter 1

THE SPERM

'The ejaculate of a healthy man contains between one and six hundred million live motile spermatozoa.'

A bleak and icy November day in England in 1677 was not the sort of day to choose for a marriage but affairs of state could not wait upon the weather. So it was then that William of Orange married Mary of England. Perhaps, for the populace, this was the most important thing to happen on that day. Yet for a small group of scientists gathered at the headquarters of the Royal Society it certainly was not, for on that very day a letter was read from Anthony van Leeuwenhoek, the Dutch microscopist, announcing that he had seen spermatozoa in the seminal fluid of a human being.

This was the event of which Martin Folkes, the eminent antiquarian and President of the Royal Society, said:

> It were endless to give any account of Mr. Leeuwenhoek's discoveries; they are so numerous as to make up a considerable part of the Philosophical transactions, and when collected together to fill four pretty large volumes in quartets which have been published by him at several times. And of such consequence as to have opened entirely new sciences in some parts of natural philosophie as we are all sensible is that famous Discovery of the Animalcula in semine masculine which has given a perfectly new turn to the Theory of Generation, in almost all the Authors that have since wrote upon the subject.
>
> *Leeuwenhoek and his Little Animals*

The evidence produced by this book showed that the human race had, for four thousand years, been actively concerned in limiting the number of its offspring, and except for the last three hundred years, had no scientific foundation to their ideas. In trying to prevent

an event from happening, of which the cause and nature was a mystery, they were, in fact, attempting the impossible. This is one reason which explains the great variety of contraceptive ideas and techniques that were adopted. The method of attempting to prevent pregnancy depended largely on the prevailing theory of what actually prevented conception.

We find that the same persons who put forward the theories of conception, are to be found putting forward ideas of how conception could be avoided.

Until the 1st century A.D., the generally accepted theory to explain the development of an animal from the mother was that of preformation; the complete animal with all its organs was believed to exist in the germ, in miniature, needing only to unfold like a flower. It followed that each germ must contain within itself the germ of all its future descendants one within the other, as in a nest of boxes.

Many other theories existed before and after this, and to understand the developments in the field of contraception some of these must be eliminated. Once the sperm had been seen, then, they had a scientifiic basis for their ideas, although it took a long time for this knowledge to spread.

Let us examine some of the theories which preceded the discovery of spermatozoa in 1677.

In Egyptian antiquity we find that the ideas of life and soul centred around the placenta, and in Ancient Egypt we find the title of Opener of the King's Placenta. It was assumed to be the especial centre of the Eternal Soul. The placenta itself was an object of some veneration and was represented on a standard until the reign of the Ptolemes.

In 1400 B.C. during the 18th dynasty, there was a hymn to the Sun god Aton written by Amenophis IV (the heretic king) who abandoned the worship of the Theban god Amen Ra and established the Aton Cult. It started:

Creator of the germ in woman
Maker of the seed in man.
Giving life to the son
In the body of the mother.

Here no distinction was made between life and soul, and during this early period there was no trace of the notions that appear later, such as the idea that the embryos are not alive until the time of birth.

The ancient Egyptians had artificial incubators for the eggs of birds and this kind of incubation was practised as far back as 3000 B.C.

There is a curious story attached to Cleopatra, the Ptolemaic queen, which says that she had investigated the process of foetal development by the dissection of slaves at known intervals during gestation, and that the basic knowledge for this work had been derived from the principle of hens' eggs.

The views of the ancient Hindus were transmitted to us by Susruta.

> At coitus, the evepjeia leaves the body through the sheath. It is then combined by means of the union of the evepjeia with the viayu of the male semen into the female genitals and is there mixed with the female monthly blood. Whereupon the nascent embryo through the union of the god of fire with the moon god reaches the uterus. The soul also goes into the uterus, endowed with god-like and demonic attributes.

From the Tamil we learn too of the Hindu physiology. The genitals were considered as the organs of both procreation and secretion, for it was considered that the embryo was formed of semen and blood both of which originated from bile (chyle). The factors which contributed towards the formation of the foetus were first the father's semen, secondly the mother's monthly blood, and to these were added the body subtle and the mind.

According to Marie Stopes the Hindu theologians considered it a crime for a girl to menstruate before going to her husband from her father's house. The regrettable institution of child marriage emanated from the belief that the menstrual blood forms the primary material of the embryo. and to lose any before the first entry of the sperm amounted to child murder. Their theories appeared to be based on their knowledge concerning menstruation.

Human beings were aware at a very early stage that the menses diminish and cease in pregnant women, This, however, was not as-

sociated with conception but it was believed that the onset of periodic haemorrhages were a sign of internal injury or sickness because under normal conditions women would always be gestating.

According to the ideas of the Talmudists there were three pre-essentials needed for the formation of the embryo. 'The father provides the white semen, from which the bones, the brain and the white of the eyes originate. The mother supplies the red semen, for the formation of the skin, flesh, hair and the iris. The expression of the face, sight, hearing, speech and movements were given by God himself.' In the *Book of Job*, however, another view is put forward which was to be re-echoed by Greek philosophers later:

> Hast thou not poured me out as milk and curdled me like cheese.

This is to be found much later in the works of Aristotle where he compares procreation with the curdling of milk by rennet, in which the milk supplies the substance and the rennet the principle of curdling.

In the *Koran* another explanation of the mystery of conception was offered. 'We created man of a choice extract of clay. Then we placed him as semen in a sure place. Then we created the semen into clotted blood and then we formed the clotted blood into flesh.' Man was a kind of clot of emitted seeds, developing into congealed blood. 'Verily he was created from a clot of mixtures.'

Sometimes the cause of conception was attributed to animals and birds with the result that the particular species mentioned passed into folklore as beings which possessed supernatural power, and for a house to be visited by one of these endowed creatures was to ensure that a birth would follow. The ancient Hindus and Egyptians thought it to be the ibis, and young bridal couples wishing to be blessed with many children would offer up prayers to flocks of these birds. Among the Japanese it was the butterfly and crane and in Mexico the red spoonbill. The ancient Teutons believed that it was the stork which brought children and the familiar picture of a stork flying to its destination carrying a small infant has remained with us to this day. Thus, they believed that to prevent further additions to an

already large family they would only have to keep this bird away. That this method was not successful gave rise to the thought that the stork flies only in the dark when it cannot be seen and that babies were born during the hours of darkness.

In Nordic folk-lore, too, we find the origin of the spirit child, living in lakes, streams and springs, and in the fruit of trees. If a woman happened to bathe in those waters or eat a fruit which was inhabited by such a spirit she would become pregnant.

B. Malinowsky confirmed the belief among some natives of the Trobriand Islands who believe that children originate only in the spirit world and that sexual intercourse has nothing whatever to do with pregnancy and childbirth. They had no idea of the fertilising power of the semen.

In the Morehead district of Papua it was reported by F. W. Williams that two widely differing ideas on the cause of conception were held. One was that if a woman bathes in a stream which contains eels, then she is impregnated by them, and the other was that the cause of pregnancy lay in the seminal fluid ejaculated by the man. Williams asserted that the second of these two theories was the one that was most favoured and that the natives recognised the part that the father played in procreation. The actual flesh and blood of the child was said to be formed from an accumulation of semen and thus it followed that pregnancy could only occur after repeated intercourse had taken place.

Even today some Australian aborigines believe that plant and tree spirits are the most active agents in reproduction; they also believe that a child could enter its mother's womb in the shape of a serpent if it was a boy and the shape of a snail if it was a girl.

N. Mandelman mentioned that the most primitive people believed in the wandering womb child, a creature which crawled in and out of a woman's mouth, in the shape of a toad during sleep. It went to water and drank and fed itself. If the woman shut her mouth it could not return and she would be childless.

This question of conception was a great problem to the Ancient Greek physicians and men of medicine. Hippocrates (460-377 B.C.)

was prepared to put forward his theory. Fertilization in the womb proceeded, he said, because of the mixing of the male and female semen and without the menstrual blood having any share in it. When fertilisation had taken place, however, menstrual blood entered the uterus, not monthly but daily, and becoming flesh assisted the child's growth. Hippocrates thought too, that the ovaries corresponded to the testes and that the woman as well as the man formed semen. The germs, as he termed them, originated when the male semen met the female semen. The resemblance of the creature produced to either or both of its parents originated from the fact that the semen was supplied by all parts of the body, and was, therefore, a kind of representative extract of the whole body.

This theory had already been expounded before Hippocrates by Plutarch and Pythagoras, but was strongly contested by Aristotle, who consistently opposed the notion that the female contributed seed of any kind. His objection to this theory lay in the assumption that she could be impregnated while constantly passive, and without orgasm. He could not envisage the existence of sperms nor the true function of the testicles. Further, he dismissed the contribution of the female to the embryo, as in striking contrast to certain ideas which were prevalent before his time and had been generally accepted in Greece. There is a passage relating to this question in Aeschylus's *Eumenides*. During the trial of Orestes, Apollo brings forward a physiological argument to defend the former from the charge of matricide, which had been brought against him.

> The mother of what is called her child is no parent of it, but a nurse only of the young life that is sown in her. The parent is the male, she but the stranger, a friend, who if fate spares the plant preserves it, till it puts forth.

There is evidence that this particular doctrine was of Egyptian origin for Diodorus Siculus says: 'The Egyptian holds his father alone to be the Author of generation and the mother only to provide nourishment of the foetus.'

The idea that the female sex played the part of farm land or of a field in which grain was sown was widespread in antiquity. This

was also shown in war-time, for it resulted in the practice of putting captured males to death and retaining the females as concubines. The conquerors, knowing that the women contributed nothing to birth, had no fear of corrupting the race with alien blood.

Aristotle regarded the menstrual blood as the element which women contributed to creation, and as is well known he drew a parallel between the flow of blood and the secretion of mucus which was observed in animals on heat. He compared procreation with the curdling of milk by rennet, in which the milk supplies the substance and the rennet the principle of curdling. Hippocrates believed that the semen contained both the dynamic and the material principle. Aristotle claimed for it only the dynamic principles.

The fact that the ovaries corresponded to the testes and that both gave up seed was held to be true by both Empedocles and Diocles. To discover if there was any truth in this Diocles prepared meticulous dissections of mules for sexual investigation. They believed that the semen came from the brain and the spinal marrow and that excessive copulation injured both the senses and the spine. On the other hand Diogenes of Appolonia thought that the semen was derived from blood as food (*sperma sanguinis*).

The medical school in Sicily which was flourishing at this time, thought that boys developed in the womb more quickly than girls because they occupied the right and warmer side. In general the physiological knowledge of the Greeks was meagre and inaccurate.

One of the ancient misapprehensions and certainly one of the most curious was that attached to the uterus. From the earliest times, as far back as the Ebers Papyrus, the uterus was regarded as an animal with an independent life and its own motion. It was customary in Hippocratic times to use abdominal palpation and vaginal inspection to ascertain the temporary habitat of this wandering organ. Its form varied, sometimes it was shaped like a tortoise, sometimes like a newt or like a crocodile.

Arateus in the 2nd century said that the womb closely resembled an animal for it moved hither and thither. He thought too, that it ran after certain odours and fled from others. Athenaeus of Attalia was

one of the more interesting Romano-Grecian physicians who flourished in the reign of the great Claudius. He wrote an important medical book in which he describes the uterus as being two-horned, male on the right, female on the left, and he conceived the ovaries as rudimentary representatives of the testicles.

But although these theories were being put forward, they were not wholly accepted by their contemporaries. Galen, for instance, although he could agree that each sex contained a seed, could not reconcile this to the fact that the female never conceived by herself.

Perhaps the next great idea on the subject came from Paracelsus. Before the spermatozoa were observed, he speculated in 1520 that generation was initiated in putrefaction and this could be made the subject of experiments that aroused expectations of spectacular discoveries. Alchemist texts before the 10th century did occasionally make references to eggs but it was not until the age of Paracelsus that the idea of applying chemical methods occurred.

In his *Treatise concerning the Nature of Things, Book I,* human semen was allowed to putrefy for forty days in the 'Highest Putrefaction of the Venter Equinas till it moves and is agitated'. It was then fed cautiously and prudently with the 'arcanium of human blood' for two weeks. The Venter Equinas was an apparatus for maintaining a temperature of about blood heat by the use of fermenting horse dung. He then stated: 'After this time it will be something like a man yet transparent without a body. Then it will become a true infant having all the members of an infant which is born of woman but will be far less. This we call homunculis or artificial man. Now this is one of the greatest events God ever made known to mortal sinful man.'

The term homunculis occurs in Cicero and was used by Paracelsus to indicate a man, made artificially. In this sense it was employed by later writers, some of whom refer to the homunculis of Paracelsus. Paracelsus was notorious for his dislike of women and this may help to explain his attempt to produce a foetus without the co-operation of a mother.

It is interesting to note that this doctrine of putrefaction as the first

initiator of generation is embedded in the Hebrew liturgy where in Chapter 3 of *Ethics of the Fathers* we find:

> Agubya, son of Mamalalel said, Reflect upon these things whence thou comest and before whom in the future thou wilt have to give an account and reckoning whence thou comest from a putrefying drop.

It was notable that Fallopius (1523-1562), a master in the study of anatomy and pursuing the same positive methods, scrutinised the ovaries and vesicles minutely in search of a seminal element and finding none denied seed to the female.

In 1621, the author Fabricius propounded a reasoned scheme of generation. 'Animals were produced spontaneously from eggs in the oviparous animals and from seminal fluid in the vivipara.'

William Harvey, who won immortal fame for his discovery of the circulation of the blood, was baffled by the secret of generation and not possessing adequate tools could not penetrate far into this mystery. He thought, as many others before him, that the testicles and the ovaries both played the same part. He was apparently familiar with the work of Borelli (1608-1679) who in his *De Motu Animalium* gave an account of generation comparing semen to a magnet arranging the particles in a field of force. In 1653 Harvey gave a discourse on conception. 'Women seem after the spermatical contact in coitus to be affected in the same manner and to be rendered prolifical by no sensible corporeal agent; as the iron touched by the lode-stone is presently moved into the vertice of the lode-stone and doth draw the iron bodies into it.'

Amongst the critics of this particular theory, a certain P. Highmore was particularly strong in voicing the objections to what he thought was imaginative theorising, for in his opinion the matter was a simple one with an equally simple explanation. 'The raw material capable of building up a complete foetus is present as a very subtle quintessence or seminale principle in the blood stream, and there it is carried in due course to the reproductive glands where representative atoms are abstracted from the blood and worked up into the seed.'

The true answer to this question, however, was not long to be delayed and perhaps Descartes sensed this when, in 1644, he gave his opinion on the matter, namely that the embryo was 'the product of the confused mixture of the male and female semen, both of which are essential, which leaven and react on each other so as to produce the parts of the foetus.'

In 1677 Leeuwenhoek announced the fact that he, with a student, had seen the spermatozoa in the seminal fluid of man. This discovery was probably one of the major events in the history of the natural sciences. 'There is,' said Leuckart, 'scarcely any discovery in the realm of animal biology which has aroused so general an interest as the discovery of these motile seminale corpuscles.'

Immediately all existing theories were dismissed and the way seemed perfectly clear for identification of these minute objects, although there was a delay before this was finally done.

Christian Huygens in 1678 gave the first complete and published description of the spermatozoa. After mentioning animals which arise in corruption he wrote: 'There is another kind which must have a different origin. Such for example are those which one discovers with the microscope in the semen of animals, which seem to belong to it and are present in such great quantity as to compose almost the whole of it. They are formed of a transparent substance, their movements are very brisk and their shape is similar to that of frogs, before their limbs are formed.'

Yet some forty years later, Anory, Dalempatius and Gautier all asserted that they had seen exceedingly minute forms of men with arms, heads and legs in the semen examined under a microscope. Gautier went as far as to say that he had seen a microscopic horse riding through the semen of a horse and a similar animal with very large ears in the semen of a donkey. Finally he described minute cocks in the semen of a cock.

The drawings of Dalempatius which showed the sperm as little men, were almost certainly a hoax, and in 1749 the Comte de Buffon in his *Histoire Naturelle* was still saying that the male semen was the sculptor; the menstrual blood was the block of marble and the

foetus was the figure which was fashioned out of this combination.

It was finally left to T. Barry in 1843 to solve the problem completely when he observed the cellular origin of the union of the sperm and ovum.

It can be seen that once this knowledge had been achieved, the process of contraception, which up to that time was based mainly on experience and tradition, could now change. The word contraception itself could be defined in basic terms as: the use by either male or female of any means where coitus may be achieved but where the fusion of the male spermatozoa with the female ovum may be avoided.

Chapter 2

PESSARIES

Dear Mrs. Cole,

In reply to your husband's letter, I advise you to write to Mr. Rendell, Chemist, 26 Gt Bath St., Farringdon, London, E.C., He is a respectable reliable chemist, and will give you all directions.

Sincerely,

Annie Besant,
Avenue Road,
St. Johns Wood.
Nov. 27, 1888.

It is early morning in the reign of the Great King Amenhat III of Egypt, two thousand years before the birth of Christ. A small boy crouches warily by the side of the river Nile, the great river which gives Egypt its fertility. The sun rises quickly over the horizon and shines on the huge crocodiles which are stirring themselves at the riverside. The boy clutches his goat skin bag tighter and as the crocodiles move from the river's edge into the water, he makes his way cautiously to where they have been lying. Experience has taught him that this is the best time to complete his task, for he has been sent here to collect the fresh dung which will be left behind by these inhabitants of the Nile.

This is long before man attempted to conjecture the nature of human sperm, yet somehow he recognised that it was possible to destroy the cause of conception by the introduction into the vagina of certain compounds; and it is from Ancient Egypt that the oldest prescription for a pessary is first noted. In the Petri Papyrus which dates from 1850 B.C. there is a section devoted to certain prescriptions which were meant to act as contraceptives.

One of these gives details of how to make a pessary by mixing the dung of crocodile with a paste-like substance such as honey. This is

to be inserted into the vagina before coitus takes place. The presence of the crocodile dung itself would not act in any way as a chemical barrier because it did not possess the quality which would enable it to do so—and it would have to rely for its effect on the efficient barrier that the clogging action of the dung combined with honey would create. This particular combination is one that has stood the test of time for it appears in various forms for almost 3000 years. In India and Africa crocodile dung was replaced by that of the elephant and the prescription reappears in the Islamic world right up to the 11th century A.D. It was specifically mentioned there by Constantinus Africanus who lived from A.D. 1020-1087 in his *Book of Surgery*. It is traced for the last time in a book of the 12th century by Ibn al Bakar and then suddenly disappears for ever and is not found or hinted at in any known source from that time onwards. Its persistence may be traced to the fact that it is a basically sound method of providing a barrier, but perhaps more prestige is given to it by virtue of the fact that both the crocodile and the elephant were renowned for their physical strength and religious attachments.

That crocodile dung was chosen was not surprising because that reptile had always played an important role in Egyptian mythology and medical works. For instance, whenever a physician treated an ailment which concerned anything to do with a disease of the eye the cure was always concluded with an adjuration to the crocodile.

In the Westcar Papyrus, there was a reference to an incident which showed how the crocodile was concerned in protecting a husband from a lover.

It was recorded that Prince Khaf Ra told to Cheops a story of an event that occurred about the year 4000 B.C. at the time of the Third Dynasty in the reign of Neb Ra. It was told that this king, while on a state visit to one of his high officials, had with him a Captain of the Guards renowned for his handsome looks. The wife of the official fell in love with the soldier, sent a message by way of her steward to her lover, and arranged to meet him at a convenient dwelling house. The steward who was to prepare the house for them went to his master, by name Abu-aner and told him everything.

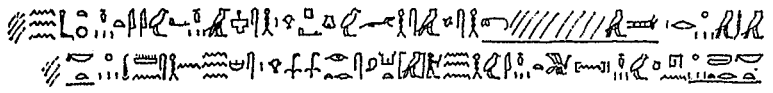

FIG 1 Three ancient Egyptian recipes for pessaries, recommending the use of crocodile dung and honey (Ebers Papyrus 1500 B.C.)

Abu-aner instructed him to obtain a quantity of the purest wax from which he fashioned a model of a crocodile, saying these words: 'When the man cometh to bathe in my waters, seize him'.

He gave the crocodile to his steward and instructed him that he was to cast it into the water near to where the soldier bathed. The next day as usual before meeting his mistress the Captain of the Guard went down to bathe and the steward threw the model of the crocodile into the water near him. It immediately became a large living crocodile which seized its prey and drew him under the water. The King stayed with Abu-aner for seven days while the victim remained under water for the whole of that time. On the last day of the King's visit when enquiries were being made about the absent soldier, Abu-aner asked the King to walk with him to the river bank. There the official addressed the crocodile—'Bring hither the man'. Whereupon the crocodile appeared with the man. The King, gazing in amazement was told the story and turning to the crocodile said, 'Take that which is thine and begone'. It immediately seized its victim again and disappeared into the depths. By royal command the erring wife was seized and condemned to death by burning, her ashes cast into the same river as her lover.

The pessary enjoyed a great deal of use and misuse, depending on whether the writer realised the full implication of the principles involved. In 49 B.C., Cleopatra, the daughter of Ptolemy and mistress of Caesar and Antony, was so versed in the use of pessaries that Dionysus acclaimed her as an expert on all matters relating to the diseases of women; and he ascribed to her certain prescriptions which could be used as either contraceptives or a cure for gonorrhoea. Dioscorides, who lived in Cilicia in the 1st century A.D., favoured a

pessary made of pepper but he insists that it be inserted after coitus had taken place.

Even Pliny the Elder, one of the eminent philosophers of his time, in A.D. 57 turned his mind to the great problem of his day, and in one of his books of *Natural History* he advocates the use of a pessary in the following words:

> Moreover this is a thing for certain known—that there is nothing encourageth a woman sooner to be barren than hard travail in child bearing. But to prevent this inconvenience, Olympus the expert midwife of Thebes affirmeth that there is nothing better than to anoint the natural parts of a woman with ox gall incorporated in the fat of serpents, verdigris and honey mixed therewith, before that she medoleth with a man in the act of generation.

Each period seemed to produce a brilliant physician who turned to gynaecology as a subject of the greatest interest. Whilst it became apparent to them that in some cases it would be inadvisable for a woman to conceive there would be women of intelligence and wealth who would experiment under the care of their physicians with methods which might assist them in limiting their families. These physicians became persons of great renown and the work they did and the thoughts they expressed have given a framework to our ideas. Such a man was Soranus of Ephesus, probably the greatest expert on the intimate life of women in the 2nd century A.D.

He tackled the problem of the contraceptive in a very rational way and drew special attention to the fact that oily substances such as honey and cedar wood oil mixed with other fleshy substances such as pomegranate pulp or the inside of figs could be made into pessaries to be used before coitus. He employed special women both to prepare the pessaries and to insert them, taking care to attach to the rolled object a piece of fine string to enable the pessary to be pulled out after use. The pessaries themselves were formed by these women by moulding them into the shape of a finger or even elaborately constructed to resemble a penis.

By the year A.D. 527 the pessary was being widely used as a contraceptive measure and almost every medical textbook of the time offers

advice on how to make and use them. In Mesopotamia, Aetius of Amida (502-575) devoted a chapter in his *Medical Encyclopedia* to the use of contraceptive methods, and was intrigued with the use of pomegranate in a contraceptive pessary. He gave instructions on how to take a young pomegranate, scrape the inside pulp from it and make two pessaries, one with water as its base, to be inserted before coitus and the other with gallnut to be inserted after menstruation. So egoistical was this Aetius of Amida that he said of one of his prescriptions: 'This method is infallible'.

The prescription he was describing gives these instructions in detail:

> 'Pulverise together 2 drachms of pomegranate and the same of gallnut with one drachm of absinthe and mix the whole with cedar resin. From these prepare barley sized pessaries and put in the cervix for two days immediately after the end of menstruation. The woman ought to remain tranquil for a day and then have sexual congress. But none before.'

The use of pessary-like substances was spreading further eastwards and many countries used variations of them. The great physician Rhazes of Bagdad, in A.D. 882, won great renown for his outstanding treatise on smallpox, but, in common with all the other experts of his day, could not refrain from attempting to solve the problem of finding an efficient contraceptive.

In his work *The Quintessence of Experience* he states his views on pessaries.

> Occasionally it is very important that the semen should not enter the womb. There are several ways of preventing its entrance, one of which is to apply to the uterus before receiving the man some drug which expels the semen and prevents conception. Such would be a pessary made of cabbage, colocynth pulp, the inner skin of pomegranate, animals' ear wax, elephants' dung and whitewash. These may be used alone or in combination.

These ingredients are not so strange as maybe they appear to be at first. Both the ear wax and the whitewash would help to bind together the pulpy and absorptive ingredients so that the pessary

would hold together and not disintegrate on insertion.

An innovation came at the end of the 10th century. There lived in Persia a renowned scientist and physician, Ali Ibn Abbas, who in *The Royal Book* devoted a whole chapter to the pessary, but he decided to include in it an active chemical spermicide incorporated with the barrier, and he describes how a pessary should be made of rock salt mixed with an oily material. The ordinary table salt is a most excellent spermicidal and any solution above a strength of eight parts to a hundred would destroy male sperm. Rock salt would possess this power to an even greater degree.

This method was evidently of great appeal for it was followed up in Bagdad by the eminent Jewish physician Ibn Sina, more commonly known as Avicenna, who lived from 979-1037 and who almost certainly would have known of the work of Ali Ibn Abbas, but as it will be seen Avicenna went one step further. He gives two prescriptions for pessaries. He says: 'Take the pulp of the pomegranate and mix it firmly with alum and make two pessaries. Insert one before coitus and one immediately afterwards.' The interest of alum is twofold in its use. Contraceptively it is a most efficient spermicide but it has a secondary virtue too. Alum has the attribute of making the mucous membrane of the vagina contract. This contracting effect is so great that it could restore the vagina which may have been stretched in childbirth back to its almost virginal size.

There is no question about the importance attached to contraceptive pessaries but it is on the tried ingredients and methods of use that their success depended.

Even primitive peoples without the background of literature and learning had sought for themselves a means of making a pessary to prevent conception—this investigation discovered a method which was efficient and usable. In Sumatra a group of people, the Achehnese, have, since early times, used a small black round mass which is introduced into the vagina before coitus takes place. This pessary was made primarily from local plants and on examination was found to contain a high proportion of tannic acid. We know now that this acid rates very high as a spermicide and a solution of as low a

strength as 1-1000 would immobilise sperm immediately. Once again this is an example of how primitive peoples in complete ignorance of the basic principles involved have found a most efficient method.

From *The Treasure of Medicine* written by Ismail of Iyrjam (c 1135) two pessaries follow one after the other, but with different instructions for their use. In the first a mixture was made of colocynth pulp, bryony, sulphur and cabbage which were thoroughly ground up and mixed with tar. They provided an efficient barrier mixed with a spermicide, but the user was directed to insert this after intercourse. In the second he gave the directions for making a pessary of pomegranate and alum to be inserted before intercourse, again a functionally sound principle, but he finished his directions thus: 'If after these methods a woman raises her thighs pregnancy will not follow'. However, it is that position that is possibly the best one for the semen to be retained and would therefore be the one most likely to promise conception.

One wonders in fact what the relationship was like in this case between the maker of the pessary, the user and the physician, and how often the latter must have heard the phrase, 'But doctor, I did exactly as you told me.'

The use of animal excrement seemed to excite some of these alchemists of contraceptives and led to the early established pattern of using the material of powerful and sacred figures. The Aztecs in the Badianus Manuscript of 1552 hinted the following pessary for contraceptive use. 'And you shall put into the vulva the crushed herb of the calabash or cucurbita root and eagles' excrement', and from the same manuscript at the same time:

> Kill also a lizard, cut off its head, eviscerate it, salt it and hang it up to dry in a cold place. When it is dry, burn it and mix the ash with Indian wine, white honey. The woman should use this first.

The practice of Soranus of Ephesus of employing special women to prepare and insert the pessaries was to find its counterpart in Mecca where because of the loose alliances between men and

women, some form of contraceptive was encouraged. So certain were these women of the success of tried pessaries that they entered into a formal and regular contract with their clients. In the advent of any mishap the money was returned to the customer. Professor Huralonge found that these women had each their own secret recipe which they could alter in strength to make their patrons sterile for one, two or three years, whichever they desired.

Thus the evolution of the contraceptive pessary progressed, and the right basic ingredients were coupled with the wrong methods, the right instructions provided for the wrong materials. Prescriptions which were haphazard in their action were linked with information which was limited not only in its accuracy but in its availability. By the 19th century this position was to change and the poverty and distress brought about by over-large families was beginning to be the concern of an ever increasing number of people drawn from all walks of life. The information which was hitherto available only to those of wealth and social standing was now to be brought to the mass of the people.

Among those who played their part in the story of the contraceptive pessary some will be remembered by their theories and others by their names. Just as Condom was associated with the sheath, so is the name Rendell associated with the pessary.

Walter John Rendell was a chemist who owned his own pharmacy in Gt. Bath Street, Clerkenwell in London in the year 1880. An intelligent and sensitive man, he had a deep understanding of the needs of the population he served. Listening to their tales of poverty and distress it soon became apparent to him that there was an urgent need for some effective method of limiting the number of children born into these appalling conditions and brought up in abject poverty. As an individual he felt that there must be something that he could do to produce some method of family limitation.

With his pharmaceutical training in making pessaries, he decided that this would be the field in which success would be attained. After much work and experimentation in the dispensary of his small chemist's shop he evolved a pessary containing quinine. These he

distributed free to a few of his customers with instructions on how to use them and awaited results. They far exceeded any expectations that he might have had, and the requests for his product grew so rapidly that it became a full time occupation keeping up with the demand. At the same time there appeared on the scene one of the great pioneers of the Birth Control Movement, Mrs. Annie Besant, who acknowledged the effectiveness of Mr. Rendell's pessaries and advised women to purchase them for themselves; alternatively, she obtained them herself direct from Mr. Rendell to distribute to those who needed them. This was the same Mrs. Besant whose name became famous when she was involved in the famous Bradlaugh-Besant trial which was one of the great cases in contraceptive history.

In 1886 Mr. Rendell decided to market his product as a commercial enterprise and Rendell's pessaries were soon in demand by other chemists in the district. In those early days no form of publicity was possible either by way of leaflet, booklet, or newspaper advertising. The demand grew solely by private recommendation. So rapidly did the reputation of these pessaries grow that large scale production was soon required and by the turn of the century they were being sold throughout the world.

It was at this time Mr. W. J. Rendell died, and his interest in Rendell's Pessaries was sold. Thus the present organisation came into being. Today W. J. Rendell Limited, established as manufacturing chemists with their main laboratories at Hitchin, in Hertfordshire, have branch factories in Brazil, Uruguay and Australia, which cope with the ever-increasing world-wide demand for Rendell's Pessaries.

The urgent world necessity for a perfect contraceptive has not escaped the attention of medical scientists in almost every country, and many new chemical spermicides have been discovered. W. J. Rendell Limited have been able to take full advantage of this medical knowledge, and in consequence the formula of Rendell's Pessaries has been completely changed.

Seventy-five years ago quinine was the only recognised spermicide which could be used with safety, but this has now been replaced by

Alkylaryl Polyalkycane Ether Alcohol, in combination with other harmless and non-irritant substances.

In addition to the greatly improved efficacy, when it dissolves the pessary come into contact with the natural vaginal secretions and forms a creamy emulsion which covers the vaginal lining and cervix, and through which spermatozoa cannot pass.

This creamy emulsion is non-greasy, and instantly neutralises the seminal fluid. It remains stable and gives full protection for at least thirty minutes. Should intercourse be delayed for longer than this period, it is expedient to insert another pessary. The continued use of this contraceptive is completely harmless to both sexes, and it may be used as frequently as required.

Previous to the adoption of the new formula, extensive trials were conducted under the guidance of one of the London teaching hospitals. Statistics were very carefully maintained, and the evidence recorded has shown there was not a single case of discomfort or known failure.

