

Defective Tales: The Story of Three Myths

DO WOMEN HAVE SOULS?

The Story of Three Myths

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Defective Tales

The Story of Three Myths

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"The Council of Macon held that Woman does not have a soul"

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Michael Nolan

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The Mysterious Affair at Mâcon The Bishops and The Souls of Women

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Abstract

The story that the Council of Macon decreed that women do not have a soul is untrue. This article traces the growth of the myth.

The decree of the Council of Macon (585 AD) that women do not have a soul, has the honoured place in liberal demonology given to historical events that never happened. It is a tale to treasure. As the eponymous wine is sipped at elegant tables, the misguided deeds of bishops can be recalled, and the only regret must be that no Synod of Brie or Council of Camembert offers occasion for further mirth. On these occasions facts become such skimble-skamble stuff as puts men from their dreams.

For the Council, of course, decreed no such thing, if only for the persuasive reason that some of the bishops may themselves have been married. [1] The penalties applied to a bishop who decrees that his wife does not have a soul are not recorded in canon law, presumably as surpassing male imagination. The decrees do indeed contain stuff to fuel liberal fires: the fifteenth requires laymen to doff their hat to a cleric, the sixteenth forbids the widow of a subdeacon to marry, on pain of being confined to a convent. But neither the word 'woman' nor the word 'soul' occurs even once in the decrees. [2]

One does not to hope ever to be free of the myth, but it may be interesting to trace its history, which is complex. The story begins in Germany in the late sixteenth century, where a young scholar from Brandenburg, Valens Acidalius (1567-1595), was teaching at Neisse, near Breslau, the capital of Silesia. His first book, a critique of the Roman historian Quintus Curtius, had failed to sell, and his publisher was complaining of money lost. Acidalius looked around him.

A certain Faustus Socinus (1539-1604) was then living in Cracow, which is not too far from Breslau. There he had become leader of a church that denied the Trinity and held that Christ was divine by office rather than by nature . [3] The Socinians were known for interpreting the Bible literally, something that lends to ready mockery. Circulating in Silesia was a pamphlet satirizing the Socinians by showing that a literal interpretation of the Bible leads to ridiculous 'proofs'—such as a 'proof that women are not human. The 'proof' seems to have turned on taking the Latin word *homo* sometimes to mean 'human being' and sometimes to mean 'adult male'. Acidalius was thought to have polished up the pamphlet to make it diverting—it was called *a 'disputatio perjucunda'*—and to have republished it in the hope of turning a penny. If he was the author—and some say he was not [4]—the joke went sour. Theologians were less than amused at the suggestion that women are not human, and the work was vigorously attacked. Simon Geddicus (Gedik), a Lutheran scholar from the neighbouring city of Magdeburg, published *a Defensio sexus muliebris: (A Defence of the Female Sex)*, in which he proposed to 'destroy manfully each and everyone of the arguments put forward': (*Singula anonymi argumenta distinctis thesibus proposita viriliter enervantur*: one admires the choice of the word *viriliter*.) Readers will learn, with regret or satisfaction as the case may be, that soon afterwards Acidalius took a seizure and died.

The work, whether by Acidalius or not, was published in various European countries in the next half-century, often bound with the critique of it by Simon Gedik. Very likely, it was this work, translated into Italian, that was published in Lyons in 1647 under the pseudonym Horatio Plato. A M. de Vigneul (a pseudonym of Bonaventure d'Argonne (1634-1704)), gives the title as *Che le donne non habbino anima e the non siano della specie degli huomini, e vienne comprobato da molti luoghi della Scrittura santa: (Women do not have a soul and do not belong to the human race, as is shown by many passages of holy Scripture)*. He notes that 'the Ladies of Italy took this system very differently. Some were vexed to have no souls. Others were pretty indifferent about the matter, and, looking on themselves as mere machines hoped to set their springs so well agoing as to make the men stark mad. [5]

The vexed soon counter-attacked, and Angelica (or, more splendidly, Arcangela) Tarabotti, under the pseudonym Galerana Barcitotti, —a feminine pseudonym, be it noted—published a work entitled *Che le donne siano della spetie deggli huomini: Difesa delle donne: (Women do belong to the human race: a defence of Women)*.

One way or another, the offending book caught the attention of Pope Innocent X. Readers will learn, with renewed regret or satisfaction, that he placed it on the Index (Decree of 18 June 1651).

So the assertion that women do not have a soul was attacked by a leading Lutheran theologian when it appeared in Germany, and the book containing the allegation was put on the Index when it appeared in Italy. Rather weak evidence, one might think, for the confident assertion that the earlier Church denied a soul to women.

It remains to be seen how the Council of Macon, held a thousand years earlier, was brought into the myth. For this we turn to Johannes Leyser (1631-1685), a Lutheran pastor from Hesse, who had exchanged the tedium of teaching for the excitement of life as a *Feldprediger* in the Danish army. The opportunities afforded by soldiering seem to have sharpened his zest for feminine variety, for in Frankfurt in 1676 he published his *Polygamia Triumphatrix: (The Triumph of Polygamy)*, a title that suggests paramilitary rather than military exertions. It was republished in Amsterdam in 1682, and was dedicated 'humbly and respectfully to all those opposed to polygamy throughout the world, whether in lands, islands or towns, trusting they would come to see the merits of a plurality of wives'.

Seeking support for his views, he decided to misrepresent the doings of the Council of Macon. He wrote: 'Among the holy fathers there was one who insisted that women cannot, and should not, be called "human beings" ("*homines*"). The matter was thought so important that it was discussed publicly and in the fear of God. Finally, after many arguments on this question, they concluded that women are human after all'. [6]

This is quite untrue, as we can see by turning to history.

The main source for the history of Gaul in the latter half of the sixth century is *The History of the Franks* by Gregory, bishop of Tours. [7] It is a work that contains not a single condescending word about women. Gregory's puckish humour is reserved for princes, clerical and lay, and for himself. It is curious that it should be an episode described by him that was used, a thousand years later, to support a calumny.

In his History Gregory describes a Council that may, or may not, have been the Council of Macon. (He never says it was held there.) Some 43 bishops attended. Gregory does not say whether any of them were married. [8]

The proceedings were in Latin, though the everyday language of the region was Frankish, and some spoke what Gregory calls Gallo-Roman. For some bishops at least, Latin was not their mother tongue. Gregory was interested in words, as writers are, and was curious when one of the bishops raised a question about the use of the word *homo*. Thorpe translates Gregory as follows:

There came forward at this council a certain bishop who maintained that woman could not be included under the term 'man'. However, he accepted the reasoning of the other bishops and did not press his case: for the holy book of the Old Testament tells us that in the beginning, when God created man, 'Male and female he created them, and called their name Adam', which means earthly man; even so He called the woman Eve, yet of both he used the word 'man'. Similarly, our Lord Jesus Christ is called the Son of Man, although he was the son of the Virgin, that is to say of a woman ... They supported their arguments with many other references, and he said no more.

Dalton in the Oxford edition translates: 'there was a certain bishop Who defended the opinion that woman could not be included under the general description "man".' Latouche translates: 'un des évêques se leva pour dire qu'une femme ne pouvait être dénommée homme'.

That is all. Dalton comments appositely: 'The bishop asked whether the word *homo* could be properly applied to a woman, and the Council replied that Holy Writ sanctioned such application ... The Council never approved any such idea as that women have no souls'. Latouche agrees: 'la difficulté n'était pas d'ordre philosophique, mais linguistique'. [The difficulty was not one of philosophy, but of linguistics] [9]

If one doubts the translation and comments of these scholars, one may turn to the text itself. Gregory tells us the bishop questioned whether a woman might be *vocitari* by the word *homo*. *Vocitare* is an unusual word that means 'to call by the name of'.⁹ Its meaning is well illustrated in Cicero: 'has Graeci stellas Hyadas vocitare suerunt—the Greeks were wont to call these stars the Hyades'. The bishop's question was manifestly one of language, not substance.

Gregory himself, one may note, followed the classical usage of *homo*. He would write of Queen Ingoberg as '*homo valde cordata*—a woman of great wisdom'. [12] He tells too of a woman who, after a stroke, could only groan: '*non vocem tit homo poterat emittebat*'. Obviously the woman's problem was that she could not make human sounds, not that she could not speak like a man.

It is simply a lie, therefore, to say that the Council decreed that a woman does not have a soul. The foundations of that lie are laid in Leyser's account of the Council, which contains a number of distortions. For *vocitari* (to be called by the name of) he substitutes *vocari* (to be called). After Gregory's 'cannot be called by the name of ' he adds 'nor should be so called'. He speaks of 'many arguments on this vexed question', yet the one bishop who raised the problem received no support. Worst of all, he slips from saying the bishops debated whether women should be called by the name *homo* to saying they debated whether a woman is *homo*.

Pierre Bayle, a Dutch Calvinist with a marked distaste for the Catholicism to which he once adhered, used Leyser's account of the Council to justify an expression of horror at its doings. 'What I think yet more strange is to find that in a Council it has been gravely proposed as a question whether women were human creatures, and that it was not determined affirmatively till after a long debate' [13] This is not true, and the immensely-learned Bayle must have known it [14] But the destruction of Catholicism *vaut bien un mensonge*. [zell justifies a lie].

For many years Bayle was avidly quarried for material with which to mock Catholicism. In the early 19th century a M. Aime-Martin was moved to write a touching book on *l'Education des mères de famille* [Education for mothers of families] in which he reflected sorrowfully that '*on va jusqu'a mettre en doute l'existence de leur àme*'. Politicians, as it their way, saw an opportunity and the *Assemblée Nationale*, no less, deplored the Church's insult to women.

How did the myth reach the wilder shores of darker Dublin? A literary city it may claim to be, but one doubts whether pamphlets in sixteenth century Latin or seventeenth century Italian were ever avidly passed from hand to hand. Some may have heard of the antics in the French Assembly, but again one has doubts. A more likely-and fitting-source is the magazine *John Bull*, founded by the fraudster Horatio Bottomley, which carried the pseudo-story in one of its editions.¹⁶ One way or another, the myth reached Dublin, where it flourishes. It will no doubt be retailed as confidently in the future as it has been in the past. If the first casualty of war is the unwelcome truth, the first weapon of the discontented is the welcome lie.

