60.

Per tutto il tempo che 'l foco li abbrucia;
Con tal cura conviene e con tai pasti
Che la piaga da sezzo si ricucia.

61. Rougemont, *Love in the Western World*, p. 92, mistakenly reads Dante and places Guinizelli among the homosexuals.

62.

'Ieu sui Arnaut, que plor, e vau cantan.
Consiros vei la passada folor,
E vei jausen lo joi qu'esper, denan.
Ara vos prec, per aquella valor
Que vos guida al som de l'escalina,
Sovenha vos a temps de ma dolor!'

63. Bergin, *Diversity*, pp. 93-96, examines Arnaut's role as the great 'wordsmith' in Dante's Provençal gallery.

64. Perella, pp. 135-37, describes the popularity of the Pyramus and Thisbe tale from the twelfth century through the Renaissance period.

65.

Solea creder lo mondo, in suo periclo,
Che la bella Ciprigna il folle amore
Raggiasse, volta nel terzo epiciclo;
Per che non pur a lei faceano onore
Di sacrificio e di votivo grido
Le genti antiche ne l'antico errore,
Ma Dïone onoravano e Cupido,--
Questa per madre sua, questo per figlio,--
E dicean ch'el sedette in grembo a Dido;
E da costei, ond'io principio piglio,
Pigliavano il vocabol de la stella
Che 'l sol vagheggia or da coppa or da ciglio.

66. Foster, "Dante's Idea," pp. 91-92, analyzes Dante's Christian critique of paganism through the process of 'demythologizing' as with the planet Venus.

67.

E come in fiamma favilla si vede
E come in voce voce si discerne,
Quando una è ferma e l'altra va e riede,
Vid'io in essa luce altre lucerne
Muoversi in giro più e men correnti,
Al modo, credo, di lor viste interne.

68. See Bergin, p. 82.

69.

'In quella parte de la terra prava
Italica, che siede tra Rïalto
E le fontane di Brenta e di Piava,
Si leva un colle, e non surge molt'alto,
Là onde scese già una facella
Che fece a la contrada un grande assalto.
D'una radice nacqui ed io ed ella;
Cunizza fui chiamata, e qui refulgo,
Perchè mi vinse il lume d'esta stella...'

70.

'Chè più non arse la figlia di Belo--
Noiando e a Sicheo ed a Crëusa--
Di me, infin che si convenne al pelo;
Nè quella Rodopea, che delusa
Fu da Demofoonte; nè Alcide
Quando Iöle nel core ebbe richiusa...'

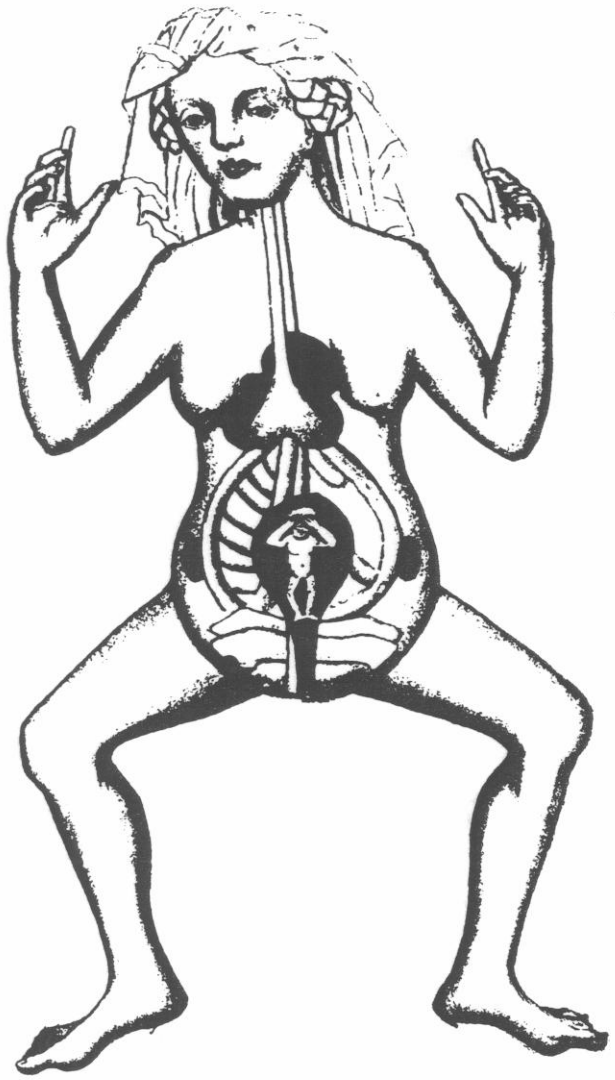
BELIEFS ABOUT HUMAN SEXUAL FUNCTION IN THE MIDDLE AGES AND RENAISSANCE

Thomas G. Benedek

We want to examine the major beliefs about human sexual anatomy and function that prevailed during the Middle Ages and Renaissance and some of the medical practices that were related to these beliefs. Historically, these were not "Medieval beliefs," because virtually all were ancient and underwent very little evolution from at least the second to the 16th century. Most were deeply ingrained in the folklore not only of Europe, but of substantial portions of Asia as well, and were not restricted to the intelligentsia. Certain of the anatomic and physiologic ideas were ennunicated by Hippocrates in the 4th century B.C., and the majority were accepted from the writings of the second century Roman physician, Claudius Galen (ca. 129-201).