The manufacture of Rendell's Pessaries is conducted under the supervision of qualified persons, and the special machinery employed is of such a nature that not the slightest variation can occur. In spite of this, routine tests are conducted, and in addition Rendell's Pessaries are subjected to the Baker Test.

This test is the International standard by which the efficiency of chemical contraceptives is assessed, and consists of the following: an artificial solution is made, which closely resembles the vaginal fluid, and to this is added a specific amount of semen containing live sperm. It is into this combination, which accurately resembles the conditions that exist during coitus, that the pessary under test is placed. After five minutes the whole of the solution is examined microscopically, and all the sperms contained therein must be dead. By reducing the size of the pessary by half and then to a quarter it is possible to find the exact amount which will kill all the sperms, and it is this ratio of 1/4 or 1/8 or 1/16 which gives the pessary its efficiency rating.

The majority of chemical contraceptives pass the Baker Test at

S/4 to S/8. A few are rated as high as S/16. Rendell's Pessaries, subjected to this test, passed at S/32.

Contraceptive pessaries have progressed much from the time of those early Egyptians with their crocodile dung and honey, to the small and easily used modern pessary with its high regard for scientific industrialisation and technological skill. Yet there is a direct continuation in their historical link, and the basic principal of an active spermicide in a low melting point base, which in use is non-greasy, is unchanged.

What has changed most in the evolution of pessaries is the method of evaluating their effectiveness, which today is based on an accurate chemical test, and it is this certainty of action which is the prime difference.

Chapter 3

DOUCHING AND FUMIGATION

'The man who will devise some perfectly certain and simple method by which birth can be put into the control of married people will be as great a benefactor of the human race as Simpson or Lister.'

Lord Buckmaster
in the House of Lords
July 13th 1931.

During the 1930's both newspapers and reputable magazines were publishing large advertisements which, addressed directly to women, advised them to use some form of douching as a contraceptive method. A pamphlet under the heading *Agressit* (1926) had this to say under the sub-title of *Directions for use.*

> Agressit having a great germicidal power kills also the human sperms and the tablets must be applied either shortly before or after sexual intercourse between man and woman. Agressit can be used in irrigation which is very efficient. For this aim it is recommended to dissolve one Agressit tablet in a glass of water and use this solution immediately for rinsing with an irrigator.

Such an advertisement was all too common in the 1930's. Two quotations will suffice to show the opinion of qualified experts on the subject which had been published some three or four years before and which had still not prevented the public advertising of notices such as the one above. In 1931, Marie Stopes says: 'As a contraceptive measure by itself, douching is unreliable, unwholesome, and psychologically harmful'. In 1928 James Cooper in his book *The Technique of Contraception* says—The Douche: Advantages: None of real value as a contraceptive.

To understand this dichotomy of thought we must go back to the beginning and try to discover the origin of this contraceptive method

and see how it is that after two thousand years of use it is both condemned and recommended.

It is apparent that the early Egyptians approved of douching as a contraceptive measure for not only have prescriptions been found giving details of the solution to use, but so have drawings of the actual instruments and instructions on their use.

The Ebers Papyrus of 1500 B.C. gives an account of a method using fumes of wax and charcoal which were received by sitting astride the burner, for it must be realised that fumigation was recognised as being an integral part of douching. This preliminary fumigation is advised in the Petri Papyrus (1850 B.C.) where it says 'Fumigate her in her vulva with minnis (a drug) then she will not receive her seed'. If this was to take place before coitus this could

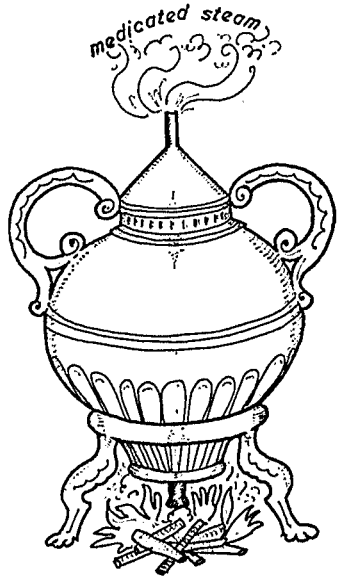

FIG 2 A special kettle used for fumigating the vagina (16th century)

have rendered the vagina into a spermicidal state ready to receive and destroy, even if only partially, any sperm which arrived there.

This, followed by an effective douche to wash away the seminal residue, could have produced an efficient contraceptive measure.

Most of the instruments described were made from the horn of various animals, the most common of all of these being the bill of the ibis which was used as a conducting tube to pour fluid into the vagina (*Pliny*). The ibis of course is directly related to the stork, which has a long attachment to the story of contraceptives or their failure.

In the same papyrus douches of wine and garlic with fennel are recommended to be used immediately after coitus and women were specially employed to administer the liquid used. These women were almost exclusively licenced by the State and came under the jurisdiction of the State Body.

One of the earlier recommendations for douchings is given in an account in *Leviticus 15-16-18*. 'If a woman lies with a man and there is an extra vaginal escape of feminine fluid they shall both wash themselves in water for they are contaminated.' It is interesting to note that the Hebrews here give an account of the first speculum in history consisting of a leaden pipe with a movable end. The edges of the pipe were bent so that it would not damage the vagina. At the end of the pipe was a small sponge which could be used to wipe out the vagina with the douching fluid. The fact that the Hebrews were so early in this field is not so strange as it may first appear because Moses himself has been described as having studied medicine and chemistry under Egyptian physicians (J. H. Baas, *Hist. Med.*, 1911).

Once it was realised that it was the ejaculated liquid which caused conception then many methods were attempted to remove the liquid from the vagina. In the Sacred Vedas of the Hindus written about 1500 B.C. and which was reputed to have originated from the mouth of the Great Brahma there is an account of injections into the vagina and urethra using a tube four fingers in length, made of wood and ivory with an opening the size of a small pea. The tube was covered with oil and the bladder of a buffalo or other animal

was used to supply the force for squeezing solutions into the vagina.

In the 1st century B.C. Charaka, the eminent Indian physician, gave details of a method of fumigation. A woman—he says—who will treat her vaginal passage with the smoke of the neem wood does not conceive. The method of fumigation itself which is described here is of great interest performed as it is with a douche afterwards.

A special kettle was used with a long thin spout, the end of which was covered with a layer of some soft absorbent lint-like material. The user was instructed to sit with legs astride over the kettle so that the ensuing steam would penetrate well into the vagina. Instructions were given on how to put live coals into the vessel and sprinkle on top of these some powdered neem wood, the opening should then be covered and the protected spout inserted into the vagina. This method is repeated again in the *Briohadyogatarangint*, an Indian medical book which collected together many medical prescriptions, and this particular reference is written in the original Sanskrit.

This method of passing some sort of spermicidal gas into the vagina has not lost its adherents, for certain communities in Eastern Europe still use a hot steam fumigation to cause the menstrual flow to occur again.

The method of fumigation of the vagina prior to coitus by a gas which will act as a spermicide is a method that has lasted for something like two thousand years. However, modern techniques have simplified this by introducing the effervescent or foaming tablet.

These tablets are inserted into the vagina before coitus takes place and a froth of gas is evolved which penetrates into the folds of the mucosa carrying with it the freed spermicidal agent. Depending on the formulae is the type of gas evolved—it could be either oxygen or carbon dioxide and the vagina is freely douched with these gases. After coitus has taken place it is advisable to use some douching solution. The entire process is in relation to the principles as recorded in the Petri Papyrus of some two thousand years ago.

Douching as a contraceptive method which sometimes followed fumigation is treated as vaguely and with as little understanding as

were other methods of contraception. Aetius of Amida suggests a douche of vinegar or brine. Both of these methods would be highly effective, for acetic acid immobilises sperm in less than a quarter of a minute, and even in the present day vinegar is recognised as an effective douching spermicidal solution. Aetius wrote of it: 'The man ought to smear his penis with gallnut saturated with vinegar or wash the genital organs with brine and he will not impregnate'. Had he applied this douche to the woman and not the man how much more effective it would have been.

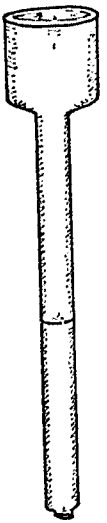

FIG 3 A vaginal irrigator made of tin, lead or wood (c. 400 B.C.)

Aetius may have drawn his original ideas for a contraceptive douche from the great work of Soranus who, with his other methods of contraception, in his *Book on Gynaecology* recommended a douche of alum and sodium bicarbonate to be used before coitus. It may have been that the alum in causing the vagina to contract would have rendered impregnation more difficult, but even so there seems to be no clear indication of where and on whom the douche should be used.

Other primitive people had also discovered the possibility of

douching as a contraceptive means, for it is known that the negro women of Martinique prepared for themselves a solution which is ingenious in its action. They took some husks of mahogany and boiled them with water. The resulting fluid was then strained and mixed with a solution of lemon juice. This particular combination possesses the qualities which appear to run through the history of the douche. For it is a combination of spermicidal agent in the form of the citric acid contained in the lemon juice and an astringent contained in the mahogany husks.

One of the greatest advocates of douching was Charles Knowlton (1800-1850), who in 1832 published in New York a book called *The Fruits of Philosophy*. This book discusses in a very forthright manner the need for discovering an efficient contraceptive, and Knowlton provides much detailed information on the use of the douche.

Knowlton was undoubtedly one of the greatest pioneers in the field of contraception and it is of him that N. Himes says: 'Perhaps it is no exaggeration to say that Knowlton's treatment of contraceptive technique is the first really important account after those of Soranus and Aetius.' In his prescriptions of substances to be used, Knowlton advised the use of solutions of alum together with the juices extracted from plants such as the bark of hemlock or green tea, but he also recommended the use of ordinary cold water. In his special prescription containing vinegar he suggested the use of four or five large spoonfuls in a pint of water. He discovered Aetius's error and suggests that the female should use it as a douche two or three times within five minutes of coitus.

It is perhaps because of the instructions for its use that the douche, although strongly recommended as a contraceptive, never maintained its popularity, for in Knowlton's time home heating was inadequate. To expect a woman to leave the warmth of her bed after the conclusion of the coital act and at a time when a process of relaxation and drowsiness sets in, to walk in winter from one cold room to another and then to be chilled by a cold water douche was perhaps asking too much of any woman. For the extremely

wealthy who could perhaps keep a maid in attendance in a nearby room it may have produced a reasonably efficient contraceptive method. Perhaps the Greeks and Romans comprehended the difficulties because they kept specially trained douche women in attendance.

The idea of a douche attracted many writers of the day and in a pamphlet called *Notes on the Population Question* written in 1831 the unknown writer specifically advised special salts to be used in a douche. He mentioned by name zinc sulphate and alum and further enlarged the scope of the douche by suggesting that any salt which was spermicidal would be suitable. The one that he rated most highly was corrosive sublimate, the substance which was to cause many deaths and much ruined health.

Opinions on the subject of douching were as varied as those on pessaries but there was no doubt that by the year 1850 it was one of the most popular methods of contraception. Dr. George Drysdale stated in *The Elements of Social Science* that it had come to his notice that the movements of sperm cease in pure water, and that therefore a douche of ordinary water was an effective method of contraception. If the sperm was rendered immobile then the problem was solved. Although his theory was right the method was quite impracticable as is shown in the following extract from a work by Dickinson and Bryand (1927):

> Water is a strong inhibitor of motility but it must be three times the volume of sperm and mixed with it to kill instantly, and in such quantity will stay within the vagina. After washing out the vagina immediately following coitus however the wetness remaining should have some effect on any minute quantity of sperms not washed away. Water as a douche before coitus is not effective.

Mrs. Besant, although she later advocated the pessary, suggested that the douche was an effective method and in her pamphlet of 1887 entitled *The Law of Population* acknowledged the fact that it would not be accepted by all women because of its inconvenience. This was a complete understatement directed as it was at the poor of her time, for not only did they find it inconvenient but in the

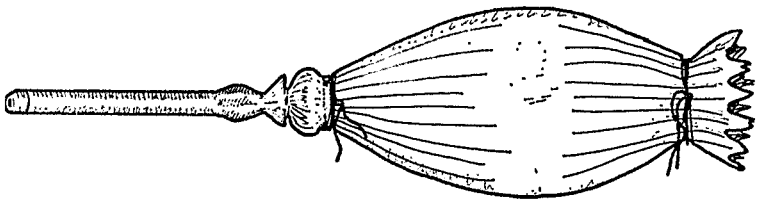

FIG 4 A vaginal douche bag, comprising a wooden nozzle and a sow's bladder (13th century)

confined space of their impoverished homes they found it impossible to carry out the instructions.

When it is realised that the average ejaculation of about three c.c. of semen contains more than two hundred million spermatozoa, then even the most effective douche would find it difficult to be completely effective, yet this did not deter Mrs. Besant from giving in *The Law of Population* a further account of douching which consisted of using sulphocarbonate of zinc and a mixture of zinc sulphate and alum. She gives with these ingredients the following instructions.

> Care must be taken that these drugs be reduced to a perfectly fine powder. The better plan is to dissolve the quantity of the powder just named in a few ounces of boiling water, to ensure its perfect solution.

The user is then advised to keep this solution and to add to it either hot or cold water, as preferred, on the occasion of use. But very soon after this Mrs. Besant had to warn the readers of her pamphlets that the douche was not completely satisfactory and that there had been many failures with it. For she said: 'If the spermatozoa have entered the womb before the injection is used, conception may occur.'

By the end of the 19th century most information on contraceptives was being compiled so that it was possible to assess the value of each kind, although the publication of any literature containing advice on contraceptives was severely restricted, and drastic action could be taken against the writers of pamphlets.

In 1887 Dr. H. A. Allbutt had his name erased from the medical

register by the General Medical Council and was charged by the Royal College of Physicians of Edinburgh with having published and exposed for sale an indecent publication titled *The Wife's Handbook.* It is in this booklet that Allbutt concluded that vaginal douches generally had failed in preventing conception; however, if this method could not be avoided he would only recommend the use of a solution of vinegar.

In spite of all the evidence against it and all the difficulties attached to its use, the douche remained a popular method and in 1913 the Malthusian League included it, together with other modes of contraception, in their pamphlet *Hygienic Methods of Family Limitation.* This pamphlet was issued free on signing a declaration and was rewritten again in 1922 when once again the douche was dismissed as an unsatisfactory method.

Why then has this method of fumigation and douching —or of douching alone—survived in spite of so much opposition? The biggest contributory cause was the entry of commercial interests into the contraceptive field. Just as other methods such as the pessary and the condom were to become large scale industries, so it was attempted to do the same with the douche. Huge advertisements appeared in newspapers and a commercial concern launched a large campaign to encourage douching which reached its peak in the early 1930's.

But as other methods became freely available and with the greater distribution of knowledge on the subject most generally available, the use of the douche as a contraceptive method has almost run its course.

The following extract from *The Lancet* of March 1918 gives us insight into the attitude of the medical profession towards douching at that time.

> Notes on a case of poisoning by Corrosive Sublimate
> by C.
>
> The patient was married, aged 32 years. To prevent impregnation had inserted a 8·75 gm tablet of Corrosive Sublimate into the vagina.

DOUCHING AND FUMIGATION

The bad habit of vaginal douching—ref.10.4.1918.

The inventor of the vaginal douche can was no friend to womankind, for his ingenuity has on the whole been a curse rather than a blessing. Just as there was a pessary age developing the haphazard use of pessaries, so there has been a period of indiscriminate douching. For some time it was the habit to swill the vagina with antiseptic lotion after coitus, but this was controlled by doctors, but the general public took the bit into its mouth on its own account, for this has gone on since and the pernicious but apparently seductive habit is now generally begun on the advice of a relative or friend.

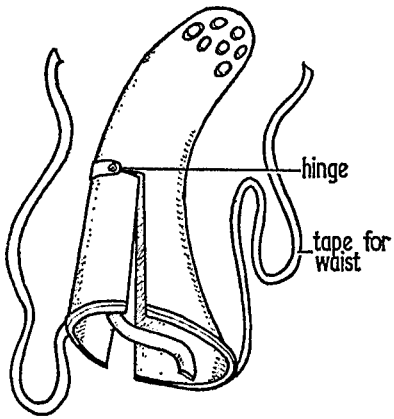

FIG 5 A metallic drug carrier for the vagina, invented by Ambroise Pare (16th century)

Chapter 4

BALLS, FEATHERS AND CAPS

The object of the introduction of chemicals of any sort is the intention to incapacitate the spermatozoa and thus render them incapable of movement or of union with the ovum.
Marie Stopes 1926.

In 1755 the Venetian authorities imprisoned on a charge of spying a thirty-year old Italian adventurer, by the name of Giovanni Jacopo Casanova de Seingalt. In the short space of his life he had been a preacher, a gambler and confidence trickster. By the time his wanderings were over he was able to write a remarkable book of memoirs in his old age. Sitting in the quiet of the library of Schloss-Dux in Bohemia he painted a remarkable picture of the life of a libertine, involved in brothels and making his seductions in some of the most fashionable establishments of the time. His interest lay not only in this aspect of life but also in occultism, alchemy and certainly contraception.

In his memoirs Casanova describes the use of a gold ball, eighteen mm. in diameter, which was to be inserted into the vagina before intercourse took place, hoping perhaps that the shape of the ball would act as a barrier to the sperm and prevent impregnation. As a means of contraception it may not have been particularly effective, but Casanova found it an inexpensive method for he states that the ones he had purchased had lasted him fifteen years.

The great lover of his day was working on the principle that it was possible to place an effective mechanical barrier in such a position that the spermatozoa could not come in contact with the ovum. Original as Casanova was in many of his ideas, this one was not new and attempts to block the entry of the sperm have been noted for

more than a thousand years and are prevalent in many forms in up-to-date contraceptive techniques.

One of the earliest references to an appliance of this sort was in the Ebers Papyrus (1500 B.C.) which describes a tampon made of lint soaked with acacia and honey, with the instructions that the woman is to place it in her vulva before intercourse. There is evidence that in both ancient India and Asia, the plugging of the vagina with small balls or wads of feathers was not an uncommon practice and in Sumatra there is an ancient custom of inserting a small ball of opium which was moulded into the shape of a cup before insertion.

The ancient Talmudists realised that a reasonably efficient method of preventing childbirth could be made by the use of some simple blocking mechanism and what more natural than to utilise the sponge which grew in their local waters. In advising the use of the sponge the ancient rabbis established a method which has persisted, almost unchanged, for over a thousand years. According to Rashi the meaning of the term to cohabit with a sponge is most clear and means that the woman is to insert the sponge before intercourse and for the semen to be absorbed by it.

The use of the sponge is to be found in almost all areas where it grew naturally and the recognition of its contraceptive use found its place in England when it was mentioned in the 'Diabolical Handbills' produced in 1823. As late as 1930 they were available in the clinics established by Dr. Marie Stopes and were being advised to be used by women who could not be taught a more complicated method of providing a barrier to the sperm.

The directions issued by the clinic instructed the woman to buy a small fine grain sponge (although by now rubber had superseded natural sponge) and soak it in olive oil. As late as 1962 the International Planned Parenthood Federation were advising that the sponge could be used as an improvised method of family planning and reminds the user to attach to it a thread for withdrawal purposes.

The ancient Talmudists were far-sighted in using this method, for

its persistence as a reasonably efficient and easily obtained method for such a length of time gives some idea of its recognised value.

In the 1st century Dioscorides suggested that the sicklewort which bears a sword-like leaf could be used as an effective contraceptive appliance. Coat this with honey and insert before coitus wrote the early physician.

Pliny the Elder in A.D. 79 says that 'pitch—the very odour or perfume thereof helpeth the hardness of the uterus and settleth it against mishap'. According to Pliny the pitch was supplied on tampons of wool (*The Natural History of Plinius Secundus*). His ideas were soon developed by Soranus who experimented with several kinds of wool-tampons soaked in wine, but Soranus could never really make up his mind as to whether the tampon should be used before or after coitus.

However by the 6th century another concept was beginning to form. If a barrier could be made from a plug of wool soaked with honey or wine, why not form a barrier in a natural shape such as a cup, so Aetius of Amida must surely have reasoned when he suggested cutting a pomegranate, removing the inside, and inserting the hollow cup into the vagina before intercourse took place.

It seems that once it was realised that to prevent conception the semen should not enter the womb some effective sort of barrier would be established, yet there is such evidence to show that doubts were felt as to what it was that really caused pregnancy. Thus we find that at the time of Rhazes in A.D. 923 the Islamic physician was capable of saying, concerning the prevention of conception, that 'it is necessary to apply to the uterus before receiving the seed, some drug which would block the uterine aperture' and he followed this by giving an effective method: 'that to prevent conception she should sit upon the tips of her toes and push at her navel with her thumb. It would help if she smelt foul odours'.

The peculiar mixture of rationalism and irrationalism persisted and would only be dispersed when the full understanding of the process of conception was understood and the day of the microscope had arrived.

Therefore Avicenna could give these instructions in the year A.D. 1000 as a contraceptive measure: 'Take the leaves of the weeping willow, place them in a flock of wool and dip it in the juice of the weeping willow. This should be inserted by the woman'. This is then followed by 'Insert pepper after cohabiting to prevent childbirth'.

By the year 1200 the great Arabian pharmacologists had preceded Casanova in the use of a round object. They advise: 'Take the testicle of a wolf, and it must be the right testicle. Rub it with oil, wrap it in wool and insert it into the vagina. This would cause her to lose desire and lessen the chance of conception.' This particular method is more functional than many of the others, and it brings many concepts of contraceptional ideas into its implication. A round ball, wrapped in oiled wool could provide an effective occlusive method. The idea of inserting it to reduce the desire of the woman and in effect to render her more passive, also includes the conception that fertility and passivity are two opposing factors.

Even more primitive people than the Hellenic and Islamic world were approaching this problem in a similar manner. For the tribes of the Basai Basin in Central Africa had devised a method which, although not generally acceptable because of its dangerous implications, nevertheless was reasonably effective contraceptively. The process was described by Walter Masters who, while he was a medical officer in Central Africa, noticed it because of the severe complications which arose in women who used it. When no more children were desired—this could have been at a time when the tribe was moving to a different place, or a time when food supplies were running short—the women tore some grass or some rags and chopped and rechopped them until they were extremely fine. These were then forcibly pushed into the vagina, plugging it up.

Masters was actually called upon to attend a woman who was seriously ill because of the complicatory effects (such as retention of urine and faeces) which this plug had caused, and could thus report this method from first-hand knowledge. (*Prevention of Concep-*

tion amongst natives of Karai Basim, Central Africa: *Journal Trop.Med. and Hygiene,* 1916).

The Far Eastern countries such as China and Japan used another type of barrier since times of great antiquity. This consisted of placing small discs of very silky paper against the cervix, and directions were given thus: 'To prevent the penis from touching the uterus take the oiled silk paper called misugami, make it into a ball and place it into the vagina.'

After this period almost up to the beginning of the 19th century there was a continual movement to provide an effective barrier without really understanding what it was that the barrier was exactly required to do. These methods which were partially effective became a part of folk lore and custom.

Slovak women, it was reported, used clean linen rags to exclude the semen and there is evidence that sponges were being sold and used for contraceptive use in parts of Russia. The women of Hungary used a more sophisticated method. Taking some bees-wax they melted it down and made it into discs which could easily be moulded into any shape required. To prevent conception one of these was placed into the vagina and forced into shape. There it would stay during intercourse because bees-wax does not liquify at the temperature of the human body.

All these methods were moving towards producing the final barrier. But the imagination of man approached this idea of a barrier in other ways and some viewed it by devising a contraption which simply plugged the cervical canal. These were presented in all shapes and sizes, some looking like an ordinary collar stud with a ring attached, others with a wishbone-shaped piece of metal attached to the base of the stud. (It was this idea with certain modifications of catgut loops and rings which Dr. Graefenberg of Berlin used in about 1920. It consists of an isolated ring of silver which is inserted by a physician and lies entirely within the uterine cavity. Graefenburg asserted that the ring could be left in place for a year at a time and that its presence would cause no discomfort to the woman at all. But this method of contraception was not received with much

enthusiasm by workers in this field in spite of the number of successes Graefenburg and others had with it. Cases occurred in fact where the ring itself became completely lost unknown to the user, and as other methods—more reliable and less liable to pathological effects—became known, the adoption of the Graefenburg ring lost some of the comparatively small following it had.)

It was not, however, until 1838 that an important development was made. At that time Dr. Friedrick Adolphe Wilde, a German physician, described how he had been using a rubber cap as an occlusive method for his women patients, and in his opinion it was most efficient. But it was left to Dr. Mensinga of Germany to popularise this method of forming a barrier made of rubber. This was designed to occlude the vaginal vault by lying between the walls and close against the cervix. Thus any semen ejaculated lies beneath this rubber division. The use of this method spread from Germany to Holland and only then did it reach England where it became known as a 'Dutch Cap'. (Note:— In the United Kingdom the term cap is used to denote any kind of rubber or plastic barrier which is to be inserted into the vagina. In the United States the term cap refers only to a cervical cap, that is one which fits into the cervix itself.)

The process was not yet complete because of the slight possibility that some spermatozoa could pass round the edge of the cap, and it became necessary to seal this area off with a spermicidal cream and a new adjunct to the contraceptive barrier which was quite different to any that had gone before.

Once the popularity of the cap type of contraception had been established it was realised that it was necessary to seal off any gap in fitting the diaphragm to prevent the sperm from entering the cervical os, by the use of a spermicidal cream, which could be used with an appliance or even by itself.

Modern science and technology have once again entered the field of contraception and produced a spermicidal cream. To understand the background of work and achievement which has gone into the

formulation of a product of this kind let us study one in detail and see what is involved.

The Volpar preparations of B.D.H. were the outcome of ten years continuous research work conducted under the supervision of the Birth Control Investigation Committee. The researches which were started in 1928 had been conducted by Dr. J. R. Baker in the science department of Oxford University. Dr. H. M. Carleton, working at the same university, had made a study of the pathology of chemical contraception and suggested that work for this organised research group should be carried out under these four headings:

1 To devise methods for evaluating the spermicidal powers of pure substances and of contraceptive preparations.

2 To investigate the principles underlying the killing of sperms by chemical means.

3 To discover powerful and harmless spermicides.

4 To produce a scientifically satisfactory contraceptive for general use.

In order that the basic discoveries of Dr. Baker and his co-workers should be coordinated with practical application, the latter half of the investigation was continued in association with the scientific staff of the British Drug Houses Limited.

In 1938 *The Lancet* published a letter drawing attention to a paper by Baker *et al.* in which the results of this research were summarised. The name Volpar derived from the words voluntary parenthood was registered for the resultant products of this research.

It must be appreciated that constant pathological control is of paramount importance in searching for an ideal contraceptive. Many powerful spermicides failed to satisfy requirements on this count and exhaustive clinical trials had to be carried out to ensure the efficiency of the product concerned.

Baker himself criticised clinical tests for the effectiveness of contraceptives (*Chemical Control of Conception,* London 1935) and directed attention to the fact that there can be little assurance that the product is used in the right way as, for instance, before coition and not after.

Many writers on contraception have expressed the opinion that there is a possibility that occasional semen could be ejected directly into the cervical os, and that, should this happen a chemical contraceptive without the extra safeguard of a mechanical barrier would prove to be ineffective. Nothwithstanding this, the number of pregnancies which occurred during the clinical trials when a Volpar product was used by itself was extremely small and although the above proposition could not be refuted entirely the likelihood of such an occurrence is not generally regarded as being great.

Baker himself produced a list of the characters of an ideal contraceptive of this type which in its final form embodied the following ten points.

1 It should be inexpensive.

2 It should require no special appliance for insertion into the vagina.

3 It should be small.

4 It should be unaffected by the ordinary range of climate.

5 It should neither have any trace on the skin when handled nor stain fabrics.

6 It should contain no volatile or odorous substance.

7 It should be non-irritant to the vagina, cervix and penis.

8 It should be without pharmacological effect if absorbed into the blood stream.

9 It should contain a substance reducing surface tension to ensure the smallest crevices of the folds of the vagina being reached.

10 It should kill sperms at 5/8 or lower concentration in the alkaline and acid test, and the spermicide should diffuse rapidly out of the vehicle into the semen.

To produce a product which fulfils all these requirements calls for the highest quality research and manufacturing technique and merely lends added strength to the premise of this book that modern science has taken unreliable basic methods and utilised them to produce an efficient end-product.

Chapter 5

THE CONDOM

I was really unhappy for want of women. I thought it hard to be in such a place without them. I picked up a girl in the Strand; went into a court with intention to enjoy her in Armour. But she had none.
25th November, 1782.
Boswell's London Journal

In human relations during the last fifty years nothing has changed quite so much, perhaps, as the relationship between husband and wife, male and female. The functions of the body have been more clearly understood and the inter-relations of social conduct with sexual behaviour have become more apparent. The advent of the condom has influenced our morals for good or evil now, and for all time.

The sheath, in one form or another, has been with man almost as long as man has existed, and its lusty history stretches back to ancient times and primitive peoples. Although its purpose has not always been contraceptive in use it would have acted in that role unintentionally. The ways in which the sheath originated, the varieties in which it exists and the means and ways in which it has been improved and adapted run parallel with the development of human society.

In ancient history and in its earliest forms its use was mainly as a disease preventative, but there is evidence that some of the most primitive societies were aware of the relationship between the act of coitus and childbearing.

In a cave at Combarelles dating from prehistoric times there are sketched on the wall scenes from the lives of those people who had made these caves their homes. One of these is of a man and woman engaged in the act of coitus, and the male seems to have covered his penis with some form of coat.

There is an interesting legend attached to Minos, King of Crete. Unfortunately for him, and even more unhappily for the women with whom he had cohabited, the semen of Minos contained seed of serpents and scorpions. This had prevented any normal heir to Minos being born, and had greatly injured his partners. Eventually Minos was offered the hand of Parsiphae, the beautiful daughter of the Sun King, in marriage and as part of the latter's blessing, he promised her that no harm would come to her in married life. Nevertheless, the marriage remained sterile. Fate was to intervene, both to influence the life of Minos and the course of contraceptive history. Prokris, the daughter of Erectheus quarrelled violently with her husband and in fear for her life took refuge with Minos in Crete, where she was permitted to remain in safety. Prokris soon realised that the lack of an heir was a source of pain and trouble to her esteemed benefactor and she devised a very cunning plan to help him. She obtained the fresh bladder of a goat and fashioned it into the form of a sheath. It is not clear as to whether Minos used to wear this himself or whether the sheath was inserted into the vagina of a woman. In any case, the result was the same.

In cohabiting with this woman, Minos cast off the scorpion-bearing semen. Then he went to find Parsiphae and cohabited with her. The plan proved extremely effective and Parsiphae bore Minos eight children.

In Ancient and Imperial Rome the bladders of animals were used to receive the man's sperm during coitus and they were expressly made for the purpose of protecting woman, not against the consequence of pregnancy, but against the greater fear of disease—that the same act could be responsible for both results had not yet been realised by this already advanced society.

That the sheath originated as a disease-preventing factor is established without doubt, for it is known that the early Egyptians wore them as such, especially as a protective against such tropical diseases as bilharsia. They have also been used as badges of rank, being dyed in various colours—each colour designating social status.

It is not difficult to formulate a theory as to how an animal membrane became used for such a purpose. A butcher of those early days would have been well acquainted with the fineness and tensile strength of the gut of an animal. Perhaps he had found that the caecum of a lamb or a sheep was an efficient covering for the cuts on his fingers. If he had contracted that disease which was so rampant in those early days—why would not this same covering which he had used for his fingers protect him elsewhere. What more natural than to cut a section of this elastic material and use it as a cover for the diseased part. From there it would not be illogical to assume that as well as protecting him now, it might well prevent others from contracting the disease in the first place.

The idea of a sheath was not the prerogative of Western civilisation—for in New Guinea there is evidence that the Djukas, a primitive tribe, used a female sheath made from a plant. This vegetable sheath was about six inches long and in the form of a seed pod open at one end and closed at the other—before intercourse took place the pod was inserted, closed end first, and was itself held in place by the vagina.