Endnotes

1. Legislation of the period indicates that some bishops were married, though of course they were bound to live with their wife as with a sister.
2. There is a summary in Hefele-Leclercq, *Histoire des Conciles*, t.III,pt.1,pp.208-214. The full text is in Mansi, *Conc. ampl. coll.*,t.ix,col.947. The latest edition is by Munier, *Concilia Gallica*, *Corpus Christianorum*, Series latina, 148.
3. *New Encyclopaedia Britannica*, s.v.
4. *Neue Deutsche Bibliographie*, s.v., holds that Acidalius was not the author: 'er als angeblicher Verfasser einer antisoianischen, scherzhaften, aber als solcher verkannten Flugschrift...ausgesetzt war'.
5. *Melanges d'Histoire et de Literature*, p.16. Cited by Bayle, *Dictionnaire historique et critique*, s.v. Geddicus.
6. *Ibid.*
7. *Historiae Francorum*, cited here as HF. See *Monumenta Germaniae Historica*, *Scriptores rerum Merovingicarum*, ed. W.Armdt and B.Krusch, Vol 1, Hanover, 1885; Migne, PL 71. There are recent translations by O.M.Dalton, Oxford, 1927; L.Thorpe, Penguin, 1972; L.Latouche, Paris, 1963.
8. HF 8,20. Married bishops existed in the region. Gregory mentions Domnola, the daughter of Victorius, the bishop of Rennes (HF 8,32) and Bodegisil, bishop of Le Mans, 'a very savage shepherd of this flock ... His wife was even fiercer than he was.' (HF 8,39)
9. Thorpe, p.452; Dalton, 2,p.345; Latouche, 2,p.151.
10. *Oxford Latin Dictionary*, s.v.

11. de Natura Deorum, 2,43,111.

12. Miracula S.Martini, 2,30.

13 Dictionnaire, s.v. Geddicus.

14. The editio princeps of Gregory's History had been published in Paris in 1512: Josse Bard, B.Gregorii Turonensis episcopi Historiae praecipue gailicarum lib X.

15. Dictionnaire d'archeologie chretienne, s.v. Femme.

16. Ibid.

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‘THE DEFECTIVE MALE’: WHAT AQUINAS REALLY SAID

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Abstract

It is curiously believed that Thomas Aquinas said that a woman is defective or is a defective male. Actually, he explicitly denies this five times. This article looks at the source of the contention in Aristotle's biology. It then examines texts in which Aquinas says explicitly that woman is not defective, whether she is seen as part of the Natural World or as part of God's creation. Prevailing misconceptions are largely due to selective misquotation: Aquinas is cited when he is stating the Aristotelean contention, and his refutation of the contention is omitted. Misunderstanding may also be due to a phrase in a widely used English translation: 'In respect of the individual nature woman is defective'. This is sometimes taken as though 'the individual nature' in question is that of 'the woman'. 'Individual nature' however here denotes not the woman but the male semen, and the phrase simply states the Aristotelean contention that the male semen does not 'intend' to produce a female child. Aquinas contends that, even if this were true, it would not mean that woman herself is defective.

In his *Summa Theologiae* Thomas Aquinas discusses the biblical account of Creation and deals at length with the production of the body and soul of the First Man and the First Woman. The soul of each, being immaterial, was created by God. [1] But whereas the human body is normally produced by the parents from the substance of their own bodies, God himself produced both the body of Adam [2] and the body of Eve. [3] He produced the body of Adam from earth, the body of Eve from the body of Adam. [4] The matter used may have been different, but Adam and Eve were equally God's handiwork and Eve was not a child of (and hence not a dependent of) Adam. [5]

He asks himself why God followed this (asexual) method of production and replies that it was to show that reproduction is a relatively peripheral activity in the life of the human being. The specific goal of human existence, the specific goal of *homo*, is not to reproduce, but to understand. [6] The Latin word *Homo* includes male and female: reproduction is not the central work of the human being, whether female or male.

Following medieval practice he states objections to his own position and seeks to refute them. Perhaps God should not have made woman at the beginning of the world? The suggestion by a theologian that God should not have done something he actually did, is obviously academic. Still, Aquinas was an academic, and academics of all centuries find that the discussion of highly theoretical issues assists them to clarify their understanding of the real world.

One objection derives from Aristotle, whose biological writings deal extensively with reproduction and embryology [7] (The correct interpretation of Aristotle is discussed in another paper [8], where it is argued that what he has to say about the conception of the female is commonly misunderstood. For present purposes that argument is left aside, and the standard interpretation is accepted.)

Aristotle, then, believes that the entire substance of a child develops from highly complex material fashioned by the mother. The male semen contributes nothing to the substance of the offspring, [9] but starts the workings of this complicated female element which, stage by stage, becomes a child. [10] Nevertheless the male semen acts, and acting things produce something like themselves, (for example, fire makes other things hot). Hence the semen 'intends to' or 'is meant to' produce a male child. Nevertheless, female children are born, children who are not 'intended' by the male semen. (Aristotle never says that they are not intended by the male parent. That is a very different matter.)

This reminds him of other instances where the child is not a replica of its parents, instances of what in modern medicine are termed congenital anomalies. [11] This in turn leads him to a phrase that has acquired an understandable fame: *thelu husper arren esti peperomenon*. The crucial word here is *peperomenon*, which derives from *peroo*, 'to wound or maim'. The word has been variously rendered. The Latin version used by Aquinas, following Albert the Great, was done from the Arabic by Michael Scot at Toledo before

1217. It gives *occasionatus*, a word that in my opinion well expresses Aristotle's thought. The great medieval translator, William of Moerbeke, uses *orbatus*, [13] which primarily means 'orphaned' and hence can mean 'lacking'. Bekker gives *laesus* ('injured'), and Peck in the Loeb edition lists such English translations as 'deformed', 'imperfectly disabled', 'underdeveloped', 'malformed', 'mutilated', and 'congenitally disabled'. [14] In current terminology, as has been seen, one would say 'congenitally anomalous'.

The original Greek, it should be noted, includes *hosper*, a word that limits or modifies an assertion. [15] It reads, therefore, 'Congenitally, the female is, in a sense, an anomalous male'. Aristotle explicitly distinguishes between the birth of a girl and the birth of truly teratological offspring, [16] and it is simply not correct to quote him as saying, *sans phrase*, that 'the female is a defective male'. Yet it was a contention with which Aquinas felt he had to deal.

It should be noted that the problem is not one of Aquinas' making and that it in no way arises from his general philosophy. Rather, it arises from a specific point in Aristotelean biology. It arises from a particular statement made in Aristotle's biology about the process of reproduction, but theologians like Aquinas and Bonaventure felt it necessary to deny that this implied Woman is defective, both using the same line of argument. Albertus Magnus, a fervent Aristotelean, mentions the phrase *en passant* but makes nothing of it. [17] Aquinas however took it seriously enough to argue five times [18] that woman is not defective. It is ironic that precisely because he deals with the contention so extensively, it is possible by selective quotation to suggest that he accepts it. (This is best done by quoting him when he is stating the Aristotelean objection, and omitting his reply to that objection.)

As has been seen, the translation used by Aquinas reads *Femina est mas occasionatus*. [19] The verb *occasionare* is not found in classical Latin. It was used by medieval scholars to distinguish between what is directly (or intentionally) caused and what is indirectly (or unintentionally) caused. [20] For example, a wood fire is meant to produce heat, but if the wood has stood in the rain, there will be much smoke. The rain is not the direct but the 'occasional' cause of the smoke, and the smoke is 'occasioned'. The word survives in Catholic moral teaching. Alcohol is not a cause of sin but an occasion of sin, and the sight of a sick person is not the cause of an act of kindness but the occasion for it.

As the examples imply, what is occasioned is not necessarily bad. If one is burning the wood to warm a house, the smoke is a nuisance. If one is curing

bacon, it is just what is needed. But since what is unintentionally or accidentally caused is more often bad than good, 'occasioned' does carry the suggestion of 'deficient', just as 'accident' suggests that something has gone wrong, though there can be happy accidents, and 'occasion of sin' is a phrase more used than 'occasion of virtue'.

So the phrase *Femina est mas occasionatus* suggests that the female is somehow deficient, and, as will be seen, it can be used as an objection to the theological assertions that God made woman at the foundation of the world, that women rise in their own bodies at the end of the world, and that female children would be born in a sinless world.

Aquinas is now in the position of a modern theologian who faces the argument that Darwinian evolution shows that there is no need for God. The theologian can answer this directly, arguing that Darwin is simply wrong. But that is not sufficient in a world that accepts Darwin. He must also suppose, for the sake of argument, that he is right and then contend that there is still a need for God. And if a theologian makes this supposition, he can scarcely be accused of agreeing with Darwin and propagating his doctrine. Similarly, Aquinas answers the Aristotelean objections in two ways, one direct, the other indirect. On the one hand, he adduces arguments to show that the Aristotelean position is untrue. On the other, he supposes that it is true, and seeks to show that, even then, it does not follow that, woman is defective. It is quite unfair for controversialists to talk as if, in taking the Aristotelean claim seriously, Aquinas is accepting it.

The claim that the female is defective derives from the assertion that she is occasioned and this, we have seen, means that she is indirectly or unintentionally produced. Accordingly Aquinas seeks to refute the claim by showing that woman is intentionally produced. To make this point he advances a number of explanations of the birth of a female child, that, whatever we may think of them now, were plausible enough in his day and served his purpose of refuting the contention derived from Aristotle.

For one, he suggests that the sex of a child may be determined by psychological factors in the parents. [21] Now on this view the production of a daughter (or a son for that matter) has a direct cause. But if she is directly caused she is not 'occasioned', and if she is not 'occasioned' there are no grounds for saying that she is defective.

For another, he argues, the sex of the child may be caused by environmental factors. [22] For example, the weather associated with the north wind might cause a male to be conceived, while the weather associated with the south wind might cause a female to be conceived. This suggestion, derived from Aristotle, [23] causes much hilarity among those whose biology is out of date, especially when, by selective quotation, Aquinas is made to speak as though he applied the explanation only to female births.

In fact over the last 30 years firm evidence has emerged that in some species environmental factors such as temperature do affect sex determination. (Few people, one may think, are so closely limited to their own time and place as those who see themselves as progressive. One is reminded of the difficulty Max Beerbohm found in keeping up with the leaders of modern thought as they disappear into oblivion.)