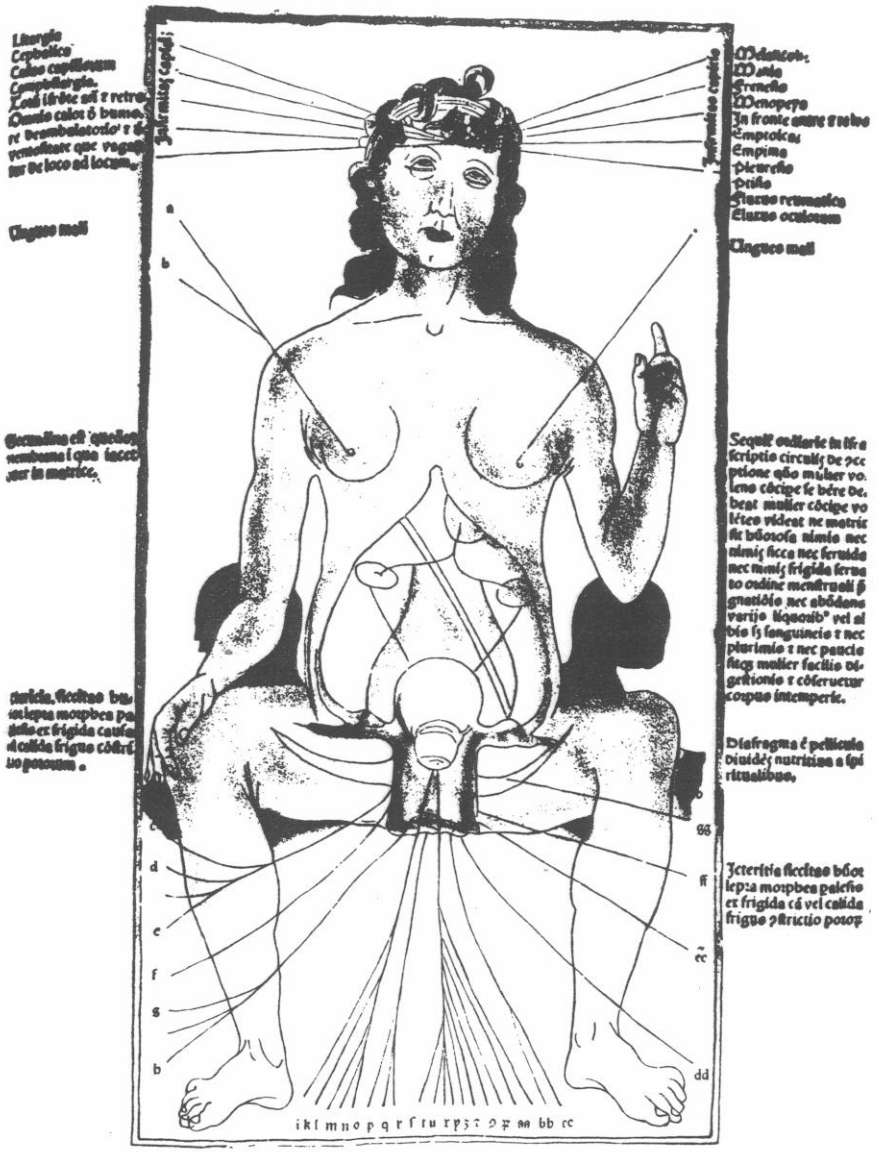
Four illustrations of female anatomy will demonstrate the lack of progress in the understanding of anatomic structure and relationships well into the 16th century. The first is very primitive and is believed to have been drawn in about 1400.[1] Essentially the same illustration was used in the *Fasciculus medicinae* of Johannes de Ketham, in 1491.[2] We see almost no true proportions or relationships. The gravid uterus appears as an inverted flask and is not differentiated from the vagina. A fetus is almost standing at attention within. The little knobs on the sides of the abdomen are the kidneys, and no gonads are shown.

The next illustration is from the second edition of the same work, which was published in 1495. This is the earliest known illustration that may have been based on a human dissection.[3] The intestines have been removed and the vagina has been opened anteriorly. A rather accurately drawn cervix can be seen and the gonads also are fairly well placed. The strange horizontal structures are not thigh bones, but the alleged horns of the uterus. The "horns", described by Galen, probably based on dissections of goats, almost certainly were the fallopian tubes.[4] Because of a misinterpretation of the infallible authority, Galen, uterine "horns" were a part of the feminine anatomy until the middel of the 16th century. The diagonal stripe is unusual, especially in view of the distinctions that



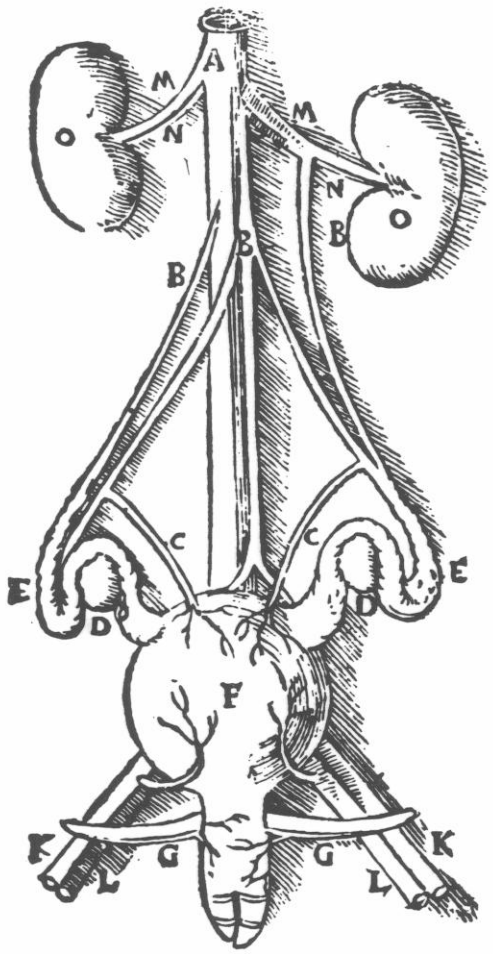
Figur 56. Weibliches Situsbild, Leipziger Handschrift 1122; um 1400.

Figure 1. Illustration of pregnant woman from about 1400. A similar figure was used to illustrate the *Fasciculus medicinae* of Johannes de Ketham, 1491.



Figur 57. Weiblicher Situs, zweite lateinische Auflage des Ketham 1495.

Figure 2. Woman with abdomen opened, showing pelvic organs. From 2nd edition of de Ketham's *Fasciculus medicinae*, 1495.

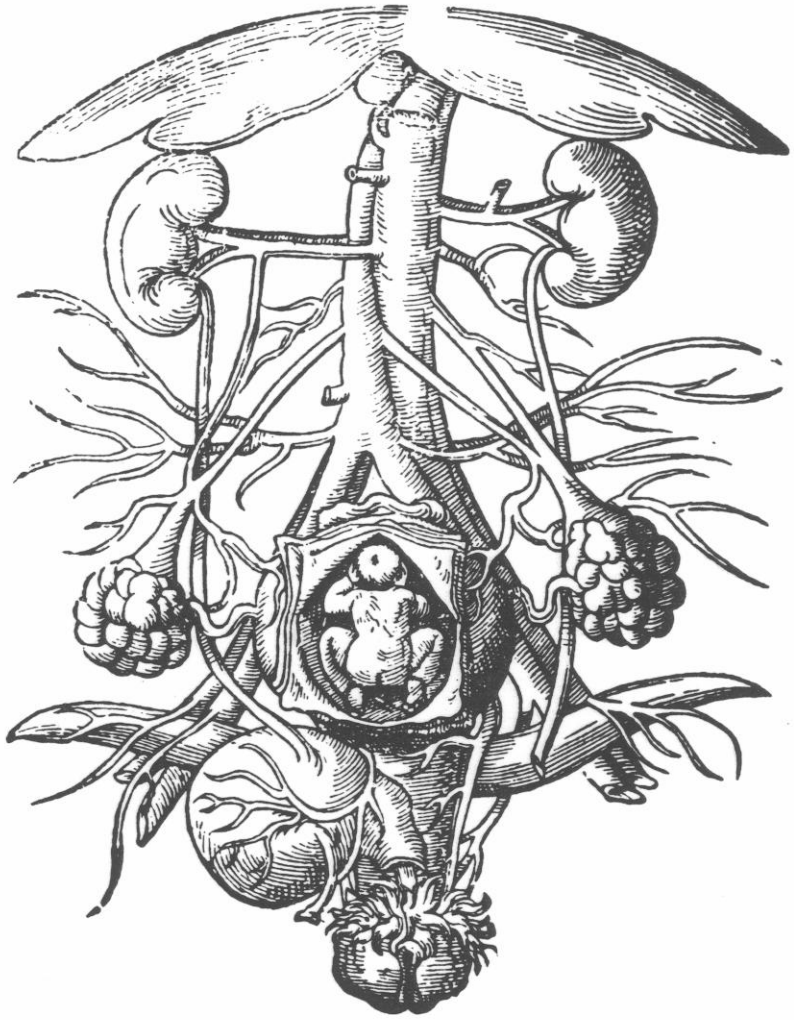


22

¶ Diſe Figur zeyget an die innerliche geſtalt eins weibs/ mit ſampt den geburt glideren / gefäß des ſamens / vnnd andern bericht. A. Bedeut die großblůtader / daher alle andere glider narung haben. B. Iſt die weiſſe ſamadern. C C. Ader ſo die bermůtter begreiffen / daher die frucht auch narung bekompt. D. D. Sindt weibs zeuglin. E. Damit werden die weibs zeuglin vmbgeben / ſeindt ein theyl ſame / vnnd ein theyl der hertzadern. F. Die bermůtter gleich der blaſen geſtalt. G. Die geſtalt der Bermůtter / daran ſie dem rucken vnnd nebenzů angehefft. H. Das innerlich mundloch der Bermůtter. I. Das euſſerſt der Bermůtter / die ſcham. K. L. Stämm odder åſt der blůtadern der ſchenckel. M. N. Harngång vonn den Nieren. O. Bede Nieren.