It appears that some form of sheath was always available and it had to rely for its form on whatever materials were at hand at the time and thus we find that the Chinese, with their knowledge of silk, were making sheaths of oiled silk paper at a very early period of history, while the Japanese with their much more practical and functional way of life had devised a type known as the Kabuta-Gata. This was a helmet which covered the glans and was made of tortoiseshell or leather. It had a dual purpose, for not only would it act as a barrier to conception, but it could be used as a hard condom and as an aid to the impotent.

Gabriello Falloppio, the Italian anatomist, one of the great authorities on syphilis, described in his book *De Morbo Gallico* (which was published posthumously in 1564)—a linen sheath which could be fitted over the glans and which Fallopius recommended as a protection against infection. In this book he gives definite instructions

on how to manipulate this linen sheath to prevent the user from contracting syphilis and his instructions would apply equally in the present day.

He goes on to say:

> As often as a man has intercourse, he should if convenience permits wash his genitals or wipe them with a cloth. Afterwards he should use a small linen cloth made to fit over the glans and then draw forward the prepuce over the glans and if he can do so, it would be as well to moisten it with saliva.

Thus the next stage in the development of contraceptive technique is reached and a new word appears in the English language. The word is 'condom'—but the origin of the word itself is shrouded in mystery. Etymologically there appears to be no source for the word and all efforts to break the word down have been in vain. A theory was put forward by Paul Richter—that it was derived from the Persian word *Kemdu,* which refers to a long vessel made of animal intestines and used for grain storage. It would be possible, however, to find other words which bear a similar sound and a meaning which could be attached to its present-day name.

The controversy as to whether it originated in France or in England stems from Bloch's suggestion that the name is derived from the French town of Condom in Gascony. Nevertheless, one thing is certain and that is that neither country desires to be attached nationally to this all-important device—for what do the French call it but *Redingote Anglaise,* while the English call it the French Letter.

All these assumptions however cannot be accepted and all the evidence of any worth points to the fact that it must have been a proper name, and there perhaps lies the truth. It is most commonly stated that the condom was invented by a physician at the Court of Charles II (1630-1685). The Royal libertine was increasingly concerned at the number of illegitimate children who were his or were being attributed to him. To prevent this happening he instructed Doctor or Colonel Condom, and there is no reason why he should not have been both, to prepare some method which might reduce the number of conceptions. Dr. Condom—being fully aware of the

use of the sheaths as a disease protective—did some more research and choosing the right kind of material—a piece of intestine from a lamb, suitably cleaned and softened—advised his royal master to use this to avoid impregnating his women.

It is argued as there is no reference to him by diarists like John Evelyn or Samuel Pepys, Dr. Condom could not have existed, but this could apply to many omissions from the diaries. It is certain that whereas before 1680 there is no reference to the word at all by 1717 and onwards it falls into common use. The article it described was not new and if there is any other source of the word other than that of a proper name it surely would have appeared earlier somewhere. In 1717 Daniel Turner, the physician, mentioned the word Condom and from then on it appeared in all the textbooks concerned with venereal disease. In a dictionary which was published in 1785 and concerned with the language of the London streets the word condom finds its official place.

As the use of the word spread so the use of the article itself increased rapidly and during the early 18th century the bawdy houses and prostitutes themselves became sellers of sheaths. The great Casanova was not averse to using them and even goes so far as to suggest that they put the 'fair sex under shelter from fear'. He tells the story of buying a stock of 'English Riding Coats' from a nun while in Vienna, but discloses that he did not really like using them because they seemed to him to be a piece of dead skin.

By the end of the 18th century they had become so popular that someone started manufacturing them and selling them wholesale. In fact not only was one business set up but it very soon faced keep opposition and there is no reason to doubt that they were made of the dried gut of sheep. The original seller was a Mrs. Phillips who opened a small warehouse in the Strand, London. She advertised her wares by circulars and handbills asking customers to call on her at the sign of the Green Canister in Half Moon Street. So brisk was business that Mrs. Phillips was able to retire altogether and she disposed of her business to a Mrs. Perkins.

The latter carried on in the same manner and with the same type

of advertisements until Mrs. Phillips after about ten years of retirement decided to return to the same lucrative field again. It is not known whether this was because her money was running out, or whether it was because her product was of a better quality and she was asked to come back. She soon began distributing handbills stating that she was back in business again and she now openly offered to supply apothecaries with any quantity they wished. Her new address was at the Sign of the Golden Fan and Rising Sun near Leicester Fields. Here on any day could be seen buyers from nearly all the main countries of Europe, from France, Spain and Portugal and the battle for business raged around them until right up to the end of the 18th century. By this time there was no doubt that the condom had a double purpose, one in preventing disease and the other in preventing pregnancy, and in Dunglinson's *New Dictionary of Medical Science and Literature* published in 1839 these last two attributes are specifically mentioned together. He describes it under the word Condom—Armour, Posthocalyptrons, French letter, Cutherean Shield (French Baudruche, Redingote Anglaise, Gant des dames, Calotte d'assurance, Peau divine, Chemisette.) It was the intestinal caecum of a sheep, soaked for some hours in water, turned inside out, macerated again in weak alkaline lye, changed every twelve hours, scraped carefully to abstract the mucous membrane, leaving the peritoneal and muscular coats exposed to the vapour of burning brimstone and afterwards washed with soap and water. It was then blown up, dried, cut to the length of seven or eight inches and bordered at the open end with a riband. It was drawn over the penis prior to coition to prevent venereal infection and pregnancy.

This entry proved to be of exceptional interest much later on. In 1953 E. J. Dingwall had the opportunity to inspect some sheaths which were made between 1790 and 1810. These had been found in a room in a large English country mansion and Dr. Dingwall describes them in detail in a short article. They were in packets of eight in different sizes and contained in white or blue wrappers, and the length was given as 190 mm., diameter 60 mm., thickness 0·038 mm.

Dingwall's very explicit and comprehensive note gives some quota-

tions in poetry, one of which came from Joseph Gay's *The Petticoat* (1716):

> The New Machine a sure Defense shall prove,
> And guard the sex against the Harm of Love.

And another from *The Potent Ally* (1741):

> Happy the man who in his pocket keeps
> Whether with Green or Scarlet Ribbon bound,
> A well made C - - - - M.

And the last one from *Panegyrick upon Cundums* which is probably the most apt, states how these 'cundums' permitted

> Joys untasted but for them,
> Unknown Big Belly and the Squawling Brat.

But Dingwall had not finished this amazing piece of work yet for he went on to describe the use of this contraceptive as a prevention against venereal disease. In 1597 Hercules Saxonia in his *Luis Venereae perfectissimus* described a device made of some type of linen soaked in a liquid and then allowed to dry, and in 1770 E. C. Bourru stated that these English sheaths were subject to tears, because as they were *'criblée d'un infinité de pores'* they would be of little use as a disease preventative. (From *Early Contraceptive Sheaths—Nova et Vetera*).

One of these sheaths was examined by Professor J. E. Young of the Anatomy Department of University College, London, and he proved conclusively that it was made of the caecum of sheep. Although Professor Young attempted to emulate the makers, his attempt to produce a similar article failed because of the difficulty of achieving such a fine texture.

In his pamphlet *Who was Condom?* E. Leonard Bernstein has summed up much of the evidence upon which Condom's claim to fame is based and he makes it possible to refer to a book entitled *Poems by the Earls of Roscommon and Dorset—the Dukes of Devonshire and Buckinghamshire,* printed in 1739.

One of the poems is a *Panegyrick upon Cundums,* which contains the following lines:

> Hail Happy Albion in whose fruitful land
> The wondrous (procurer) arose and from whose strange skill
> In inmost Nature thou hast reaped more Fame
> More solid Glory than from Newton's Toil.

A footnote to the word procurer says 'Colonel Cundum who invented them—call'd so from his name.'

The French writer P. J. Cabanes was perplexed by the question as to whether Condom existed or not but he then described in his book *Indiscretions de l'histoire* published in Paris (1903), a definition of the words *Redingote anglaise,* which he says is the name given to little bags made from the caecum of certain quadrupeds. He goes on to say that these bags were invented in London by Condom whose name became so dishonoured that he was forced to change it and that the bags served to protect the genitals from venereal disease.

It is interesting to list the sources of opinion on this matter as it is through forming it that perhaps some final conclusion on this matter could be drawn.

AUTHOR	DATE	CONCLUSION
Turner	1717	Condom is mentioned but no reason for name.
Bauchmont	1881	'The Condom is the law', no reason for name.
Farmer	1891	Condom named after a colonel in the Guards of Charles II.
Cabanes	1903	Condom—invented by a man in London of that name who had to change it.
Bloch	1908	Condom comes from the French town of Condom in Gascony.
Ellis	1927	Condom—named after English physician.
Himes	1936	Condom named after Dr. Condom or Conton physician at the court of Charles II.

There can be few cases in history where the founder of a great modern industry whose name and whose occupation is established and whose approximate period on earth is known, who seems to have left so indefinite a trace of his actual presence. No trace of a Colonel or Doctor Condom has been found in either of the army lists or any other register of that period. It appears most likely therefore that although he must have existed as Doctor or Colonel Condom originally, he was forced to change his name because of the ridicule and notoriety which was being attached to it.

It is a long way in history from the story of fire to dynamite to the immense power of the atom. It is an equally impressive evolution from the goat's bladder of Minos through the caecum of lamb to the modern condom, but its effects may be no less important. It is difficult to imagine the growth in production from the little warehouses of Mrs. Phillips and Mrs. Perkins to the vast organisations which stand behind the manufacturing of the sheath today. Popularity and common usage had to wait for man to develop scientifically first, but with the advent of the industrialisation of rubber and the diversity of its uses it was not long before it was being put to use in the manufacture of contraceptives. It seems that man was waiting for some material which would give him a secure and aesthetic form of contraception and, once that material appeared and the product was reasonably cheap, then the demand increased beyond anything that could have been imagined. The number of sheaths produced now must be almost three million daily.

In Europe the largest producer is the London Rubber Company, which was first formed by a Mr. Jackson in 1916 in one room at the back of a little tobacconist's shop in the City of London. By 1939 and just before the outbreak of the last war, additional premises had to be found, and by the end of 1960 it was a public company with a capital of over one and a quarter million pounds and a factory on the outskirts of London working three shifts daily and producing 1,050,000 gross of sheaths annually.

The substance from which the protectives are made is a strange fluid with many properties, but it is just as much a natural product

as is the caecum of sheep or the vegetable pod of the Djukas; for it is in its treatment for use as a protective that the process becomes complicated and requires the attention of highly skilled technologists.

It is that skilful treatment that ensures that the viscosity of the latex solution remains the same all the time, and that the elasticity and tensile strength of this natural material remains constant under changing conditions of storage. Most important of all, it has to make absolutely certain that there is no reaction at any time with any of the physiological liquids in contact with it.

It is this liquid which is transported from the tree to the factory which is the basis of the process. It was this same substance that Columbus saw when he landed in America and noticed the marvel of this vegetable gum which the natives rolled into a ball and amused themselves by throwing and bouncing. He had to cut one open with a knife to ensure that it was not a living thing.

In order to understand fully what a high degree of skill and scientific achievement is necessary, the manufacturing processes must be described. Huge tanks are filled with the purified latex of the correct viscosity. An endless chain of glass formers constantly rotating is sent through this creamy coloured liquid and the rotation of these formers must be strictly controlled to revolve at a certain rate with complete smoothness to prevent the formation of any bubble or deposit at the closed end.

As they are lifted clear of the tank they are subjected to a stream of hot air which dries the first coat and the process is repeated again to ensure that the deposit of latex is evenly distributed. The process of vulcanisation now takes place to give to the latex the property of being able to withstand any change of temperature so that the material will not wilt in summer or stiffen in winter. The condoms are then dried in hot air and dusted with talc before being stripped off the formers by brushes. If a glossy transparent appearance is required then the sheath is removed without dusting but with a higher degree of vulcanisation.

This carefully controlled sequence of events is followed by a

rigorous testing scheme and the most modern electronic devices are brought into play to detect any fault, such as the presence of foreign matter, and the absence of any point of weakness. It is essential that each condom should be of the same uniformly high quality and modern science and technology have devised the most ingenious methods to ensure that this is so.

One of the well-known properties of rubber is that it is an extremely poor conductor of electricity and it is this property which is put to use in testing. Each sheath is drawn over a metal cylindrical mould, which is large enough to distend it without any possibility of a tear. The condoms are then dipped into a large tank of water where both the cylindrical moulds and the tank are electrically charged. If the condoms are in order, then the current will not be able to flow through. However, if a condom is faulty and there is a flaw in it then the current will pass and the faulty piece identified and destroyed. By this means not only will defects like the minutest of holes be detected but the presence of a particle of dust however small, would be discovered.

That the modern sheath has attained complete recognition is beyond doubt, and that the old time when the mention of the device was tinged with shame has gone for ever, is established when it is realised that the British Standard Institutes have proposed an actual test as to its quality. The test consists in taking at random a finished condom which is carefully unrolled and suspended with the open end upwards. A specified amount of water is poured into it and after a period of three minutes the outer surface is examined for any appearance of water leakage. If this is doubtful the condom is closed by twisting it from its open end and then rolling it on dry filter paper. The appearance of any spot of moisture would indicate a fault.

In Sweden and Denmark the tests are even more comprehensive both for leakage and for tensile strength. A special machine designed purely for the inflation of condoms has been designed, which subject the sheath under test to extremely high pressure at a rate of nearly 3,000 condoms per hour.

Historically the sheath has at the present time reached its zenith and with the new refinement which has been added recently of pro-lubrication, has achieved an imperceptibility in use, that overcomes one of its main contra-indications. From its early beginnings it is now the mainstay of several major industrial concerns throughout the world.

Chapter 6

COUGHS AND SNEEZES

'But if we should conceive, what would become of us then?'
'You think of the worst before it happens. It will be time enough to talk of that when it takes place; there are a thousand ways of managing in such a case, that nobody will ever know, unless we ourselves divulge it.'

From The Story of Filostrato
on the Third day.
The Decameron of Giovanni Boccaccio, 1353.

It has always been recognised in contraception, as in other fields of medicine, that certain methods which might have some value in their social or physiological context, could, on closer examination by a worker experienced in the contraceptive methods, be proved to be without any real scientific foundation. Nevertheless these techniques could still be in use.

In this category would be procedures which do not involve chemical or mechanical appliances of any sort and rely entirely on what nature has provided. Thus it was that methods were adopted which required excess movement on the part of the male or female or extreme passivity. Powers were attributed to coughing, sneezing and jumping which, if correct, would have solved the question of contraception many hundreds of years ago, and the reference to these natural methods stretch back to the days of antiquity.

It must not be assumed that as soon as science progressed, these physiological methods of contraception were discarded. As late as the middle part of the 19th century one of these techniques was adopted by a community of people with extremely high ideals, who decided to base the sexual part of their life on practising a method of contraception which was controlled by the leaders of the Group.

PLATE 1 A Roman brothel during the Imperial era *(from an etching by Dufour)*

ĩcestus. ¶i erga masculū sodoĩa. ¶i cū uirgine extra matri
moniū stuprū ¶i cū religiosa sacrilegiū. ¶i puellēciā raptus
¶Interrogādū est eciā quociēs habuit. ¶i p ĩtuala temporū
hoc fecit puta desiderat rōe cōmittere fornicacōnē cū al'quo
ul' al'qua postea occupat se ī alio negocio ul' cogitat de gu
bernatioē domus & huiusmōi ¶Et ide item desiderat fornica
ri peccat pl'ries & mortl'r. ¶ed si cōtinue uersat ītali cogita
cione p horā unū ē. ¶ed tanto grauius q̄nto diutius. ¶Item si
mutat cogitacōes de una ad aliā psonā uel ad diuersa spēcie
cū eadē psonā deliberās de pse deq̄al'bet de nouo semp pec
cat mortal'r. ¶Unde si centum mulieres uidet unā post aliā
& ad q̄l'bz spāliter delectat aiuz, & mortl'ia cōmittit. ¶ecus
si una cogitacōe hoc appetit quia unū ē hūs deformitatē tot
peccatoz. ¶Itē interrogandū si diebus festīs discurrit p eccle
sias, quocādo ml'eres & si philocaptus ex aliqua secutus ē
eam & q̄nto tēpore. Quod dicit de uiro dicēdum ē eciam
de mulierē erga uiz. ¶De delectacōne morosa & cogitacōe
īra hēs ī capitulo de luxuria. ¶i mulier contētatur habere
amatores & cum ppendit aliq̄s ul' al'quos eā prouocari seu
amare carnal'r potīt se ad fenestrā ul' uadit ad al'quē locum
ut uideat ab eo ul' potīt se ī alio publico loco. Ubi discurrūt
iuuenes ad quocādum mortale ē eciā si non appetat pecca
re cū tl'ibus q̄a occōnē rúine prestat

NOta q̄ ioĩbus spēbus usure ē peccatū mortale & tētur
ad restitucionem si pōt ei a quo accepta ē. Quod si ille
ignorat ul' nō ĩuenitur pauperibus erogef. ¶Et non solum q̄
accepit sed eciā heredes eius si tñ de boĩs eius ad eos per
ueīt. ¶Prīo de usura quero ¶i mutuauit pecuniā nūeratā uel'
aliquid eoz que usu cōsummuntur ut frumentum uinum
& oleū & huiusmōi ītencōne al'quid recipiēdi. Ultra suum

PLATE 2 Facsimile extract from an early MS. of St Antoninus Florentinus (1389-1459) prescribing recipes for contraception and abortion

That this community existed at all, in comparatively recent times, shows the persistence of the idea that it was possible to control conception by the use of a physiological process.

Let us then trace this trend of contraceptive history, recalling that at no time is there any reference to, or any involvement of, an artificial means of preventing impregnation. Probably the most widely adopted of these processes and one that shows a great preponderance of use over any other method was the practice of *coitus interruptus*, that is the withdrawal of the stimulated penis to permit ejaculation outside the vagina. This method is without doubt one of the oldest contraceptive techniques and references to it are to be found in most books, however old, which deal with this subject.

There is a clear reference to it in *The Old Testament, Book of Genesis 38*, where the story is told of the two sons of Judah, Er and Onan. After the death of the former, Judah asks his son: 'Go into thy brother's wife and marry her and raise up seed to thy brother'. And Onan knew that the seed should not be his: 'and it came to pass that when he went to his brother's wife that he spilled the seed on the ground lest he should give seed to his brother.'

There is another allusion in the work of Rashi when he gives the interpretation of the term bow and arrow (*kesches*). These terms are used in the *Pentateuch* as the symbol of ejaculation *seminales*: 'The seminal fluid spurts like an arrow from the bow'. (*Rashi Gen. 4 49.24.*)

When Jacob said of his son Joseph 'His bow abode in strength' he is referring to Joseph's relationship with the wife of Potiphar, who had tempted him into adultery. 'But at the crucial moment he controlled his bow (*coitus interruptus*) and all the semen was discharged and Joseph cupped his hand to receive it.'

The ancient Hebrews would be acquainted with the principle underlying this method for they were versed in the study of the female anatomy. This latter science had been fully studied by the Talmudists who based their knowledge on the dissection of animals, and of prostitutes who were fairly numerous amongst the Hebrews (Rabbi Ishmael). They were well acquainted with the uterus which they

named the sleeping chamber, the vagina, the outer house, the hymen, which was unknown to the Greeks but which had not been overlooked by these zealous Talmudists, was referred to as the virginity, the clitoris was called the key, and the whole of the female generative organs were known as the larder. Possessing this detailed knowledge it is not surprising that the technique of *coitus interruptus* was understood. With the emigration of the Hebrews into other lands this method would have gone with them and it is therefore not difficult to find references to it in other nearby lands.

That it was known to the Greeks is certain for there is a reference to it in the works of the Hippocratic writers. 'After coitus if a woman ought not to conceive she should make it a practice for the semen to fall outside.'

In *The Book of Quintessence* written by Rhazes in A.D. 923 several methods of preventing impregnation are described. One is that at the time of ejaculation the man should withdraw from the woman so that the semen should not be deposited in her, and almost the same advice is given some eighty years later in the *Book of Avicenna* where the eminent physician says in his instructions to avoid conception that 'there should be a quick separation of the two persons just before ejaculation.'

It is interesting to note that this method was used and has retained its popularity for well over two thousand years, and that it is only with the popularisation of other methods and the growth of the theory that it was harmful to certain individuals, that it has begun to show a decline in use.*

If the peculiarity of this method lies in the fact that the semen is deposited outside the vagina by the physical withdrawal of the penis, what then of other physiological methods where this does not occur? As a derivative of the method described above there arose a practice called *coitus saxonicus* which was mentioned in a set of recipes given by Kokkoka in *The Secret of Sexual Desire* in the early 14th century. A method is described consisting of normal coitus up to the point of emission of the semen. At that moment the woman places her fingers

*(S. Freud. Mid 1924. *Papers* vol. 1, p. 359).

on the base of the male canal and by putting as much pressure as she can at that point closes the normal channel of exit of the sperm. There is thus no external ejaculation and the seminal fluid is forced into the bladder to be passed out with the urine. For many obvious reasons the method was not effective and as in all processes of evolution was discarded.

One of the contraceptive techniques almost as old as *coitus interruptus* was the advice given by the Chinese philosophers, for a woman to adopt an attitude of complete passivity during intercourse. The concept that women could control fertility as a result of controlling their emotions had originated from very early times. The Chinese gave it the name of *Kong Fou* and their advice included, in 1100 B.C., the following adjunct: 'At the moment of ejaculation draw a deep breath and think of other things'.

There is a reference by H. Ploss in 1887 to the women of the Buru Island in the Malayan Archipelago who had used this method of passivity as a part of their sexual ritual, for when they had union with strange men, they maintained absolute passivity to prevent impregnation.

Musitanus in 1700 advised that to avoid childbirth avoid passionate intercourse. This concept prevailed almost to modern times, amongst the most civilised of peoples, even in Victorian England. The premise existed that for women to enjoy coitus was satanical in origin and often led to pregnancy, and passivity could avert this. Perhaps one of the marked effects of the improvement in contraceptives has been to free women not only from the strain of continuous pregnancy but to release them from the burden of controlled passivity.

There is, however, a basic reason that passivity could in fact reduce fertility. There would in this case be a tendency for the sperm to be retained within the vagina for a longer period than was normal, enabling the natural acid secretion to destroy their mobility.

But just as some believed that inertia was the solution, so others believed the opposite. Almost at the same time that Julius Caesar was preparing to invade Britain, Lucretius, the great Latin poet and

scientist, was making his study of the fertility and sterility of the women of his day. In observing these problems he commented on a method to reduce the possibility of fertilisation. 'Effeminate movements during intercourse will reduce the chance of fertility. To prevent conception therefore harlots, use this motion.'

Activity by itself was presumably not sufficiently effective, for Soranus says: 'The woman ought at the moment when the man ejaculates his sperm in intercourse to draw her body back and hold her breath. Immediately after she must get up quickly, sit in a squatting position and sneeze several times.'

Coughing and sneezing seemed to have attained popularity as a contraceptive device for Avicenna some hundreds of years later stated: 'The woman should rise up when coitus is finished and then take seven jumps backwards sneezing at the same time and endeavouring to jump higher each time. Great care must be taken in remembering to jump backwards, to dislodge the sperm, for jumping forwards will cause the sperm to remain where it is.'

Rhazes accepted this theory, but was not content only with sneezing and jumping, and he added several other refinements. 'The woman should, at the moment after ejaculation, rise in a quick manner, and sneeze several times. She should then jump violently backwards seven to nine steps and at the same time call out in a loud voice.' What it was she should call out Rhazes did not say, but it could be an interesting conjecture; and also, whether this method could be recommended to the flat dwellers of an urban society is highly debatable.

But as with all these methods there is a glimpse of some understanding as to why they were even partially adopted. According to Trall, coughing would cause the pelvic muscles to contract sharply so that the seminal fluid would be emitted. Trall stated that even after the sperm had been deposited in the Vagina, if sudden or violent motions are undertaken which would cause the uterus to contract vigorously, then pregnancy would be prevented. Coughing, running, jumping and dancing immediately after connection has taken place, are all recommended. Perhaps if complete confidence could be gained

for the methods, some amusement might be found in inventing a modern dance which would include a violent movement such as twisting.

Professor Malinowski asserted that the native women of British New Guinea possessed special ejaculatory powers which they used after coitus, so that by abdominal and uterine contractions the male seed could be expelled.

One of the most intriguing incidents in contraceptive history was the foundation of a community comprised of intelligent and high-minded individuals, all of whom had agreed that amongst other things they would use the same method of birth control. When John Humphrey Noyes founded the Omeida Community he did not foresee that this plan which he had undertaken would eventually cause him to flee in exile from his own country.

John Noyes was born in Vermont in the U.S.A. in 1811 and educated at the Theological School of Yale College from where he was licenced as a Congregational Minister. In 1847 he established the Omeida Community in New York as a Communal Society which held all things to be of joint ownership. They undertook several manufacturing enterprises in the name of the community and all the benefits which accrued from these, their farmlands and other industries were shared amongst the members. The Community government met weekly in public session and all decisions affecting the life of the Community were discussed freely in front of all. Cohabiting was permitted according to individual tastes, and a system of complex marriages was set up. The Community took an active part in promoting contraception and this was directed by the Community leaders, who theoretically at any rate, attempted to impose eugenic principles in order to produce healthy and intelligent children. In spite of its marked economic and sociological success, and in spite of its atmosphere of freedom and the excellent general health of its members and their offspring, the community was doomed to failure. There grew up outside the Community a virulent antagonism to the system of Complex Marriage and in 1880 Noyes, now an old man, was forced to flee to Canada with a few of his most loyal followers, leaving the rest of his Community behind in Omeida. Some time

later it was announced that a special meeting was to be held in the Communal House at the Settlement where an important announcement from their exiled leader was to be read. In at atmosphere of great tension and absolute silence the letter from Noyes was read advising the Community to give up the idea of Complex Marriage and to abandon the enterprise. The Company still exists today and has given its name to a make of fine silverware.

But what was this method of contraception in which Noyes had so much faith and which he fully believed that he had originated? It has been known by many names such as male continence, Zugassents discovery, sedular absorption, *coitus reservatus,* and Karezza. It consisted basically of complete control of the act of coitus so that even after prolonged union, ejaculation does not take place. Similar to *Coitus interruptus* it consists of the normal unclothed entry of the penis into the vagina, and is accompanied by movement but not ejaculation. The union can be one of great protraction, but the climax is intentionally avoided and the erect penis permitted to subside naturally before withdrawal from the vagina. By the adoption of this contraceptive technique the Omeida Community reputedly reduced the number of unplanned births to one in five. This method has been described and discussed in great detail by Dr. Alice Stockham in her book *Karezza,* and it was due to this book that the method achieved a measure of publicity and popularity. Dr. Stockham wrote:

> Karezza gives a free motherhood, whether in a Government controlled by men or women. Karezza is a mutual relation and removes all vestiges of the old idea of man's domination over women.

There is one more method of physiological contraception which has found its way into most civilisations and is dependent for its success on the continual suckling of a child. In nomadic peoples this could have arisen by virtue of the fact that it is easier and cheaper and more convenient for the mother to suckle her child. At the same time it may have been noticed that a nursing mother did not become pregnant as easily as a non-nursing mother. Thus the belief grew up that suckling was a natural method of contraception.

Chapter 7

STERILITY IN MAN AND WOMAN

We have here the most desirable as well as the most certain of all contraceptives. At the present day, all other contraceptives are in one way or another objectionable and always uncertain. It is quite possible that we are approaching the time when they will for the most part, all be thrown aside in order to rely entirely on sterilisation.
Havelock Ellis on Vasectomy
Sex and Marriage, 1951.

Sterility in men and women, that is the sterility which is deliberately provoked to prevent conception, has always been a matter of particular interest to humans, for whom the prime object of sterilisation is to prevent conception without destroying the capacity for sexual intercourse, but this object is not always achieved.

Sterility can be induced by taking a substance by mouth, that is by means of an oral contraceptive, a surgical operation, the use of radiation, or even by the injection of semen. The history of sterility in the story of contraception shows that many superstitions were attached to this question which can be traced back to before the birth of Christ. (The subject of oral contraceptives, which is becoming an important aspect in modern methods, is discussed in Chapter 10.)

This chapter will be divided into two sections: sterility and methods by which it can be obtained in men, and then in women, tracing these through superstition and myth, from the Ancient Egyptians who could tell a women 'who will not bear' from a woman who would; the crude and cruel methods by which intercourse by male or female was prevented, so that conception could not take place; the primitive surgical techniques to remove the structures carrying the semen in the man and the ovaries in the woman; until

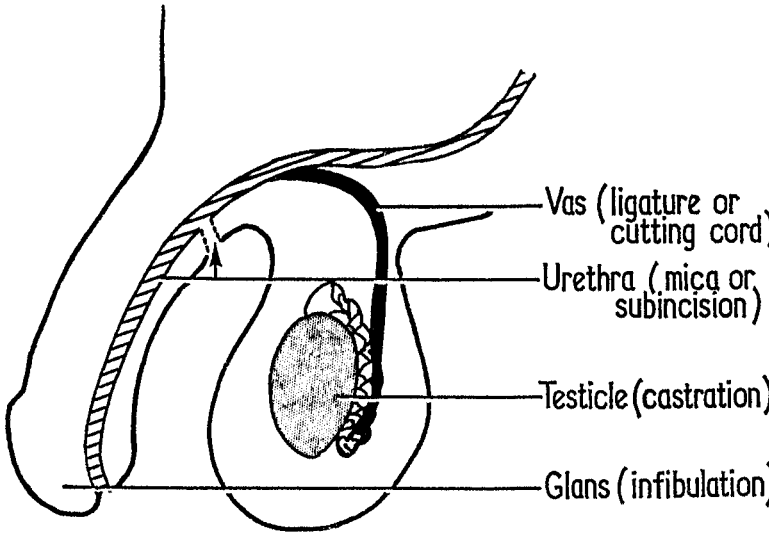

FIG 6 Sites of surgical contraceptive methods in the male

modern techniques have made it possible for a man or woman to undergo an operation which will render them temporarily sterile and yet at a later date will allow the process to be repaired so that normal conception can occur again. This search was not always concerned solely with 'family limitation' or economies; sometimes the reason was a eugenic one. It may have been intended to ensure that only certain types should breed.

Male Sterility

Probably one of the oldest methods of producing sterility was castration and, although this necessarily involves permanent sterilisation, no modern interpretation of sterility as a contraceptive measure would use castration.

Castration was a means of producing sterility in slaves in ancient times to make them safe guardians of the harem. These slaves became known as eunuchs, i.e. a man rendered incapable of sexual

reproduction by means of a surgical operation. The word eunuchism is derived from the Greek words, bed and guarding, and the term referred to male castrates and indicated their principal function, but the Romans adopted the use of the term, Spado, (meaning to cut).

The eunuchs were employed by Assyrians, Babylonians and the Chinese; sometimes they were slaves captured in war and retained by the victors to assist in the household, or as soldiers. This occurred particularly amongst the pre-Hellenic barbarians and is depicted in the paintings at Karnak.

The importance of a secure position within the leading families of Rome was so greatly sought after, that parents would have their sons castrated hoping that they could fill these places of great trust. For the Roman officer away at the wars, the possession of a trustworthy and intelligent eunuch at home was essential.

But castration and the part it played in the prevention of conception was known in religion as well as in relation to the harem. Before one could be admitted to the priesthood of Cybele, the goddess of nature, the male acolytes had to be sterilized, for Cybele was the mother and source of life. The worship of Cybele probably originated in Asia Minor with its chief centre in Phrygia, the priests were known as the Corybantes and the worship of the goddess took place on the mountain tops and in wild forests. It was gradually introduced into Grecian thought, identified with the goddess Rhea (of Cretan origin), and eventually this form of worship penetrated to Rome early in the 3rd century B.C., where the goddess was known as the Great Mother. In 1926 before the Royal Society of Medicine A. G. Francis described a Romano-British Castration clamp which was used in the rites attendant upon the sterility process.