It does not of course matter whether this explanation of sex-determination is true or false. The point is that it shows how Aquinas determinedly seeks to prove that the conception of a female is not an accident, and so to show that there are no grounds for saying a female is defective.

He has a third explanation. This is that the sex of children may be due to the influence of the heavens. This was a common view among medievals. They did not of course see this as an astrological (in the modern sense) explanation. They thought that the stars affect our world, just as we accept that the sun, which is simply one star among many, affects our world. So he argues that the heavenly bodies may determine the sex of a child, and he states explicitly that he is doing this so as distinguish between the birth of a female, which is intended by a cause, and defective births, which are wholly unintended. He writes:

If the birth of a female child was not attributable to any cause, the birth would be like that of defective children. So [to avoid this conclusion] it is said . . . that the birth of a female child is intended by the heavens.[25]

Thus for a third time the birth of a female is seen as caused rather than accidental, and for a third time the grounds for saying the female is deficient have been removed.

Aquinas now turns to his second line of argument, where he supposes that Aristotle is correct, and then argues that it does not follow that the female is defective. He formulates the objection as follows:

According to Aristotle, Woman is an occasioned male. But there should have been nothing occasioned and deficient in the first Creation. And so Woman should not have been part of that Creation. [26]

One can understand his reply if one thinks again of a modern theologian dealing with the contention that the theory of Natural Selection explains the world and that is no need for God.

The theologian would distinguish. That Natural Selection explains some of the features of the world he would, for the sake of argument, concede; that it explains all the features of the world, he would deny. He would then go on to argue that God is still necessary.

Aquinas does precisely this: he distinguishes. He concedes the Aristotelean objection in a narrow and unimportant sense, and denies it in the wide and important sense.

He lays the foundation for his reply by distinguishing between *natura universalis* and *natura particularis*. *Natura universalis* is the natural world in all its workings, more especially perhaps the world of living things. It is what we mean by the word Nature. *A natura particularis* is the working of an individual animal, or plant, or body system or cell. Male semen is such a *natura particularis*.

He now argues as follows. The male semen (*natura particularis*) may not intend to produce a female child, but Nature (*natura universalis*) intends that female children should be produced. So the female may be accidentally caused vis-a-vis the male semen, but she is no accident so far as Nature is concerned. On the contrary, she is intended by Nature, and because she is intended rather than *occasionatum* there are no grounds for saying she is deficient. Moreover, since God is the author of Nature, she is intended by God. That is why, he concludes triumphantly, God made woman at the foundation of the world. The text reads:

Vis-a-vis the *natura particularis* [the male semen] Woman is deficient and occasioned. For the active force in the male semen seeks to produce something perfect of the male sex. If a woman is produced, this is because of a weakness in that active force, or some indisposition in the [female] material on which it acts, or to some external factor, such as winds from the South, which are humid: so Aristotle says in his book *The Generation of Animals*.

But vis-a-vis *natura universalis* [Nature] the female is not accidentally caused but is intended by Nature for the work of generation. Now the intentions of Nature come from God, who is its author. This is why, when he created Nature, he made not only the male but also the female. [27]

In the first paragraph, Aquinas, for the sake of argument, concedes the objection in a narrow and unimportant sense; in the second, he denies it in the wide and important sense. It has become traditional for controversialists to cite the first paragraph and to omit the second: with what honesty, the reader can judge.

That the *natura particularis* is the working of the male semen is explicitly stated in a passage in the *Summa Contra Gentiles*:

A whole and a part may have different goals. The part seeks its own good and works towards it as best it can, but the whole works towards the good of the whole. Thus a particular outcome may be defective so far as the part is concerned, but is not a defect so far as the whole is concerned. It is clear, for instance, that the generation of a female is not intended so far as the part concerned, that is by the power of this semen. But it is intended by the whole, that is by the overall power that brings about reproduction. [28]

Some examples from modern biology may illustrate the point Aquinas is making. So far as we know it is a matter of chance whether on any particular occasion the female ovum accepts a spermatozoon that will trigger the development of a male child, or one that will trigger the development of a female child. An individual act of intercourse, therefore, produces a male or female by accident. Yet this does lead us to say that Nature produces children accidentally, or that children are accidents. An accidental or random element at the micro level does not mean there is no order at the macro level. Modern science turns on that.

A further illustration comes from the world of insects. Bees are divided into three castes: drones, workers and egg-layers (anthropomorphically called queens). Workers and egg-layers begin their existence with the same genetic endowment. Whether a particular egg develops to be a worker or egg-layer depends on how it is fed. The ovaries of the worker develop only partially, the ovaries of the egg-layer develop fully. Bee society so arranges things that most

eggs do not develop into egg-layers. Nothing could be more disastrous for the community than that they should do so. Now looking at an individual worker, one might say that it is an incompletely developed egg-layer. Yet this does not justify the assertion that it is defective. For, looking at the hive as a social organisation, one sees that it needs workers quite as much as it needs egg-layers. In the socio-biology of bees, workers are not defective egg-layers. In the socio-biology of humans, women are not defective males.

A word must be said about the most widely used English version of the *Summa Theologiae* [29] which translates *per respectum ad naturam particularem femina est aliquid deficiens et occasionatum* thus: *As regards the individual nature, woman is defective and misbegotten*'.

Those unaware of the meaning of *natura particularis* might take this to mean that the individual nature of woman defective. As we have seen, the individual nature is the power of the male semen and while a female may not be what this semen intended to produce she is what Nature intends should be produced and as such is not defective.

'Misbegotten' is an unhappy translation of *occasionatum*. In a more recent translation, it is given as *manque*. But since Aquinas had to hand William of Moerbeke's translation *orbatum*, which does mean *manque* and chose instead to use *occasionatum*, one wishes 'unintentionally produced' had been used, for that is precisely what *occasionatum* means.

Something must be said too about the phrase 'woman is directed to the work of generation'. This does not mean that she is directed solely or indeed principally to the work of generation. The context here is that of Nature, of the world of plants and animals (including human animals), and in this context it is natural to say that the female is directed to the work of generation, in which she plays the principal part. We have already seen that in another context Aquinas argues that the principal work of every human being, male and female, is to understand rather than to reproduce. Moreover, following Aristotle, [30] he explicitly states that it is not with husband and wife as it is with animals, where sexual congress is purely to have offspring. A wife, he says, does not exist merely to have children but is meant to share life with her husband. [31]

As we have seen, the Aristotelean problem comes up when Aquinas is discussing the creation of the world. It recurs when he discusses what would have happened if Adam had not sinned. Such discussion is not as idle as it may seem: it allows Aquinas to describe his Utopia. In such a world, he thinks,

children would be conceived through sexual intercourse, and as many girls would have been born as boys, so that in adult life everyone would have a partner.

As usual, he states objections to his own position. One objection runs:

No females should be born in a perfect world, for, as Aristotle said, the female is an accidentally produced effect, something unintended by Nature. But in a perfect world, nothing unintended by Nature would be found. Hence no females would be born .
[32]

He replies:

A female is said to be accidentally produced because her production lies outside the intentions of a particular natural entity, but she does not lie outside the intentions of Nature as a whole. [33]

The contention that in a perfect world only males would be born is thus refuted.

The matter comes up a third time when he is discussing the resurrection of the dead. He holds that everyone, male and female, will rise in their own body, and gives his reasons:

Just as individual people differ in stature, so they differ in sex, and this diversity makes for the completeness of the species. So as they will rise in diverse stature, they will also rise in diverse sex . [34]

As always, he states objections to his own position. One objection runs:

Anything that is occasioned and is produced beyond the intentions of Nature will not rise again, for in the resurrection all error will be removed. But the female sex is produced against the intentions of Nature, because the weakness of the formative power in the male semen is not able to fashion a male embryo,

for, as Aristotle says, the female is an occasioned male. Consequently the female sex will not rise again. [35]

and he replies:

Although the production of a female is beyond the intention of the *natura particularis* [i.e., the male semen], it is intended by Nature [*natura universalis*], which requires both sexes for the completeness of the species. [36]

There is therefore nothing imperfect in the female and hence no reason why women should not rise in their own bodies.

It should now be clear that Aquinas does not say that woman is defective. But it must be added that the entire thrust of Aristoteleanism makes it implausible that he ever would have said such a thing, or for that matter that Aristotle said it in the crude sense in which it is often attributed to him. Aristotle's biology is markedly teleological and he thinks that in Nature what is intended to happen, normally does happen, and that what normally happens, is intended to happen. From time to time the unintended does indeed happen. Yet Nature is adroit at using such unintended events to serve her purpose, to achieve her end. [37] The dropping of dung by cattle feeds the dung-beetle and nourishes the earth.. What is a mere happening when seen from the narrower view has a function when seen from the wider view. It is this distinction coming from Aristotle that Aquinas continually employs.

One can only be surprised that a single phrase has so readily been taken to express the kernel of Aristotle's and Aquinas's thinking. For, of all the great philosophers, they believed most strongly that Nature acts for the best. 'There too—in the humblest living creatures—are gods', wrote Aristotle. [38] And Aquinas was a member of an order founded to combat the Catharist teaching that the natural world in general and reproduction in particular are evils, creations of a malevolent God. That, he thought, was the worst possible heresy. [39]

Neither Aristotle nor Aquinas was ever in the least likely to believe that half the human species is defective.

There is perhaps a further point to be made. Aquinas in his biology is manifestly dependent on Albertus Magnus, and those who have not read Albert's biological writings in detail are inclined to mock. Not so those who have read him. Travelling on foot from priory to priory, he observed the natural world carefully. *Fui et vidi experiri* (I was there, and saw for myself) is a favourite phrase.[40] Albert in fact brought about a powerful scientific movement.

Joseph Needham was a distinguished historian of science, and indeed a distinguished biochemist, being a Fellow of the Royal Society. His *History of Embryology*, [41] published by Cambridge, is a work of incomparable learning. There his account of Albert appears under the heading: Albertus Magnus; the Re-awakening of Scientific Embryology. He does not rank him with Aristotle—who could indeed rank with *it maestro di color the sanno?*—but remarks: 'The importance of Albert in the history of embryology is clear. With him the new spirit of investigation leapt into being, and, though years were yet to pass before Harvey, the modern as opposed to the ancient period of biology had begun'. He contrasts Albert with St Hildegard of Bingen in whose writings 'embryology touched, perhaps, its low-water mark'. Happily, 'a great man was at hand, destined to carry on the Aristotelean tradition and to add to it much of originality. the Dominican Albertus of Cologne'. St Hildegard, no doubt, had her moments, though one pauses at a vision in which God tells her that 'often in forgetfulness of God and by the mocking devil a mistio is made of the man and the woman and the thing born there from is deformed, for parents who have sinned against me return to me crucified in their children' [42], an observation that suggests a less than perfect recollection of the ninth chapter of the Gospel of St John. On the whole, one may feel, Aristotle's theory of teratology was more merciful.