Figur 77. Aus Dryanders „Anatomia Mundini". 1541.

Figure 3. Diagram of kidneys and female reproductive organs from the *Anatomiae* of Johannes Dryander, 1541.



Figur 95. Aus Jacob Rueffs Hebammenbuch. 1583.

Figure 4. Female genitourinary system with pregnant uterus as shown in the *Hebammenbuch* (Obstetrical text) of Jacob Rueff, 1583.

were ascribed to the right and left sides of the body. Presumably, it is the diagrammatic indication of the vessel through which the breast was believed to receive blood or menstrual fluid which it converts into milk.

The third illustration comes from the anatomy of the German physician Johannes Dryander (1500-1560), published in 1541. The legend reads as follows:

> This figure shows the internal configuration of a woman, including the genital organs, the seminal vessels, and other information. A is the great blood artery (aorta) from which all other organs are nourished. B is the white seminal artery (ovarian artery). CC uterine arteries from which the fetus also is nourished. DD are the feminine gonads. E. The feminine gonads are enclosed in this, which is in part the gonadal and in part the heart artery. F The portion of the uterus which resembles the shape of the bladder. G The portion of the uterus which is attached to the back and adjacent (structures). H The internal mouth of the womb. I The outermost portion of the womb (cervix), the pubis. K, L Trunks or branches of the arteries of the thighs. M, N Ureters from the kidneys. O Both kidneys.

We again see the horns of the uterus, but this error is conceptually less important than the display of the blood vessels. The asymmetry of the ovarian veins is here shown accurately. The right ovarian artery and vein, respectively, connect with the aorta and vena cava. The left ovarian artery arises symmetrically from the aorta, but the left ovarian vein enters the left renal vein. The same relationships are true of the internal spermatic vessels in males. The misinterpretation of these anatomic relationships also originated with Galen. [5] (Vide infra)

The fourth illustration appeared in the obstetrical text of Jacob Rueff (1500-1558). [6] The uterine horns are even more massive than on the previous two illustrations and the relative size of the kidneys and ovaries is shown less realistically than by Dryander. The bladder, deflected to the right, is shown correctly anterior to the uterus. The relationship of the aorta and vena cava is reversed from the previous illustration, and here is accurate. However, instead of the left ovarian vein entering the left renal vein, the right ovarian vein entering the left renal vein, the right ovarian artery is shown branching from the right renal artery.

We must keep in mind that anatomists did not recognize that blood circulates. William Harvey (1578-1657) published this epoch making discovery in 1628. Arteries were correctly distinguished from veins by the difference in the thickness of their walls, but erroneously with the belief that embryologically arteries come from the heart and veins from the liver, and that arterial blood flows out of the heart and venous blood out of the liver. The question how the supply of blood is continuously replenished if there is no circulation was left a mystery of Nature. If one accepts the premise that blood does not circulate it becomes easier to

accept the hypothesis that the right and left side differ from each other physiologically.

If Shakespeare had wished to obtain some anatomical information he would have sought *The Englishemans treasure: with the true anatomy of mans body* ... by Thomas Vicary (d. 1561). This was first published in 1548 and was reprinted three times before the end of the century. He presented not only anatomy, but also explained fertilization and fetal development. Like most of the anatomy texts of the time, that of Vicary contained no original research and was largely a compilation of Galen and Medieval masters. Nevertheless, it was important because it was the first printed anatomical text in the English language. [7]

Any discussion of Medieval physiology must be prefaced with the fundamental premise that males are warmer than females and that sexual differentiation depends on differences in the heat of several portions of the genital system of both sexes. Greater warmth results in the development of males, and lesser warmth in females. [8] A subsidiary premise is that impurities cool the blood and, consequently, its purification regenerates heat. If, for the moment, these fallacies are accepted as fact, some logic can be appreciated in the related beliefs. The right ovarian vein, and in males the right spermatic vein, contains blood which has been cleansed by the kidney because this vessel branches from the renal vein. The left ovarian and spermatic veins, however, arise proximal to the left kidney and the blood it carries has therefore not been cleansed by the kidney before it reaches the gonad. Hence, this blood is diluted by impurities and is cooler than the blood on the right side. Because the uterine vessels come from the ovarian vessels, the right half of the uterus also is warmer than the left. As was suggested by the 3d and 4th illustrations, anatomists before the discovery of the circulation of blood were unable to distinguish the functional difference between arteries and veins. This probably explains the anatomical inconsistencies in the explanations of the differences in the purifying action of the kidneys in relation to the gonadal blood supply. I have generally been referring to gonads rather than to ovaries and testes, because ovaries were not described as unique organs specific to females until 1672. [9] There were only male and female testes.

The following is Vicary's description of genital anatomy, paraphrased and modernized for brevity and clarity. The penis contains three channels: one for the passage of urine, another for the ejaculation of sperm, and a third through which pass "insensible pollutions" to bring about erection. [10]

Male testicles, in the scrotum, receive nerves from the brain via the epididymis in which they are first gathered, arteries from the heart, and veins from the liver, thereby having both sensation and nourishment. There also are spematic vessels which come from the vena cava and bring the pure blood which the testes convert into semen. [11]

According to Vicary, the female testicles lie in the sides of the outer mouth, presumably meaning the labia majora. Galen and most other writers on anatomy were more accurate, in that they identified these organs within the abdomen. The female spermatic vessels are shorter than those of the male, and at the time of coition the woman's sperm is shed into the bottom of the womb.[12]

Germinal cells develop in the following manner:

> ...this sperm that comes both of man and woman is made and gathered of the best and purest drops of blood in all the body; and by the labor and chafing of the testicles... this blood is turned into another kind and is made sperm. And in man it is hot, white and thick, wherefore it may not spread or run abroad by itself, but runs and takes temperance of the woman's sperm, which has contrary qualities; for the woman's sperm is thinner, colder, and feebler.[13]

Each gential organ in one sex was considered to have its analogous organ in the other sex. The most surprising of these analogies is between the uterus and the penis. The greater heat of the male embryo causes the genital structure to become everted and to mature as a penis, while the lesser heat of the female embryo leaves the structure inverted and internal, so that it matures as a uterus.[14] The uterus was believed to be subdivided internally. Galen and most later writers on human anatomy stated that there is a right and a left "cell, while some of the Salernitan school attributed five or seven cells to the uterus.[15] Galen also equated the number of "cells" with the number of nipples, and approximately with the number of fetuses that might be conceived.[16] One reason for the right side of the womb to be warmer than the left has been described, namely, that it is nourished by purified and, therefore, warmer blood. However, there was a secondary cause of the alleged temperature difference. The liver, on the right side of the abdomen was believed to be "warm and humid," while the spleen, on the left side, was "cold and dry."[17] The relative proximity of these organs to the two sides of the womb further accentuated the difference in the temperature within that organ. This difference between the "cells" was a crucial determinant of the sex of the fetus.