In the fury and heat of religious fervour these intense worshippers of Cybele danced and drank for many hours, losing all sense of reality and becoming completely indifferent to any kind of pain, and when they had finally achieved a trance-like frenzy, they would castrate themselves, in order that they could better serve the goddess-mother. Later, their severed genitals were presented to the goddess and buried with their virility before the altar. Those who survived

adopted women's dresses and served the goddess in the manner of priestesses. Castration was a feature of most of the closely allied cults of Syria, in Ephesus (Artemis Cult) and the Cult of Osiris in Egypt.

This method of permanent sterility was found among the early Mediterranean people, and in *Seven Books of Paulus Aegentia,* Francis Adams, the editor, stated that it was practised to prevent conception and offspring as a consequence of the sexual orgies of the people.

In the Christian religion, castration appeared early and was generally accepted by the great patriarchs of Constantinople in A.D. 325. It reached its zenith almost at the same time and was then denounced by the Church of Rome.

It was probably in China that the practice had its earliest history for castration was being used in the Chou Dynasty of 1100 B.C. on the attendants at the palace. The practice of castration is mentioned in early Chinese medical history, written during this period, and was originally adopted as a mode of punishment for certain grave offences. Later on however, the operation came into vogue as a means of procuring suitable servants for the imperial palaces and for the eight hereditary princes who alone besides the members of the emperor's family had the right to keep eunuchs.

The operation of castration was performed in Peking in a special establishment maintained outside one of the palace gates. The applicants were from Hochienfu, a city one hundred miles south of Tientsin. The operators were known as 'Knifers' and they contrived to keep the trade in one family. The fee they charged including after treatment was about thirty shillings.

When about to be operated on, the patient was placed in a semi-supine position on a broad bench, one man squatting behind him gripped his waist and another was told to look after each leg. Bandages were fastened tightly round the hypogastric and inguinal regions. The penis and the scrotum were bathed three times in a hot decoction of pepper pods and the patient, if an adult, was solemnly asked whether he repented or would ever repent his decision. If he

appeared doubtful, he was unbound and dismissed, but if his courage had held out, as it usually did, all the parts were swiftly swept away by one stroke of a sickle-shaped knife, a pewter plug was inserted into the urethra and the wound covered with paper soaked in cold water and firmly bandaged. The patient, supported by two men, was then walked about the room for two or three hours after which he was permitted to lie down. For three days he received nothing to drink nor was the plug removed from the urethra. At the end of this period the dressings were changed and the accumulated urine allowed to escape.

The parts generally healed after about a hundred days. Roughly two per cent of all cases proved fatal, some by haemorrhage, and some by sepsis. For a long time after the operation, the patient suffered from incontinence of urine*.

Besides man the Chinese have always boldly castrated animals. From early times they discovered the dependence of conception upon the presence of testicles and ovaries, and acting upon the knowledge they have castrated boars and cocks, and spayed sows with remarkable success.

The practice had its followers in recently modern times amongst the Skoptsy or Skoptzi of Russia. This group believed that sexual union was the original sin and that the ability of humans to mate and rear children should be reduced; they therefore adopted a method of self-castration. The beginnings of the Skoptzi or 'White Doves' occurred at a very early period in Russia but the movement increased in the middle of the 18th century. By 1772 Catherine II had imprisoned and severely tortured the leaders of the movement which culminated under Lisin 'Second Redeemer and Czar Peter III'. In 1776 he was exiled to Siberia and the remainder of the 'White Doves' emigrated *en masse*, chiefly to Rumania.

That there were other means of reducing the possibility of conception which are as old as castration is evident if one surveys some of the customs of primitive tribes. In Vienna in 1847 J. Hyrtl re-

* Ref. Jamieson, *Medical Customs Report*, No. 14, 1877, p. 51. After a paper by N. Stent, read before the Shanghai Branch of the Royal Asiatic Society.

lated in his *Handbook of Topography and Anatomie* the following case. 'A pork butcher operated on the wife of a fellow butcher, lest she bear him more children, for her fecundity had already been so great that he knew not how to maintain her.'

It was reported by D. M. Carson, in 1894, that there was, in Australia, an inland race of primitive peoples who practised a ritual operation called *Mica* or *Koolpi*. This has as the basic principle, the concept of a slit along the urethra so that at the time of ejaculation, semen will merely dribble out externally and the deposition of semen into the vagina is prevented. It is certain that the history of this operation dates as far back as the Stone Age, for when the operation was observed in 1894, it was still being performed with a piece of sharpened flint. The operation was performed on young men about the age of 18 years and it has been asserted that only those who were indolent or who were physically weak were chosen for the operation.

The young man who had been selected was drawn away from the rest of the tribe and the ceremony of *Koolpi* took place. After having been physically overpowered the man was held in a suitable position by the warrior members of the tribe and his penis was laid on a piece of bark. Then, with remarkable skill, using only a piece of sharpened flint, the primitive surgeon made his incision. The cut could vary, depending on the particular custom of the tribe, sometimes a small incision was made directly into the urethra immediately in front of the scrotal sack, sometimes the urethra was dissected out from below the glans penis to the scrotus. Once the incision had been completed a piece of bark was placed over the wound to prevent it closing up.

Missionaries have described how a suitably fashioned kangaroo bone is introduced into the urethra at the base of the scrotum and it is pressed forward until it emerges near the glans. Then with a knife made of stone or quartz the 'surgeon' strips the urethra open lengthwise.

Richard Semon stated in his book *In the Australian Bush* that the ultimate purpose is contraception.

If the hordes of a tribe are to live near each other in peace, it

is necessary that the number of the population remains stationary—as things are the land is able to nourish only a scanty populace so that we must regard it as a fitting accommodation if the Australian tries by artificial means to prevent the growth of the tribe and thus render the population stationary. Some tribes attain this by exposing or killing a certain number of new born infants, others castrate a number of their youths as soon as they are grown up and before they enter the class of adults, or render them infertile by slitting the urethra.

This mixture of eugenics and contraception revealed another fact, for among the more intelligent of these Australian tribes not only were the racially inferior men sterilized, but married men, who had fathered one or two children, also submitted to this operation.

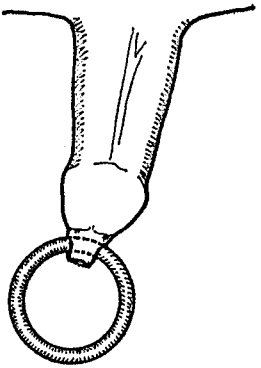

FIG 7 An example of male infundibulation practised by the Romans

It was comparatively simple for an observer to recognise the tribesmen who had undergone this mutilation, for when they urinated, they would stand with their legs apart.

And so it continued from one variation to another, from brutal castration with its irreversible effect, to the painful mutilation of the mica.

Infibulation was a method of contraception employed by the Romans, the name itself is derived from the Latin *in* meaning 'into' and *fibula*, a 'clasp', and it consisted in attaching a ring or clasp to the penis. Celsus stating that the Romans carried out this process,

describes how the prepuce is drawn up and over the glans so that it forms a complete cover. Two threads were then drawn through the prepuce and each day the threads were moved backwards and forwards, forwards and backwards until two clear holes of the required size were made. When these were sufficiently large they were penetrated by a ring which was then clasped into position and thus both intercourse and conception were prevented.

In the 1820's in Germany it was suggested by C. A. Weinhold that a similar process should be used to prevent young men from marrying and having families before they could support them. This time certain refinements were to be added in the form of a seal, soldered and stamped on. The seal could not be broken until the right economic status was attained. The method was not adopted.

By the beginning of the 20th century, due to the improvement of surgical techniques and a greater understanding of the problems involved, other methods were used which were to produce sterility in men. Numerous advances had been made in the use of X-ray and in *The Lancet* of 10th September 1922, an interesting theory was put forward by Markowitz, in which he suggested that it would be possible to induce a temporary sterility in either the man or the woman by irradiation. This was to be carried out alternately so that for varying periods first the woman, then the man would be sterile. It was easy to know when the period had lapsed in the woman because of the recommencement of menstruation, but with men it would be more difficult, because a constant checking of the seminal fluid would have to be carried out. Dr. Markowitz set out a method which emanated from the Central X-Ray Laboratory of Vienna General Hospital. He stated that the genital glands were affected by X-rays to a point of actual degeneration and he proposed that in cases where temporary cessation of conception is desirable, to obtain it by alternately dosing the husband and the wife. In the early experiments ten women out of about thirty were rendered temporarily sterile by X-ray radiation whereas before the treatment they were bearing children at an average of one every eighteen months. Weber showed that sterility commenced within six months and menstrua-

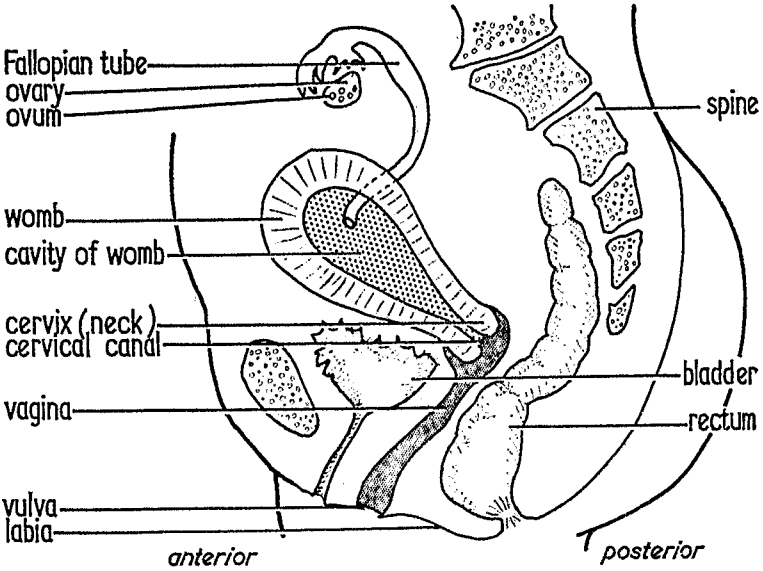

FIG 8 Sites of the female genital organs showing the relationship of the uterus, cervical canal and vagina

tion and normal pregnancy occurred a few months after stopping the X-rays.

Male sterilisation by occlusion of the seminal ducts is a completely reliable and simple method and does not alter in any way normal sexual desire or potency.

When the opportunity to be sterilised was offered to men in the town of Graz in Austria in the 1930's the number that came forward was sufficient proof that it was certainly acceptable to a good proportion of the male population.

That England has been slow to adopt the method is partially due to the fact that voluntary sterilisation for other than therapeutic purposes is illegal.

Sterility in Women

Historically, the promotion of sterility in women is of greater in-

terest than in men; because in the relationship of women to men in those early times, it was the female who was the object of experiment and conjecture. Here we find that not only methods of mutilation and surgical operations were carried out, but the use of a female method of infundibulation in the form of a chastity belt had been employed.

There were also methods by which women who would not bear children could be detected from those who could. If these methods had been successful, or at all reliable, then they would have rendered all other methods unnecessary. The Berlin Papyrus, a source of so much of our contraceptive knowledge of those early Egyptian times, reveals several ways in which a woman who can bear children can be differentiated from a woman who is sterile.

Thus we find the following. 'Fumigate the woman with the smoke of Hippopotamus Dung. If she urinates, or evacuates, or passes wind at the same time, she will bear, but if she does not she will not bear.' The same source includes a method which could be used even today as a quick test, for the Papyrus states 'Take the woman and place her in a doorway where her face can be seen, then examine her eyes closely. If one is like that of an asiatic and the other like that of a negress, she will not bear.' An even more remarkable piece of advice from the same source is the following: 'To detect a woman who will not bear from a woman who will, let her take some wheat and spelt. Place them in separate bags and let the woman urinate over them daily. If neither grow, she will not bear.'

This method had perhaps some basic truth in it because of the increase in the urine of the hormonal content, and this same method was found in the folklore of mediaeval Europe many hundreds of years later.

Even the Romans decided that to induce sterility would be a good method of family limitation and Hippocrates in the 4th century B.C. had noted that as fat women appeared to bear less children than lean women therefore it followed that fatness should be encouraged in those women who wish to remain sterile.

At the beginning of the 18th century a small religious group

carried on extraordinary propaganda under the leadership of Eva von Buttlar on the Wittgenstein Estate in Bavaria. All their public worship concluded with general sexual intercourse and therefore they took the precaution of endeavouring beforehand to sterilise their female members. The method they used was an extremely painful and often fatal operation, and consisted of physically crushing the ovaries. But even this drastic method did not always have the desired effect. The foundress, together with some of her followers, was eventually arrested in about 1705 but managed to escape and make her way to freedom. Is it not strange however that women were prepared to submit themselves to treatment which could cause their death rather than run the risk of producing life?

There have been as many superstitions over as long a period, attached to contraception as there has been to any other field of human experimentation. But running parallel with these superstitions other methods were being used which were to produce better results, and these relied on surgical techniques.

The purpose of these operations to prevent the ovum from uniting with the sperm and the most drastic method was ovariotomy or removal of the ovaries by an abdominal operation, and this, like castration in men, resulted in permanent sterilisation. In an address before the Berlin Anthropological Society in 1881, W. E. Roth described how the natives of Queensland practised removal of the ovaries to produce a special class of prostitutes for the young men of the tribe. Certain that they could not become pregnant they were permitted to live with the young men of the tribe sharing both their pleasures and their hardships. Together with the removal of their ovaries secondary sex changes took place so that these young girls physically resembled the young men with whom they lived. The long scars which ran the length of their abdomen was a sign of their state and position.

Removal of the ovaries for the prevention of conception was known from very early times. Francis Adams, editor of *Seven Books of Paulus Aegentia,* noted that the practice of removal of the ovaries was well known to the Ancient Egyptians.

The Kings of Lydia, Aeramyttes and Gyges castrated women of their harems in order that they might 'continually be used with the full bloom of youth and beauty'. Athenaeus of Naucrates in Egypt in the 2nd century described the sexual orgies of the ancient Lydians and accorded to the Lydian King the somewhat dubious honour of being 'the first man who ever castrated women and used female eunuchs instead of male'. Here again it is stated explicitly that the motive for their castration was to avoid offspring as a consequence of the sexual orgies of the people.

In 1893 B. H. Purcell described certain customs among the natives of Central Australia under the name of *Eurilthas*. This is an operation on women identical with spaying in animals and is a horrible mutilation. The operation is to prevent childbearing to women of the tribe who are over-burdened with children in times of drought and when they are on the march. Girls of ten to twelve years of age were chosen by the old men who pushed a roll of emu feathers into the vagina and uterus. This was left there for a few days and then pulled out together with 'what portions of the womb they have got hold of'. After three weeks they cut the neck of the womb vertically and horizontally and duck's and eagle hawk's down was then pushed in to keep the womb open. The wound was greased with hot fat and when it was healed the vagina was slit across the perineum as far as the anal margin. After the operation, the women who survived were called *eurilthas**.

But the induction of sterility as a contraceptive measure, was clearly not practicable both for physical and for technical reasons. If a single ovary was removed, this for a time would not influence fertility but it is likely to speed up the change of life, which is caused by a relatively quicker exhaustion of the stock of germ cells from the remaining ovary.

Just as there was a method of male infibulation so there was a corresponding female one. Sometimes known as the 'girdle of chastity' or a chastity belt, it had as its main purpose the prevention of illegitimate offspring.

(*Purcell, B. H., *Rites and Customs of Australian Aborigines*, Berlin 1893, Anthropological Society.)

It was known in Biblical times that women wore chastity belts—or *koomuz* made of gold or copper and placed in such a position that they guarded the opening of the vagina. It is stated in an ancient document *Beth Haredem Nidd 8:9:* 'The history of the girdle of chastity is the history of the locking up of the portal that leads to the home of virtue.' The move was from the barbarous method of sewing up the parts, then the passing of a ring through the labia majora, thus drawing them together, to the adoption of the girdle of chastity. This contrivance preserved the purity and virtue of the woman, protected a jealous husband against the fear of adultery and prevented the possibility of illegitimate offspring. Occasionally, however, a master locksmith would break the spell of this guaranteed safety lock.

Dingwall in *The Girdle of Chastity,* has written an exhaustive treatise on this subject, and he traces the origin of the chastity belt in Europe to an incident in the *Guigemar Epic* (A.D. 1180) which concerned 'the handing over of a pledge of fidelity in the shape of a belt worn around the nude body, suggestive of a girdle of chastity'. This episode serves to corroborate the theory that it was introduced into France at the time of the Crusades.

It was left however for another writer to give the first true description of a chastity belt, the *Military Encyclopedia* of Konrad Kyeser von Eichstadt which was written in A.D. 1405 where it was called Bellifortis.

Rashi (Ex. 35/22) was well acquainted with the sexual life of the Frankish nation, who were addicted to sexual perversion. Rashi was a Jewish commentator, who was born in Troyes in France in A.D. 1040 and so named from the initials of his title the name Rabbi Shelomo Izaaki. The great scholar of Scripture and the *Talmud,* whose chief work was his *Commentary on the Old Testament* had this to say about chastity belts. 'The three consonants of the word *Koomuz* (another name for the Belt of Chastity) K.M.Z. stand for Kahn, Mokolm and Zimo, which means a place of illicit intercourse'.

In a book *Treasures of the Oxus* Captain Buston describes a chastity belt which resembled an anklet in its shape, but the ends

were fashioned in the form of winged monsters or griffins. These symbolise the mystical consecration of empire by the supernatural unction of the Gods (*Gen* 3/16), 'and the man shall rule over her', said the Lord.

These mystical griffins are found in India as guards of gold, and at Temple Bar in London, guarding the wealth of the City; they are found too, guarding the tree of life (Soma) on Assyrian cylinders. Here they are guarding the sacred entrance to man's most precious possession—his woman.

The girdle of chastity thus consisted essentially of two main parts, a band of flexible metal, and a perforated plate or a pair of hinged plates. The band was worn around the body above the hips, the under portion passing just above the buttocks, and the second part of the apparatus if in one portion, was attached by a joint to a band in front. The second piece, constructed of either metal, bone or ivory, was made convex so that it pressed firmly against the *mons veneris* and extending downwards completely enclosed the vulva; a dentured or plain perforation permitted the natural functions, but was too small to admit even the tip of a finger.

When two plates were used, not only were the genitals guarded, but also the anus for this precaution was taken in order to prevent those variations in the methods of coitus, which were introduced into Europe from the East. Female infibulation therefore spread across Europe from Africa and the East, and although there were many variations, the orthodox belt without doubt was introduced by the Crusaders, who spent many years at a time away from their homeland.

There is still another method by which reversible sterility can be induced in women. In the normal pelvic cavity, the womb is bent forward on the cervix (the neck), so that it lies upon the fundus of the bladder (anteflexion) and the cervix is turned forwards upon the vagina (ante-version). This is the normal and usual position. There is too a small canal, called the cervical canal, which passes through the cervix and joins the vaginal cavity with the uterine cavity. It is along this canal that the sperm pass, after coitus, to meet and fertilise

the ovum in the fallopian tube and to enable the sperm to pass, the cervical canal must be patent. If it is occluded, as when it is kinked, sperm will not pass, fertilisation will not take place and contraception is effective. This is the principle used by certain primitive and native tribes. In 1887 Van der Burg reported a practice which occurs among girls in the Dutch East Indies: 'In the girls the sexual impulse develops very early, and is gratified, even though they have regular sexual intercourse with men without fear of consequences, when the services of certain skilled elderly women have been requisitioned.' He describes how these women endeavour by rubbing and kneading to bend the uterus backwards, to such an extent as to prevent the occurrence of conception. At a later date when a girl wishes to marry and have children then a further manipulation restores the uterus to its natural position.

In 1897 C. H. Stratz examined some native women of Java and showed that they induced a retroflex uterus with the object of pre-

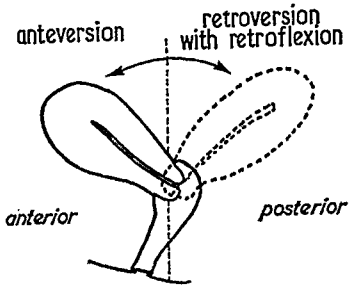

FIG 9 Retroflexion of the uterus to block the cervical canal

venting pregnancy. Retroflexion means the bending back of the uterus on the cervix, thus occluding the cervical canal, and Stratz maintained that in over fifty per cent of the women examined, the womb had been tipped backwards artificially for the specific purpose of preventing conception. He describes the method thus: 'First, the abdomen of the woman, closely above the symphysis was pushed

down by the dukum or midwife by the use of stiff spread fingers. Then with both hands close above the inguinal ligaments on both sides, the midwife rubs very forcefully, causing the abdominal muscles to relax. Then both hands grasp the uterus from the side, pulling this forward, while the thumbs with a forceful pressure push the uterus downwards. The latter movement causes extreme pain.'

But as with man, operative techniques improved and the use of surgery for sterilisation became widely advocated. Today the process consists of tying the fallopian tubes, and its wide use as a contraceptive technique is limited to countries such as Puerto Rico and India, where it is difficult to popularise other methods.

A news item which was reported in 1962, draws attention to the pre-occupation of all nations with the problems of family limitation.

> One Minute Device: The Soviet Government announced in Moscow yesterday that it had started mass production of a vacuum device for producing abortion in women. The instrument is said to be effective in the early stages of pregnancy. The entire operation takes about one minute and is practically painless.

It has been claimed that women who have been injected with semen can avert pregnancy for about twenty months, the temporary sterility being due to the production in their blood of a spermatoxic antibody. If this was correct a new contraceptive method would become available. Dr. S. S. Rosenfield, gynaecologist at the Lebanon Hospital, New York, has carried out some experiments in the production of spermatoxin in human beings who are immunised with injections of living spermatozoa. In his preliminary reports (*American Journal of Obstetrics and Gynaecology Vol. XIII, No. 3*) he says:

> In no case was a spermatoxic reaction demonstrated in the serum of the three women who received repeated injections of human semen. Negative results were obtained after sixteen cases were immunised with dead spermatozoa. In the light of these experiments many injections of semen would appear to be necessary in order to obtain a temporary sterility so that as a practical contraceptive method immunisation with injections of semen need not be considered seriously.

Chapter 8

FOLKLORE

Caesar: Forget not in your speed Antonius to touch Calpernia; for our elders say The barren, touched in this holy chase shake off their sterile curse.
Julius Caesar William Shakespeare.

One of the peculiarities concerning the odd superstitions which have crept into the story of contraception is the fact that they appear to be concentrated in a few particular spheres of the imagination and can thus be grouped together and almost classified. There are of course a few which fall outside this category but by and large these portions of folklore appear to fall into well defined groups.

Every country appears to have its superstitions which have been passed down by word of mouth as methods which could prevent conception.

Lucretius who died in that historic year 55 B.C., had made some perceptive remarks concerning sterility and reached the conclusion than fertility could be reduced by eating certain foods which would alter the viscosity of the seminal fluid. Dioscorides had distinct views on methods which would render women sterile. He advises, 'Take some asparagus, tie it up as an amulet and wear it perpetually', or if asparagus was out of season, 'Take the menstrual blood of women, spread it over them—they will remain sterile'. Aetius of Amida, too, agreed that something had to be worn and in the 6th century he stated that a woman who wished to remain sterile should wear a cat's liver in a tube on the left foot or wear testicles of a cat in a tube around the umbilicus. As a more effective method he suggests that a tube of ivory should be worn and inside the tube should be placed a part of the womb of a lioness.

For those who perhaps were a little more squeamish than the

others, and who might object to having portions of animals suspended on their body, he suggests an alternative: 'Mix with the milk of a she-ass a little myrtle and a berry of black ivy. Wrap all this in the skin of the hare, or the mule or the stag, and wear as an amulet'.

In Eastern literature references are found to techniques which were supposed to prevent childbirth. In China one of the oldest methods was the burning on the stomach of what Wilde, the German gynaecologist, called moxa-balls. Women who wished to remain free from childbirth, took three of these moxa-balls and placed them immediately on the navel. They were burnt until they became ash.

In India, the amulet was in favour, and consisted of tying a large piece of the root of the datura plant around the waist. Bassos, the great Byzantine writer advises: 'Enclose in a piece of linen cloth the seed of patience or sorrel, attach it to the left arm of a woman. She will not conceive.'

One of the methods which appears to have aroused great interest and which is used in rather wide-spread communities is the use of knots; amongst the women of Central Europe the following was known. On the way to church to get married the bride would tie round her waist a ribbon presented to her by one of her women friends. She must not know the length of this and must encircle her body with it round her waist while her eyes are closed. When entering the bridal chamber with her husband she releases the first portion of the ribbon and ties in it as many knots as she requires years free from childbirth, each knot representing one year.

At the beginning of this century Karl Weule came across an interesting use of the knot amongst the Yao women. According to Weule, a woman who wished to prevent herself from becoming pregnant contacted an elder of the tribe who specialised in tying knots for various ceremonies. This person who was called a Fundi when summoned went into a wood and obtained the bark from two types of tree which were only known to him. From this bark he made two long pieces of cord and then plaited them together so that they became as one. Into this he rubbed the yolk of an egg. Then began the most difficult part. Three most complicated knots were tied,

which required great dexterity, saying as he did so: 'Tree you are called so-and-so; and you so-and-so. Out of you', (he points to the egg) 'arise life. But from now on I want no more life!' As he said this he tied the last knot in the cord and gave it to the woman to wear. The charm of this induced sterility would remain with her until she in her turn performed certain rituals with the knots. At the time when she decided that she wished to bear children she untied all the knots in the cords, placed it in water, some of which she drank and the remaining cord was thrown away. Then she would become fertile again.

That menstrual blood should appear in superstition is not surprising, for it must be remembered that amongst some ancient societies it was believed that once a woman bore her first child she would go on producing children annually with or without intercourse. The commencement and stopping of the menstrual flow would thus appear in some miraculous light as being partly responsible for conception.

A spell which was used in Russia was as follows. A peasant girl would collect the menses from as many women as she could in her village. Invariably this unmarried girl would have been in the position where she was in fear of the consequences of having a lover. The fluid was collected together in a special vessel which when full was carried to a local witch, who put it on a hot stove. The young girl was now expected to listen carefully. If she heard the weeping of children she would remain sterile until such time as the witch bade the children to stop their crying.

According to J. Jaworski who reported some superstitions in Southern Russia the following was carried out. A young girl who wished to have intercourse but who did not wish to have children was instructed to collect the first egg of a young hen. Into this she delicately made a tiny hole and let flow into this puncture a few drops of her first menstrual blood. The egg was then taken to her room and buried under the floor. After nine whole days had passed the now worm-containing egg was picked up. She would have as many children as there were worms in the egg, unless she

immediately threw the egg into a fire and ensured that every worm was entirely consumed. Then she would have no children.

Another variation on this theme, from the same area was to collect the menstrual blood of the women of the village and spread this on some flax lint. This is then tied into ten knots and rolled together in the form of a belt, and worn for nine days and nights. During the hours of night from sunset to dawn, it is to be carried under the right arm and from dawn to sunset in the light of the day it has to be wound round the left knee. After this period has elapsed the lint is taken off and buried in the earth in the corner of a room while the following words are repeated three times 'I do not bury you for one year, but for eternity'. The woman will not have children until the lint is disturbed.

Even Dioscorides at a much earlier time had suggested that conception could be prevented by women spreading themselves with or stepping over their menstrual blood.

Another group of superstitions was concerned with the use of fingers, and most of these seemed to stem from Middle Europe and the strange thing about them is that the same superstition is held to be effective in totally different communities.

In old Serbia, women who wanted no more children had only to dip their fingers into the bath water of their first born child. Each finger which was then licked clean from the water represented one year of childlessness. F. S. Kraus who commented on this also stated that it was believed that pregnancy could be avoided in the following way. Once the bride had left the place where the ceremony had occurred she was to take her gloves off her hands in the coach and sit on her fingers for the whole of the journey to the bridal chamber. Each finger sat on, represented one year free from pregnancy.

G. Lamnert reported that in Central Europe an anti-conceptional superstition that carried great weight was for the woman to wear the longest finger of a child who had been prematurely still-born and in the same area it was thought that if a woman wanted no more children she mounted a horse and placed her fingers under the saddle. Each finger constituted one year of sterility. That a woman

should turn to death to prevent a birth is not an unnatural course of events and it is not surprising that many superstitions concerning contraception should be allied to the dead.

It was Edward Westermarck, that persistent worker in this field of customs among primitive peoples, who drew attention to the following, which was a method employed by one of the peoples in Morocco, the Ait Sáddèm. A girl who has had sexual intercourse and who is frightened of any repercussions would remain behind at a funeral when the rest of the party had departed. In order to avert the event she feared she would step three times over the grave, all steps in the same direction. To take a pace in the reverse direction would counteract the desired effect.

Another method was for a woman to go to the grave of a younger sister and call out loudly 'I do not want any more children'. This was more difficult than at first sight, because dead younger sisters were not easy to come by.

In mediaeval France sacred customs had arisen and had passed into the folklore of their respective regions. If a woman were to hang about her neck the finger and anus of a dead foetus she would not conceive in its presence. If the foot of a female weasel was cut off leaving the animal still alive and the foot dried and hung as a pendant about her neck, the woman would not conceive. If she took it off she would become pregnant immediately.

Dead babies were often the source of these legends. In Middle Europe in what was old Bosnia custom had it that if a woman went to the coffin of a dead child and shook is vigorously saying 'I will never again bear children when I shake thee once more,' the desired result would occur.

Among the southern Slavs, when a child died, unless his coffin lid was nailed at the head and foot of the corpse, the mother thought she would become barren. If she washed herself in the water in which a dead child had been washed prior to its burial she would not bear children again.

Sometimes the same method is used in one country for fertility and occurs again elsewhere as a method of producing sterility. And

it might be easy to digress here for a moment and show one or two of these similarities. The method is the same, it is the result which differs.

In Cairo there was a large space to the west of the citadel, where criminals were exterminated. The penalty of decapitation for murder was exacted in public in front of a building called the Maghsil-es-Sultan, or the Sultan's washing ground for the dead. Before the beheaded criminal was buried his body was laid on a table of stone, to be washed before burial. There was also a small trough to receive the blood-stained water which was never emptied but was allowed to remain there for all time.

To become pregnant, women would go to this stone table and step over it seven times with the left foot foremost, and then wash themselves in the stagnant and evil-smelling mixture of blood and water which had collected in the trough. To step backwards over the trough was to encourage barrenness.

Another practice in Egypt which was used until comparatively recent times was for a woman to lie down between the railway lines and wait for a train to pass over her. To lie on her face would induce sterility and to lie on her back would induce pregnancy.

The wearing of certain types of clothes or amulets were said to act in a contraceptive manner. Aetius of Amida suggested that the best amulet to wear was to enclose part of the womb of a lioness in a tube of ivory and suspend it round the neck. He also thought that the following was extremely effective. 'Take,' he said, 'the milk of a she-ass, mix into it a little myrtle and a crushed berry of the plant known as the black ivy. Wrap a little of this mixture in the skin of a hare, or a mule or a stag. But the amulet must never touch the ground.'

A woman too, should carry as a preventative against conception the tooth of a child enclosed as an amulet. It should be attached to the anus.

And yet another amulet, very similar in pattern to the earlier one was used. The seed of the henbane plant was diluted in the milk of a mare nourishing a mule. The mixture had to be wrapped in a

portion of the skin of a stag and worn as an amulet on the left arm. Care had to be taken that it did not touch the ground.

The wearing of these lucky charms as an anti-conceptional device was spread far and wide. In the area near Algiers the women who did not wish to conceive wore on their hands an amulet consisting of a piece of leather on which is drawn two squares. At each corner are inscribed certain Arabic words. In Mecca on the other hand they resorted to rabbit droppings. These were collected into a little box and worn around the breast of the women to guard against pregnancy.