Endnotes

1. Summa Theologiae 1,90, 2
2. Summa Theologiae 1,91,2.
3. Summa Theologiae 1,92,4.

4. Summa Theologiae 1,92,2&3. In view of the 'spare rib' jibe it is interesting to note the significance Aquinas sees in the fact that God made the body of Eve from the body of Adam: the man should have a primacy of honour, and he should love his wife the more and cling to her more closely because she was of his own flesh. Eve was made from Adam's side rather than his head or in his feet because woman should neither dominate man nor be his servant; rather both should live side by side in alliance (*socialis coniunctio*).

5. Summa Theologiae 1,92,2,ra3.

6. Summa Theologiae 1,92,1.

7. For an account of Aristotle's embryology see J.Needham, *A History of Embryology*, 2nd ed., Cambridge, University Press, 1959.

8. *New Blackfriars*, Vol 75, No 884, September 1994.

9. It is plain then that there is no necessity for any substance to pass from the male'. *De Generatione Animalium* 1,21,729b19. It may be noted that this feature of Aristotle's biology was availed of by Aquinas in his account of the conception of Christ. Cf. *In Sententias*, 3,3,5,1.

10. Aristotle does indeed talk of the male element as active and the female as passive, but only in the sense in which an enzyme is active and the process it facilitates is passive. 'The action of the male in setting the female's secretion in the uterus is similar to that of rennet upon milk.' *De Generatione Animalium*, 2,4,739b22. Cf. Job 10,10: 'Hast thou not poured me out as milk and curdled me like cheese?'

11. Cf. M. V. Barrow, *A Brief History of Teratology to the Early 20th Century*, *Teratology*, 4,119-130. Pp.119-122 have interesting comments on Aristotle.

12. *De Generatione Animalium*, 2,3,737a27.

13. Cf. *Aristoteles Latinus*, XVII 2, *De Generatione Animalium* edited by H. J. Drossaart. Desclée de Brouwer :Bruges-Paris, 1966. William translated this from the Greek in or before 1260 and it would have been available to

Aquinas when he wrote his *Summa Theologiae*. Cf. *De Generatione Animalium*, translated by A. L. Peck, Loeb Classical Library, Cambridge, Mass: Harvard University Press, 1990, p.xxi.

14. Cf. A.L.Peck, o.c., p.174, note a.

15. Cf. Liddell and Scott's *Greek-English Lexicon* s.v.

16. Cf. *Metaphysica*, 7,9,1034b5: 'Natural generation is like artificial production:

The seed operates as do things that work by art; it contains the form potentially, and its source is something which has the same name, in a sense, as the offspring. But only in a sense, because we cannot expect all instances to have exactly the same name, as in the production of human being, for a woman is produced from a man. Unless of course the offspring is a freak which is why the sire of a mule is not a mule.' Translated by J. Warrington. London: Dent. 1956.

17. *Animalium* 3,8.

18. In *Sententias* 2,20,2,1,ra1; In *Sententias* 4,44,1,ar3c,ra3; *Summa Theologiae* 1,92,1,ral; *Summa Theologiae* 1,99,2,ral; *De Veritate* 5,9,ra9.

19. Following the translation of Michael Scot from the Arabic. Cf. Aristoteles, *De Animalibus* XVI. Ed. A.Van Oppenraay.

20 Cf. *De Malo* 3,5: 'Causa alicuius potest aliquid dici dupliciter: uno modo directe, alio modo indirecte. Indirecte quidem, sicut cum aliquod agens causat aliquam dispositionem ad aliquem effectum, dicitur esse occasionaliter et indirecte causa illius effectum; sicut si dicatur quod ille qui seccat ligna est causa combustionis ipsorum.'

21 *Summa Theologiae* 1,99,2,ra2.

22 *Ibid.*

23. Cf. *De Generatione Animalium* 4,2,767a10.

24. Cf. M. W. J. Ferguson and T. Joanen. *Temperature-dependent sex*

determination in *Alligator mississippiensis*, *Journal of Zoology* (London), 1983, 200, pp. 143-177.

25 De Veritate 5,9,ra 9.

26. *Summa Theologiae* 1,92,1,agl.

27. *Summa Theologiae* 1,92,1,ral. The Latin reads: `Dicendum quod per respectum ad naturam particularem femina est aliquidiciens, et occasionatum: quia virtus activa quae est in semine maris intendit producere sibi simile perfectum secundum masculinum sexum: sed quod femina generaretur, hoc est propter virtutis activae debilitatem, vel propter aliquam materiae indispositionem, vel etiam propter aliquam transmutationem ab extrinseco, puta a ventis australibus qui sunt humidi...sed per comparisonem ad naturam universalem femina non est aliquid occasionatum, sed est de intentione naturae ad opus generationis ordinata: intentio autem naturae universalis dependet a Deo, qui est universalis auctor naturae, et ideo, instituendo naturam non solum marem sed etiam feminam produxit.'

28. A *Summa Contra Gentiles* 3,94,n10. The Latin reads: `Ad aliud igitur tendit intentio particularis agentis, et universalis: nam particulare agens tendit ad bonum partis absolute, et facit eam quanto meliorem potest; universale autem agens tendit ad bonum totius. Sicut patet quod generatio feminae est praeter intentionem naturae particularis, idest, huius virtutis quae est in hoc semine, quae ad hoc tendit quod perficiat conceptum quanto magis potest: est autem de intentione naturae universalis, idest, virtutis universalis agentis ad generationem inferiorum, quod femina generetur.'

29. Translated by the Dominican Fathers, London, Burns Oates, 1920.

30. *Ethica Nicomachea* 8,12,1162a20.

31 *Summa Theologiae* 1,92,2.

32. *Summa Theologiae* 1,99,2,agl. °

33. *Summa Theologiae* 1,99,2,ral.

34. In *Sententias* 4,44,1,3c.

35. *Ibid*, ag3.

36. Ibid, ra3.

37. A.L.Peck, o.c., p.xliii, cites nine instances where Aristotle does this: 642a31, 663b13, 663b20, 738a33, 739b28, 743a36, 755a22, 776a15, 776b33.

38. De Partibus Animalium 1,5,645a23.

39. In Sententias 4,26,1,3.

40. Cf. K.Simonyi, Kulturgeschichte der Physik, Harri Deutsch, Frankfurt a.M., 1990, p.158.

41. See note 7 above.

42. Needham, o.c., pp.85-91.

SEE NEXT ARTICLE BELOW

PASSIVE AND DEFORMED? DID ARISTOTLE REALLY SAY THIS?

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Abstract

Aristotles' phrase thelu hosper arren esti peperomenon is commonly translated into English as 'the female is as it were a deformed (or defective) male' and is then taken to express his basic understanding of Woman. The phrase however is a technical expression in a work on biology, and the critical word peperomenon is used of perfectly formed creatures such as the seal which 'depart from type'. The seal is said to be peperomenon because other quadrupeds have external ears whereas it does not. Similarly, the crocodile's jaws are said to be 'deformed' because (Aristotle thinks) they are arranged in a way not found in similar animals. Aristotle holds that these 'departures from type' are intended by Nature and are indeed advantageous. Obviously, they are not deformities in the English sense of the term. In saying that the female is peperomenon, he is simply saying that she departs from the male type in a way intended by Nature, a way that enables her to generate children 'in herself' whereas the male generates them 'in another' As to passivity, Aristotle does say that the male is active and the female passive in the act of fertilisation / conception, but he does not say she is passive in the work of reproduction. He offers in fact an extended account of the activity of the female in the generation of offspring.

Belief in the passivity of the female survives few honeymoons, and would appear to be largely confined to people of celibate life and retiring disposition who do not visit supermarkets and have little opportunity to note the skilled use of what the French appositely call *un chariot*. Aristotle was not long married—happily, it would seem—when he wrote his biological works, and if he says that in the act of reproduction ‘the male is the active partner and the female qua female is the passive one [1], he goes on to remark more discretely that ‘that which acts, is acted upon in return’.

Indeed, ‘sometimes the extent to which it gets acted upon is greater than that to which it acts’. [2] Quite so. Indeed, *horresco referens*, the male may on occasion be ‘mastered [3] and then a female is born, one, to boot, taking after her mother.[4] All of which suggests that Aristotle’s beliefs are not to be summarised in the simple schema: ‘female passive, male active’. The seemingly absolute assertion is attenuated when set in context.

The same applies to the much-cited statement ‘the female is as it were a deformed male’. [5] One can appreciate the anger this phrase causes when it is taken to encapsulate Aristotle’s metaphysical and ethical understanding of Woman. Phrases, however, have contexts, and this phrase occurs in a work on biology. A little reading of this biology shows that Aristotle also says that that elegant and beautiful creature, the seal, is ‘deformed’. [6] (He uses the exact word he uses of the female: *peperamenon*). The reader may wish to pause and wonder in what way the seal is ‘deformed’. Because of its curious feet? Not at all. Aristotle knows about its feet, and simply remarks that they are stunted. [7] He thinks the seal is ‘deformed’ because it has no ears. Again the reader might wish to reflect: who, looking at seals, has ever thought “Poor deformed creatures! No ears!”? The puzzle deepens when Aristotle goes on to remark how clever Nature has been in producing this ‘deformity’, for the very lack of ears, he thinks, means that the seal’s underwater hearing is all the more acute. [8] So a ‘deformity’ in Aristotle’s biology can be both natural and advantageous. Obviously, the full meaning of *peper omenon* is not well conveyed by the English ‘deformed’.

One’s curiosity is further aroused when one finds that the word was not translated as ‘deformed’ by medieval scholars. Michael Scot (working from the Arabic) says *occasionatus*, which simply means ‘indirectly caused’. (This was the version accepted by Albert the Great [9] and Thomas Aquinas. [10]) The greatest of the medieval translators, William of Moerbeke, writes *orbatus*, [11] which primarily means ‘orphaned’ and hence ‘to lack’. For example, *orbatus oculis* means ‘lacking sight’. A child born blind would scarcely be called

`deformed' or `mutilated'.