At conception the male introduces two substances into the female: the sperm and an ephemeral matter which Vicary termed "kindly (i.e., natural) heat" and Galen had called "innate heat."[18] This was the metabolic energy which mixes the male and female sperm and brings about fertilization. Once fertilization has occurred, the "kindly heat" fulfills a second funtion. It causes the amniotic membrane to develop, to enclose the embryo and then to become attached to the womb.[19] The placenta was, of course, recognized, but it was not distinguished from the amniotic sac.

Speculations about the factors which determine the sex of children

are ancient. Hippocrates only stated that "The male foetus is usually seated in the right, and the female in the left side."[20] However, the principal beliefs about sex determination from Galen well beyond the Renaissance contained up to three components, to which varying degrees of importance were attributed. These were the location of the gonads from which the fertilized germinal cells came, the relative vigor of the parents, and the site of implantation of the embryo. Various right-left combinations were used to explain the development of effeminate boys or masculine girls. Believers in the seven cell uterus attributed hermaphrodites to implantation in the middle cell.[21] The 11th century Benedictine, Constantinus Africanus (ca. 1015-1087) closely followed Galen in writing:

> If the warm semen falls in the cervix and reached the left side, it will engender a girl, and if it reaches the right side, a boy; though it happens sometimes that the virtue of warmth is defeated. Some doctors say that if the semen which comes from the right side of the man falls in the left side of the womb it produces a boy, but an effeminate one; whereas if the semen from the left side falls in the right, it makes a masculine girl...[22]

The potential parents had two means to influence the sex of the child, and these were derived from the foregoing beliefs. If intercourse were performed in the side position, or if the woman at least turned onto her side immediately after intercourse, the sex of the child would tend to be associated with the dependent side. Lying on the right side would favor procreation of a boy, lying on the left side, a girl.

Vicary conceived of intrauterine development in the following way:

> ...the first things that are shaped are the principals: the Heart, Liver, and Brain. Of the Heart spring the Arteries, of the Liver the Veins, and of the Brain the Nerves. And when these are made, Nature makes and shapes Bones and gristles to keep and protect them, as the bones of the head for the Brain, the Breastbones and the Ribs for the Heart and the Liver. And all other members spring after these, one after another. And thus is the child bread forth in four degrees, as thus: The first is when the said sperm or seed is at the first like milk; the second is when it is turned from that kind into another, yet being as a lump of blood... The third degree is when the principals are shaped, as the Heart, Liver, and Brain. The fourth and last is when all the other members have been perfectly shaped; then it receives the soul with life and breath; and then it begins to move by itself. Now in these aforesaid degrees, in the first, as milk, it continues seven days; in the second, as Foetus, nine days; in the third, as a lump of flesh engendering the principals, the space of nine days; and the fourth, unto the time of full perfection of all the whole members, is the space of 18 days. So there are 46 days (sic) from

> the day of conception unto the day of full perfection and receiving of the soul... [23]

According to Vicary, flesh and fat are added to the skeleton and the viscera due to nutrition derived from the menstrual blood. He does not explain other aspects of fetal nutrition, while most authorities attributed the nourishment of the embryo and fetus entirely to retained menstrual fluid. This was an inherently logical idea: not only does the menstrual discharge cease during normal pregnancy and, hence, might be diverted internally, but vaginal hemorrhage during pregnancy usually presages a miscarriage.

Menstrual blood was not only believed to provide partial or total nourishment of the fetus, but according to Vicary, like Galen, [24] was the raw material which the breasts convert into milk:

> ...in women there come from the womb into their breasts many veins which bring into them menstrual blood, which is turned (by the digestive virtue) from red color into white, like the color of the breasts, even as chyle coming from the stomach to the liver is turned into the color of the liver. [25]

So much for anatomy and embryology. Now let us proceed to ideas about sexual activity and how it might be influenced by medical or other means. Efforts to influence sexual activity can roughly be divided into five categories. These have not changed over the centuries. 1. Improvement of fertility; this was condoned for both sexes; however, it primarily pertained to women, and improvement of lactation may be included in the same category. Agents to improve fertility must be distinguished from category 2. aphrodisiacs, which are intended to improve the interest in and ability to engage in sexual intercourse. These agents were primarily intended for men, although a few were also reputed to be of use to women. 3. There were anti-aphrodisiacs for both sexes; 4. contraceptives mainly for women, and 5. agents to induce abortion. Regardless of time or place, it is impossible to estimate how widespread the use of any agent in any of these categories may have been.

Many of the methods antedated Christian Eruope or originated in Asiatic cultures. Most of them were ingrained in folklore in one region or another and were not eradicable by the vehemently anti-sexual attitude of the Medieval Catholic Church, even though it was the dominant cultural force in Europe. The writings of St. Augustine (354-430), although they had little influence at first, formed the basis of this policy. Briefly, since dietary and sexual gratification are necessary, respectively, for the survival of the individual and of mankind they are moral as long as they are carried out in moderation. Enjoyment of itself does not make eating or coition sinful. Nevertheless, virginity or celibacy were considered more virtuous than intercourse for the sake of procreation, and intercourse primarily for pleasure was sinful. Augustine considered marriage to have three goals: procreation, mutual fidelity, and

permanence. Fidelity meant "...not only fidelity in sexual intercourse for the purpose of procreating children, but also the mutual service, in a certain measure, of sustaining each other's weakness, for the avoidance of illicit intercourse." [26] Even though continence was valued theologically above procreation, it was deemed inferior to fidelity, because if one spouse desired intercourse the other was obliged to cooperate - if intercourse was to be vaginal and not "excessively" frequent.

Pope Gregory I (d. 604) amended the Augustinian doctrine by pronouncing that sexual intercourse, because of its enjoyable quality, is invariably sinful. [27] Theologians during the "Dark Ages" and the Medieval period largely accepted this premise. St. Thomas Aquinas (d. 1274), six and a half centuries after Gregory I, probably was the most influential theologian to reintroduce a mild degree of permissiveness. However, the debate over the reasons for the sinfulness of marital sexual activities and about exceptions to this sinfulness waxed and waned for a millenium.

Aphrodisiacs.

The moral question of the use of means to enhance fertility resulted in a quandary which received little discussion. The folklore on which medical practices were based did not distinguish clearly between remedies which were believed to improve fertility without altering sexual pleasure and aphrodisiacs, that is, agents which act to increase the capacity for sexual intercourse and its enjoyment. Means to enhance fertility were morally acceptable, but the simultaneous enhancement of pleasure would, nevertheless, have made the use of such methods sinful. There appear to have been no consistent beliefs about methods to enhance fertility in either sex, in contradistinction to aphrodisiacs, some of which had lengthly traditions.