Westermarck reported from Morocco that if a man wished to have intercourse but desired no offspring from the connection he wore a special gold and silver ring on his finger. Contained in it was a stone called Ain L-horr. If, while he has coitus, he turns the stone so that it faces towards the next finger free he would obtain the desired effect.

F. S. Kraus stated that the women of South Eastern Russia who wished to remain free from childbirth removed the waistband from the pants of an innocent dead youth. Providing she kept this round her waist she would be free of the fear of pregnancy.

In the Nordic countries of Scandinavia and Greenland more magical methods played an important part in preventing pregnancy. By rotating a mill the still unborn child as well as those still unconceived was killed. It was necessary to rotate the mill backwards four times at the hour of midnight. By putting under the mill as many grains as children were expected, the deed was accomplished. The slow turning of the mill always raised a sound which was supposed to be the noise of crying children. Sometimes a red liquid—the blood of these unborn infants—was seen dropping from the wheel itself.

Another custom was to put a knife in a cleft between the boards forming the ceiling of the sleeping chamber. The position of the knife in relationship to the bed determined the number of years of childlessness. Another one was as follows: A woman was to extinguish a certain number of glowing coals in her bridal bath water, saying at the same time: 'If these coals begin to burn again, then I

shall give birth to a child'. She could remove the spell by throwing these coals into the fire and as soon as they were entirely consumed, she would become pregnant.

Otherwise she could do the following. On her way to church to the wedding ceremony, she must set an open padlock and a key on the footpath leading to the place of worship. On her return as a married woman, she must fasten the lock with the key saying 'Until I open this lock will my body remain closed and I will not conceive'. On entering the house she lifts the kettle of water for her wedding night bath with one hand if she wishes no children—or if she wishes a desired number she says 'With so many fingers as I use to lift this kettle may I be blessed with children.'

It is strange that in all this there is not one reference to any superstition or folklore regarding contraceptive practices in England. Nor does it seem possible as yet to trace any books on this subject up to the 18th century.

Chapter 9

THE SAFE PERIOD

We affirm the legitimacy and at the same time, the limits—in truth so very wide—of a regulation of offspring which, unlike so-called 'birth control' is compatible with the law of God. One may even hope that science will succeed in providing this licit method with a sufficiently secure base.

Pope Pius XII
Address to the National Congress of the 'Family Front'—December, 1950.

The effects of time and tide, of the sun and the moon, of the wind and the rain had been noted by the ancient savants in relation to their everyday life. As their concern was partly with limiting the family, it is not strange that these natural elements should be included in the story of contraception. The sun, moon, stars and the very passage of the seasons were thought to be intimately connected with fertility and infertility. One aspect of this involvement with contraception, and certainly the one about which most has been written, is in the evolution of the safe or sterile period.

A principal concept of this book is that modern science with new techniques has taken the older practices and made them more accurate and secure. The safe period, in its relation to time, has evolved from an era when complete abstinence from coitus was advised, to the present day when four or five days of fertility in each month can be pinpointed.

To understand what the ancients thought and how far they were right or wrong, it is necessary to explain briefly what the physiological process is that gives rise to a period when intercourse can take place without conception.

Conception is the direct effect of the sperm of the male uniting

with the ovum or egg cell of the female. It is this egg which is vitally important, for although the male produces millions of living sperms each capable of producing a fertilized state, the female produces only one egg each month. This lives for only one full day unless the process of fertilization intervenes. Thus, there is a period of twenty-four hours after the egg has been produced in which it can be impregnated and so affect fertilisation.

Opposed to this comparatively short-lived existence of the egg cell, the male sperm can actually live for four days after it has been deposited in the female beyond the vaginal area. This, therefore, lengthens the time of possible conception to five days, that is the day of the actual release of the egg, the three days before and the one day afterwards. Apart from these five, theoretically fertile days, intercourse without conception should be possible for the rest of the time. The process of ovulation, that is, the release of the egg, usually takes place on about the fifteenth day before the beginning of a menstrual period, so that once the data of a menstrual cycle has been established over some months it follows that the rhythm of ovulation can be established and that the days when conception will not take place can be established as a safe period.

What did the ancients make of this phenomena? Did they recognise and use it and how accurate were they in the choice of days? For it must be remembered that a mistake of one day could defeat the whole purpose of the method. How have modern techniques and knowledge enabled us to use this method?

First, the Abelians of the very early days of Christianity claimed that Abel, the second son of Adam, lived in the marital state yet had no children, and that consequently his followers took wives but bore no children by them. So great was their fear of bringing progeny into the world that they abstained from normal sexual intercourse except on special days which coincided with the time of menstruation. They adopted children and raised them in the same tradition within the community.

In Mexico, the ancient tribes who dwelled there decided that intercourse for conception should be limited to one month in the

PLATE 3 Avicenna (979-1037), the Jewish physician. who evolved a scientifically sound recipe for pessaries

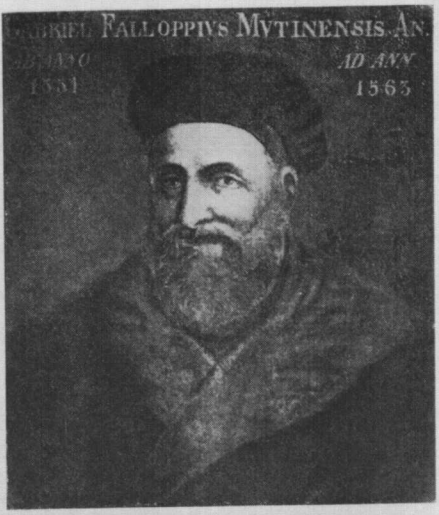

PLATE 4 Fallopius (1523-1562), the Italian anatomist, who recommended a linen sheath against syphilis *(by courtesy of the International Pharmacological Institute, Rome)*

PLATE 5 Anton van Leeuwenhoek (1632-1723), the Dutch microscopist, who discovered spermatozoa *(by courtesy of the Rijksmuseum, Amsterdam)*

PLATE 6 Mrs Annie Besant, a pioneer of the Birth Control movement in the late 19th century

PLATE 7 Site of Mrs Phillips's warehouse at the sign of the 'Green Canister' in Half-Moon Street (now Bedford Street)

and after menstruation. In fact those who adopted this method thought that the safest period was the middle of the cycle which was, in fact, the most fertile. The sight of the abject philosopher contemplating yet another addition to his family and wondering whether it was his arithmetic or the gods who were at fault, must have been fairly common.

The only people who did not accept this analogy were the ancient Hebrews, for according to the Mosaic Law, a woman was unclean for fourteen days after the onset of menstruation. During this period intercourse was unlawful and relations were thus resumed at the time of ovulation and the middle section of the fertile period. According to Dr. Halliday Sutherland it was partly by observation of this law that the Jews in spite of persecution have increased and multiplied.

The Bible puts the fact very concisely,

> And if a woman have an issue and her issue in her flesh be blood, she shall be put apart seven days: And whosoever toucheth her shall be unclean until the even.
> But if she be cleansed of her issue then she shall number to herself seven days, and after that she shall be clean.

Once the period of fertility has been established, then the time of infertility is known too. The Talmud was also responsible for the belief that at the time of the menses, the state of the genitals and the quality of the semen will be unsuccessful for conception. This supposition concerning the relationship of the menstrual flow and a period of infertility was known to other peoples too.

Among the Maoris of New Zealand menstruation is called panche and the ten days after are known as Koero. One of the most ancient traditions has it that to avoid conception it is necessary to abstain from coitus during the period of Koero, and similarly one of the oldest concepts of Japanese marital instructions was that the husband must refrain from intercourse with his wife during the first ten days after the menses to avoid the possibility of impregnation.

According to A. C. Hollis in his book concerning the Nandi, the young girls are forbidden to go to the living quarters of the warriors

for the period immediately following menstruation, and Elsie C. Parsons states, when writing of the Isleta Indians in New Mexico:

> If a woman does not want to conceive, she will not have intercourse for nine days after menstruation nor at the time of pregnancy, nor for six months after pregnancy.

There is much evidence that many centuries ago in India, literature was available that gave expression to certain ways of life. The *Dharma Castras* dealt with religious duties and the *Kama Castras* dealt with sexual pleasures. It was noticeable that to devote oneself to sexual desire—that is khama—is to give oneself to a study of a worthwhile attainment.

The great anthology which contains the lyrics of eroticism is the *Kama Sutra* of Vatsyayana Mallanaga which was written in the early part of the 4th century A.D. and which was followed by other works of an imitative nature. From these writings certain statements affecting the time of safe intercourse are derived.

These abstentions were insisted upon not only as hygienic methods but as ceremonial tradition, eventually becoming part of the very religion itself; but at the same time they were practised as methods of contraception, even if only by limiting the days on which intercourse could take place. Coitus for instance, was not to be indulged in during sunset, or from the first to the fourteenth day after the appearance of the menstrual flow, or on the eighth or fourteenth day of each fortnight, be it in the light or the dark. Abstention from intercourse was enforced on the anniversary days of dead parents or on the nights prior to these days or in the daytime at midday during an eclipse.

Nevertheless, in spite of all these days when intercourse could not take place, the times when it could be indulged in safely were to become more numerous. In roughly A.D. 1000 Ibn Sina, or to use his Latin name — Avicenna, noted the possibility of a safe period. In his book, *The Canon of Avicenna* he wrote that to prevent pregnancy one should 'avoid the period of coition which favours conception'. It is a pity that this great scholar has not left a meticulous diary showing by what process he had arrived at this premise or how he calculated the period.

Impetus was given to this method under the religious influences of the Roman Catholic Church, mainly at the instigation of St. Thomas Aquinas (1225-1274). But still no scientific explanation had been given, and, of course, could not be reached until the processes involved were understood.

Until comparatively recent times very little new knowledge was gained, and even as late as 1878 Mrs. Annie Besant in *The Law of Population* discusses the safe period at great length but hesitates whether or not to advise its use. Modern science, however, has elucidated this practice. In the Report of the National Birth Rate Commission of 1917 the Vicar General of a Roman Catholic church, the Rev. Mgr. W. F. Brown stated 'Where all deterrents fail, married couples may be allowed to limit intercourse to the inter-menstrual period, sometimes called *tempus ageneseos*'. Thirteen years later, in 1930, D. Ogino in Japan and B. Kraus in Austria discovered almost simultaneously and independently that ovulation occurred twelve to sixteen days before the onset of menstruation. Therefore, in a cycle of twenty-eight days where menstruation begins on a certain date it is almost able to determine positively the days of fertility. All the other days would be sterile.

In America and in Europe, slide rules and scientifiic calculations have been made to enable a woman to calculate the date on which the safe period commences. A small gadget called a C. D. Indicator has been evolved on a precision calculator basis on which can be worked out those days of the month on which a woman cannot conceive. According to the instructions with the indicator it 'takes into account personal variations in the monthly cycle. Every woman is different and the C.D. Indicator will work to her own cycle.'

The evidence of Kraus and Ogino has been challenged, but other facts conclusively prove the safe usage of a sterile period. In his book *Laws of Life* Dr. Halliday Sutherland quotes an authoritative example concerning the German Army. Four hundred men were granted leave, to begin twenty days after the onset of their wives' menstruation. Of these, only one resulted in a pregnancy.

But even the help of calculators cannot prevent mistakes and a

helpful adjunct was soon evolved. It had been observed that the body temperature of a woman measured rectally or orally, before rising in the morning is higher in the later portion of the menstrual cycle than in the earlier part. This rise in temperature occurs one or two days after ovulation when conception is no longer possible. Therefore it follows that once the higher temperature level has been established for forty-eight hours, coitus cannot lead to pregnancy in that cycle.

It has been found too that not only does the passage of time influence the temperature but there is also a change in the fluid secreted by the uterus. A test which can be combined with the others has recently been developed in which a colour change is produced on a slip of chemically treated paper in contact with the fluid from the cervical canal around the time of ovulation.

But the passing of time is not the only natural process involved, for it has been suggested that there are people who exhibit a regular seasonal period of sex activity and there could be an almost annual safe period. Traces of this have been found among some of the peoples who inhabit Siam and even amongst those who live in an extremely cold climate as the Eskimo. F. G. A. Marshall in his book *The Physiology of Reproduction* (1910) pointed out these matters, but it was difficult to establish with certainty that an annual safe period existed.

Perhaps it is sometimes easier to make a discovery by looking for its opposite, for it has been ascertained that the months of May and June are more successful for conception than any of the winter months. The influence of the sun and the moon must not be omitted in the course of contraception history. The effect of the moon on love and lovers has been dealt with by too many of the lyricists to find its place here, but it is well known that fertility and sterility rites were performed in the light of the full moon. In Uganda J. Roscoe found that an ancient custom dictated that the period when the moon is on the wane was considered to be the time when intercourse would be non-reproductive.

To other races, the sun had an equal significance. In ancient Peru

it was supposed to be related to the daughters of the Cacique of Guacheta and they themselves could only be fertilised by the sun. These daughters lived like vestal virgins in a convent and were buried alive when the consequences of badly timed intercourse was apparent, unless they could prove that they had been impregnated by the sun.

According to J. Schmidt, the Ancient Hindus believed that a ray of strong sunlight could fertilise menstruating girls and therefore they would remain sterile if intercourse took place in the shade or the dark.

Even the air we breathe has been said to have some influence. In 1807, in the United States Navy, a surgeon put forward the following fallacious theory. The fertility of the negro is higher than that of the white man. He surmised that this was because negroes practised coitus in the open air more frequently than white people. This exceptional fertility could only be due to the effect of oxygen. For those who do not wish to enlarge their families it would be necessary to embrace in a vessel filled with carbonic acid. (*The Medical Repository*, p. 131, 1807).

The last word on this subject must be left to Origines who believed that to prevent conception, intercourse should be performed dispassionately, and that it should not take place at the same time or in the vicinity of people who are praying. (H. E. Sigerist. *History of Medicine*).

Chapter 10

ORAL CONTRACEPTION

Some think, as I myself did for a long time, that charms are no better than old wives' fables, but I have become convinced in the course of time and by manifest evidence that there is power in them. There are many which are excellent for particular cases.

Quoted by Alexander of Tralles
in the 6th century from the
Works of Galen

Running parallel with man's search for the liquid which would give him eternal youth and with the alchemists' endeavour to find a method of transmuting base metals into gold, there has been a search for a substance far more important in its application.

Perhaps, in fact, this is the one instance in history when all nations and classes have been united in the same cause: how to control effectively and safely the fertility of their race by means of an oral contraceptive.

The search was almost to exhaust the ingenuity of man. First he tried to eliminate the source of conception in women by the use of pessaries, or by surgical means, by the use of magic and of draughts to be taken by mouth. Then men tried to control themselves with superstitions and mechanical means, and even the extreme method of physically mutilating themselves.

The search for an oral contraceptive has taken the scientists into strange fields, explorers have gone into unknown jungles to find a small plant which was reputed to control fertility; chemists and botanists have studied the effects of certain plants which were used in areas of India where families were smaller than could naturally be accounted for—every possibility is being explored. Large sums of money have been spent in laboratories and thousands of hours of

highly trained and experienced personnel have been devoted to this task.

From experimentation with magic and metals, plants and potions, from research in jungle and laboratory, there has resulted a small sugar-coated pill about the size of a small pea, which has the possibility of producing this temporary sterility which man has been seeking.

How has this success been achieved? From earliest times there has been a constant belief in the magic of medicines and in no sphere has this attitude been stronger than in the field of contraception. It would be impossible to enumerate all the substances which have been used at various times for this purpose, but they range from simple substances in everyday use to the most complicated and evil-tasting potions. Even base metals were to be involved in this and for hundreds of years potions containing metals were prescribed.

One of the earliest mentions of a metallic contraceptive originates from the Chinese *Book of Changes,* which dates from 2736 B.C. Even then it was realised that some women found childbirth a 'troublesome and unwanted thing' and there is a prescription giving the following advice. 'Take some quicksilver. Fry it for a whole day in oil, take a piece about the size of a lozenge and swallow it on an empty stomach. The taker will never become pregnant.' In the same period in China, prostitutes were advised to drink lead every month to prevent impregnation.

Dioscorides in the 1st century A.D. thought that metals might prove to be the solution, and being particularly intrigued by the redness of water in which iron has rusted, wrote the following:

> 'Not to bear children, take the solution of water in which iron has rusted and mix it with the leaves of willow which have been finely ground. This is to be drunk continuously from the end of menstruation.'

Other Greeks were also unable to resist the lure of these metallic contraceptives and, in the Hippocratic writings, mention is made of a curious preparation called misy. 'If a woman does not wish to become pregnant take a piece of misy the same size as a large bean

and give it to her drink. She will not bear child for one year.'

The exact identification of misy appears to be difficult but there is no doubt that it contained sulphates of iron and copper; and it was to the copper that other physicians turned in their search. Says Aetius of Amida (A.D. 540) on the Upper Tigris: 'Take some copper water; extinguish in it some hot iron and drink the solution continuously after menstruation.'

This particular draught is of extreme importance, particularly as some hundreds of years before, Soranus of Ephesus had advised as a contraceptive measure the drinking of a potion of water in which the smiths quenched their forceps and, some five hundred years after Aetius, the same liquid was prized as an efficient contraceptive draught in Middle Europe.

The interest of primitive peoples, uninfluenced by other cultures, also turned towards the metals and it was reported by Professor de Zwaan that in the islands near Sumatra an ancient custom existed. A woman who did not wish to become pregnant should take a knife and sharpen it on a grindstone. Over this she was to pour some water, so that the liquid fell on to both the grindstone and knife, washing away the fine metallic deposit left behind. If these washings were drunk the woman would not conceive.

By the Middle Ages it was lead which became the popular oral contraceptive and the drinking of Tincture of Lead to induce sterility gave rise to innumerable cases of lead poisoning.

Sometimes substances such as arsenic and strychnine were tried in place of pure metals; these had devastating effects and the taking of arsenic as a contraceptive measure was especially rife among the people living in the rural Alpine districts of south and eastern Austria—the so-called arsenic eaters.

Even as late as the middle of the 19th century a book was written by Dr. Soule, with the title *The Science of Reproduction and Reproductive Control;* it recommended that doses of strychnine and iodine should be taken with the sole purpose of killing the sperm internally.

Typical of those seeking the elusive oral contraceptive was the Dominican philosopher-doctor and alchemist, Albertus Magnus,

who lived in the period 1193-1280. Better known as Albert the Great, Bishop of Ratisbon, he was probably one of the most scholarly men—and certainly the greatest alchemist—of the Middle Ages. Not only was he responsible for cultivating the castor oil plant but he also evolved many contraceptive recipes, although most of them seem to have been magical in their form and useless in their application.

The castor oil plant seems to have retained its popularity as a contraceptive potion throughout Europe and the Middle East. For instance, in Morocco, women were supposed to prevent pregnancy by eating castor beans as part of their diet, and this method was reputedly so effective that its use spread amongst the peasants throughout the Middle East and quite frequently as far as lands bordering the River Nile.

The use of the seeds of the castor oil plant seems to have attracted an aura of magic, for Miss W. S. Blackman in her book *The Fellaheen of Egypt* describes the belief that if an expectant mother desiring no more children eats one of the seeds of the castor oil plant, she would be free from childbirth for one year.

A number of magical recipes which were to act as contraceptive measures have been attributed to Albert the Great and were included in his *Book of Admirable Secrets* where he gives an oral contraceptive in reverse. He states that if a woman spits thrice into the mouth of a frog she would not become pregnant. Another recipe was as follows: a hunter should catch a strong wolf, kill it and remove its penis. He should then boil this with water and add to it some hair plucked from the most delicate parts of his body. If a woman drinks this she cannot conceive.

And yet another specified: Take a red bull and remove its sexual organ. Dry it and reduce it to a fine powder. Add a little of this to a soup made of veal and vegetables.

But these were not the first to attempt the use of magic in search for a contraceptive, for Dioscorides had several to his credit. 'The bark of the white poplar tree, being drunk to the quantities of one ounce doth help sciatica and stranguries.' It is reported also to take

away conception if drunk with a mule's kidney, and the leaves thereof being drunk, after the cessation of menstruation, mixed with wine, is said to effect the same. The fact that the mule is sterile makes it a suitable medium for contraceptive magic and one of the most ancient methods among the nomadic tribes of Morocco, the origin of which is so old that it has become a custom; it is also a means of revenge by a man on a woman.

If a man desires to have intercourse with a woman and the latter declines, with the great politeness of these ancient people he accepts the rebuff in a gentlemanly manner and indicates that perhaps she would care to take bread with him—if nothing else. The bread, however, contains special ingredients—the hoof parings of a mule are ground down and charred and then mixed with barley or wheat and made into a bread. If the woman partakes of this bread she will become as sterile as a mule.

This is an opportune moment to digress on to the function of the oral contraceptive. The Moroccan revenge lay in the fact that it was intended to make the sterility permanent—that is, of course, in direct contrast to the real concept which is to produce only a temporary sterility so that the number of children may be limited at will, not permanently.

The mule, however, was not the only animal which was experimented with; even in Ancient Greece they used the rabbit family as an object for research, and Dioscorides turned to the hare.

> The brain of a land hare being eaten roasted is good for the trembling that comes with fear. The head being burnt and mixed with grease will cure Alopecia and the Coagulum thereof being drunk three days after the menstrual course will cause sterility.

Dioscorides seemed to have a particular penchant for the combination of plant potion and moonless night; he twice mentions plants which must be dug up and collected when there is no moon. Describing the attributes of the plant Asplenon he says: 'It is thought to be a cause of barrenness of itself, but they say that to cause barrenness it must be digged up when the night is moonless'.

Dioscorides gives yet another potion—'Go out on a moonless

night and pick the leaves of the spleenwort. Cook them in wine and drink the liquid for four consecutive days. Sterility will ensue.'

The Byzantine writer, Bassos, who lived in the 6th century was an expert on agriculture and he was recognised in his day by the Emperor Constantine III as being the leading authority on farming. 'There is a fact' he says, 'proved by experience, which will prevent a woman from conceiving. She must take after her period for seven days, seven seeds of solanum'. The same source gives the preparation of a draught made by boiling with vinegar a small insect which resembles those in the Cochineal family.

It was strange however that Bassos should select solanum, for this very same plant was chosen as the basic ingredient for the potions which the Welsh physicians of Myddfai prepared in the 13th century and which was supposed to contain some property of sterility.

One of the other concepts of magical medicine was the relationship between fruitless trees and sterility, and Moritz Winternitz in his book *Witchcraft in Ancient India* pointed out that the idea found its place in contraceptive potions. A tea which was made from a tree which did not bear fruit would in its turn ensure that the drinker remained fruitless, and it was this principle which gave the willow popularity as an anti-conceptional measure.

The magical properties of tree bark were known even in the Solomon Islands where it was recorded by W. H. R. Rivers that a very ancient method of contraception existed, which went back to the origins of the population. The ritual is called *Egoro* (Barrenness) and consists of scraping the bark from a special tree which grows locally. The bark is finely powdered and mixed with some red stone, which is only found on the island of Gizo. The whole of this mixture is then put inside a betel leaf and given to the woman to eat. While she partakes of it the following words are said: 'I make thee woman here eat betel—let her be as the stone on the mountain. Let her be barren, let her not make a child.'

The use of oral contraceptives with magical powers were to be found everywhere. Just as with other methods of contraception, the

use of excrement was not to be ignored. The pessaries of crocodile and elephant dung in Egypt were to find their companion in the Mongolian tribes of Tibet where an oral contraceptive was made which included as one of its main ingredients the excrement of the Dalai Lama which was hardened and made into a pill (Baas. *The History of Medicine,* 1889).

In Morocco, Westermarck reported an ancient method of contraceptive practice existed for men in the form of a magical drink. (Perhaps they had forestalled the most recent development in this field of an oral contraceptive pill to be taken by men.) The method was slightly more complicated for the man was obliged to take the oviduct of a freshly boiled hen, make a knot in it and eat it.

Just as the metals had provided no solution to this age-old problem, so the world of magic failed too, and what more logical than to turn to the plants in an effort to discover what they had to contribute.

Finding a plant with contraceptive properties has lured men to risk their lives in the most remote parts of the world—brilliant research teams have travelled to India and China, all in an attempt to find a plant that would act as a safe and effective oral contraceptive.

In an obscure Thailand newspaper in 1956 there appeared a small advertisement. This was soon to bring a highly experienced team of botanists from England to a remote part of Thailand. For in this unimportant local newspaper the small paragraph appeared 'Try the stimulating effect of a natural herb, the herb that will improve the fertility of men and the sterility of women.' And it was the latter part of the sentence which interested the botanists. In 1958 an experimental group was sent to collect this strange root which could prevent women from having children. They hacked their way through the jungles and forests of Siam and after several months of exploration were able to obtain sufficient of the root to begin laboratory exploration. The plant was an Indian alpine climber, *Pugfaria Tuberose,* which the natives prepare in a special method if they wish to use it as a contraceptive. The roots are cut into small pieces

and boiled with water, and the resulting fluid is evaporated, leaving behind a greyish powder. It is this powder which contains the active principle responsible for its contraceptive action, and it is a hormone called miroestrol. When given to men in small doses it makes them virile, when given to women in large doses it makes them sterile.

At about the same time, Nicole Maxwell entered the Columbian jungle with the intention of bringing back a plant which taken orally acted as an extremely potent contraceptive. She describes in her book *The Witch Doctor's Apprentice* the ultimate meeting between herself and a friendly woman of the local tribe.

> I explained that I wanted the leaves women took so that they would not conceive. Her face cleared. Yes, she had that too—she would run to get me some.
> The native woman returned with a basket of weeds in earth. 'This one' she explained: 'You take a teaspoonful just once of the root. Never get child again.' She showed the bulb of the plant—it was a member of the sedge family.

One of the most closely guarded secrets of the jungle had been yielded up and it remained now for the pharmacists and other scientists to evaluate their real worth.

A knowledge of oral contraceptives has been collated from information acquired by ancient and primitive peoples concerning the use of herbs and various plants for the control of fertility. Such information which is almost completely unevaluated is available in fragmentary forms about many plants in all parts of the world. This information comes primarily from the collected folklore of primitive peoples from so-called 'popular medicine' of Western civilisation and from 19th century books on mediaeval botany and materia medica.

Many investigations have taken place and many of these plants with contraceptive properties have been abandoned—yet there remains the fact that it is possible to compile a list of more than a hundred plants which contain substances that are suspected to affect human reproduction and can be used as oral contraceptives.

Some idea of their range and distribution can be gauged from the chart showing some of their properties.

NAME	PLACE OF ORIGIN	TAKEN BY	EFFECTS AND MEANS OF ADMINISTRATION
Yarrow	N. Europe	Women	The plant is powdered and made into an infusion and drunk daily to prevent conception.
Pineapple	Malaya	Women	The unripe juice is drunk continuously each day to render the woman sterile.
Dogbane	N. America	Women	The root is boiled and eaten weekly to produce sterility.
Indian Turnip	Hopi Indians of N. America	Women	A decoction of the powdered dried root in ½ glassful of ice cold water prevents conception for one year.
Birthwort	Hungary	Women	The seeds are chewed continuously to prevent conception.
Wild ginger	N. America	Women	The root is sliced and boiled and the infusion drunk daily. The woman will not conceive.
Milk weed	Colorado	Women	An infusion is made of the plant and drunk weekly for sterility.
Petits Coclon	Quebec	Women	The roots and rhizomes are infused for 20 minutes in water and drunk daily to prevent conception.
Asparagus	S. Europe	Women	A decoction is made by boiling in water and drunk daily to render the woman sterile.
Black spleenwort	India	Women	The leaves are chewed to produce sterility.
Poison arum	S. American Indians	Men	The leaves are boiled and the warm infusion is drunk. It renders them sterile by stopping spermatogenesis.

NAME	PLACE OF ORIGIN	TAKEN BY	EFFECTS AND MEANS OF ADMINISTRATION
Argerarger	Torres Straits	Women	The young leaves are well chewed and swallowed and supposedly give permanent sterility.
Hirtenta Schelkraut	N. Europe	Women	The powdered plant is mixed unknowingly into the woman's diet daily to render her sterile.
Thistle	Quinalt Indians of N. America	Women	Brewed and drunk as a tea daily as a contraceptive measure.
Spotted Cowbane	Cherokee Indians of N. America	Women	The women chew and swallow roots on 4 consecutive days to produce permanent sterility.
Green Coconut	Pacific Is. and Java	Women	The unripe milk of coconuts is drunk because it reduces fertility.
Os Segi	Masai, N. Africa	Women	Pieces of root are chewed by young girls to prevent them becoming pregnant.
Tjarri	Cape York Australia	Women	The tuber is eaten raw in the early morning on an empty stomach. The women lie down and drink nothing all day in an attempt to become permanently sterile.
Barrenwort	N. Europe	Women	Finely ground leaves taken in wine for 5 days after menstruation prevents conception. The roots cause sterility.
Antelope Sage	The Navaho of Arizona	Men and Women	The root is boiled for 30 minutes and one cup drunk by women during menstruation to prevent conception. The men too partake of this drink.

NAME	PLACE OF ORIGIN	TAKEN BY	EFFECTS AND MEANS OF ADMINISTRATION
Deers Tongue	Nevada Shoshone Indians	Men and Women	½ cup of infusion made from the roots as a contraceptive.
Collon root	S. America Creoles	Women	The women drink a decoction of the plant root made with hot water and taken daily to prevent conception.
Ivy	Mediterr-anean	Women	The finely pulverised berries drunk after purification will cause sterility.
Gromwell Lithosperm	S. Europe	Women	The powdered leaves are boiled and the infusion drunk daily as a contraceptive measure.
Stoneseed	Nevada Shoshone Indians	Women	The cold water infusion of the leaves taken daily ensures sterility.
Paparau	Solomon Islands	Women	The root scrapings chewed with betel mixture and swallowed with meals daily produce sterility.
Monch Pfeffer	Central Europe	Women	Infusion made of leaves. The sterility increases with increasing doses.
Black Haw	Italy	Women	The hot decoction taken four-five days before menstrual period produces sterility.
False Solomon Seal	Nevada Indians	Women	Conception is prevented by drinking tea — ½-cupful daily for one week.
Pavak or Agni tree	India (Hindus)	Women	The root is crushed and soaked in rice water and the fluid drunk for 3 days at end of menstrual period to produce sterility.

NAME	PLACE OF ORIGIN	TAKEN BY	EFFECTS AND MEANS OF ADMINISTRATION
Garden Burnet	Central Europe	Women	The powdered and dried plant is mixed with normal diet.
Rosemary	Europe, Central America	Women	A tea is made of rosemary leaves and drunk continuously.
White poplar	Europe	Women	A decoction is made from the bark and drunk continuously. It causes sterility.
Water pepper	C. Europe	Women	The liquid extract of powdered plant used.
Spitzwegerich	C. Europe	Women	Powdered plant sprinkled into normal diet will suppress desire and prevent conception.
American mistletoe	Indians of Mendocino country	Women	A tea is made from the leaves and drunk daily to make the women infertile.
Majoram	Germany	Women	Drunk as a tea during menstruation. Renders women sterile for one month.
Haholon	Buku	Men and Women	The scrapings from the roots are chewed with betel mixture and swallowed. Reduces sexual desire and fertility.
Hassn	Madagascar	Women	One or two budding flowers are eaten daily to make women sterile.
Ipil-Ipil	W. Indies, C. America	Women	A decoction of root and bark is made and drunk daily as a contraceptive measure.
Pea	Britain and Europe	Women	The oil is extracted and taken regularly. Acts as an anti-conception measure.
Rogawood	Fiji and Samoa	Women	An infusion is made of leaves and grated roots. Drunk daily while it is hot for contraception.

The work of Dioscorides in the field of oral contraception was immense and in his *Greek Herbal* he revealed how important he thought this subject was even in the 1st century A.D. He gives details of plants and their properties and never fails to mention if in fact they have some part to play in contraception.