If one looks more closely at the Greek, yet another if minor curiosity emerges. Aristotle commonly puts the female first, writing `female and male' rather than `male and female'. This may be no more significant than the fact that Dubliners breakfast on bacon and egg and Londoners on egg and bacon. Yet why, one wonders, do recent translators invert the order? `The principles of generation', writes Aristotle, `are the female and the male'. [12]

`The male and female principles', translates Platt, `may be put down first and foremost as the principles of generation'. `The sperm', writes Aristotle, `comes from the female and the male'. [13] `The semen itself, translates Peck, `is secreted from the male and the female'. This shows a perhaps excessive respect for grammatical usage.

Did not Wolsey loose his Chancellorship for writing *Ego et rex meus*? It is an inversion that Moerbeke does not make: *femella et masculus*, he writes.

But the main fact to note is that the phrase occurs in Aristotle's biological writings, and only in those writings. It does not come from his *Metaphysics*, the work in which he discusses general philosophical issues, nor from his *Ethics*, in which he discusses the relations between human beings, including the relations between husband and wife. It is a technical phrase used in a technical context, and to give it an overarching meaning is rather like arguing that when modern genetics speaks of `dominance and recessivity', it is talking psychology or politics.

To understand the phrase correctly, account must be taken of Aristotle's biology, of his understanding of the Natural World. It is a world dissonant with modern physical science, yet consonant with our normal language when we speak of the world of living things. I am indebted to Herbert McCabe for the perceptive remark that if one asks today to be shown `a thing', one will likely be shown a stone, but had one asked in medieval (and hence Aristotelean) times, one might well have been shown a horse. [14] For those in thrall to Descartes, the real world is the world of atoms in senseless motion, a world therefore that is itself senseless. For Aristoteleans the angels keep their ancient places, turn but a stone and start a wing, [15] and living things are the most real entities that we encounter. For Descartes a living thing is nothing but a machine—if it is a human living thing, then a machine with a soul added. For Aristotle the lowliest living creature is more wondrous than the most complex of machines. `Purpose and Beauty', he writes, `are more fully present in the

works of Nature than in the works of human hand'. [16] The Cartesian Pascal would say '*Le silence eternal de ces espaces infinis m effraie*'. [17] The Aristotelean Dante—famously he called him '*Il maestro di color the sanno*' [18]—would write of '*L'amor the muove it sole e l'altre stelle*'. [19]

Aristotle, in other words, sets the living above the physical, and that, surely, is consonant with our everyday feelings. He himself is deeply in love with the living world. One must quote at length from his magnificent protreptic with which he begins his account of this world:

We must now speak of animals and their Nature. So far as in us lies, we will not leave out any one of them, be it ever so mean; for though there are animals which have no attractiveness for the senses, yet for the eye of science, for the student who is naturally of a philosophic spirit and can discern the causes of things, Nature which fashioned them provides joys which cannot be measured . . . We must not betake ourselves to the consideration of the meaner animals with a bad grace, as though we were children; since in all natural things there is something of the marvellous. There is a story which tells how some visitors once wished to meet Heracleitus, and when they entered and saw him in the kitchen, warming himself at the stove, they hesitated; but Heracleitus said:

'Come in; don't be afraid; there are gods even here.' In like manner, we ought not to hesitate or be abashed, but boldly enter on our researches concerning animals of every sort and kind, knowing that in not one of them is Nature or Beauty lacking. [20]

This is not written by someone who believes that a full half of a species, animal or human, is 'deformed'.

He is as good as his word. His curiosity extends to the sexual congress of hedgehogs ('they must of necessity accomplish their copulation quickly'[21]—*c'est un amour piquant, quand même*) and to the entangled, if that is the word, love-life of the octopus—he discusses the possible hectocotylistation [22] of one of its arms. He often knows more than do contemporary critics. Platt translates him as saying 'mutilated parents produce mutilated offspring' [23] and comments that 'modern science simply denies the fact in toto'. Yet 'congenital amputation' is a recognised condition, common in pigs and cattle. [24] Ranke-Heinemann derides [25] his belief that environment plays a part in sex-determination, but it is now firmly established that in, say, the Mississippi

alligator—an animal for which one might expect her to have a sisterly sympathy—the sex of offspring is determined by the temperature at which the eggs are incubated. [26] Environmental factors affect sex-determination in many lower species, and it is foolish to deride the idea that they operate in mammals. [27] We know so little.

To return to Aristotle. He loves Nature, and it is his most basic maxim that Nature acts for the best. In the works of Nature purpose and not accident is predominant. [28]

Nature is a potter, [29] a painter, [30] a cook, [31] a housekeeper. [32] Nature does nothing which lacks purpose. [33] Nature does nothing which is superfluous. [34] These, he claims, are not a priori principles:

The assumption we make—and it is an assumption founded upon what we observe—is that Nature does not make mistakes and does nothing idly. [35]

Purpose, we have already seen, is more fully present in the works of Nature than in the works of human hands. [36] It is however important to notice that for Aristotle biological purpose is not of the "Nature-made-grass-so-that-cattle-may-eat-it" variety so often attributed to him. His is, to quote the great Marshall, a 'doctrine of internal finality (that is to say, that each individual, or at any rate each species, is made for itself, that all its parts conspire for the greatest good of the whole, and are intelligently organised in view of that end, but without regard for other organisms or kinds of organisms)'. [37] Marshall goes on to say that the doctrine of external finality, according to which living beings are ordered in regard to one another, has never gained acceptance among scientific philosophers and that there is indeed no good evidence that Aristotle ever adopted it. (Which did not spare him much mockery at the hands of the villainous Bacon.).

It may be useful to cite an example of Aristotle's 'internal finality':

Animals which use their mouths for feeding, respiration and speaking have rather narrow mouths, while those that use them for self-defence have wide and gaping mouths. All the saw-toothed creatures have these wide mouths, for their method of attack is biting, and so they find it an advantage to have a mouth that will open wide; for the wider it opens the greater the space the bite will enclose and the greater the number of teeth will be brought into

action. Biting and carnivorous fishes have mouths of this sort; in the non-carniverous ones, it is on a tapering snout, and this suits their habits, whereas a gaping mouth would be useless. [38]

This, of course, is the sort of material found in any modern text of biology under the name of 'adaptation'.

The fact that Nature acts for a purpose does not mean that mechanisms are not required to achieve that purpose.

Even in so manifestly purposeful a process as the growth of an embryo, mechanisms are present: the growth of the embryo is like that of the wonder-puppets beloved of the Greeks, in which one part moved another and that the next and that the next. [39] In holding for final causes, Aristotle never doubts the need for efficient causes. Of this, more below.

Aristotle's understanding of efficient or mechanical causality leads to a distinction that is central to his biology. 'Everything which Nature does, it does either because it is necessary or else because it is for the better [i.e., for a purpose]'. [40] Mechanisms do indeed act to achieve purposes, but in so doing they often produce outcomes or effects which lack purpose. For instance, the process of digestion produces blood [i.e. nourishing substances] from food, but it also produces materials which lack purpose and are excreted from the body. The first line of action takes place 'on account of what is better, i.e., on account of the final cause (the Cause for the sake of which)'; the second takes places 'from necessity'. [41]

Now, to quote Peck, 'Aristotle is continually drawing our attention to the adroitness of Nature in employing the results of this latter sort of Necessity in order to serve her *purpose*, in order to achieve her *end*'. [42] For example, the eggs of fish grow of necessity because they contain yeast, but they also grow for the sake of what is better, since it is impossible for them to obtain all their growth in the uterus owing to the prolific habit of these animals. [43]

This is a line of thought which we today readily apply to the relations between parts of the Natural World. We note with interest how the waste products of cattle are the food of the dung-beetle, and how its work removes the cow-pats and allows the grass to grow again, now nourished by the leeching of the dung. Aristotle, peculiarly, is little interested in these external relationships, but highly interested in the internal relations within an individual animal or species. For instance:

Serpents have this peculiarity: they can turn their heads backwards while the rest of the body remains still. The reason is that their body (like an insect's) can roll up: the vertebrae are cartilaginous and flexible. This then is the *necessary* cause why they have this ability; but it serves *a good purpose* too for it enables them to guard against attacks from the rear. [44]

All this indicates that for Aristotle a particular process may have produced something *by necessity*-we might say 'accidentally' or 'incidentally'-and so, narrowly seen, 'without purpose', when from a wider perspective one can see that *Nature* has produced it 'for a purpose'. He applies this principle specifically to the production of the male and female:

As for the reason why a particular [embryo] comes to be formed, and is, male, and another female, (a) in so far as this is *from necessity* (*ek anagkes*), *i.e.*, from the proximate motive cause and from what sort of matter, our argument as it proceeds must endeavour to explain; (b) in so far as this occurs *on account of what is better* (*dia to beltion*), *i.e.*, on account of the final cause (the Cause 'for the sake of which'), the explanation is derived from the upper cosmos. [45]

This, Peck explains, means that both male and female derive via the 'heavens' from the Unmoved Mover. As we shall see later, the female may be produced *by necessity* so far as the proximate efficient cause (the male semen) is concerned., but this does not imply that the female is any less derived from 'the heavens', any less produced '*on account of what is better*' than is the male.

The point must be stressed. The Unmoved Mover, the supreme and ultimate cause, equally produces male and female. Manifestly it does not produce what is defective, either female or male. That is what is 'metaphysically' important. The details of reproduction matter less.

One can take a modern illustration. So far as we know, it is a matter of chance whether on any particular occasion, a male child or a female child is conceived. That appears to be a biological fact. But this fact offers no grounds for the 'philosophical' assertion that human existence is the outcome of chance. Similarly, what Aristotle has to say about the biology of the conception of male

and female affords no grounds for attributing to him 'philosophical' distinctions between them.

It may be useful to expand a little on Aristotle's theory of causes (or 'causal factors' or 'explanatory factors' or 'reasons'—one despairs of finding an exact translation). His work *The Generation of Animals* begins and ends with a discussion of this theory, which is thus manifestly important for all that lies between.

He writes:

As we know, there are four basic causes: (1) that for the sake of which the thing exists, considered as its 'End'; (2) the *logos* of the thing's essence (really these first two should be taken as being almost one and the same); (3) the matter of the thing, and (4) that from which comes the principle of the thing's movement. [46]

Peck provides the following illustration. [47] Suppose the thing to be explained is a dog.: then these are the four causes:

(1) The Motive Cause [the Efficient Cause]: the male parent which supplies the 'movement' that sets the process of development going.