Beliefs in and about aphrodisiacs form a large subject by themselves and cannot be examined comprehensively here. These medicaments were more often prescribed as mixtures of numerous botanical ingredients, but some animal substances were used as well. Prescriptions were either in the form of medicines or foods. According to Constantinus Africanus, the ideal aphrodisiac is nutritious, warm, moist, and generates windiness. Reading on, it becomes apparent that "warmth," or the ability to generate heat was the most important characteristic. [28] Because of this belief seasonings were particularly frequent ingredients of stimulant potions over the centuries. Being mild irritants, they create the sensation of warmth. Constantine and many other authors cited, for example, pepper, mustard seed, ginger and anise. Some ingredients gained prestige from having to be imported, such as ginger and, later, pistachio nuts. Others were merely esoteric and were perhaps alleged to be included in the prescription to increase its price. For instance, according to Constantine, "A tested electuary which increases lust" was a broth which

contained 19 ingredients, one of which was a dram (about a teaspoon) of birds' tongues! Like various later authorities, he claimed to distinguish between substances which stimulate the generation of semen, that is, improve fertility, and aphrodisiacs which ostensibly were intended to counteract impotence. I have been unable to discern any consistent difference between the preparations which were prescribed for these two purposes.

Most animal products that were considered aphrodisiacal were portions of the male genitalia and were either carried to achieve magical intervention, or ingested for a medicinal effect. A relatively simple prescription of this type was recommended by the famous 12th century Hebrew physician-philosopher, Maimonides (1135-1204):

> Take the penis of an ox, dry it and grind it. Sprinkle some of this on a soft-boiled egg, and sip it. [29]

Two of the largest herbals that were published near the end of the 16th century, by the Italian Pietro Mattioli (1501-1577) and by the Englishman John Gerard (1545-1612), each contain at least 40 plants the ingestion of various parts of which was said to be sexually stimulating. Mattioli included the following prescription, which combines the effects of the "heating" action of a botanical irritant and the symbolic potency of animal genitalia:

> A man whose conjugal ardor has cooled should take the penis of a stag that was killed while in rut, dry it and grind it into a powder. He should take 5 gm. of this and a dram (3.9 gm.) of black pepper, mix these together in a drink of malmsey (a sweet wine), and take it in the morning. (Taken) several days in a row it will make him right again. [30]

The most highly reputed aphrodisiacs of all would have to be the tubers of various orchids. In ancient Greek lore tubers with a single bulb were called satyrion and those with a double bulb were called orchis, whence comes the name of this family of plants. They gained their reputation from their alleged resemblance to male genitalia, the satyrion species being considered penile, and the orchitic species testicular. Albertus Magnus (?1193-1280), the 13th century Dominican theologian and naturalist, was among the distinguished persons who subscribed to the belief that orchid bulbs affect sexual ability. This belief included a refinement, not original with him, that the larger of the two bulbs stimulates, while the smaller depresses potency. [31]

Little was acknowledged about sexual feelings of women beyond their desire to bear children. What was written about the medication of feminine sexual function pertained predominantly to the enhancement of fertility, the improvement of lactation, and the suppression of sexual urges. The infrequent references to feminine aphrodisiacs were in the form of advice to men who wished to administer a remedy to their reluctant partner. The following example of this comes from 15th century Germany:

> To sexually stimulate someone (i.e., a woman) with whom you desire to have intercourse, take two spoonfuls of verbena juice, 12 pepper corns, and bile from a stag or another animal, mix the three substances together with honey and (have her) drink it in wine...And when you will want to do it...you will be amazed. [32]

A few authors did acknowledge, without impugning their morality, that some women are particularly interested in sexual activity. According to the 16th century French surgeon, Ambroise Paré (1510-1590):

> Those women that are speckled (? freckled) in the face, somewhat lean and pale because they have their genitals moistened with a saltish, sharp and tickling humor, are more given to venery than those who are red and fat. [33]

This statement probably means that Paré was attracted to slim freckled women and that he felt obliged to offer a physiologic rationalization for this. However, women in the 16th century no longer could be thought of as having sexual desires entirely in their own right, which they had been accorded several centuries earlier. According to Paré, women's desire exists to safeguard men, because of the male's physical inability to tolerate celibacy. He put this self-serving idea as follows:

> ...the sense and feeling of venereous actions seems to be given by Nature to women, not only for the propagation of issue and for the conservation of mankind, but also to mitigate and assuage the miseries of man's life, as it were by the enticements of that pleasure; also the great store of hot blood that is about the heart, wherewith men abound, makes greatly to this purpose, which by impulsion of imagination, which rules the humors, being driven by the proper passages down from the heart and entrails into the genital parts, does stirr up in them a new lust. [34]

Of the numerous concoctions which were claimed to improve the fertility of women most have no discernible explanation. The paradoxical recommendations which pertained to some of them are, however, interesting. For example, while lettuce was widely regarded to be a depressant of sexual ardor (see below) it also was alleged to facilitate conception and to be useful as a test for pregnancy. According to a 16th century obstetrical guide, claimed by its author to be a new edition of Albertus Magnus' *Secrets of Women*:

> Boil lettuce in water and give it to a woman to drink on an empty stomach. She will become able to conceive. Should she, however, expel the drink, she is pregnant. [35]

The carrot was popularly held to have aphrodisiacal effects for men, but John Gerard added to this that

> ...the roots boiled and eaten, or boiled with wine, and the decoctions drunke... is also good for the passion of the mother and helpeth conception... [36]

Authors occasionally admitted to uncertainty about the effects which

they reported. Thus, we find in another English herbal, pertaining to asparagus, which also was considered to be a male aphrodisiac:

> The decoction thereof... stireth up bodily lust in man or woman, although some have written the contrary, that it hindereth conception and causeth barrenesse. [37]

Lactation.

Numerous remedies were recommended to stimulate lactation and to facilitate nursing. Some consisted of applications to the breasts, while others were oral medications or dietetic prescriptions. The following example of a topical remedy is interesting in that it combines symbols of purity and of costliness, an aphrodisiac, and an analgesic sedative.

> The woman should bind her breasts with wool soaked in oil of white lilies, or oil of violets, in which musk, frankincense and laudanum are mixed. [38]

Lettuce, among its several roles in influencing sexual function, was believed by some to stimulate lactation. According to the 16th century German pharmacopoea of Adam Lonitzer (1528-1586):

> ...These lettuce seeds give much milk to the nurses when they eat them, and produce an unblemished face. Lettuce tea is good for the women who nurse their children and do not have enough milk. Their milk will increase if they drink it or mix it into their drink. [39]

The many remedies for nursing women were not necessarily intended for the new mothers. Wet nurses were in demand, in part as a consequence of the high maternal mortality rate, but in part also as a status symbol. The high perinatal mortality rate undoubtedly contributed to the availability of wet nurses. Paré recommended on the one hand:

> That all mothers would nurse their owne children were greatly to bee wished: for the mothers milke is farre more familiar nourishment for the infant than that of any other nurse... [40]

But on the other hand:

> Many husbands take such pitty on their tender wives, that they provide nurses for their children, that unto the paines that they have sustained in bearing them, they may not also adde the trouble of nursing them... [41]