He describes the Ivy and names different attributes of various parts of this plant. The juice of the leaves and of the berries if poured into the nostrils is good for pains in the head, and another part if powdered and drunk in the weight of one drachm after menstruation hinders conception.

He found the *orchis* plant particularly intriguing and it seemed that this one plant could control all the facets of love between man and woman. If the great root, says Dioscorides, is eaten by man it makes them beget males, if the small root it eaten by woman she will beget females. If the tender root is mixed with goat's milk it will provoke venery and the dry root will suppress venery.

The plant of *Juniperus Sabina* was well known to both Dioscorides and to Pliny and it was believed that the prolonged and methodical use of sabine would prevent conception. Sabine is a powerful uterine stimulant and so important had this plant become that in A.D. 812 Charlemagne ordered that it be cultivated on the Imperial farms of Central Europe. It would be logical to assume that the female workers in these fields would soon have had their attention drawn to the peculiar attribute of the plant, and its use as a preventative of conception persisted in Central Europe right up to the Middle Ages.

The use of the Male Fern Plant—*Aspidium Filix Mas*—was noted too by Pliny and Theophrastus who both give very full descriptions of the root, which was supposed to have had the power of rendering women sterile. Again it is found that the use of this plant for this purpose continues right up to the Middle Ages, when in Germany a special nostrum was prepared by the Berlin Apothecary, Daniel Mathieu. The work of this apothecary attracted the attention of Frederick the Great who conferred upon him the dignity of Aulic Councillor.

From the work of Aetius of Amida we find the following:

> A draught which has as its constituent the extract of the Aloes Plant which is to be mixed with ginger and pepper and ground up in wine. After the end of menstruation a woman is to drink three doses immediately and she would not conceive.

But aloes was no ordinary plant and even by the time of Aetius it had acquired a certain aura in legendary writings. When Alexander had conquered the King of the Persians he set out to seek the islands that produced aloes. He arrived, at last, at the Island of Socotra and so much importance did he attach to the sovereign plant aloes that he removed all the island's inhabitants and replaced them with Greeks.

In the wisdom of the old prophets expressed in the Bible there was a recognition that man was ruled by two desires—that for food and that of sexual satisfaction, and within the laws laid down in *The Old Testament* due care was taken to govern and control the latter of these two vital urges. With this there came the concept that some method should be adopted to prevent conception outside marriage. Rashi (*Gen. 4-19*) says 'and Lamech took unto himself two wives—one for procreation and the other for sexual gratification only. The latter was given a potion "The Cup of Roots" to prevent child-bearing.'

In his book on Talmudic medicine Dr. Snowman gives the following prescription for this oral contraceptive: Alexandrian gum, alum and turmeric leaves pounded up in grape or palm wine. Again we read in the Talmud that a man is not allowed to drink a cup of roots in order to become sterile but it is permissible for a woman to do so.

Just as in all other cases of contraceptive control primitive tribes have chosen for themselves medicines which were based on their own experience and which they were able to produce from the substances which were easily obtainable. Thus it is that each group would produce from a plant which was indigenous to their habitation an extract which served to produce sterility.

In Malaya it is the evil smelling and tasting *asafoetida* which is

used and to mask the taste a sandwich is made with banana. A woman who wishes to remain free from pregnancy must eat the prepared banana three times a month. *Asafoetida* was an ancient drug of such extreme importance that it was one of the articles on which duty was levied at the Roman Custom House of Alexandria in the 2nd century.

In Sumatra the young girls who do not wish to conceive chew the nuts of the betel or areca plant. They must be taken for three consecutive days in the morning as soon as the sun rises. We are accustomed to seeing the pineapple either whole or in slices and one immediately thinks of it as an item of food but it has other uses too—for it was reported by Professor Snouck Huraronje that the Achinese of Sumatra used the prepared pineapple as an oral contraceptive. A ripe pineapple is chosen, the top cut off carefully so that the fruit remains attached to the stem. A little of the inside is taken out and the vacant space filled with yeast. The removed piece is again replaced securely and the pineapple left to hang for another day or two. The woman who plucks this fruit and eats it will not become pregnant.

The heat of Sumatra and the cold of Siberia provide extremes in temperature but the same desire to prevent pregnancy is in both places; but with different vegetation, different potions are found. Krebel found that the Russian women to hinder conception drink an infusion of *locopodium clavatus* or saxafrage, and Trjic noted in his book on the life of Rumanian peasant women living in Serbia, as it was then, that if a woman wished to remain childless, she must refrain from intercourse during the time of menstruation. However when that time was finished she may have intercourse as often as she liked providing that she took a decoction of chickweed each day; this would avoid pregnancy.

In 1912 a manuscript was found in an ancient castle in Southern Europe by the late M. Voynick, and after much expert advice, it was attributed to the hand of Roger Bacon who lived in the latter part of the 13th century. It was of great interest as it was particularly concerned with the use of plants in preserving the health and curing

the diseases of women. In Folio 93 a preparation intended as a contraceptive is mentioned which contained the extract of the plant known as spindle, (*Enonymus Europaeus*) and as late as 1950 spindle was still being investigated for its contraceptive properties.

In the *Glasgow Medical Journal* of 1887, there appeared a letter by a Dr. Blyth, on the British Government Medical Staff stationed in Fiji; he wrote that he had come across an extract made from the *roqa* tree which was given to the Fiji women to prevent conception. The extract was made by placing the scrapings of the bark and the bruised leaves in cold water. The resulting extract had to be taken once or twice to be effective and at a special time in relationship to coitus, that is to say, if coitus took place in the evening the draught should be taken the following morning. Blyth went on to say with remarkable awareness that there was no reference to the point of time which coitus may bear to the menstrual period and not only would this oral contraceptive prevent the first conception but it would prevent future pregnancies for those who already had children.

As time went on, more and more plants were found that had the attribute of controlling fertility, plants for the remote areas of India, roots from secluded territories in South America, and even from some of the vegetables that are part of our everyday life, for the oil extracted from the ordinary garden pea has been found to exert a contraceptive effect. That Dr. Marie Stopes thought the pea of great significance, is substantiated by the fact that she wrote a poem about it.

From the amount of material available and the tremendous variety of plants used, it seemed incredible that no natural product had been found in a period of more than four thousand years which could be given naturally and easily in most climates and would provide a safe and efficient oral contraceptive. In spite of the hundreds of plants which had been tried, not one had provided the solution to this age-old question, and once again the problem of controlling fertility became of the utmost importance. With the advent of the skilled

biologist and laboratory worker new and important facilities became available.

As a result of this mass of information, of money expended, of man hours spent in laboratory research, it was almost inevitable that a major advance in the field of oral contraceptives should take place and it was in 1960 that this method of contraception reached a new pinnacle of achievement.

Just as other scientists had explored the possibilities of nature so had the technician and the biologists explored the chemical aspects of controlling sterility. The main progress occurred in the field of physiological contraception and no better definition of this term could be found than the following excerpt from a symposium given on a closed television circuit on January 18, 1961. This symposium was sponsored by G. D. Searle Ltd. who had devoted so much research time to the project, and the opening speech in the discussion was made by Alan F. Guttmacher, Professor of Clinical Obstetrics at Columbia Medical School. It was in this introduction that he de- the term Physiological Contraception. He said:

> It is a technique of birth control which operates by harmlessly altering the physiology of the body, so as to render conception temporarily impossible, at the same time imposing no impediment to the normal physiology of sexual intercourse. The fact that the time of application of such an effective physiologic agent is wholly removed from the time of coitus bestows an overwhelming advantage, an advantage permitting much greater acceptance of contraception the world over.

The new drug to which Professor Guttmacher was referring was called Norethynodrel. One of the other speakers on this programme was a Dr. Gregory Pincus, Research Director of the Worcester Foundation for Experimental Biology in Massachusetts and possibly the man whose drive and energy did most to accomplish the presentation of this oral contraceptive pill. He was, at this time, a man who had achieved world-wide recognition by his production of many papers on a special group of hormones which play an important part in the role of reproduction.

As far back as 1940, a paper had been published suggesting that

the female sex hormone could be used to prevent the development of the female egg cell. It had already been established experimentally that the amount of the hormone progesterone is increased in the blood stream simultaneously with the implanting of a fertilised egg cell in the lining of the womb. And it is due to this hormone that the ovaries are prevented from releasing any further egg cells during the period of pregnancy.

In 1951, Dr. Pincus with the knowledge of progesterone in his mind, set to work to discover whether this hormone could be taken with the deliberate purpose of controlling fertility, and to verify whether in fact the introduction of progesterone could control the release of egg cells for a prolonged period. Taken very simply his task was uncomplicated in its main purpose and control. Dr. Pincus reasoned that if the production of egg cells can be controlled by giving, orally, a hormone such as progesterone to an animal—then the next task would be to discover what success it could achieve with human beings, and it was here that the prolific rabbit was introduced.

A calculated dose of progesterone was administered to female rabbits who were then penned in with male rabbits in a condition which made mating almost certain and the results of these experiments were remarkable—for it was found that in each case where an experimental dose of more than 5 mg had been given—not one single female rabbit produced a litter. With the high fertility rate of the rabbit already well established, this in itself was of exceptional importance in the history of contraceptives. After further long and successful trials with rabbits and rats, a new stage had arrived and with the same meticulous care and concern for details which had been used on the rabbits, woman was used for experimentation.

And so it was that Dr. Gregory Pincus consulted Dr. John Rock, who in 1952 was the Director of the Fertility Clinic at the Free Hospital for Women in Brooklyn. A group of female volunteers was selected for his first trial and were each given orally a regulated amount of progesterone over a regulated period; the results were awaited with great excitement. Would the oral administration of

progesterone produce inhibition of ovulation during the treated cycle?

The results, although not as complete as with the rabbits, were sufficiently good to prove to Dr. Pincus that he found a method of controlling sterility by an oral contraceptive means. The final figure, however, showed that one in five women did not respond satisfactorily to progesterone itself and the laboratories worked for another four years in an effort to discover even more efficient methods.

By 1956 progesterone itself had been discarded and had been replaced by a synthetic chemical. This could be manufactured in the laboratory instead of being extracted from animal tissue. It was called norethynodrel and the tests were repeated.

This time it was found that a smaller dose of this synthetic chemical than in the case of progesterone was sufficient to give temporary sterility to a much higher proportion of women, and it was decided to carry out trials on a world-wide scale, using this chemical in preference to the natural hormone.

In April 1956 Dr. Pincus set up a contraceptive field trial and selected a product manufactured by Messrs. G. D. Searle Ltd. and afterwards called *Enavid,* which contained norethynodrel, to be used as the testing agent. The first area was in Rio Piedras in the metropolitan area of San Juan in Puerto Rico—by 1957 a second was set up in Rumaco, and in the December of that year yet a third group was established in Haiti. Trained social workers were engaged and were given a small group of women to control, to ensure that the pills were taken regularly and the course completely finished. When the social worker was satisfied that the initial course of tablets had been taken, she issued another bottle for the next course.

Each visit was accompanied by a set of questions to gain more information about the effect of this contraceptive. Questions were asked, such as: What was the frequency of intercourse? Was there any feeling of sickness? Were there any swellings or any unusual occurrence in the menstrual cycle? All the information was carefully noted, and gradually the defects and merits of this form of

contraception became known, and here at least there was one great advantage—guinea pigs who could talk!

Meanwhile in England progress continued and it was in 1959 that the Council for Investigation of Fertility Control undertook to conduct trials on oral contraceptives. The Council is an independent body set up by the Family Planning Association of Great Britain, as a result of a munificent gift from Captain Oliver Byrd, for the purpose of organising research on simpler methods of birth control. It was agreed that, in the first place, small scale studies should be carried out by Dr. Margaret Jackson of Crediton, Devon, and Dr. G. I. M. Swyer of University College Hospital, London, using the preparation Conovid. By 1960, the Medical Advisory Council of the Family Planning Association under the Chairmanship of Lord Brain considered the possibility and advisability of carrying out larger scale clinical trials on volunteers. They now decided that it was safe to do so.

By that time the total experience with Conovid included administration to over 1,000 women. Large scale trials were now initiated first in Birmingham, then in Slough and more recently in London at the Headquarters of the Family Planning Association.

Certain anomalies then became apparent. It had been found in America that the results from Puerto Rico differed from the results in Los Angeles. In the former twenty per cent of the women had withdrawn from the trial in the first year, but in California the reported number was as high as sixty-six per cent. For this reason it became necessary to see whether geographical differences extended to British women. In fact there appeared to be a difference in the figures between Dr. Margaret Jackson's women of Devon and Dr. G. I. M. Swyer's women of London.

Another aspect of these trials was to try to establish the smallest possible dose which would produce the same efficiency of result.

In June 1961 Dr. Peter Eckstein and others of Birmingham reported the results of the trials in Birmingham and Slough; and it must be borne in mind that the tablet used for the first forty-eight volunteers in Birmingham had only a quarter of the strength of the

original Conovid tablet. It became apparent from the results that it was below the limit of effectiveness. Thirteen patients promptly conceived (a further patient was found to be pregnant before starting the tablets). The remaining patients and any later volunteers were therefore transferred to a 5 mg dose and no further pregnancies occurred (Eckstein et al. 1961).

Valuable information emerged from these trials concerning the incidence of various side effects. The more important of these are changes in the menstrual cycle, break-through bleeding (the period beginning before the end of the twenty-day course of tablets) and failure of a withdrawal bleeding to occur at the end of the course.

To deal with these menstrual disturbances the patients were instructed to continue with the course of tablets, if there was only a slight staining, but to stop them if break-through bleeding occurred and to begin a new course after five days. In the event of a period failing to occur after the end of a course, the next course was started one week later.

The subjective side effects were principally nausea and breast discomfort. The former occurred in about forty per cent of the patients in the first cycle but rapidly declined afterwards. About ten per cent also complained of vomiting. Breast discomfort occurred in some thirty per cent in the first cycle but showed little tendency to decline.

Dr. Swyer felt the general incidence of side effects had clearly been too high, although it must be emphasised that the *majority* of patients were very satisfied with the results.

Meanwhile the search for more tolerable preparations has been intensified and large numbers of synthetic progestagens are being tested for possible suitability as oral contraceptives.

Under the direction of the Clinical Trials Committee of the Council for Investigation of Fertility Control promising compounds are tested for their ability to inhibit ovulation. The method of establishing their efficiency as an inhibitor is carried out by collecting the urine from volunteers, who take the preparation. The compound is taken daily from the fifth day of the cycle for twenty days and the entire urine output is collected on cycle days 8-10 and 20-22.

Pregnandiol determinations are made and if ovulation has been inhibited, the results in the two urine pools are similar, but if ovulation has occurred, the second figure is three or more times the first. Simultaneously, studies of ability to maintain a normal cycle are made. If any of the preparations justify further study, they are then used on volunteers as oral contraceptives to enable them to be carried out on a large scale. The Council for the Investigation of Fertility Control, under the direction of Dr. Mears, have established another trial centre at the Family Planning Association headquarters in London.

Dr. Swyer pursued the subject still further, and finding that a combination of 4 mg of noresthisterone acetate combined with ethinyl oestradiol was well tolerated, abandoned the use of the 10 mg tablet and began to evaluate the use of a 4 mg tablet. It soon became apparent that as an oral contraceptive norethisterone acetate was extremely effective and no pregnancies occurred in any of the patients using this preparation.

In the final assessment of this group it was concluded that it was exceedingly unlikely that a preparation which could be tolerated by all taking it, would be found or that it would be entirely free from side effects, and indeed it seems doubtful that any preparation will have a substantially lower incidence of side effects than *Anovlar*. Theoretically, drawbacks to the use of this preparation are the possibility of virilization, although no patients using this preparation as an oral contraceptive have yet exhibited this symptom; and of such an effect on the female foetus should a patient be pregnant when commencing treatment, or if she should conceive while continuing with the treatment. These possibilities do not seem to be very likely.

Further tests have been carried out in Britain on twenty-four compounds, two of which are *BDH 1928* and the other *Organon 611*, with promising results.

It is thus firmly established today that over the short term period available products such as *Conovid, Conovid E* and *Anovlar* appear to be clinically safe. Some women have been using this method for contraceptive purposes for five years, without harmful effect. On the

other hand a few cases have now been observed in which inflammatory conditions of the leg veins, similar to those which the patients had experienced during pregnancy have developed while using the tablets. This thrombophlebitis is, however, a common disease affecting perhaps more than one woman in a thousand during the reproductive years. The number of cases believed to have occurred in women using oral contraception is certainly not above, and indeed appears to be below, this expected rate. In a letter to *The British Medical Journal* this point was discussed at length.

> . . . You refer to a private conference held in the United States. This was arranged by the Searle medical department so that independent experts might review the evidence. You appear to have been misinformed about the conclusions arrived at by the experts. None of the experts present expressed the opinion that oral contraception increases the risk of thrombophlebitis to the level associated with pregnancy. You state correctly: 'These cases do not establish cause and effect;' but this is precisely the assumption in your statement: 'It must be asked whether even this risk should be run just for contraception.' The pseudo-pregnancy effects of oral contraception were discussed at the conference, but in another context. The Searle medical department have been keeping a close watch on the side-effects of oral contraception for many years (since 1952). Our literature draws attention to the fact that oral contraception mimics the hormonal effects of pregnancy, as this is important in relation to definite known effects, including nausea, breast changes, and transient fluid retention at the start of medication. There is, however, no evidence that the risk of thrombophlebitis in pregnancy is in any way related to the female sex hormones. It is likely that the connexion is related to local effects upon the venous return due to changes in the circulation in the pelvis.
>
> The conference reviewed the data on possible hormonal influences on the thrombotic process, and the following considered statement has been authorized by Dr. Sol Sherry (Professor of Medicine, Washington University), a world authority on coagulation and fibronolysis:
>
> > Though preliminary data suggests that some patients on Enovid might develop abnormally high levels for those clotting factors involved in the later stages of clotting (pro-

thrombin or proconvertin or Stuart Power factor), this point remains to be established. Were it established its true significance would still remain obscure.

(In my opinion the only connexion between sex hormones and thrombosis which rests upon any secure foundation is the well-known immunity from coronary thrombosis enjoyed by women with normal ovarian function. While no claim is made that oral contraception provides any beneficial action of this type there is no evidence of any contrary effect).

It was pointed out at the conference that in view of our existing comments on the pseudopregnancy effects of oral contraception there appeared to be no need for any additional warning in our literature. It was in this context that the opinion was expressed that oral contraception carries no greater risk of thrombophlebitis than normal pregnancy. The conference did not make any suggestion that the use of oral contraceptives leads to an increased risk of thrombophlebitis such as exists in pregnancy. The writer of your annotation is definitely incorrect in making this assumption.

Apart from this there are many aspects of the problem not even considered in your annotation; some should at least be mentioned. Short found pulmonary embolism to be commoner than pneumonia in a general hospital, and it is now increasingly becoming realized that thrombo-embolic disease may occur without known precipitating factors, even among premenopausal women. A very conservative estimate of the incidence of thrombophlebitis in women aged 15 to 45 is 1,000 cases per million women per annum. Less than 30 reports have been received from among a million women using norethynodrel. While there are probably a number of unreported cases the data certainly provide no evidence of increased risk. As, however, the matter has received wide publicity in the lay press throughout the world as a result of your annotation we recommend that oral contraception should not normally be advised for women with a history of thromboembolic disorders in pregnancy. It should, however, be pointed out that these women run a real risk if they become pregnant again, and this should be weighed against the hypothetical risk of oral contraception.*

Another point arose as a contra-indication in the case of lactation where it was feared that there was a possibility of the hormones in-

*Letter to *The British Medical Journal*, dated August 18, 1962 from Dr. G. R. Venning, Medical Director, G. D. Searle & Co. Ltd., High Wycombe, Bucks.

gested being transferred to the milk of the baby. This, in actual fact, is very remote. But as with all new products the long term safety of the method is still unattained and will give some cause for anxiety for another twenty years or more.

Concern has been expressed mainly on the grounds of possible carcinogenesis and that the disturbance in endocrine balance resulting from inhibition of ovulation for long periods of time might have undesirable consequences.

The fears with regard to carcinogenesis have centred largely on the oestrogen content of the tablets, although no authority, who has actually studied the matter, has found any evidence that exogenously administered oestrogen has ever been responsible for cancer in humans. Experimentally, the tumour-producing effects of oestrogens are seen only with continuous administration. Once the treatment is interrupted the effects are lost. Progestagens appear moreover to be anti-carcinogenic experimentally, and although there is a view that anti-carcinogenic agents can themselves be carcinogenic, the validity of this proposition, at least in respect of progestagens, is quite unknown. Since these tablets suppress ovarian oestrogen secretion it is probable that the oestrogen present in the tablet does no more than make up for the decreased endogenous supply.

As far as any disturbance of endocrine balance is concerned it must be pointed out that no such consequence ordinarily follows the far greater disturbance occasioned by pregnancy, and there is nothing to suggest that women with long standing secondary amenorrhoea of the so-called hypothalamic variety, in which failure of pituitary gonadotrophin secretion is the cause of failure of ovulation, suffer ill-health as a result—even after years of amenorrhoea. Therefore, although the possibility of an endocrine disturbance must be recognised it seems unnecessary to be unduly apprehensive.

By 1961 the use of *Conovid E* and *Anovlar* were added to the list of approved oral contraceptives, and there are now eighty Family Planning Association Clinics in Britain which prescribe these products.

But the search still continues for other oral contraceptives. Some

research is now being carried out on non-steroidal ovulation inhibitors, but until these reach the stage of clinical trial its potential value cannot yet be assessed.

If it could be considered that contraception dates not from the moment of fertilization but from the time of implantation, then we might be able to include in this history of oral contraceptives a new range of products which are destined to prevent the development of the fertilised egg itself. These products would have an enormous advantage over the ovulation-inhibiting type of oral contraceptives because they would not interfere with either the endocrine function or the menstrual cycle. There is the possibility too, of interfering with fertilisation itself and applying immunological techniques. This is not as strange as may seem when it is realised that in *The Lancet* of 20th November 1926 an abstract of a paper by a Dr. Rosenfeld entitled 'Semen Injections with Serological Studies' showed that fertility in the male could be reduced by injections of spermatozoa.

For as with other ages and other types of contraception the balance has often swung from man to woman or woman to man, so with oral contraceptives there are many anti-fertility factors which are now known, but which are not yet suitable as oral contraceptives because of their high toxicity.

Two workers in this field in 1961, D. H. McLeod and W. O. Nelson, both reported some experiences with one of a series of compounds which were originally developed as amoebicides. Volunteers were requested from inmates of a prison and treatment showed that fairly rapid and severe depression of the sperm content of the ejaculate could be brought about, and equally important, full recovery took place on cessation of treatment, when the latter had been maintained for a year.

Nelson, encouraged by this success reported that in a series of some 40 non-prison volunteers who had used the drug as an oral contraceptive success had been maintained from a period of six to eight months.

And a greater advance would occur if a product was found which prevented the motility of the male sperm, without any side effects,

uerucam, & mediam partem glandis exesit: sed quia ego dixi quòd caries oritur per contagium. sciatis quòd etiam oriri solet ratione hæpatis transmittentis: dimittamus hanc secundam speciem loquamur de prima, atque quo iuuenis coiens cum infecta ab hac præseruetur, & cariem non sentiat.

De præseruatione à carie Gallica. CAP. LXXXVIIII.

EGo nihil feciſſe uideor niſi doceam uos, quomodo quis uidens pulcherrimam ſirenam, & coiens cum ea, etiam infecta, à carie, & lue Gallica præſeruetur. Ego ſemper fui huius ſententiæ, quòd adſit ratio præcauendi, ne per contagium, huiuſmodi ulcera oriantur: ſed quæ eſt iſta ratio? Ego dixi quòd naſcitur caries hæc per communicata corpuſcula ſanioſa, quæ imbibita poris glandis faciunt cariem, ideò opus eſt, ut ſtatim ſaniem à glande expurgemus, ſed ſi imbibita ſit in poris licet uino, lotio, uel aqua detergamus priapum, tamen eam detergere non poſſumus. & hoc ſæpe accidit in tectis, & mollibus glandibus. Quomodo ergo agendum? ſemper fui iſtius ſententiæ, quòd ponamus aliquod habens uim penetrandi corium, & diſsipandæ materiæ, uel extrabendæ, uel ſiccandæ & uincendæ natura ſua. ideò inueſtigaui hoc medicamentum. Sed quia oportet etiam Meretricum animos diſponere, non licet nobiſcum unguenta domo afferre. propterea ego inueni linteolum imbutum medicamento, quod poteſt commodè aſportari, cum fæmoralia iam ita uaſta feratis, ut totam apotecam uobiſcum habere poſſitis: Quoties ergo quis coiuerit abluat (ſi poteſt) pudendum, uel panno detergat: poſtea habeat linteolum ad menſuram glandis præparatum; demum cum coiuerit ponat ſupra glandem, & recurrat præputium: ſi poteſt madere ſputo, uel lotio bonum eſt, tamen non refert: ſi timetis, ne caries oriatur in medio canali, habeatis huius lintei inuolucrum, & in canali ponatis, ego feci experimentum in centum, & mille hominibus, & Deum teſtor immortalem nullum eorum infectum. Notate autem obiter, quòd quælibet ſpecies lienteoli mundi tantam habet uim in præſeruatione, ut nihil magis [ad dite quòd goſsipium nouum, molle, fidibus bene concuſſum glandi optimè lotæ detergentibus, obuolutum mirum in modũ præſeruat, & quum quis Gallicis ſcopulis lignum percuſsit poſt ablationem inſpiciat: uidebit enim inuolucrum illud ſanioſum, aut citrino, aut pallido, uel ſubnigro colore infectum] ideò ſemper quis paruo linteolo obuoluat glandem per ſpatium quatuor, aut quinque horarum, & hoc non eſt moleſtum mulieribus: ſed tamen præparati lintei ratio eſt præſtantiſsima. Præparatur autem hoc modo.

Nota de præseruatione.

Linteoli mundum. Goſsipiũ.

Præparatio lintei.

PLATE 8 Facsimile extract from *De Morbo Gallico*, published in 1564, in which Fallopius first describes a protective linen sheath *(by courtesy of the British Museum)*

Canal upon the *Dorsum Penis*; (as it lies incompast and arch'd over, as it were by the Nervous Bodies thereof) and that also the undoubted Seat of the first Taint; Nevertheless without the internal Præscription, we should I fear be at a loss to secure many of our Patients, by the sole Use either of the best Preventives, Defensative or other Topical and Chyrurgical Applications whatever; we frequently see this, in some simple or slight Frettings on the *Præpuce*, but much more in *Chancres*, where altho' the Remedy has immediate access to the Part, and the Ulceration is digested, deterged and cicatrised by Mercurial Applications; (and 'tis rare that any other will avail) yet if the Patient trust only to this Part of Regiment, 'tis odds if somtime after he be not forced upon taking much more Medicine, and of undergoing a severer Discipline, than he need have done at first: Not to mention oftentimes the Difficulty if not Impossibility of Healing some of these Ulcers, without the internal Assistance. However if the Method answers (as I believe it neither does nor will) I shall be far from grudging the Gentleman, even a Patent (if he can obtain it) for the sole Propriety in this way of Practice.

The Preservative from this first Impression.

As to the Preservative in general, I have this only to add farther, that whether any such Thing be possible or not, I shall not take upon me absolutely to determine. But when a certain Gentleman tells us, *That it will become every Man to be modest, when at any time a Method of preventing may be recommended upon due Experience:* I can't forbear Enquiring, whether we may expect the Discovery from a Modest Man, or what Reward even a common Moral

moral Man will deem him worthy, (without consulting Casuists) that shall first publish it to the World? and indeed when it is revealed, I leave every honest Man to judge of the Consequence; tho' I think there is no great Danger of such an Invention. The *Condum* being the best, if not the only Preservative our Libertines have found out at present; and yet, by reason of its blunting the Sensation, I have heard some of them acknowledge, that they had often chose to risque a *Clap*, rather than engage *cum Hastis sic clypeatis*.

Fallopius, I own, has with greater Vivacity than, I fear, Veracity, communicated a *Prophylactick*; which he gives us to understand in above a Thousand Experiments, never fail'd him once. The Composition seems a Jumble of Ingredients, neither the best adapted for such a Purpose; and the *Modus* or Manner of its Application, as little promising; but surely if so infallible, as he represents it, is it not somewhat strange, that himself thought fit to alter it, and to substitute another in its Place (which he did afterwards) which I knew prepar'd strictly according to the prescrib'd Form, and as carefully directed by a Surgeon of the Town, who observ'd the Issue or Event so different, that he told me, he believed not one had far'd the better for it, out of half a hundred that had try'd it, where they had to do with an infected Person.

The *Cinnabarine* Fumigation is rather curative than preventive, of which I have already, and shall hereafter take farther Notice.

But these Pretences (as we have already observed) being like to come to nothing; another Person has undertaken with the Help of the

PLATE 9 Facsimile extract from *A Practical Dissertation on the Venereal Disease*, published in 1717, in which the English physician, Daniel Turner, describes the condom *(by courtesy of the British Museum)*

and with complete recovery at will. It may well be as Dr. Eleanor Mears has said that the great problem here will be to convince men that the regular use of these pills will not affect their fertility, virility or masculinity.

It has been reported from Israel that a new type of oral contraceptive pill could soon be in use. This is largely due to the work of Professor M. C. Shelesnyak at the Weizmann Institute in Israel, who was awarded the Oliver Byrd prize in 1958. More recently a special award of £250,000 was granted him by the New York Population Council for furthering his research on the control of reproduction which is based on the following theory. In early pregnancy the fertilised egg is implanted in the lining of the uterus. This action is dependent on the interplay of three substances. They are two female sex hormones, oestrogens and progesterones and a third substance found in the body, histamine.

If it were possible to stop the production of any one of these three temporarily, it would then halt the process of implantation and hence pregnancy would be averted. The professor has found that anti-histamine and anti-oestrogen drugs interfere with the action of the two hormones. He has found too that the alkaloid ergocornine stops the production of the progesterone hormone which plays so vital a role in the maintenance of the nest which accommodates the fertilised egg.

The first steps of proving the effectiveness of ergocornine on rats has been completed successfully and it now remains to subject it to the final testing of women. Professor Shelesnyak hopes that if the experiments are brought to a successful conclusion, pregnancies could be avoided by taking only one tablet a month.

The story of oral contraceptives has progressed a long way from these incredible potions and draughts, from the use of metals and magic, to the taking of a small pill which effectively will control fertility.

Chapter 11

CONTRACEPTION AND THE LAW

There is one thing undoubtedly not to be lost sight of, namely that there is not one of these books intended to inflame the imagination or passions. There are no indelicate or indecent things or lascivious descriptions of marriage. It is not one of those books which you have only to look at to see that they ought to be suppressed and burned by the common hangman. It is not a work of that kind. There is nothing in its language or the ideas conveyed by it of a voluptuous character, it is simply a dry physiological discussion and the defendant is entitled to the benefit of that.

The Judge's summing-up.
Lord Justice Cockburn in the trial of
Regina v. Bradlaugh and Besant (1879).

Just as the story of contraceptives has its place in the history of science and of medicine, so does it have one in legal history. The incidents which are concerned with contraception are of especial interest when they are related to the social climate of the day and the country in which legislature took place.

Thus we find that certain passages exist which can only be understood if the historical background is clear. Let us take three examples, England, France and the United States of America and see how each has dealt with this particular aspect of the law; the results are surprising.

In England, no specific laws have been passed to prevent the knowledge of contraceptives becoming widespread, yet several trials with this in mind have taken place which had this as their reason. In France, the land where a Birth Control Clinic was established as early as 1880, the legal position was clarified in 1920 when all reference to contraceptive knowledge was completely banned. Finally in the U.S.A., a bill was passed through the Senate in 1873

prohibiting the sale of any production in any form which referred to the practice of contraception. Yet while the bill was still in force Birth Control Clinics were being set up.