(2) The Material Cause: the menstrual fluid, the nourishment supplied by the mother, and other nourishment taken after birth.

(3) The Formal Cause [the *logos*]: the embryo, and the puppy as it grew into a dog, following a process of development which had the special character proper to dogs.

(4) The Final Cause: the end towards which the process was directed, that is, the perfect and full-grown dog. [Again, the *logos*.]

(The chronological order of the causes is different from their logical order).

Now for many today the important cause, indeed the only real cause, is the Motive or Efficient Cause. For Aristotle the important cause is the Final Cause. He writes:

Anaxagoras asserts that it is the possession of hands that makes the human being the most intelligent of animals; but surely the reasonable point of view is that it is because he is the most intelligent animal that he has got hands. Hands are an instrument; and Nature, like a sensible human being, always assigns an

organ to the animal that can use it . . . thus Nature has provided that which is less, as an addition to that which is greater; not *vice versa*. We may conclude, then, that if this is the *better* way, and if Nature always does the *best* she can in the circumstances, it is not true to say that the human being is the most intelligent animal because he possesses hands, but he has hands because he is the most intelligent animal. [48]

This implies that a thing is to be evaluated in terms of what it is, or of what it has come to be-of its *logos*- not in terms of the mechanism that has produced it. Mushrooms are evaluated in terms of their taste and flavour, not in terms of the dung on which they grew, and a diner who returned them to the chef on learning of their origin would assuredly be adjudged squeamish. A maid however fair who rejects her swain's gift of flowers because they were grown on manured ground is likely to experience a dearth of suitors. (There can be a falseness in our ordinary language here. We speak of a *mongrel* dog, *cross-bred* cattle and *hybrid* plants, yet these are genetically the same. Geneticists rightly talk of hybrid vigour, and if a mongrel dog guards our children well, shall we despise it?)

One must particularly note Aristotle's assertion that a thing's *logos* or formal cause and its End, what it finally comes to be, are almost identical. [49] *Logos* is perhaps best translated in biology as 'what a thing is meant to be'. It is in terms of its *logos* that we adjudge a thing to be 'perfect' or 'imperfect', 'complete' or 'incomplete'. A cat is meant to hear, and we adjudge a kitten born deaf to be 'imperfect'. It is not meant to have horns, and one cannot return a purchased kitten to the vendor on the grounds that it hornless. Someone buying a parrot, John Cleese famously pointed out, expects it to be a living parrot. To be alive is part of the *logos* of a parrot.

It is within the context of these ideas-and only within that context that we can seek to understand Aristotle's theory of animal reproduction. It is as distant from Platonism as can be imagined. After all, was Plato's horse a mare or stallion? Did it whinny when its mate approached? For Aristotle in contrast the world of procreating things is not a shadow but a full reality.

One must quote Peck:

It may, I think, be justly claimed that in this treatise [*Generation of Animals*] Aristotle's thought is to be seen

integrated as it is nowhere else; for in reproduction, as understood by Aristotle, not only the individual is concerned but the cosmos at large: it is a business in which the powers of the universe are concentrated and united; and it is the means whereby that eternity, with which, if he could have done it, God would have filled the whole creation from one end to the other, is attained so far as is possible by the creatures that are subject to decay; indeed, these very beings, animals and plants, have in Aristotle's view the best claim to the title of 'being' (*ousia*), a much better claim than the lifeless things out of which they are composed, or the objects made by human art; and therefore they merit to an exceptional degree the attention of the student of reality. [50]

(It is indeed curious that nowadays these writings little attract philosophers. Albert the Great, it may be noted, wrote an extended paraphrase of them, [51] and Aquinas, while he wrote no explicit commentary, cites them, by my reckoning, not fewer than 16 times, often giving chapter and verse. [52])

Reproduction is important to Aristotle because it fulfils the purposes of the heavens by maintaining species in existence. Individual animals die, and reproduction is necessary so that the species may survive. This is indeed akin to our own concern that species may not 'die out'. On the other hand, he sees the individual living creature as the End of reproduction, not reproduction as the End of the individual. It is not as with Samuel Butler where 'a hen is Nature's way of producing another egg'.

Even though plants have no other evident function than to make one another like themselves ... and similarly in certain animals too one can grasp no other function besides generation...As soon as sensation is added their lives differ both in regard to mating, because of the pleasure, and in regard to the birth and rearing of the young. [53]

But while he thinks that the existence of male and female is due to the heavens, he has no *a priori* commitment to the view that all reproduction depends on the interaction of male and female. He is aware that in many species reproduction is asexual, [54] and even for groups, such as fishes, which normally reproduce sexually, he is undisturbed by the knowledge that some reproduce asexually. [55] He is much taken with reproduction in bees, and concludes that what he calls 'masters' and we call 'queens' produce, without copulation, both themselves and the drones, while the 'honey-bees' (the 'workers') reproduce themselves alone. [56] He has no *a priori* commitment to the belief that reproduction requires active and passive partners. If it often does involve such

partners, that is a matter of fact, not a matter of metaphysical necessity. His approach is highly empirical. What he says of bees, expresses his general attitude:

The facts have not been sufficiently ascertained; and if, at any future time they are ascertained, then credence must be given to the direct evidence of the senses more than to theories---and also to theories provided that the results which they show agree with what is observed. [57]

His theory of reproduction, it should now be clear, is not derived from a metaphysics of 'the active' and 'the passive', but from what he has observed.

He has however no appreciation of the biological reasons for sexual reproduction—for that it was necessary to wait for Darwin. He sees that in plants there is a beginning of sexuality, in that parts are found which are called male and female 'by way of similarity and analogy'. [58] He believes that the sexual parts are found, one set in one individual, one in another, (that is, there are separate sexes) in animals that have sensation and can move around, and he seems to think that this is to allow them to have a fuller experience of life. [59] In other words, he seems to think that the males and females are separate so that they can escape from sex and get on with other things. That is certainly the interpretation of Aquinas, who argues that God made the male and female to be distinct so that both, Man and Woman, might devote themselves primarily to the life of the mind. [60]

They do indeed come together for the purpose of reproduction, but one must add that for both Aristotle [61] and Aquinas the coming together of husband and wife is not merely for that purpose. It is rather meant to be what Aquinas calls a *socialis coniunctio* [62] in which there should reign the most complete friendship. [63]

He is however aware of the questions that have to be dealt with in any serious theory of sexual reproduction: (1) why offspring resemble their parents; (2) why they are not replicas of them; (3) why males and females are produced; and (4) why some offspring, though few, are congenitally abnormal. [64]

He begins by defining male and female: 'by a male animal we mean one which generates in another, by female, one which generates in itself. Moreover—a supremely important remark—each has a *logos*, that is to say, each is something which it is meant to be. They differ in their *logos*, because

the male is that which has the power to generate in another, while the female is that which has the power to generate in itself. [65] Each, it should be noted, has a power: Aristotle does not think that only the male has the power of generation.

Yet since male and female have distinct powers, it is necessary that for purposes of copulation and creation, there should be certain parts—‘the uterus, the regions about the testes and the penis’— in respect of which the female will differ from the male. [66]

Nevertheless he stresses that ‘even if “male” and “female” are used as epithets, a thing is not male or female in respect of the whole of itself, but only in respect of a particular faculty and a particular part’ [67]. In other words, male and female are basically identical, and differ only in a particular respect.

Now if the organs have been determined, what is the reproductive substance? It is the semen (*sperma*)—a term he often applies equally to the male and female reproductive substances:

Although the things that are formed in the course of Nature no doubt take their rise out of the semen, we must not fail to notice how the semen itself is formed from the female and the male, since it is because this part is secreted from the female and the male, and because its secretion takes place in them [the female] and out of them [the male], that the female and the male are the principles of generation. [68]

Aristotle later goes on to distinguish between the female and male semen: this should not conceal the fact that they are basically the same.

It had been held by some of his predecessors that the semen has generative power because it contains a *homunculus*—a miniature replica of an adult. (This, it may be noted, was a view that was still held by some in the 18th century.) Aristotle argues rather that the semen is condensed or concentrated blood, and this for the following reasons. All the parts of the body of an adult were, when it was in the embryonic stage, produced from blood, [69] and in adult life they continue to be sustained and nourished by blood. Blood, therefore, contains the entire body potentially, and concentrated blood contains the body in a way that is closer to actuality. (To take an illustration: the ingredients in the recipe, contain a cake potentially; the cake-mix still contains

it only potentially, but is closer to the actuality or reality.) This condensation of the blood yields, in the male, the semen in narrow sense, and in the female, an especially pure form of blood found amidst the other blood which will later be released as menses. [70]

The only difference between the semen and this special blood is that the former is more condensed. The special blood, no less than the semen, 'contains all of the parts of the body potentially, though none in actuality; and "all" includes those parts which distinguish the two sexes'. [71]

In other words, the female element contains everything that is needed to produce a male body. (One begins to see why Aristotle's theory of conception attracted Aquinas when he was dealing with the Incarnation of the Word. [72] On Aristotle's theory, a woman accepts no physical contribution from a man when she becomes a mother. The fact therefore that Jesus had no physical father did not make him less human. In a sense, for Aristotle no one has a physical father, that is, one whose substance comes to form part of the child's substance.)

Now the male semen is manifestly smaller in volume than the uterine blood. Aristotle concludes that the semen is more condensed than is this blood. Since the work of concentration requires heat—this is not temperature but what we would call metabolic energy—Aristotle concludes that the male has more 'heat' than the female. It should be noted that Aristotle does not begin from the supposition that the male has more 'heat' than the female: he concludes to it from the empirical fact that the male reproductive substance is of lower volume than the female substance.

The question now arises of the mode of action between the male and female substances. One might think of mixture, but Aristotle has little time for mixtures, which only postpone the problem of what happens when the twain are mixed. Rather, he thinks that the action of the semen is like that of what today we call an enzyme—a word the use of which will be shortly justified.