The different ways in which a pseudoscientific criterion was employed, albeit in different eras, is shown nicely in the importance that was accorded to her complexion in selecting a wet nurse. According to Trotula, the 11th century Salernitan woman physician, "The nurse ought to be young and have a pink and white complexion". [42] Half a millenium later Paré disagreed:

> ...She must not have a red or freckled face, but brown or somewhat shadowed or mixed with redness. For truly, such women are more hot than those that are red in the face, by reason whereof they must needs concoct and turn their meat the better into blood...a brown woman has more milk. [43]

In another criterion for the selection of a wet nurse we again find an expression of the pervasive pro-male prejudice. Namely, the woman who was lactating because she had born a son was preferred over one who had born a daughter. For example, we learn from the diary of a lady-in-waiting to Queen Elizabeth of Austria and Hungary, concerning the impending delivery of the queen in 1440, far from home:

> Two honorable ladies... came to her Grace and brought two birth attendants with them. One was a midwife and the other was the wet nurse. This wet nurse also brought her child, which was a son, because the wise men were of the opinion that the milk of a woman who has born a son is better... [44]

This belief remained credible late in the next century, when Ambroise Paré explained it on the basis of the Galenic ideas about bodily heat. He wrote:

> That nurse that has born a man child is to be preferred before another because her milk is the better concocted, the heat of the male child doubling the mother's heat. And moreover, the women that are great with child of a male child are better colored and in better strength and better able to do anything all the time of their greatness, which proves the same: and moreover the blood is more laudable and the milk better... [45]

Anti-aphrodisiacs.

Methods to counteract the sexual drive became important because of the emphasis that was placed on celibacy, beginning in the 7th century. Some of the clerical regulations that were intended to maximize celibacy must have been honored mainly in their breech. For example, a German abbot, Regino of Prüm (d. 915) advocated the following schedule, which was also adopted into Anglo-Saxon law: a married couple was to remain celibate for 40 days before Easter, Pentecost and Christmas, on Wednesdays, Fridays and Sunday nights, for at least three days before each communion, and from the first indication of pregnancy until after delivery! [46] Such admonitions led to accusations by more liberal clergy that the conservatives were trying to destroy the institution of marriage. The residents of the numerous monasteries and convents, being under vows of celibacy, were perhaps in even greater need of medicinal support of their chastity than married couples. The use of anti-aphrodisiacal agents was not overtly praised by theologians, but it also was not condemned.

Anti-aphrodisiacal qualities were attributed to several plants by Dioscorides in the 1st century A.D. His pharmacopoea was the most prestigious of the Middle Ages, and hence, his approval contributed to particular confidence in these. The following descriptions are from a 17th

century translation. Rue had a particularly large number of medicinal uses, its chief indication being as an antidote against various poisons. According to Dioscorides: "...it is good against serpent-bitings, & either eaten or drank it extinguisheth geniture." [47] Rue was the only anti-aphrodisiac mentioned in the extant portion of the *Regimen of Health of Salerno*, the best known Medieval medical text. It states that a drink containing sage, rue and roses "...will vehemently lessen your love," Without amplification, the comment was added that "The rue acts as an aphrodisiac with women and as an anti-aphrodisiac with men." [48] In the herbal of Hieronymus Bock (1498-1554) we find that

> Rue belongs to the group that stimulates urine. However, if it is used regularly it abolishes sexual desire. All residents of cloisters and monasteries (who want to be celibate), and arrogantly extol that they keep themselves pure, need it regularly in their food and drink. [49]

Various effects on sexual functions were attributed to lettuce. Even in the 19th century it was considered to have a soporific effect,[50] and the durable belief in its anti-aphrodisiac action was probably related to this. Dioscorides stated that lettuce seeds when they are made into a tea "...avert wanton dreams & venerie. The juice also is good for the same purposes, yet weaker." [51] According to Lonitzer:

> When one eats too much lettuce one gets dark (around the) eyes, and abolishes lasciviousness. One should also understand this about the seeds and decoction (of lettuce). [52]

Many more botanicals could be cited, but the one anti-aphrodisiac that was held in the greatest esteem for many centuries was Vitex agnus castus, which was also known in English as the Chaste Tree. Albertus Magnus attributed an anti-sexual effect to its blossoms, leaves and juice when any of them were ingested as a component of a prescription. [53] His Spanish contemporary, Arnald of Villanova (1235-1315) claimed that even carrying a knife with a handle made of wood of this bush was reliable. [54] According to Lonitzer:

> Whoever puts these leaves underneath himself in his bed has his carnal urges driven out. It may be that the mats on which Franciscan monks lie are made of it.
>
> A half teaspoon of these little berries crushed into wine induces menstruation, disperses flatulence, and extinguishes the desire for marital intercourse. [55]

A few years later John Gerard described the effects of the "chaste tree" as follows:

> Agnus castus is a singular medicine and remedie for such as woulde willingly live chaste, for it withstandeth all uncleannes, or desire to the flesh, consuming and drying up the seede of generation, in what sort soever it be taken, whether in powder only, or the decoction drunke, or whether the leaves be carried about the body; for which cause it was called *Castus*, that is, chaste, cleane, and pure.
>
> It is reported that if such as journey or travell do carry with them a branch or rod of *Agnus castus* in their hand, it will keep them from merry gals, and weariness. [56]

We have a particularly clear example of the mixture of medicine and magic in the ways this plant was employed. There is no evidence that any of the anti-aphrodisiacal practices could have had a pharmacologic effect, although they may have been of some aid by the power of suggestion.

Contraception.

Since sexual intercourse at the best was saved from being sinful when it was intended to result in impregnation, contraceptive practices were transgressions. However, at least medicinal contraceptive measures generally were not castigated as vehemently as many other sins. Although Dioscorides also attributed contraceptive properties to several of the plants which were described in his herbal, much less was written about contraception in the European Christian culture than about the stimulation or suppression of sexual desires. In general, interest in contraception was greater in the Medieval Hebraic, Islamic and Hindu cultures. It is, of course, impossible to estimate how widespread any of these practices were, but they certainly could not have had an impact on the birth rate. The principal literary sources about contraceptives were the writings of two Persian physicians, Rhases (865-925) and Avicenna (980-1037). Tha latter was the more important both because his work was more extensive and that it was translated into Latin late in the 12th century, a century before the first translation of Rhases.

Undoubtedly, the most frequently used contraceptive method, and the one most likely to have been effective, was coitus interruptus. Other functional methods were advocated as well. According to Albertus Magnus, for one, the female superior position interferes with conception because it permits the semen to escape, rather than entering the uterus. [57] A widely held belief that originated in ancient Greece was that various types of vigorous activities immediately after the completion of intercourse could shake the semen out. In this regard, sneezing or shaking oneself violently were simply mechanical. However, numerologic magic might have an enhancing effect. For instance, Avicenna recommended that

> The woman should rise at the end of coitus and jump backward 7 or 9 times. In this way the sperm may come out. Jumping and leaping forward causes the sperm to remain. [58]

A belief which perhaps related the sin of enjoying sexual intercourse with the belief in the contraceptive effect of vigorous movement by the woman after intercourse was that women are sterile "...who move their

whole body while they have intercourse, from an excess of voluptuousness." [59]

Several varieties of pessaries were mentioned which were intended either to promote menstruation, avoid conception, or both. These were made of vegetable matter impregnated with various extracts and inserted into the vagina. One example described by Avicenna and copied with modifications by European writers consisted of cabbage leaves which had been soaked with cabbage seeds, mint, and/or cedar oil. [60] One may suppose that, depending on the size and position of such masses, they may have formed a physical impediment to conception analogous to a diaphragm. However, it is likely that frankly magical methods predominated over those which might have had a remote possibility of being effective.