How these situations arose, what their effect was, and how they ultimately solved themselves is as important a part in the story of contraception as collecting information on the methods themselves.

In the year 1876, two days before Christmas, Henry Cook, a bookseller in Bristol, England, was convicted and sentenced to two years imprisonment with hard labour, for selling a pamphlet called *The Fruits of Philosophy*, an essay on the problems of increasing population. This had been written by Charles Knowlton, the eminent American physician, some forty years before, and was one of the earliest booklets popularising certain methods of Birth Control.

In this publication which had been available in England since 1833 and which was openly sold by the Agents of the Free Thought Movement, Knowlton gave advice on using a douche, and *coitus interruptus* and referred to other methods of contraceptive technique; he wrote in a most enlightened and understanding manner. However, Cook had included some obscene pictures between the leaves of the book.

Some two weeks later, at the Guildhall in London, the publisher Charles Watt, because of his plea of Guilty received a much lighter sentence, and all the copies of the pamphlet were confiscated by the police.

Amongst the members of the Free Thought Movement, there were two dominating figures, Charles Bradlaugh and Annie Besant. The former had been advocating Family Limitation since 1860, and had achieved a certain amount of prominence when he had published the *National Reformer*. He was destined to become a distinguished Member of Parliament.

Mrs. Annie Besant, the British Theosophist, had become interested in Socialism and the Free Thinking Movement at a very early stage in her career and by the time of her death in 1933 had not only been the centre of a notorious trial but had become President

of the Indian National Congress in 1917 and the Founder of the Central Hindu College in Benares.

These two eminent and honourable social workers believed that the work of Knowlton was neither obscene nor in any way unfit for distribution. On the contrary, the popularisation of the book could only be beneficial. They were so determined to ensure their right of publication that they organised the 'Free Thought Publishing Company' with the express purpose of printing and selling the pamphlet. On 23rd March 1877, they let it be known to the police that it was once again being offered to the public. The law of the land had been challenged and the two challengers were soon to find out that this was a serious matter. After they had been remanded on bail, the proceedings found their way into the High Courts and there on 18th June 1877 in the Court of the Queens Bench the trial of *Regina v. Bradlaugh and Besant* commenced. These two were accused of having published an indecent libel in that they had published matter which was calculated to destroy or corrupt the morals of the people.

Both Mrs. Besant and Bradlaugh, who was by profession a solicitor, defended themselves; Mrs. Besant endeavoured to show how desirable it was that knowledge of contraception should be made available to the poor. The very poor, the ones who with their ever-increasing families could benefit the most by this knowledge, were being deprived of the very information which could help them, and she concluded her speech with the following passage.

> Mothers beg me to persist in the course which I have entered and at any hazard to myself, at any cost and at any risk; they plead to me to save their daughters from the misery they have themselves passed through during the course of their married lives.

The case for the prosecution was led by the Solicitor General, Sir Harding Giffard, and unfolded with a two-pronged attack. First, it set out to prove that the book as a piece of literature was in itself obscene and secondly that it tended to corrupt public morals. Here perhaps was the vital point, because it was directly aimed at the

poor for whom Mrs. Besant was so ardently working. The book tended to corrupt because, not only could it be obtained by the young or the old—single or married—but it could be obtained for the price of sixpence, thus bringing it within the reach of all. This complaint was reiterated at a later trial.

After five days of patient listening to the evidence and the brilliant summing-up by Lord Chief Justice Cockburn, the jury brought in the following verdict:

> We are unanimously of opinion that the book in question is calculated to deprave public morals, but at the same time we exonerate the defendants from any corrupt motives in publishing it.

Nevertheless a verdict of Guilty was brought against the defendants and their application for a new trial was refused, even though there appeared to be a contradiction in the jury's findings.

The attitude of the Court was further hardened, when the Solicitor General produced evidence that on the night of June 24th, the two defendants had actually openly sold hundreds of copies of *The Fruits of Philosophy* to anyone who cared to buy it, and the Lord Chief Justice now deliberated on the form of sentence. Each of the defendants was to be fined a sum of £200 and imprisoned for six months. The penalties were never enforced and, on the Right of Appeal being allowed, the verdict was quashed and there was no further condemnation of the publication. Thus the case of *Regina v. Bradlaugh and Besant* ended in a victorious manner for the courageous two, and the right to continue publication was ensured.

What the trial had achieved was to arouse an enormous public interest in the whole question of birth control. Great crowds, estimated to number about 20,000, assembled outside the court room. Newspapers devoted much of their space to providing complete and comprehensive reports of the day-to-day happenings in court. The effect of the publication concerning contraception on the minds of the populace was tremendous and electrifying; it brought to the notice of the ordinary man in the street the fact that contraception could be approached in a scientific manner and that methods were

available which were not haphazard in their choice nor ineffective in their result.

In the same year 1877, two booklets appeared in the shop window of a publisher at 256 High Holborn in London, England. The name of the publisher was Edward Truelove and the two pamphlets were first, J. H. Palmer's *Individual, Family and National Poverty. Reasons why in every family the number should be regulated,* with a subtitle—'The methods that have been proposed, extensively adopted and found to answer for doing it together with a few valuable hints for the young.' The second was *Moral Physiology* by Robert Dale Owen. In the first pamphlet there were references to various types of contraceptive techniques which included douching and the withdrawal method. The second was written by the same Owen who together with Knowlton had helped to initiate the Birth Control Movement in America. It was an extremely well written book delicately handling a delicate subject and by the time Owen died, in 1877—the same year in which Truelove was charged—well over 70,000 copies of the pamphlet had been sold in the U.S.A. and in England. But in May of that year the Society for the Suppression of Vice complained to the police that literature of an obscene nature was being published by Truelove and exhibited at his premises.

The attack on Truelove ran the same course as that on Bradlaugh and Besant. The prosecution attempted to prove that the open publication of such literature would have an injurious effect on the minds of the young. It must be remembered that the trial of the two free-thinkers—and Truelove was a member of the same group—was proceeding at the same time.

On 1st February 1878 the case came to the Queens Bench Division of the High Court of Justice and, when the jury failed to reach agreement, it was re-tried at the Central Criminal Court. This time the jury had no difficulty in reaching a verdict in a short time. Within an hour they agreed on a verdict of Guilty and the seventy-year old Truelove was sentenced to four months imprisonment and fined £50. It was to no avail that his friends, Bradlaugh and Mrs. Besant, rallied to his help, and he served his full sentence. The size of the

crowd and the affection with which they greeted him on his release was some measure of the esteem in which this venerable old gentleman was held. However, the pamphlets which had been the cause of the trouble were destroyed by an order of the Court.

The attack on the distribution of literature concerning contraception had still not run its course. Although so far only members of the lay public had been involved it was not long before a respected member of the medical profession was reprimanded for writing and distributing a sixpenny pamphlet containing a chapter entitled 'How to prevent Conception'.

In 1887 it was brought to the notice of the Royal College of Physicians of Edinburgh that a certain Dr. H. A. Allbutt, practising in Leeds and a member of that Royal College, was publishing a booklet entitled *The Wife's Handbook,* which was considered to be an indecent publication, for it included in it advertisements of an unprofessional character.

The case was referred to the Committee of the General Medical Council who delivered their verdict in the following terms: 'That Dr. Allbutt was Guilty and that his name was to be erased from the Medical Register. That the crime of which he was accused was of having both published and caused to be sold at so low a price a booklet which although detrimental to public morals could be purchased by the young of both sexes.'

It was on Dr. Allbutt's own decision that the case was to be tried before the Civil Court in an effort to have his name restored to the Medical Register. These efforts were unsuccessful. It was perhaps because of this trial and the notoriety attached to a member of the medical profession that in 1905 a branch of the British Medical Association passed a resolution that it should be made a penal offence to advertise or sell or distribute any literature concerned with the use of contraception.*

The next important legal battle, and one which has been referred to by a participant as the second legal landmark (the Bradlaugh-Besant trial being the first), became officially known as the Birth

* *British Medical Journal* 18th March, 1905.

Control Libel Action of 1923. The case concerned Dr. Marie Stopes, who had recently opened a Birth Control Clinic, and Dr. Halliday Sutherland. An action for libel was brought by Marie Stopes complaining of certain words in a book which had just been written by Dr. Sutherland. The phrase in question implied that, at her Birth Control Clinic, Dr. Stopes who was not a medical practitioner was instructing working women in a method of contraception which had been stated to be harmful.

The trial was heard before the Lord Chief Justice of England, Baron Hewart, on 21st February, 1923 and Sir Patrick Hastings appeared for Dr. Stopes. Once again public interest was stimulated as more details of Birth Control Clinics were brought to their notice. The country was still suffering from the devastating effect of the first Great War and the concept of family limitation was very much in people's minds. The main interest of the case was provided in the battle between Sir Patrick and the leading witness for Dr. Sutherland, Professor Anne McIlroy. The latter endeavoured to prove that it was harmful to induce women to wear rubber check pessaries as recommended in the clinic run by Dr. Stopes.

After six days the jury found in favour of Dr. Stopes and awarded her £100 damages. When on 1st March 1923 the final judgment was delivered to the Judge he ruled that although Marie Stopes had been awarded damages she had not won her action. In the Court of Appeal some months afterwards it was decided that as the jury had awarded her damages it followed that the verdict must be in her favour and she was awarded the cost of the appeal plus half the costs of the first case.

But even then the case was not finished and an appeal was lodged by the representatives of Dr. Sutherland to the House of Lords. On the 21st November, in the presence of the Lord Chancellor, a final judgement of the case was reached and the verdict was given in favour of Dr. Sutherland. The Birth Control libel action had now lasted nearly three years and the sum of £10,000 had been spent by the defendant in the courts of Justice. Once again the publicity of the trial had given great publicity to birth control. One of the inci-

dents which arose out of the trial, and which had repercussions afterwards, lay in the statement of the eminent Professor Anne McIlroy that she had never had a case of a woman who had worn a check pessary. That she had changed her attitude afterwards became apparent when Dr. Stopes disguising herself as a charlady attended the hospital where Professor McIlroy had her clinic. This was more difficult than it at first seems because Dr. Stopes had to maintain this pose under the careful scrutiny of a medical examination. She was successful, and left the hospital with a vaginal rubber cap which had been advised and put in place by Professor McIlroy herself.

The cumulative effect of all this publicity was to ensure that the provision of contraceptive literature and the establishment of advisory clinics became general.

In Britain, therefore, in the early 1920's contraception was beginning to be accepted as a subject upon which advice could be sought and freely obtained. There was no doubt that the Stopes-Sutherland trial helped in no small way to reduce official opposition to Birth Control, for it was on 28th April 1926 in the House of Lords that the following motion was put forward by Lord Buckmaster and it was carried by a good majority: 'That His Majesty's Government be requested to withdraw all instructions given to, or conditions imposed on all Welfare Committees for the purpose of causing such committees to withhold from married women in their district information when sought by such women as to the best means of limiting their families'. It was this which put an end to any real attempt to check the spread of contraceptive knowledge.

Gradually there was an increase in the process of extending information about forms of contraception considered reliable. Clinics of the Family Planning Association were set up and access to them and to their services were made easily available to all. Pamphlets concerning specific contraceptive techniques were published by individual firms and could be easily obtained from most pharmacies throughout the country.

Contrary to public belief on the matter, there was no law against contraceptive knowledge in France until 1920, and in fact a Birth

Control Clinic was installed there many years prior to that date.

On the last day of July 1920 after the end of the First World War which had left its devastating mark on the population of France, a special law was passed. What was intended was clear to the legal profession and to the public. It was entitled 'The Law Repressing the Provocation of Abortion and the Propaganda of Contraception'. This bill expressly forbade the sale or distribution in any way of pamphlets or literature of any kind giving details of contraceptive techniques. Article 3 of this law stated:

> A term of imprisonment varying from 1 month to 6 months and a fine varying from 100 francs to 5,000 francs shall be the punishment of anyone desiring to propagate contraception who shall divulge or offer to explain methods for preventing pregnancy or to facilitate the use of these methods.

In a personal communication dated 31st October 1962 the following statement concerning the bill was made to the authors. 'There is no change in the law in France since the 1920 bill and no legal action has been taken against our member group in France'. This information was given by the International Planned Parenthood Federation Council.

In September 1962 a meeting was held in France to discuss problems of Family Planning. Maitre Anne Marie Dourlen-Rollier, a lawyer, pointed out the way in which the law of 1920 discriminated particularly against women to whom the sale of contraceptives is expressly forbidden. It was pointed out, however, that the sale of male type contraceptives was permitted as a method of preventing venereal disease, and had now reached a figure of more than twenty-one million a year.

The paradoxical legal situation at present exists in France that while contraceptives approved by the medical profession are forbidden, permission has recently been given by the Ministry of Health to produce a pill which will be on sale through the pharmacies of France. Ostensibly these pills are for the treatment of sterility, but administered in a different manner they can have a contraceptive effect.

In the U.S.A. in the 1920's the situation was more complicated for while Birth Control Clinics were being set up, Federal Law expressly prohibited any references to contraceptive practice and appliances by advertising.

That this situation arose at all was due to the work of Anthony Comstock. Comstock was born in 1844 and after serving as a Brigadier General in the Civil War returned home to organise the New York Society for the Suppression of Vice. He devoted himself to a vigorous crusade against any kind of publication which he considered injurious to public morals and is credited with having convicted 2,500 persons on moral charges. He was chiefly responsible for putting a bill into Congress which was to go down in history as the Comstock Law. The bill was initially designed to prevent the growth in the sale and distribution of literature and pamphlets which were deliberately obscene and pornographic in their nature.

Although the bill mentioned contraceptive literature, this point seemed to escape the notice of members of both Houses, who appeared to be willing to pass the bill without caring too much about the effect on family limitation. When the Federal Law was passed in 1873, it prevented not only the publication of any kind of literature of an indecent nature but specified that no mention must be made of any article which would prevent conception. In addition, it was specified that no preventative against conception was to be imported into the U.S.A. The penalty for breaking this law was a fine of not more than 5,000 dollars or up to five years imprisonment; or both.

As late as 1920 it was a criminal offence to send obscene or indecent matter through the American Post Office system, 'this forbidden matter includes anything printed or written or any indecent pictures, or any directions, drugs or articles for the prevention of conception'.

The penalty for breaking this law was the same as above. Thus it was that in 1915 Margaret Sanger, the American born nurse who had devoted herself to the promotion of birth control ideals, was indicted for circulating through the mail a magazine called *The Woman*

Rebel. The book was a direct attack on the restrictive legislation which prevented the distribution of contraceptive information. Although this case was dismissed, she was penalised later for establishing the American Birth Control Clinic, and charged in the State of New York with being a public nuisance. She was convicted and sentenced to serve thirty days in the Queens County Penitentiary. Even in 1929 the same clinic was raided and the Medical Director, Dr. Hannah Stone, together with the three attendant nurses, were all arrested. The case against them was finally dismissed.

Whilst the Comstock Law prevented publicising knowledge in a desirable way, there was nevertheless an enormous increase up to the mid-twenties in the illegal sale of contraceptive information, and the battle to repeal the Comstock Law remained extremely active.

On 13th September 1930 a copy of Marie Stopes book *Married Love* was seized by the Collector of Customs at the Port of New York on the ground that it was 'obscene and immoral' and libel proceedings against the book were commenced on 22nd November 1930. It was clearly stated for the Government that it was for the jury to decide whether in fact Marie Stopes's books were either obscene or of an immoral nature, and what was more important in contraceptive history, whether in fact the books were offensive because they contained 'prints or drawings or representations for the prevention of conception'.

The matter was caustically summed up by Judge William H. Kirkpatrick who said: 'They are not in my judgement books which would tend to deprave the morals of persons into whose hands they might fall by suggesting lewd thoughts or exciting sensual desires. They treat the subjects with which they deal in a perfectly serious and perfectly honest manner.' And on his direction the jury returned a verdict for the defendant. Another step forward had been taken in the progress of conception.

As late as 1957 although knowledge and distribution of contraceptive information was widespread in the state of Connecticut the law expressly forbade the use of any kind of contraceptive by married couples. It remained a criminal offence for any doctor,

nurse or pharmacist to advise the use of, or to supply, any contraceptive material.

In late 1961 a Birth Control Clinic was opened in New Haven, Connecticut, which directly challenged this eighty-two-year-old state law. Two members of the Planned Parenthood League of Connecticut were arrested and charged with being accessories to the use of a contraceptive. They were the Chairman of the Obstetric Department of the Yale Medical School and Mrs. Richard Griswold, an Executive Director of the League of Planned Parenthood Federation, and they were both convicted of violating Connecticut's Anti-Birth-Control Law and fined 100 dollars each. Both the defendants lodged an appeal, but the Birth Control Centre with which they were concerned was closed nine days after it had opened. The legal battle still continues in Connecticut, although it attempts to sustain a law which it is impossible to enforce.

Chapter 12

FAMOUS NAMES IN CONTRACEPTION

If, above all, it were once clearly understood, that it was not disreputable for married persons to avail themselves of such precautionary means as would, without being injurious to health or destructive of female delicacy, prevent conception, a sufficient check might at once be given to the increase of population beyond the means of subsistence.

Francis Place, 1822.

Although for many years the idea of birth control has been generally accepted, at the same time it has been ringed around with fierce controversy on religious and ethical grounds. To understand how these objections came about, how they were sustained or weakened and how the use of contraceptive techniques was affected it is necessary to trace the origin of contraceptive ideas from the very beginning of family limitation.

It is probable that the writings of St. Thomas Aquinas (1225-1274) have had as great an influence on the pattern that contraception has taken as any other writer in this field. For it was his views that became those of the Roman Catholic Church, only slightly modified in the present day.
those of the Roman Catholic Church, only slightly modified in the present day.

Thomas of Aquinas was born in the Castle of Rocca Secca near Aquinas in Italy. At the age of seventeen he decided to enter the order of preaching friars founded by St. Dominic and eventually found his way to Cologne, the centre of theological learning. Here he pursued his studies with such great intensity and in such silence that his companions called him the Dumb Ox. It was in Cologne that he wrote his famed commentaries on the works of the Greek

philosopher Aristotle. In the year 1261 the Pope called him to Rome to teach there and it was then that he achieved his greatest work. His *Summa Theologica* is divided into three parts, the first is concerned with the existence and the attributes of God and the Trinity. In the second part he treats of the subject of morality in general with relation to the Ethics of Aristotle. The third part while not completed dealt with the actual work of Christ himself. It was in this work that St. Thomas gave his views on birth control. He made it quite clear that in his opinion anything which hindered the 'generation of offspring' as a result of the carnal act was against the religious concepts of the Roman Catholic Church. He stated too, that to waste seed (semen) is against the good of nature; for the good of nature is the conservation of the species. He held therefore that the sin by which the generation of human nature is held back should take second place only to the sin of homicide; that is the destroying of a life which is actually in existence. Since he produced the *Summa Theologica,* the Roman Catholic Faith has wholeheartedly condemned the prevention of conception by artificial means and it was this that brought some measure of popular adoption of the use of the safe period. Aquinas, therefore added nothing to the furtherance of contraceptive devices and almost half a century elapsed before his views were challenged.

It was not until 1798 that another figure appeared who once again like Aquinas focussed attention on the question of family limitation but who like Aquinas added nothing to improve the methods by which this could be achieved. Thomas Robert Malthus was born in 1776 in Surrey, near the town of Guildford and after entering Jesus College, Cambridge, was elected a Fellow in 1793 and eventually took Holy Orders some four years later. The first edition of his great work *An Essay on the Principle of Population as it affects the Future Improvement of Society* was published in 1798. Malthus and his father used to spend many evenings together discussing the cause of poverty, and the ways and means that society could be brought to a stage of perfection. It is said that his accomplished essay was the direct result of one such dissertation. The young

Malthus maintained that the tendency of the population to increase faster than its subsistence would always bring in its train abject misery and that a happy society could never be realised because of this. He took his point a little further by stating that only certain naturally occurring factors, such as vice, disease, epidemics and war prevented the world from being overburdened with its teeming inhabitants. He did not, however, give any practical advise on how to cope with this explosive situation and contrary to popular thinking he at no time advocated the use of any kind of contraceptive appliance.

Some four years later, after having studied the subject in greater detail he published a second edition of the same book. He had meanwhile collected material bearing on the rates of increase of population in many countries, and although he still maintained that it was necessary for the natural factors to exist to restrain the growth of population he suggested that this would not be enough. He therefore called upon people to practise what he called 'moral restraint'. He meant by this that marriage should be postponed until a much later age and even in marriage strict abstinence from sexual intercourse should be observed.

Looking on this view retrospectively it can be seen that the passage of time has destroyed any validity his argument may have had. No modern believer of family limitation would uphold his opinions. On the contrary the age at which marriage takes place is earlier, not later.

The person who appeared to be diametrically opposed to Malthus and possibly the real founder of the birth control movement now appeared on the scene. Francis Place (1771-1854) was a London tailor, who by sheer perseverance and real ability rose to prominence in the English political scene. In 1822 he published his now famous book, *The Principle of Population, including an Examination of the Proposed Remedies of Mr. Malthus.* In this book he inquired into the Malthus cure for over-population and ably demonstrated the utter futility of either deferred marriage or complete abstinence. He himself was the father of fifteen children and was able

to experience the problem which over-large families created for the working man. He was possibly the first one to try to apply the Malthusian population theories to the everyday life of the individual, and to actually publish literature which gave positive instructions on the use of contraceptive techniques. On page 173 of his book the following passage occurs.

> Mr. Malthus seems to shrink from discussing the propriety of preventing conception, not so much it may be supposed from the abhorrence which he or any reasonable man can have to the practice, as from the possible fear of encountering the prejudices of others, has, towards the close of his work resolved all his remedies into one, the efficacy of which he has all along doubted, and on which he seems afraid to reply. He candidly confesses that if the people cannot be persuaded to defer marriage till they have a fair prospect of being able to maintain a family, all our former efforts will be thrown away. It is not in the nature of things that any permanent general improvement on the condition of the poor can be effected without an increase in the preventive check.

This is possibly the first time that the word preventive occurs in this context in contraceptive literature.

As one reads through this book of Francis Place one sees the same question being argued for and against contraception that appears today. Place asserts that it would be childish to shrink from developing methods however repugnant they may be, which might control over-population. He poses the same question that is being asked today in the light of greater contraceptive knowledge than Place could have dreamed of. 'Would not incontinence be increased, if the means recommended were adopted?' He answers 'I am of the opinion that it would not' and suggests that the most effectual mode of diminishing promiscuous intercourse is early marriage.

Still more courageous than his attack on Malthus was the distribution of handbills amongst the working classes. These were circulated by Place and his friends and by 1823 were being widely disseminated in London itself. It was in these pamphlets, among which the famous 'Diabolical Handbill' made its appearance, that the ex-tailor

gave some indication of practices that could be used and indicated techniques such as *coitus interruptus* and the use of the sponge.

Place asserted that marriage should not be delayed but on the contrary, that conception should be prevented until it was convenient and that it was necessary to give advice on methods whereby this could be achieved. Here perhaps for the first time is a glimpse of what was to come. The dissemination of literature was only the first step.

The author of these handbills and his friends amongst whom was Richard Carlile, became the subject of scurrilous attacks in the daily press. In one particular case a journal called *The Bulldog* was edited and published for the sole purpose of attacking Place and his helpers and accused the former of being the author of 'the filthy pages entitled *What is Love*?'

It is now supposed that the book, *Every Woman's Book; or What is Love* was written by Carlile or Place in 1825 and is possibly the first book on birth control which was published in England. If the author's name is not certain, the publisher's certainly was, for Carlile in 1826 advertised this book featuring 'Practical Hints on how to enjoy Life and Pleasure without Harm to Either Sex' as being published by R. Carlile, 62 Fleet Street, London, with the author's name given as a Dr. Waters.

Richard Carlile (1790-1843) like Place, was the son of a working man, a shoemaker. He was born at Ashburton in Devon and made his way to London in 1813 where he worked as a journeyman tinman. He was greatly influenced by the works of Thomas Paine and in 1817 he printed and published some of Paine's works which had previously been suppressed. For this and for other offences of a similar nature he underwent several terms of imprisonment. There is no doubt that it was his efforts as a printer and publisher that enabled Place to secure the distribution of his pamphlets.

This was only the beginning of a flow of literature in the form of books and pamphlets which was to bring the question of contraception to the notice of the mass of the people. In almost every case a penalty of imprisonment and social ostracism was to be paid by

the writers and distributors of this information. Let no one think that the availability today of easily obtained information on contraception has come about by mere chance. It has happened through the perseverance of pioneers such as those we are describing here.

The next event which aroused controversy and interest in this subject was the publication in 1832 of a treatise called *The Fruits of Philosophy; or the Private Companion of Young People* by a United States physician, Charles Knowlton and he, as the men before him, acquired his early education through his own efforts.

Born in Massachusetts in 1800, the son of a farmer, he acquired a medical degree some twenty-four years later. In 1832 Knowlton published anonymously his treatise called *The Fruits of Philosophy* and re-issued it the following year under his own name. Though the book presented a temperate picture of the social, medical and economic aspects of contraception it was against the stream of public opinion of that time and Knowlton was prosecuted and ordered to pay a fine and suffer imprisonment for three months. In this book were discussed openly several methods of contraceptive technique and it included descriptions of the sheath, the withdrawal method, the sponge and particularly emphasised the use of douching as a good, reliable technique. The book itself was the most comprehensive work on this subject which had been presented up to that time, but was to achieve greater prominence in England during the trial of Mrs. Besant and Charles Bradlaugh when they attempted to secure the right to freely publish and distribute Knowlton's work. [See Chapter 11, Contraception and the Law]. It was as a direct result of this trial that the Malthusian League, originally founded by Bradlaugh, was now brought back again as an active organisation with Mrs. Besant as its secretary. It achieved greater repute a year later (1878) when C. B. Drysdale, the senior physician to the Metropolitan Free Hospital became its President, and together with his wife, devoted their lives to writing and lecturing on the desirability of small families.

Some of the effects of the legal proceedings have been dealt with in a previous chapter, and it is obvious that the publicity given by

the Bradlaugh-Besant trial and the incident of Dr. H. A. Allbutt greatly helped to bring the practice of contraception to the notice of the public.

By 1900 the problem of limiting the family was beginning to interest some of the foremost thinkers of that period. Although not directly concerned with the setting up of Advisory Clinics, Sir Julian Huxley did much to draw the attention of government bodies to the threat of over-population.

In the U.S.A. Margaret Sanger opened the first clinic in the Brooklyn area of New York in 1916. After having spent a period working as a trained nurse in the city of New York, and appalled by the poverty and misery caused through overcrowding, she became convinced that there existed a desperate need for information concerning contraception and gave up her nursing career with this sole objective in mind. The term 'Birth Control' was first coined by Mrs. Sanger in an article in a magazine called *The Woman Rebel.* It was for the circulation of this journal through the American Mail system that she was indicted.

She won great support for her case by the publication of a pamphlet on Birth Control and in 1916 the case against her was dismissed. After the opening of the Brooklyn Clinic she was charged with 'maintaining a public nuisance' and it was after serving a thirty-day sentence on this charge that she began publication of *Birth Control Review,* a monthly magazine. In 1923 Mrs. Sanger founded a Research Bureau in New York and this was followed shortly afterwards with the holding of the first World Population Conference in Switzerland in 1927. The culmination of her great work in the establishment of some organised method of disseminating contraceptive literature was with the inception in 1941 of the Planned Parenthood Federation of America which now maintains contact with nearly 600 centres throughout the United States.

Meanwhile in England as in the U.S.A. progress was being made and there is no doubt that the start of this was associated with the name of Dr. Marie Carmichael Stopes. This distinguished scientist who had established an international reputation in the field of coal

research, turned at the age of forty to the subject of birth control and devoted the last thirty years of her life to bringing to the notice of the general public the desirability of birth control in married life.

Marie Stopes was born in Edinburgh on 15th October 1880, the daughter of an English engineer, Henry Stopes and Charlotte Carmichael, a pioneer of university education for women. Marie herself was educated at the Universities of London and Munich and became fellow and lecturer in Palaeobotany at the Universities of London and Manchester. In 1918, the period began which was to be a turning point in her career, for it was then that she became interested in the sociological aspect of family limitation. She was aged thirty-eight and had written a book which she personally believed would be a best seller and which set out to give advice to married men and women on how to deal with many of the problems that arose through ignorance of the sexual needs of both partners in marriage. The book, entitled *Married Love* had been rejected by two well-known publishers but when it was eventually printed at the beginning of 1918 it was an immediate success and two thousand copies were sold in the first two weeks.

So enthusiastic was the reception of this book that she followed it with another *Wise Parenthood* which filled some of the gaps in birth control that the first book had left. These books were not enough for the intrepid Dr. Stopes and on 17th March, 1921, she opened the first birth control clinic in the British Empire at 61 Marlborough Road, Holloway. One of the main ideas behind the opening of this clinic was to see whether or not the people of the working class would welcome the idea of birth control. Dr. Stopes believed that they would, and in a very short period she was proved to be absolutely correct. Working class women literally swarmed to the clinic where this free advice on contraception could be had.

The next big step was to hold a public meeting and put her ideas forward to as large an audience as possible. With this in mind Dr. Stopes hired the Queen's Hall in London for the evening of Tuesday, 31st May, 1921. It was this famous public gathering which was to draw attention to her plans and bring admiration from her followers

and attack from her enemies. The Hall which seated two thousand was filled to capacity and several well-known physicians, both male and female, spoke in support of the Marie Stopes movement. The tremendous ovation which greeted Dr. Stopes's speech spoke of the success of the meeting and gave her the support she required to press on with her schemes.

Opposition against her crystallised and certain members of the medical profession attempted to bring the case for birth control into disrepute and the legal case of *Stopes v. Sutherland* ensued.

On August 10th, 1921 at the Hotel Cecil in London, the Society for Constructive Birth Control and Racial Progress was formed with Dr. Stopes as its President, and the establishment of an organised centre for dissemination of information concerning birth control methods to all who required it became an established fact.

By 1930 a voluntary society had set to work and formed the National Birth Control Association founded as a central body to co-ordinate the previously existing small organisations, which were running contraceptive clinics. The oldest of these was the clinic founded by Dr. Stopes. The section of the public which these associations wished to serve were married women of the lowest income levels. At some of their clinics they undertook to instruct doctors in contraceptive techniques; and as a secondary function a purely scientific committee was formed to investigate existing contraceptive appliances and chemicals to see how these could be improved, and to set up standards of testing the chemical spermicides which were now being used. There are now more than three hundred clinics which are working within the sphere of the Association.

Today contraception is news and progress is reported and distributed on a world-wide scale as with any other science. The newspapers are just as eager to print items of news concerning the population question as they are on any other subject.

On 10th September 1962, *The Daily Telegraph* reported that Russia was experiencing a sharp drop in her birth rate and said that one of the reasons was the greater availability of contraceptive information and abortion. In the same year in Turkey it was reported in

The Family Forum that a campaign had begun to enlighten women on the subject of contraception. For women who could read, a book had been produced called *A Calendar for Women,* and had received wide publicity.

The book explained, with the help of coloured diagrams, the use of the safe period as a method of contraception. Since many women in Turkey are illiterate a more novel method of instruction has been evolved. A string of twenty-eight different coloured beads with white beads representing the safe period can now be obtained. The ban on the import of contraceptives has been lifted and strange as it may seem, this may alter the very names which Turkish children have been given. For these names were a direct reflection on the situation which lack of birth control was causing. Such names as Yeter (meaning enough) or Bitsim (let it end) may now be a thing of the past.

Perhaps the final step in the evolution of the social side of the story of contraception was the suggestion from the United States in 1963 that a world-wide organisation under the auspices of the United Nations should be set up to give help in this matter wherever it was required, anywhere in the world.