The action of the semen of the male in 'setting' the female's secretion in the uterus is similar to that of rennet upon milk. Rennet is milk which contains vital heat, as semen does, and this integrates the homogeneous substance and makes it 'set'. As the nature of milk and the menstrual fluid is one and the same, the action of the semen upon the substance of the menstrual fluid is that of rennet upon milk. Thus when the 'setting', is effected, i.e., when the bulky portion 'sets', the fluid portion comes off; and as the earthy portion solidifies, membranes form all around its outer

surface . [73]

Now while the semen acts upon the menstrual fluid and `sets' it, it does not become part of the embryo:

It is plain that there is no need for any substance to pass from the male; and if it does pass, this does not mean that the offspring is formed from it as from something situated within itself during the process, but as from that which has imparted movement to it, or that which is its `form'. [74]

Once the semen has acted, a complex process begins within the *conceptum*:

The semen has within itself the movement which the generator sets going. It is possible that A should move B, and B move C, and that the process should be like that of the miraculous automatic puppets; the parts of these automata, even while at rest, have in them somehow or other a *potentiality*, and when some external agency sets the first part in movement, then immediately the adjacent part comes to be *in actuality*. [75]

Needham in his *History of Embryology* writes that `these remarkable passages contain the first reference to enzyme action ever made in a discussion in embryology'[76] and since Needham was by training a biochemist, and an FRS to boot, he writes on enzymes with authority. For an enzyme precipitates a chemical process without itself becoming part of the output of that process. This, in essence, is what, on Aristotle's theory, the semen does.

Aristotle expresses the relation between the male and female elements in a number of ways. He talks of form and matter: `the female always provides the material, the male provides that which fashions the material into shape' . [77] By matter, of course, Aristotle does not understand primitive and unformed matter, like putty or plasticine. Matter and form are relative terms, and what is matter in one relationship may be form in another:

For animals the matter of them is their parts: the non-uniform parts [e.g., the eye] are the matter for the animal as a whole in each case; the uniform parts [e.g., the blood] are the matter for the non-uniform parts; and the corporeal elements [e.g., earth] are the matter for the uniform parts. [78]

The matter contributed by the female is not any matter: it is highly formed

matter, it is the result of a process of concentration of blood. It is structured as are the wonder-puppets—, more wonderfully indeed that they are, for Nature, it will be recalled, surpasses Art. As we have seen, it already contains all the parts of the body potentially, including the parts that distinguish the sexes.

Not only that.

Since the *conceptum*

is already an animal potentially, though an imperfect one, it must get its nourishment from elsewhere; and that is why it makes use of the uterus, i.e. of the mother, in order to get its nourishment from elsewhere . . . That is why too Nature produces first of all the two blood vessels that run from the heart [of the *conceptum*]; and attached to these are some small blood vessels which run to the uterus, forming what is known as the umbilicus. [79]

Thus the mother supplies blood to the heart of the embryo, and from the blood produced by its heart, the other parts of the body are formed.

So it is true that Aristotle sees the male matter as active and the female matter as passive in the act of fertilisation [male viewpoint] or conception [female viewpoint], but this is not to say that he sees the female as passive in the entire process of reproduction. In any case, he is not talking about the interaction between the male and the female as wholes (as animals, as people), but about the interaction between the male and female productive materials. Aristotle is simply saying that the male impregnates the female, and while this may express things from the male rather than the female standpoint, there is no more to it than that. He has no doubts of the importance of the female contribution, and indeed page after page is filled with his account of the development of the embryo. [80]

It may be asked how the male and female materials differ. The male semen, it has been seen, is more condensed or concentrated than the female material. Yet this latter, even before it receives the semen, is alive: he instances unfertilised eggs, which are not on a par with wood and stone, because they go bad, yet are not the same as fertilised eggs. He concludes that

they have the first level of life, nutritive life, which means (roughly) vegetative or plant life. An animal possesses sense-perception and sentient Soul. This, he thinks, is contained in the male semen and is communicated to the female material. [81]

Aristotle does not see conception as a purely physical process. Ultimately it is caused by the 'heavens' and semen contains a substance analogous to the element which belongs to the stars'. [82] When it comes to human conception the question is even more difficult:

It is a very great puzzle to answer another question, concerning Reason. At what moment, and in what manner, do these creatures which have the principle of Reason acquire their share in it, and where does it come from? [83]

He answers:

Reason enters in as an additional factor from outside, because physical activity has nothing whatever to do with the activity of Reason. [84]

(One may note that Aristotle makes no distinction here between male and female.)

So much for reproduction in general. We must now turn to the likenesses and unlikenesses between parents and children, and to the likeness and unlikeness that lie in being male or female.

Since the male semen is active, Aristotle takes for granted that its natural tendency is to produce a child that is the replica of the father. Fire tends to make other things hot, ice to make them cold. As the scholastics would later say, *omne agens agit sibi simile*—everything that acts tends to make other things to be as it (the agent) is. In an 'ideal' world, the resulting similarity would be total. In the real world, this is not achieved. In an 'ideal' world cold water will reduce a bottle of wine to its own temperature, in the real world the wine will slightly heat the water, and the resulting temperature will be slightly higher than the original temperature of the water. As Aristotle says (and we have seen before), 'that which acts, is acted upon in return'. If one throws a drop of water on a hot electric plate, the water will indeed cool the plate, but will itself be turned into steam. 'Sometimes', writes Aristotle, 'the extent to which it gets acted upon is greater than that to which it acts'. [85] The difference between the ideal and the real world is, in Aristotelean thought,

attributed to matter 'overcoming' form.

Now for these reasons, a child is never a replica of its father or mother. It may differ in sex, and it may differ in how far it resembles its parents. Aristotle has quite distinct accounts of what causes these (different) differences. He distinguishes between 'departing from type and changing over' (*eksistasthai kai metaballein*) and 'relapsing' (*lyesthai*). Peck describes the difference between these two processes as follows:

The result of the former process is that the embryo acquires a characteristic opposite to that of the original movement . . . the result of the latter process is that the embryo acquires a characteristic which belonged to one of its ancestors. [86]

In the first process the embryo 'passes not into any casual thing, but into its own opposite': [87] what was meant by the male semen to be a male embryo becomes a female embryo. It does not pass into any casual thing, something meaningless or accidental that is, because, as we have seen, the female has a logos—there is something it is meant to be. In the second process the offspring differs along a continuous scale from its father, and resemble its mother along a similarly continuous scale.

Aristotle accounts for the two processes as follows

:

The reason why relapsing occurs is that the agent in its turn gets acted upon by that on which it acts (e.g., a thing which cuts gets blunted by the thing which is cut, and a thing which heats gets cooled by the thing which is heated . . . sometimes the extent to which it is acted upon is greater than that to which it is acting.[88]

He goes on:

The reason why that which is acted upon departs from type rather than gets mastered is either (a) deficient potency in the heating and motive agent [the male semen], or (b) the bulk and coldness of that which is being heated and fashioned [the female material]. [89]

So a female has 'departed from type', and that that departure is due to lack of heat in the male or an excess of cold in the female. Now this undoubtedly means that there is a failure or weakness in the process, and the outcome—the

female—does lack something it would otherwise have: heat in the measure in which the male has it. It is a deviation (*anaperia*) so far as the proximate process of production is concerned.

Yet from a wider perspective, it is one `one which occurs in the ordinary course of Nature'[90] and is intended by Nature, `since the race of creatures which are separated into male and female has got to be kept in being.` [91] Now this returns us to the distinction between the efficient cause of a thing and its final cause. [92]

The efficient cause of the female has a weakness, but the final cause 'intended by Nature has been achieved and the female itself has achieved its *logos*, —it is what it is meant to be.

Moreover, seen in the wider context of Nature, the female proceeds via the `heavens' from the Unmoved Mover. It is worth while repeating the crucial passage:

As I have already said, the female and the male [his order] are the principles of generation, and I have also said what is their power [to generate in itself, to generate in another] and what is the *logos* of their essence. As for the reason why some are formed to be female and others male, (a) in so far as this results from necessity, our argument must endeavour to explain, (b) in so far as this occurs on account of what is *better*, *i.e.*, on account of the Cause for the sake of which, the principle is derived from the heavens.[93]

Aquinas will put this later in the language of his Christian theology: an individual female is not what the male semen 'intends' to produce. but she is what Nature intends to produce, and hence she is what God intends to produce. [94]

It would be quite wrong however to conceal the following passage, which occurs when Aristotle is wondering why there are two sexes:

The proximate motive cause [the male semen], to which belongs the *logos* and the Form is *better* and more divine in its nature than the matter, it is better that the superior one should be separate from the inferior one. That is why wherever possible and so far as possible the male is separate from the female, since it is something *better* and more divine it is the principle of movement for

generated things, while the female serves as their matter. [95]

Equally 'the upper parts of the body have this pre-eminence over the lower parts, the male over the female, and the right side of the body over the left'. [96] Just what such a priority means the reader can decide. 'Every nation', he writes, 'reckons currency with reference to the standard most familiar to itself.' [97]

Moreover, it is one thing to say that the female is a departure from the male type and another to say it is a defective male. This brings us to consider the phrase which, for some, says just that.

The Greek word, it will be recalled, is, *peperomenon*, which has indeed the primary meaning of 'maimed'. Peck chooses 'deformed' and lists further attempts to bring out the meaning: 'imperfectly developed', 'under-developed', 'malformed', 'mutilated' and 'congenitally disabled'. An author is however his or her own best interpreter, and we must look at how Aristotle uses the word elsewhere in his biology.

Now we have already seen that he uses precisely the same word about the seal as he does about the female: it is, he writes, *a peperomenon* quadruped, [98] and he explains why he uses the word:

One viviparous animal, the seal, has no ears but only auditory passages; but this is because, though a quadruped, it *is peperomenon*. [99]

The point is that 'the quadrupeds generally have ears which stand out free from the head'[100]—but the seal doesn't. In Aristotle's language, it departs from type. But:

Nature has brought off a clever piece of work in the seal, too, which, although it is a viviparous quadruped, possesses no ears but passages merely. The reason is that it spends its life in a fluid medium. The ear is a part of the body which is an addition made to the passages in order to safeguard the movement of the air which comes from a distance and therefore is no use to the seal; indeed, it would actually be a hindrance rather than a help, because it would act as a receptacle for a large volume of water. [101]

So in being a *peperomenon* quadruped, the seal is not defective or deformed in any normal sense of the term. It 'departs from type', but it is what Nature intends it to be. The female is *peperomenon* in precisely the same sense: she 'departs from the male type', but she is not defective. She is what Nature intends her to be.