Some magical methods were physically associated with the genitalia. Thus, a follower of Arnald of Villanova claimed that "it has been proved" that a woman will not conceive for a month if she places the hoof of a mule on burning coals and lets the resulting smoke fumigate her vulva. [61] The key to the partial interpretation of this is that mules are sterile. Portions of various sterile animals, whether eaten, worn as charms, or employed in other ways, as above, were commonly believed to confer infertility. The contraceptive effect that was attributed to iron is more difficult to explain, since this metal has always been associated with strength. Arnald, for instance, claimed that a woman who on three successive mornings drinks water in which a smith has quenched his tongs will be permanently rendered sterile. [62] Simply eating iron filings was alleged by others to have the same result.[63]

In the Near East, at least, male contraception also was written about. The methods usually consisted of anointing the penis with some sort of oil, or even tar. [64] The condom was invented in the 16th century, although it did not gain much use until two centuries later. It is an historical curiosity that the first description of such a device was published by the Italian anatomist, Gabriele Fallopio (1523-1562), who is remembered primarily for having described the tubes through which the ova travel from the ovaries into the uterus. His version of the condom was made of linen and was reusable. As during most of the 20th century, its use was advocated to prevent syphilis rather than for contraception. [65]

Why was less written in Europe about contraception than about sexual stimulation, and why were magical beliefs more prevalent in relation to the former? Any interpretations must be speculative. It seems likely to me that less was written about contraception because the edicts against interfering with pregnancy were taken more seriously than the pronouncements that sexual intercourse was not to be engaged in for pleasure. Secondly, pregnancy was considered a particularly magical event and, therefore, magical countermeasures were as appropriate as medicinal ones, if not more so.

Abortion.

This brings us to the last and most conflictful issue: abortion. The fact that people for thousands of years have desired to abort some pregnancies is evident from the statement in the Hippocratic oath, composed in the 4th century, B.C.: "I will not give to a woman an abortive remedy." Such a sentence would have been meaningless if the medical lore of that time did not already include methods that were reputed to induce abortion. The methods that were employed by the ancient Greeks and Romans remained in use in the Middle Ages and the Renaissance without much change. [66] They may be divided into four categories: general activities, oral and vaginally applied medications, and invasion of the uterus. Among the activities, horseback riding was deemed most likely to succeed. The various kinds of exercise mainly had their easy and legitimate availability to recommend them.

As in modern times, various objects were inserted into the cervix. Avicenna, for one, specified twigs of rue, perhaps because other parts of this shrub were also employed both in abortive and in anti-aphrodisiac remedies. [67] Nearly as many plant parts or extracts, either individually, or more often in mixtures, were inserted into the vagina with the purpose of abortion as were consumed by mouth. Pessaries of various materials were covered with herbs or impregnated with their extracts, as was also sometimes done to prevent conception; herbal suppositories were inserted, or a liquid extract was simply injected.

The juniper was cited by Galen as a source of an abortifacient. [68] It is uncertain whether this usage disappeared for some centuries, but it undoubtedly had resumed by the Medieval period, and from the 16th to the 19th centuries juniper was the most popular source of botanical abortives. Avicenna cited a prescription of an extract of rue leaves, myrrh and juniper, to be taken twice per day. [69] References to juniper from three major 16th century medical herbals that were published in rather widely separated sites, Strassbourg, Frankfurt, and London will illustrate the consistency with which such folklore was perpetuated.

According to Hieronymus Brunschwig (ca. 1450-1512):

> (Juniper berry) ...water stimulates the urine and brings the menses when drunken twice per day in doses of one ounce (3 Lot).
>
> The water expels the dead and living foetus, drunken in 1 1/3 ounce doses. Therefore, women who are with child should not drink it. And this drink also expels the defective. [70]

Adam Lonitzer deleted abortion of the normal foetus:

> Juniper berry water brings the women their normal period drunken in doses of 2/3 of an ounce (2 Lot). It expels the dead foetus and the defective, drunken in doses of 1 1/3 ounces. [71]

John Gerard wrote about juniper, which was also known as savine:

> The leaves of Savine boiled in wine and drunke, provoketh urine,

bringeth downe the menses with force, it draweth away the afterbirth, expelleth the dead childe, and killeth the quicke... [72]

Both Gerard and Brunschwig here alluded to a legal problem for which there could be no clear evidential solution. Expulsion of retained dead foetus was legitimate medical practice, while abortion was a capital crime. The first comprehensive criminal code since that of the Roman Empire was the so-called Carolina, which was enacted during the reign of Charles V (1500-1558) in 1532 to govern the Holy Roman Empire. It contains the following paragraph pertaining to abortion:

> Anyone who aborts a living child, whether by force, food or drink, and also anyone who makes men or women sterile, bringing such evil about deliberately and maliciously, shall be executed: a man by the sword, and a woman, even if she has aborted herself, shall be drowned or otherwise put to death. If, however, the child was not yet alive when it was aborted the judge shall obtain the counsel of lawyers or others in regard to the sentence, to achieve the intent of this law. [73]

To repeat what Vicary wrote about fetal development only 16 years after this law was enacted: "...the child is bread forth in four degrees... The fourth and last is when all the other members have been perfectly shaped; then it receives the soul with life and breath; and then it begins to move by itself." Ensoulment occurred more rapidly in males and various authors placed this event at from 30 to 46 days after conception. [74] Fetal movement is not perceived so early and whether, as a practical matter of law, perception of fetal movement was required to make abortion a mandatory capital crime is uncertain. At any rate, it could be a lesser crime if the woman was aborted early.

I hope to have pointed out the long heritage of sexual questions which remain of great interest today. Our anatomic and physiologic understanding has advanced greatly, while the emotional concomitants have evolved much less. For example, aphrodisiacs which are no more effective than those that were touted in the Middle Ages continue to be sold, and we continue to debate the legal status of abortion based on the question of when "life" begins.