APPENDIX I

Tests for Rendell Pessary

APPARATUS

Unicam sp/500 Spectrophotometer with 1 cm glass cells.
Mechanical shaker
Thermostatically controlled water bath at 20°c - 0·1%
Glass stoppered centrifuge tubes (50 ml)
Centrifuge
Balance, Analytical

REAGENTS

Ammonium Cobaltothiocyanate reagent
15g of cobaltous nitrate hexahydrate and 100 g of ammonium thiocyanate are dissolved in distilled water and diluted 500ml.
p-Nonyl Phenoxy Decaethoxy Ethanol
Dissolve an accurately weighed amount in chloroform and dilute daily for working standards.
Chloroform Analar

METHOD

Unwrap the pessary and weigh accurately on an analytical balance. Dissolve the pessary in about 10ml of chloroform and dilute to 20ml with chloroform.

The bottles containing the ammonium cobaltothiocyanate reagent, working standard solutions and chloroform are placed in the water bath and allowed to reach temperature equilibrium at 20°c.

One ml of the pessary solution is pipetted into a centrifuge tube held in the water bath. To this is added 10ml of the ammonium cobaltothiocyanate reagent followed by a further 9ml of chloroform. A blank containing 10ml of chloroform alone and a suitable standard solution diluted to 10ml of chloroform are set up simultaneously. The tubes are stoppered immediately and shaken mechanically for exactly three minutes. The tubes are then centrifuged at 2000

r.p.m. for 2 minutes to separate the phases. The bulk of the chloroform extract is transferred by means of a dry pipette to a dry glass-stoppered tube, care being taken to avoid contamination by the aqueous phase. These tubes are then transferred back to the water-bath for exactly six minutes. The optical density of the solution is then determined in the SP 500 spectrophotometer at 620 u using a 1cm glass cell, setting the instrument with the reagent blank.

Even with such careful standardisation of conditions, it has been found preferable to work with standards carried through the method simultaneously with the test samples rather than to calculate the results from a previously prepared standard graph. The colour reaction of the active ingredient with ammonium cobaltothiocynate obeys Bears Law, that is to say the intensity of the colour produced is proportional to the amount of surface active ingredient present. However, it has been found that small, but significant, differences occur in the slope of standard graphs from day to day. Thus for precise work reference to standards, the optical density of which are approximately the same as the samples under investigation, are preferable.

APPENDIX II

Determination of Spermicidal Power

At the outset of investigation it was realised that a precise method for evaluating spermicidal power was essential. A technique was initially developed by Baker by the examination of pure substances (*Journ.Hyg.*, 1931, *31*, 189) and later, modified, improved and rendered generally applicable to the examination of contraceptive preparations in addition to the testing of active principles (Baker, Ranson and Tynen, *Journ.Hyg.*, 1937, *37*, 474). The following account is abstracted from the original papers. The technique permits the grading of substances according to their spermicidal power in such a way that each division represents twice the activity of the one next below. In testing pure substances the compound dissolved in normal saline at some concentration in the series 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, etc. per cent is warmed to 37°c. and 0·3 c.c. of the resulting solution is mixed with 0·3 c.c. of human semen at the same temperature. The substance is now at half the concentration at which it was first made up. If after half an hour the sperms are found to be immobile the suspension is diluted with three times its volume of an alkaline fluid favourable to their activity in order to distinguish between temporary immobility and death. The strength of the weakest mixture in this series which kills all sperms in half an hour is quoted as the 'killing concentration'. In the grading of preparations containing a spermicidal substance, one suppository, or 2 grm. of a paste or ointment, is added to 3 c.c. of normal saline at 37°c., allowed to disintegrate, the mixture filtered and 0·3 c.c. of the filtrate mixed with 0·3 c.c. of human semen and the observations carried out in the manner to be described. These quantities represent the 'standard' or 's' concentration, and it is based on the assumption that 5 c.c. of semen and 1 c.c. of vaginal fluid will be normally present after coition.

In conducting the test, 0·3 c.c. of the solution of the pure substance in saline, or 0·3 c.c. of the filtrate produced by filtering the solution

resulting from treating one suppository (or 2 grm. of paste or ointment) with 3 c.c. of saline at 37°C. for one hour, is transferred to a test-tube. If it is intended to test a pure substance at 1 per cent then the strength of the solution in saline must be 2 per cent, since later, it is mixed with an equal volume of semen; similarly, a suppository dissolved in 3 c.c. gives the standard, or S. concentration while, if it is desired to test at S/2, then 6 c.c. of saline must be employed. The test-tube is introduced into a damp chamber consisting of a glass tank which can be closed by means of a greased plate and containing an internal platform supported above water. This tank is maintained at 37°C. by keeping it in a thermostatically-controlled cupboard. Another test-tube contaning 0·3 c.c. of saline, which will serve as a control, is also placed on the platform. Into each of two flat-bottomed specimen tubes contained in the damp chamber is transferred 0·3 c.c. of human semen derived from voluntary donors who collect the material in rubber sheaths at coition. After 15 minutes the contents of the experimental test-tube (containing the spermicide) are transferred to one of the specimen tubes, plain saline is mixed with the semen in the other specimen tube and in both cases complete mixing is effected by blowing in air for a few seconds. After 25 minutes at 37°C. air is again bubbled through the control mixture, two drops of the mixture are transferred to a hollowed microscope slide previously warmed to 37°C., a warm coverslip applied and the slide left in the thermostat while another slide is similarly prepared from the experimental mixture containing the material under test. The slides are marked, the designations covered by detachable blank labels and the slides shuffled until the observer does not know which is which, thus eliminating the possibility of errors due to unconscious bias. Half an hour after the commencement of the test the activity of the sperms is observed, using a microscope provided with a warm stage and a 1/6 in. objective. In expressing the results, complete immobility is indicated by 0 and full motility by 3, while 2 indicates that between 10 and 50 per cent of the sperms are moderately active; any activity, however slight, which is less than 2 is signified by the figure 1. Extreme activity is indicated by 3+ while intermediate mobility between 2 and 3 or 1 and 2 is similarly expressed by addition of a plus sign. Results are only recorded when the control sperms show activity equal to at least 2+. The above procedure is repeated at

different concentrations in the series 2, 1, ½, ¼, etc. per cent for pure substances (or at s/2, s/4 etc. for suppositories or pastes) until the weakest concentration capable of immobilising the sperms in half an hour has been determined. It is then necessary to ensure that the sperms have been killed, and not merely immobilised, by mixing 0·3 c.c. of the suspension in each tube with 0·9 c.c. of warm alkaline diluting fluid and, after the elapse of 20 minutes, again examining microscopically in order to ascertain that the experimental sperms are dead. The alkaline diluting fluid is favourable to the life of sperms; it contains glucose, sodium chloride, disodium phosphate and potassium hydrogen phosphate in aqueous solution. Finally, when the weakest concentration which kills all sperms has thus been determined the whole procedure is repeated, and, provided three or four similar results are obtained, the strength at which the spermicide was applied is recorded as the killing concentration.

By the above procedure the spermicidal power of any substance is measured under conditions of alkalinity, human semen being a buffered alkaline medium. Some spermicides are less active in acid solution, a case in point being methylhydroquinone with a spermicidal power of only one-eighth of the value which it possesses in the presence of alkali. On the other hand, slight conditions of acidity retard the activity of sperms; further, as lactic acid is normally present in the vagina it is important to acquire knowledge of the spermicidal properties of substances when acting in the presence of sufficient of this acid to neutralise the alkalinity of the semen. Therefore, the whole of the above procedure is repeated with semen which has been first slightly acidified (to pH 5·5-6·5) with a specially prepared 3 per cent solution of lactic acid. If the result differs from that originally found, it is quoted as the killing concentration in acid medium, in contradistinction to that which obtains for alkaline conditions.

Classification of Spermicides

Substances exhibiting similar killing powers at the same concentration are placed in the same 'grade' of spermicidal power. If the minimum killing concentration is $1/2^x$ then the substance is said to be in 'grade x'. Thus, hydroquinone always kills sperms at 1/64 per

cent but not at 1/128 per cent, therefore its killing concentration is $1/2^6$ per cent., and it is classified as a 'grade 6' spermicide. Phenylmercuric acetate, the spermicide used in Volpar preparations, is much more powerful, since in acid solution it always kills at 1/1024 per cent and thus falls into 'grade 10'. Since a compound in any given grade has twice the spermicidal power of substances in the next lower grade it follows that the active constituent of Volpar preparations is sixteen times more effective than hydroquinone at the same concentration; again, hydroquinone, in its turn, is thirty-two times more spermicidal than quinine bisulphate which is so commonly used in contraceptive preparations.

A selection of the results obtained for pure chemical compounds is presented in Table 1. Phenyl mercuric acetate is the most powerful of the whole series when acting in acid media, and, although in alkaline solution its activity is reduced, it is still more than sixteen times stronger than the highly toxic mercuric chloride and over one hundred times more spermicidal than quinine bisulphate. Originally, it was not anticipated that any substance would be found to surpass the spermicidal activity of mercuric chloride, but, as work proceeded, several substances, including organic compounds of the quinone class, were found to be much stronger. The relatively low position as a spermicide occupied by mercuric chloride, and certain ionisable mercury salts, is connected with their property of forming an insoluble complex with proteins. It is of interest to observe that before experiments were made with phenyl mercuric acetate, toluquinone was regarded as the most spermicidal of all substances, but was found to be too toxic for use as a contraceptive. It will be noted that disinfectants are not necessarily strong spermicides, and results obtained during this investigation have emphasised the lack of parallelism between spermicidal and bactericidal properties.

Most substances have little or no effect upon sperms at one-eighth of the concentration at which they kill every time, although they exert considerable action at one-half this strength. However, there are exceptions in both directions, as, for example, hydroquinone which always kills at 1/64 per cent, but is almost ineffective at 1/128 per cent; on the other hand, zinc sulphocarbolate fails to kill every sperm even at 2 per cent, and at the same time it is able to impair their activity at a concentration of only 1/128 per cent.

The Diffusion Test

In assessing the practical utility of a contraceptive preparation the rate at which the spermicide escapes from the vehicle must be considered just as important as the actual spermicidal power. It is obviously useless to incorporate a powerful spermicide into a preparation if it cannot diffuse out rapidly enough to kill the sperms. Hence, before discussing the spermicidal power of contraceptives the essentials of the diffusion test developed by Baker, Ranson and Tynen (*Journ.Hyg.*, 1937, *37*, 474) will be briefly described. In this test mechanical mixture of the contraceptive with the semen is avoided.

A glass capsule, 3 cm. in diameter, is placed on a metal plate which is supported on the platform of the damp chamber and allowed to warm to 37°C. Similarly, a supply of artificial vaginal fluid (prepared by adding 1·4 c.c. of approximately 3 per cent lactic acid to 10 c.c. of beaten egg-white) and some human semen are warmed to body temperature. A quarter of one suppository is added to the capsule, and after half an hour, or when the suppository has melted, whichever is later, the material is smeared evenly over the bottom of the vessel with a glass rod and 0·25 c.c. of the artificial vaginal fluid added. After five minutes 1·25 c.c. of the warm semen is squirted into the capsule. At timed intervals drops of the preparation are removed from three places, and drops mixed in a small warm tube and a sample of the resulting mixture examined microscopically for motility of sperms. As soon as the sperms are immobilised two drops of the mixture are tested with six drops of the alkaline diluting fluid as used in the test for spermicidal power, and a drop of the mixture examined miscroscopically in order to ensure that the sperms are actually dead and not merely immobilised.

APPENDIX III

Tests for Chemical Spermicides

When the Medical Committee of the International Planned Parenthood Federation decided to publish an international list of spermicidal products it became obvious that this would have little meaning and be of no value unless some indication could be given of what each product contained and how thoroughly and by what means and where it had been tested. As the list of products grew and information about them accumulated it was found that some had been more thoroughly investigated and checked than others; that a great variety of standards had been used and it was difficult to compare and assess the results. In particular, spermicidal testing was in confusion. As a consequence of this it was extremely difficult to ascertain how the spermicidal efficiency of a product tested, for example, in India compared with that of another tested in the U.S.A.

To deal with all these difficulties and to decide which of the many tests gave most reliable information the International Planned Parenthood Federation Medical Committee appointed its Evaluation Sub-Committee the members of which came from the few countries where laboratories already existed in which contraceptive products were being tested (i.e. Denmark, India, Japan, Sweden, United Kingdom and United States of America). One of its first tasks was to evolve a test for spermicidal efficiency which would be acceptable to workers in different parts of the world and which could then be used to bring results of international testing into line. This was originally known as the Compromise Test and later as the IPPF Agreed Test. The details of the technique have gradually been improved and modified in the light of experience and these as they stand now (1960) are given below. The Evaluation Sub-Committee has also considered and sifted many other tests which deal, not only with spermicidal power, but with physical properties, packaging, durability, local harmlessness and general acceptability and have

made decisions as to which they think give most useful information. Brief descriptions of these are given here.

Before listing a product the manufacturer is asked for the full formula on the understanding that this information, if given, will be treated as strictly confidential. Almost all have complied with this request; some have not replied and some have given only partial formulae.

Alkaline test of Total Spermicidal Power (Baker)*

Modification used by Dr. H. A. Davidson. As used at Government of India C.T.U. *and* F.P.A. (U.K.) *Laboratories.*

1 Weigh out 2 gms of contraceptive paste or take 1 suppository (or tablet).

2 Add 6 mls. of normal saline at 37°C.

3 Stir until paste or suppository is completely disintegrated. This makes a solution of S/2 when mixed in equal parts with semen.

4 Measure 0·3 mls. of the solution and 0·3 mls. of semen into separate small test tubes. This is the *'test'* sample.

5 Measure 0·3 mls. of normal saline and 0·3 mls. of semen into another pair of tubes. This is the *'Control'* sample. Keep all these in an incubator for 15 minutes then proceed to:

THE TEST

6 Transfer the semen into the spermicidal solution (4) and into the saline (5 control) respectively. Note the time. Draw up the mixture into a pipette and run down the side of the test tube 3 *times.*

7 *5 minutes later* Take one drop each from the 'test' and 'control' tubes, put on warm slides, adjust cover slip and examine under microscope.

8 Examine 10 high power fields of the 'test' drop for motile sperms. If no motility observed mark '0'). If fully active mark '3' and '1' or '2' for intermediate stages of motility.

* Baker, J. R.; Ranson, R. M.; Tynen, J. (1937) *Journ.Hyg., Camb. 37,* 474.

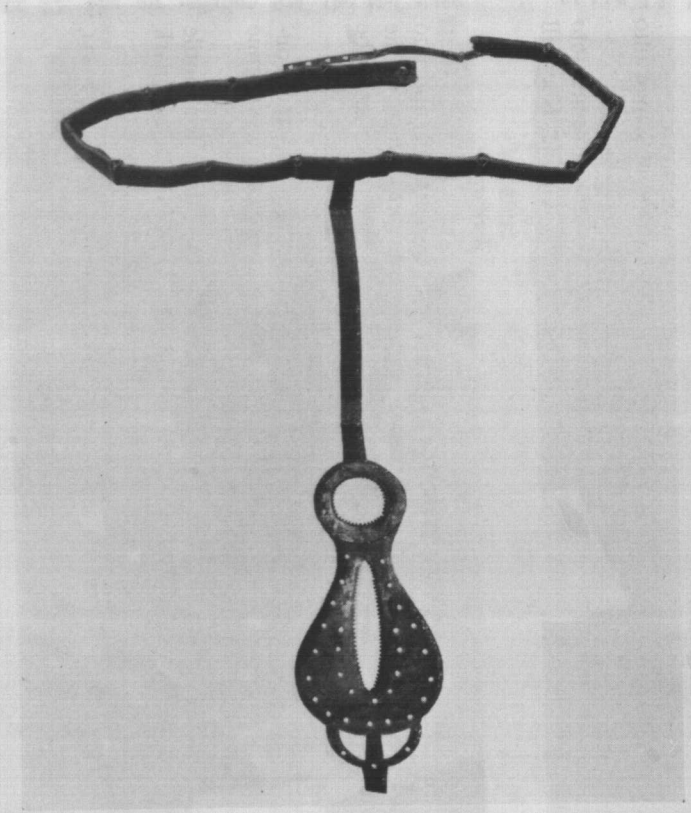

PLATE 10 The chastity belt, an oriental device introduced into Europe at the time of the Crusades *(by courtesy of the Nordiska Museet, Stockholm)*

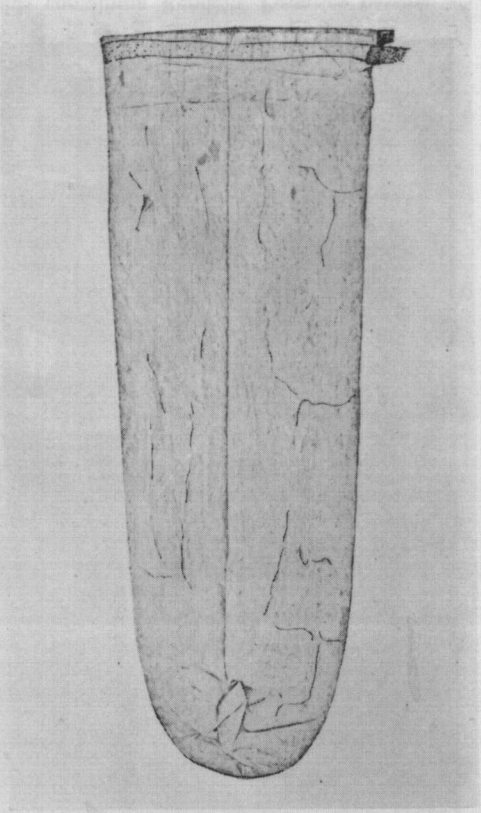

PLATE 11 An original 18th-century condom, made from the caecum of a sheep and measuring 9½″ x 3″

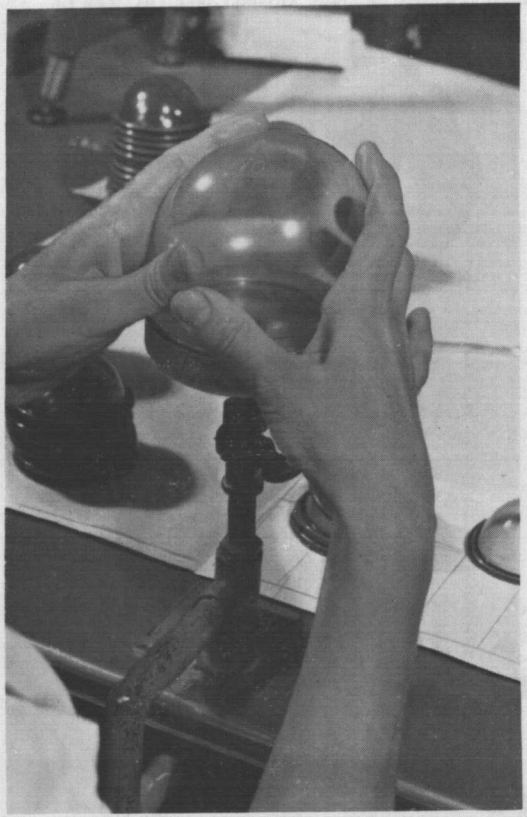

PLATE 12 The air inflation test, the last stage in London Rubber Industries' manufacture of the diaphragm

PLATE 13 Moulds containing Rendells Pessaries passing into a refrigeration tunnel for final cooling and trimming

9 Examine 'control' drop. This should be fully active. *If activity is impaired discard the whole test.*

10 If no active sperms are found in 'test' drop add 0·6 mls. of buffered glucose solution to the tube containing semen-spermicide mixture. Keep in incubator 5 minutes then re-examine. If still no active sperms are seen in 10 high power fields mark '0'. In this case the final result would be noted as 0/0 for the 'tests' and 3/3 for the control drop. If there is revival then the result will be scored as 0/1 or 0/2 depending on the degree of revival.

Sander-Cramer Method*

As used at the Margaret Sanger Research Bureau, New York and the Ortho Pharmaceutical Laboratories.

APPARATUS

Magnetic mixer: magnet coil of induction motor
Lock-washers
Test tubes
Pipettes, 1 ml. rapid
Pipettes, 1 ml. grad
Micro-culture slides
Cover slips
Stirring rods
Vaseline
Stopclock

METHOD

1 Place 0·2 ml. semen in bottom of test tube.
2 Add lock-washer, insert tube in field of magnetic mixer.
3 Add 1·0 ml. of diluted preparation, at same time starting mixer and timer.
4 Let mix 10 seconds.
5 Remove and prepare hanging drop.
6 Note condition of sperm and record time for 'no activity'.
7 If sperms are not all immobilized within 20 seconds, determine dilution necessary to do this.

* Sander F. V. and Cramer, S. D. (1941) *Human Fertility.* 6, 134 and (1952) *Am.N.Y. Acad.Sciences.* 54, 806.

NOTE: The hanging drop preparation is prepared as follows:

1 On a culture-slide, place a daub of vaseline on opposite sides of the well.
2 Place drop of mixture on a cover-slip.
3 Invert culture slide and press to cover-slip so that the well is over the drop. The vaseline will hold the corners of the cover-slip.
4 Quickly invert slide and cover-slip and insert in microscope stage.

IPPF Agreed Test for Total Spermicidal Power (1960)

Minimal requirements for semen to be used for testing

Sample age: Not more than 4 hours old.
Density: 50 million/ml.
Motility: 40/50% of the sperms should show rapid forward motion when examined with a fresh mount at 35-37°c.
Viscosity: Properly liquified semen, not 'stringy' when run out of a pipette, and appearing homogeneous to the naked eye.

Specimens must not be collected in a rubber or latex sheath or condom and should be kept in a tightly stoppered tube at room temperature while waiting to be used.

(A) *Control test for effect of dilution and magnetic mixing*

The following control test should be done on each specimen of semen just prior to the spermicidal tests. If the semen is in use for more than 2 hours the control test should be repeated.

APPARATUS

0·9% saline solution
Magnetic mixer (magnet of synchronous motor or similar device)
Stainless steel lockwasher or other suitable magnetic stirrer
Test tubes 85 × 15 mm. thick walled
Pipettes as required
Stopclock

Microscope, slides, etc.
Incubator or waterbath (at 35-37°c.)

PROCEDURE

1 Bring all materials to 35-37°c., using incubator or waterbath.

2 Pipette 0·2 ml semen into test tube, taking care that no semen splashes up the sides of the tube.

3 Add lockwasher, insert tube in field of magnetic mixer. Check that mixer is working.

4 Add 1 ml saline, at same time starting mixer and timer. This is zero time.

5 Let mix 10 seconds, place drop on plain side with cover slip and put in microscope stage.

6 At 40 seconds (i.e. 30 secs. after end of mixing) rapidly examine five fields with low power (100-150x) followed by five fields with high power (400-600x).

7 If activity in the dilution is not satisfactory in terms of the original assessment the sample of semen must be discarded.

8 Add 1 ml of buffered glucose solution, mix and re-examine for sperm activity after 30 min. at 37°c.

(B) *The Test Proper*

Dilutions of spermicidal products should be made up freshly with 0·9% NaCl solution, just before the test is to be done: 1·0 gram of the product is added to 11·0 ml normal saline (1 : 11 or 1 in 12 solution). The test should be made at 35-37°c. and semen sample, glassware and dilution should be brought to this temperature by leaving in incubator for ½ to 1 hour. At the end of this time the jelly, cream, tablet or suppository should have disintegrated or melted and the solution is stirred gently. A note is made of the rate of disintegration.

The pH of the solution is recorded using a universal indicator solution or pH meter, but *not* indicator papers.

In the case of foaming tablets one reading is taken while foaming is in progress and a second when foam is completely exhausted.

PROCEDURE

1 Bring all materials to 35-37°C.
2 Place 0·2 ml. of warm semen in test tube, taking care that no semen splashes up the sides of the test tube, as this might cause a false fail.
3 Add lockwasher, insert tube in field of magnetic mixer, check that the mixer is working.
4 Add 1·0 ml. of the warm spermicidal solution prepared as above at same time starting mixer and timer. This is zero time.
5 Let mix 10 seconds. Place a drop on a plain slide and cover with cover slip and put on a microscope stage.
6 At 40 seconds rapidly examine 5 fields with low power (100-150x). If no motility is observed confirm by examining at least 5 fields under high dry (400-600x). If even a single sperm shows any sign of life—jerking, or swimming—score 'fail'. If no sperms show any sign of life, score 'preliminary pass'.
7 If no active sperms are found add 1 ml. of buffered glucose solution* to the tube containing the mixture of semen and dilution of spermicide. Stir well with glass rod or mix well by drawing the fluid into pipette and running out three times. Place in incubator for about 3 mins. and re-examine as above. If still no active sperms are seen, score 'final pass'.

Pass Level: It is suggested that product passes when 1·0 ml. of a 1:11 solution completely immobilises 0·2 ml. of semen under the conditions of the test as described above. Each product should be tested with semen from three different individuals and if the pass level is reached with all three semens the product is accepted. If there is a fail with one of the first three a further three tests must be done and a "pass" obtained with all three, making a total of five passes out of 6 tests. If a product fails more than once it cannot pass.

Formula:

Na_2HPO_4 $12H_2O$ - 10.2 grms
KH_2PO_4 - 0·4 grms
Glucose - 16·0 grms
Distilled Water - 500 mls

NOTE: The solution of phosphates should be made up separately, as a stock solution, and glucose added in small quantities as and when necessary. After addition of glucose the solution should be kept in a refrigerator to prevent formation of mould.

TEST FOR FOAMING CAPACITY

The test is carried out at body temperature, placing one tablet in 4 ml. of saline pre-heated to 35-37°C. in a 100 ml. cylinder of 25 mm. internal diameter, and the following observations made:—

Time taken for total dissolution
Maximum volume of foam (Volume and time)
Point of break (Time at which foam starts to break down)
Exhaustion time (Time taken for foam to collapse completely)
Quality of foam (Bubble size, uniformity, etc.)

TESTS FOR LOCAL HARMLESSNESS

On Animals

(a) RHESUS MONKEY VAGINA: BIRMINGHAM SCREENING TEST

This is carried out by introducing the preparation under investigation into the vaginae of rhesus monkeys (*Macaca mulatta*)and assessing their effect by direct visual inspection and repeated biopsies of the vaginal mucosa.

Mature, regularly cyclic monkeys are used, ranging from 4 to 6 kg. in weight at the start of the tests.

The test preparations are used as received from the manufacturers and applied daily, for not less, and usually more, than two complete cycles or 60 days, except during phases of active menstruation and immediately following vaginal biopsies. Measured volumes of creams and ointments are administered by graduated glass syringes directly into the vagina, as deeply as possible. The amount of material introduced daily is 1·5-2·0 ml., which is about the maximal amount that can be accommodated in the vagina of an average female. In the case of *tablets and gels*, one is broken up and similarly deposited in the depths of the fornices through a vaginal speculum.

Biopsies A standard technique has been adopted in order to control cyclic changes occurring in the vaginal mucosa. The biopsies

are taken under full anaesthesia during the follicular part of the cycle. After inserting a specially-designed, illuminated speculum into the vagina and observing its general condition and that of the cervical 'portio', a minute piece of mucous membrane is lightly picked up with forceps, cut off at its base and immediately dropped into Bouin's fluid. Bleeding, which is rarely profuse, is stopped by pressure with a dental swab, after which the biopsy area and rest of the vagina is dusted with powdered sulphonamide-penicillin and the animal returned to its cage. Every specimen is obtained from a different site in the vagina, approximately 1-1·5 ins. (ca. 2·5-4.0 cm.) from the vulva.

Each biopsy is serially sectioned 7 and alternate strips of sections are stained by haematoxylin and eosin or by the periodic acid Schiff (PAS) reaction for muco-polysaccharides.

A control biopsy is taken before the first administration of spermicidal material and compared with subsequent specimens obtained during the test period proper, which may be extended to over a year. Provided that sufficient time is allowed between trials, more than one preparation can be tested in the same monkey.

Some indication of the systemic effects of the compounds studied can be obtained by frequent weighing and by urine and blood analyses of the animals.

(*b*) RABBIT VAGINAL IRRITATION TEST

The method consists of the instillation of one-fifth of a human dose into the cervical end of the vagina in each of three rabbits daily for fourteen days, exclusive of weekends. One day after the last dose, the vaginae are examined grossly and then microscopically for intactness of epithelium, infection, oedema and injection of vessels.

Trials with Women

(*a*) GOVERNMENT OF INDIA CONTRACEPTIVE TESTING UNIT 24-HOUR CAP TEST

A plastic cervical cap containing one vaginal suppository or foam tablet or a 2 in. ribbon of jelly is placed on the cervix and the time of application is noted. Twenty-four hours later the cap is removed and a smear is made from the contents. The full gynaecological examination is repeated and any change noted.

The cervix should preferably be clean. If there is a small ectopy present, there should be no bleeding points.
The presence of pregnancy and any pelvic pathology, including vaginitis must be excluded.
There should be no triochomonal or gonococcal infection.
The exfoliative cytology must be normal. (Papanicolaou's stain).
Menstruation should have stopped and there should be neither macroscopic nor microscopic bleeding from the os.
The test should not be done at the time of the expected menstrual period.

Criteria for a satisfactory Cap Test

There should be no macroscopic bleeding.
There should be no irritation of the cervical mucosa as evidenced by cervicitis or tissue damage.
There should be no red blood cells in the smear.
There should be no abnormal changes in the smear.
Total of 5 or 10 cases. Results: 80% satisfactory (4/5; 8/10).

(b) MARGARET SANGER RESEARCH BUREAU
21-DAY TEST

Twelve volunteer women patients are instructed to introduce one dose of the spermicidal product deep into the vagina each night before going to bed, beginning at the end of menstruation and continuing for 21 consecutive days. Coitus should take place normally. The volunteer patient should have been examined gynaecologically during the cycle before the beginning of the test. The patients are examined twice a week during the test period and finally immediately after the end of the test. At each examination the cervix and vagina are examined by the doctor conducting the test. Note is made of subjective symptoms such as burning, irritation, rash, swelling or oedema, messiness etc. Smears for Papanicolaou staining are made before the beginning of the test and after the test is completed. The smears are collected as nearly as possible on the same cycle day.

Government of India Contraceptive Testing Unit Clinical Test

Fifty to 100 couples are given the spermicidal product to use in

the normal course of married life. Note is kept of complaints from husband or wife of undesirable symptoms as mentioned in the M.S.R.B. Test. There should be no complaints in at least 75% of the cases.

The Exeter Family Planning Association (U.K.)
Acceptability Test

The product being tested is issued to about 150 consecutive cases attending a birth control clinic. These couples use the product in conjunction with an occlusive cap, sheath, or condom. The trial continues until the product has been in use by all patients for at least 3 months; this means that the couples at the beginning of the trial will have been using it for much longer. A follow-up is made during and at the end of the trial. Note is made of the aforementioned subjective complaints and of any abnormal findings on routine pelvic examination. It is found by experience that roughly one-third of the patients are lost trace of; by starting with 150 cases it is possible to obtain reports from at least 100 patients. Not more than 8% should produce complaints.

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G. I. M. Swyer, M.A., D.M., M.D., M.R.C.P., M.R.C.S. (Consultant Endocrinologist, Dept. of Obstetrics and Gynaecology, University College Hospital, London)
writes:

'Family limitation or birth control—is widely supposed to be a recent preoccupation and it may therefore come as a surprise to many readers that advice on how to prevent pregnancy is also of great antiquity. Dr. Finch and Mr. Green show that this has been of a magical, superstitious or otherwise wholly unscientific and ineffective character. It is true that only comparatively recently has interest in birth control come to be regarded as 'respectable'—even though there is good reason to believe that 'respectable' people have, in fact, been practising it, with varying degrees of success for a very long time. The most important consequence of this development is that contraception is now considered to be a proper subject for scientific study and is engaging some of the best scientific brains in the world.

'Scientific progress in this field is undoubtedly entering upon a new phase which seems likely to become spectacular within the not too distant future. It is therefore very timely that the interested reader should have available a survey of contraception from the earliest epochs to the present day, and in this volume, Dr. Finch and Mr. Green ably fill the need.'

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