One can see the same logic at work elsewhere in Aristotle. He writes of the crocodile:

Among the factors which contribute to the deformity (*anaperia*) of the crocodile's tongue is the immobility of its lower jaw, to which the tongue is naturally joined. We must remember however that the crocodile's jaws are topsy-turvy; the bottom one is on top and the top one below . . . The tongue is not fixed to the upper jaw (as one might expect it to be) because it would get in the way of the food as it entered the mouth, but to the lower one, which is really the upper one in the wrong place. Furthermore, although the crocodile is a land-animal, his manner of life is that of a fish, and this is another reason why he must have a tongue that is not distinctly articulated. [102]

Once again we have a 'deformity'—if one still wants to use that word-intended by Nature. Once again, it is a useful deformity. Examples could be multiplied: lobsters [103] and flat-fish, [104] for instance.

Aristotle in fact uses the sort of language we do when we say that the sloth walks 'upside down'. It does so relatively to other tree-dwellers, but, relatively to its own nature, it walks perfectly. Few things distress the maternal heart of a sloth more than the sight of its baby tripping— slothfully, of course—along the top of a branch.

Now it is indeed the case that Aristotle once uses the word *peperomenon* in the sense of 'maimed', when he is talking of polypods which have lost feet through amputation." [105] We too use the word 'lost' in the distinct but related senses of 'departing from type' and 'maimed'. We say that someone 'lost' a leg in

accident, and also that fish which have lived for many millenia in underground caves have `lost' their colour, or that the seal, originally a land-mammal, `lost' its external ears in the course of its adaptation to marine life. The fish, we would say, `lost' their colour because it serves no purpose in their present environment, and the seal's `loss' of its ears has improved its adaptation to life in the sea. These are not true losses, much less are they deformities. They are in fact positive adaptations. Aristotle in fact speaks a language very close to that of contemporary biology.

The English word deformed does not carry Aristotle's true meaning. The example of the seal shows that, for the seal is *peperomenon*, but, manifestly, not deformed in our meaning of the word. Woman departs from the male type-and Nature intends she should. She departs in having less heat, and Nature turns this to good. Because she has less heat, the blood she concentrates is voluminous. Because this blood is voluminous, Nature provides a place where it may be stored—the uterus.'[106] Because Woman has a uterus, she can `generate in herself—whereas the male can only `generate in another'." [107] By being *peperomenon*, a woman can become a mother.

There is a further point. In the critical phrase Aristotle uses the word *hosper*, a word that limits or modifies an assertion. [108] So Aristotle does not say `a female is a deformed male' but `the female is as it were a deformed male' (Peck's translation). It is so in a limited or modified **sense**. Aristotle is thoroughly familiar with the concept of variation that is, that offspring differ from their parents—and discusses it at great length. [109] Some of these variations are what we would now call 'congenital anomalies'. [110] They are, in a sense, contrary to Nature. Others, which happen often and habitually, are not so called: they are not really contrary to Nature.' [111]

It is true that in Aristotle the truly mutilated and the female are produced by the same mechanism—more exactly, by a failing in a mechanism. In modern biology variations or mutations occur because of failures or in the process of reproduction. Most of these variations are for the worse, but some are for the better. Which are which is not determined by how they are caused but by how they serve the adaptive purposes of the species. Whether a variation is adaptive or maladaptive depends on other circumstances.

In sooty 19th century England, a variation towards darkness was adaptive in a moth: it was better camouflaged against a dark background. In the cleaner England of today, a variation towards a lighter colour is adaptive [112] A variation therefore is evaluated not in terms of how it has been caused, but of

how it serves the animal, or if one prefers, the species.

Being born earless is a variation, and would normally be a deformity in the true sense, for the earless rabbit is manifestly handicapped; but it is not a real deformity if it occurs in the seal, because in the seal being earless is adaptive and has been brought about by Nature. It is an adaptive variation. In just the same way, the female's lack of heat is a variation, but from the perspective of the species and the perspective of Nature, it is an adaptive variation.

We are back to the basic Aristotelean principle that things are to be evaluated in terms of what they are and how they achieve their end, not in terms of how they have been produced.

It is curious that a single phrase should be used to damn Aristotle, for his writings show him to be the most human and understanding of men. Perhaps his biology is best criticised by those who have read it. He married happily, and—in a personal conceit—I wonder whether he may not on occasion have thought of the Heracleitan phrase and have murmured to his wife: 'there are gods even here'.

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Endnotes

1. GA 1,20,729a27.

The following abbreviations are used:

GA de Generatione Animalium.

HA Historia Animalium.

PA de Partibus Animalium.

PrA de Progressu Animalium.

2. GA 4,3,768b17.

3. GA 4,3,768a22. The Greek is *krateisthai*, which Peck translates as 'mastered'.

4. GA 4,3,768a35.

5. GA 2,3,737a25. A.L.Peck, Loeb Classical Library, Harvard University Press, 1942, repr.1990, gives `deformed', and A.Platt in the Oxford translation gives `mutilated'.
6. PA 2,12,657a24. Both Peck and Platt give `deformed'.
7. HA 1,1,487b24.
8. GA 5,2,781b23.
9. de Animalibus XVI.
10. Summa Theologiae 1,92,1,agl.
11. Aristoteles Latinus, XVII 2.v., ed.H.J.Drossaart Lulofs, Bruges-Paris, Desclee de Brouwer, 1966.
12. GA 1,2,716a5.
13. GA 1,2,716a10.
14. A remark made in his Agnes Cuming Lectures in University College Dublin in1978.
15. Francis Thompson in *The Kingdom of God*.¹⁶
16. PA 1,1,639b20.
17. `The eternal silence *of* these infinite spaces terrifies me.' *Pensees*,iii,206.
18. 'The teacher *of* those who understand.' *Inferno*,4,131.
19. 'The love that moves the sun and the other stars'. *Paradiso*,33,145.
20. PA 1,5,645a10.
21. GA 1,5,717b30.
- 22 The use of one of its arms (legs) to funnel sperm.
23. GA 1,18,724a5.

24. Cf. F.B.Hutt and B.J.Rasmussen, *Animal Genetics*, 2nd ed., Wiley, New York, 1982, p.514.
- 25 U.Ranke-Heinemann, *Eunuchs for Heaven*, trans. J.Brownjohn, Deutsch, London, 1990, p.165.
- 26 Cf. M.W.J.Ferguson and T.Joanen, 'Temperature-dependent sex determination in Alligator mississippiensis', in *Journal of Zoology (London)*, 1983, 200, pp.143-177.
27. Cf. S.T.H.Chan and Wai-Sum O, *Environmental and Non-genetic Mechanisms in Sex Determination* in C.R.Austin and R.G.Edwards, *Mechanisms of Sex Differentiation in Animals and Men*, New York, Academic Press, 1981.
28. PA 1,5,645a24.
29. GA 2,6,743a20.
30. GA 2,6,743b23.
31. GA 2,6,743a37.
- 32 GA 2,6,744b16.
33. GA 2,5,741b5.
34. GA 2,4,739b20.
- 35 GA 5,8,788b20.
- 36 PA 1,1,639b20.
37. F.H.A.Marshall in the Foreword to A.L.Peck, *De partibus animalium*, Loeb

Classical Library, p.3.

38. PA 3,1,662a30.

39. GA 2,1,734b10. Cf. GA 2,5,741b10.

40. GA 1,4,717a15.

41. GA 2,1,731b20.

42. Peck, o.c., p.xliii, where he cites no fewer than nine instances of this.

43. GA 3,4,755a25.

44. PA 4,11,692a5.

45. GA 2,1,731b20.

46. GA 1,1,715a5.

47. O.c., p.xxxviii.

48. PA 4,10,687a10.

49. GA 1,1,715a10.

50. O.c., P.V.

51. His de Animalibus.

52. E.g., Summa Theologiae, 1,99,2,agl.

53. HA 7,1,588624.

54. GA 1,1,715a25, GA 1,18,724b10.

53. GA 3,5,755b23.

56.GA 3,10,759a8.

57. GA 3,10,760630.
58. GA 1,1, 715b20.
59. GA 1,1,715b15.
60. Summa Theologiae, 1,92,1,c.
61. Ethica Nicomachea, 8,12,1162a20. °2
62. Summa Theologiae, 1,92,3,c.
63. Summa Contra Gentiles, 3,123.
64. GA 4,3,769a1.
65. GA 1,2,716a20.
66. GA 1,2,716a32.
67. Ibid.
68. GA 1,2,716a14.
69. GA 3,2,753b20.
70. GA 2,4,739a10.
71. GA 2,3,737a25.

72. In Sententias 3,3,5,1.
73. GA 2,4,739b19.
74. GA 1,21,729b19.
75. GA 2,1,734b10. Cf. GA 2,5,741b10.

76. J.Needham, A History of Embryology, 2nd ed, Cambridge, 1959, p.51.
77. GA 2,4,738b25.
- 78 GA 1,1,715a10.
79. GA 2,4,740a25.
80. GA 2,6,743a3 et seq.
- 81.GA 2,5,741a10.
82. GA 2,3,737a1.
83. GA 2,3,736b5.
84. GA 2,3,736b28.
- 85 GA 4,3,768b35.
86. GA 4,3,768a15, note a.
87. GA 4,3,768b15.
88. GA 4,3,768b15.
89. GA 4,3,768b25.
90. GA 4,6,775a16.
- 91 GA 4,3,767b9.
- 92 GA 1,1,715a10.
93. GA 2,1,731b24.
94. Summa Theologiae, 1,92,1,ral. °5
95. GA 2,1,732a5.

96. PA 2,2,648a15.
97. HA 1,6,491a23.
98. HA 2,1,498a33.
99. PA 2,12,657a24.
100. PA 2,12,657a15.
101. GA 5,2,781b24.
102. PA 2,17,660b26.
103. PA 4,8,684a31.
104. PrA 17,714a6.
105. PrA 8,710b.
106. GA 1,18,725b5.
107. GA 1,2,716a20.
108. Cf. Liddell and Scott's Greek-English Lexicon s.v.
109. GA 4,3,769b10.
110. Cf. M. V. Barrow, A Brief History of Teratology to the Early 20th Century, Teratology, 4,119-130. Pp.119-122 have interesting comments on Aristotle.
111. GA 4,4,77022.
112. Cf. C.Starr and R.Taggart, Biology, Wadsworth, Belmont, 4th ed, 1987, p.525.

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