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NOTES

1. F. Weindler, *Geschichte der gynäkologisch-anatomischen Abbildung*. (Dresden: Lahn & Jaensch, 1908) pp. 62-63. The four illustrations are copied from this volume.
2. C. Ferckel, "Zur Gynäkologie und Generationslehre im *Fasciculus medicinae* des Johannes de Ketham," *Arch. Gesch. Med.* 6:205-222, 1913.
3. Weindler pp. 62, 64.
4. Galen, *On anatomical procedures*. Trans. by W. L. H. Duckworth. (Cambridge Univ. Press, 1962) pp. 116-117. Galen, *On the usefulness of the parts of the body*. Trans. by M. T. May. (Ithaca: Cornell University Press, 1968) Book XIV, p. 646: "...the juice which they have been formed to receive is the semen, and since there are two semens, two kinds of canals have been formed for the uteri. One of these is called the neck (cervix) by anatomists, which is for the attraction of the male semen and which I have said extends to the female pudendum, and the other is the horns, which are for the semen from the female's own testes. The horns accordingly tend upward toward the flanks, becoming gradually narrower and have extremely narrow ends where they are attached each to the didymus (testis) of its side."
5. Weindler, p. 94.
6. Galen, *Usefulness*, pp. 635-636: "...it is clear that the left testis in the male and the left uterus in the female receive blood still uncleansed, full of residues, watery and serous, and so it happens that the temperaments of the instruments themselves that receive (the blood) become different. For just as pure blood is warmer than blood full of residues, so too the instruments on the right side, nourished with pure blood, become warmer than those on the left..." Weindler, p. 131.
7. T. Vicary, *A profitable treatise of the Anatomie of mans body*... F. J. & P. Furnivall, eds. London: Early English Text Soc., 1888.
8. Galen, *Usefulness*, p. 630. "...within mankind the man is more perfect than the woman, and the reason for his perfection is his excess of heat, for heat is Nature's primary instrument..."
9. The Dutch anatomist, Regnier de Graaf (1641-1673) described the seminiferous tubules of the testicle in 1668 and the ovarian follicles in 1672.
10. Vicary, pp. 81-82.
11. Ibid., pp. 82-83.
12. Ibid., p. 78.
13. Ibid., p. 79.
14. Ibid., pp. 628-629.
15. F. Kudlien, "The seven cells of the uterus: the doctrine and its roots," *Bull. Hist. Med.* 39:415-423, 1965. Also in Lind, L. R.: *Studies in Pre-vesalian Anatomy* (Philadelphia: Amer. Philos. Soc., 1975) p. 50, citing A. Achillini, 1520.
16. Galen, *Usefulness*, p. 625.
17. Kudlien, *passim*.
18. Vicary pp. 78-79. Galen, *Usefulness*, pp. 50-52.
19. Vicary, p. 79.
20. Hippocrates: *Aphorism* V:48.
21. F. Kudlien, "Mondinos Standort innerhalb der Entwicklung der Anatomie," *Med. Mschr.* 18:210-214, 1964.
22. P. Delany, "Constantinus Africanus' *De Coitu*: A translation," *Chaucer Rev.* 4:55-65, 1970. Cf. Galen, *Usefulness* pp. 637-638.
23. Vicary, p. 80.
24. Galen, *Usefulness*, pp. 638-639.
25. Vicary, p. 55.
26. J. Noonan, *Contraception. A history of its treatment by the Catholic Theologians and Canonists.* (Cambridge: Harvard Univ. Press, 1966) p. 127.

27. D. Bailey, *Sexual relation in Christian thought.* (New York: Harper & Bros., 1929) pp. 133-135.
28. Delany, *passim.*
29. H. Kroner, "Eine medizinische Maimonides Handschrift aus Granada," *Janus* 21:231-247, 1916.
30. P. Mattioli, *Kreuterbuch...* Translated and enlarged by J. Camerarium, (Franckfurt am Main: S. Feyerabend, 1590). p. 447.
31. H. Balss, *Albertus Magnus als Biologe* (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1947) p. 169.
32. H. Sigerist, "Eine deutsche Übersetzung der Kethamschen Gynäkologie," *Arch. Gesch. Med.* 14:169-178, 1922.
33. A. Paré, *The Workes of that famous Chirurgion Ambrose Parey...* Trans. by T. Johnson, (London: T. Cotes & R. Young, 1634.) p. 932.
34. Ibid., p. 889.
35. O. Appolinarem, *Naturalia Alberti Magni...* (Strassburg: J. Cammerlander, 1548) Book I, chapter 1.
36. J. Gerard, *The herball or generall historie of plantes* (London: J. Norton, 1957) Chap. 391, p. 874. "The passion of the mother" means pain in the region of the uterus.
37. J. Parkinson, *Theatrum Botanicum* (London: T. Cotes, 1640.) p. 456.
38. Appolinarem, Book I, chap. 6.
39. A. Lonitzer, (Lonicerus); *Kreuterbuch...* (Franckfort am Mayn: C. Egenolffs Erben, 1577) Chap. 69, p. 120 verso.
40. Paré, p. 907.
41. Ibid., p. 908.
42. Trotula of Salerno: *The Diseases of Women*, trans. by E. Mason-Hohl, (Ward Ritchie Press, 1940) p. 27. For a recent discussion of Trotula see E. F. Tuttle, "The *Trotula* and Old Dame Trot: a note on the Lady of Salerno," *Bull. Hist. Med.* 50:61-72, 1976.
43. Paré, p. 908.
44. H. Freund, "Die Entwickelung der Deutschen Geburtshülfe aus der Hebammenkunst," *Klin. Jahrbuch* (Berlin) 3:32-80, 1891, p. 44.
45. Paré, p. 910.
46. Bailey, *Sexual Relations* p. 134 note.
47. R. Gunther, *The Greek herbal of Dioscorides* (New York: Hafner Co, 1959) p. 286.
48. P. Parente, *The Regimen of Health by the Medical School of Salerno.* (New York: Vantage Press. 1967) p. 69.
49. H. Bock, *Kreuter Buch...* (Strasburg: W. Rihel, 1546) Chap. 22, p. 27.
50. J. Pereira, *The Elements of Materia Medica and Therapeutics.* 2nd American ed. (Philadelphia: Lea and Blanchard, 1846) 2:412.
51. Gunther, p. 177.
52. Lonitzer, Chap, 69, p. 122.
53. Balss, p. 155.
54. J. Davenport, *Aphrodisiacs and Love Stimulants* [Original 1869], (New York: L. Stuart, 1966) p. 68.
55. Lonitzer, chap. 26, p. 40 verso.
56. Gerard, chap. 50, pp. 1201-1202.
57. Noohan, p. 206.
58. N. Himes, *Medical History of Contraception* (Baltimore: Williams & Wilkins, 1936) p. 142.
59. Ibid., p. 172.
60. Noonan, p. 202.
61. Ibid., p. 207.
62. Himes, p. 162.
63. Noonan, p. 209.
64. Himes, pp. 142-143.
65. A. Streich, "Zur Geschichte des Condoms," *Arch. Gesch. Med.* 22:208-213, 1929; Himes, pp. 188-191. L. Lewin, *Die Fruchtabtreibung durch Gifte und andere Mittel.* (Berlin: J. Springer, 1922) pp. 211-219.
66. V. Brøndegaard, "Der Sadebaum als Abortivum," *Arch. Gesch. Med.* 48:331-351, 1964.
67. Lewin, p. 214.
68. Brøndegaard, *passim.*
69. Lewin, p. 215.
70. H. Brunschwig (Brunschweick), *Das distilierbuoch* (Straszburg, 1521) Chap. 20, p. 128.
71. Lonitzer, chap. 25, p. 40 recto.
72. Gerard, chap. 46, p. 1194.
73. J. Kohler; W. Scheel, *Die peinliche Gerichtsordnung Kaiser Karls V. Constitutio criminalis Carolina* (Halle: Waisenhaus, 1900) p. 69, para 133.
74. For example, (Pseudo-) Hippocrates: *On pregnancy.* Trans. by Ellinger, (New York: H. Schuman, 1952) p. 59. "And now it has become a child; and a female embryo reaches this stage in forty-two days at the most, a male in thirty days at the most. For in general it is within that period of time or a little more or a little less that the parts are differentiated..."