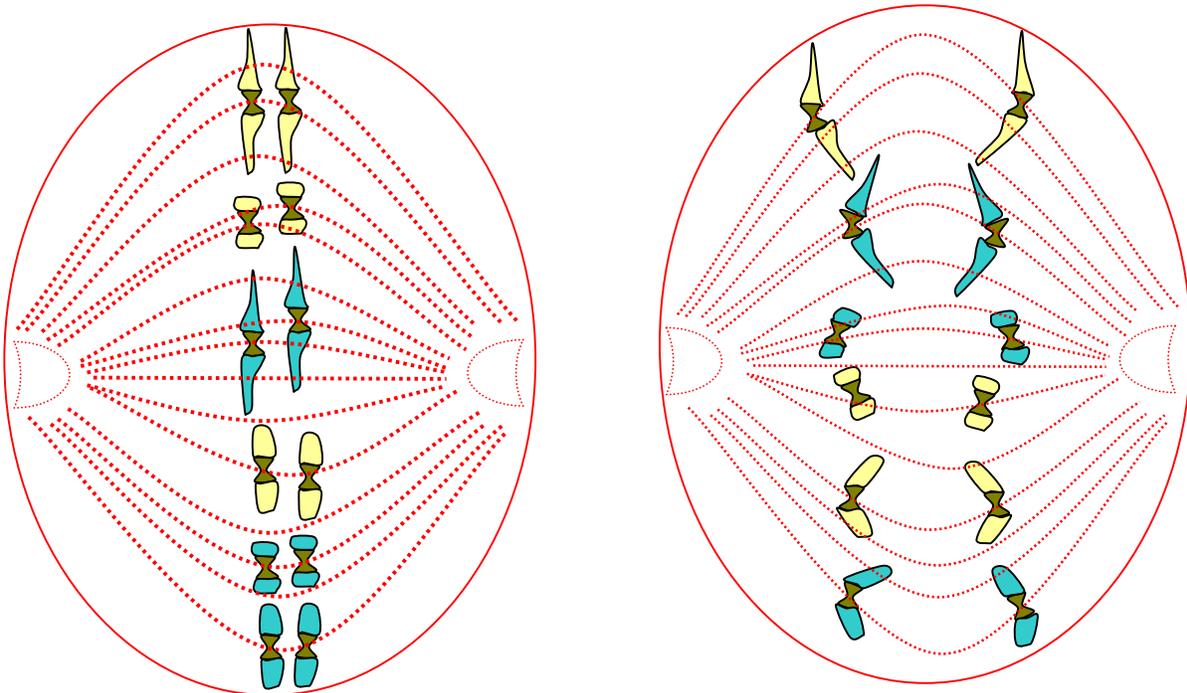


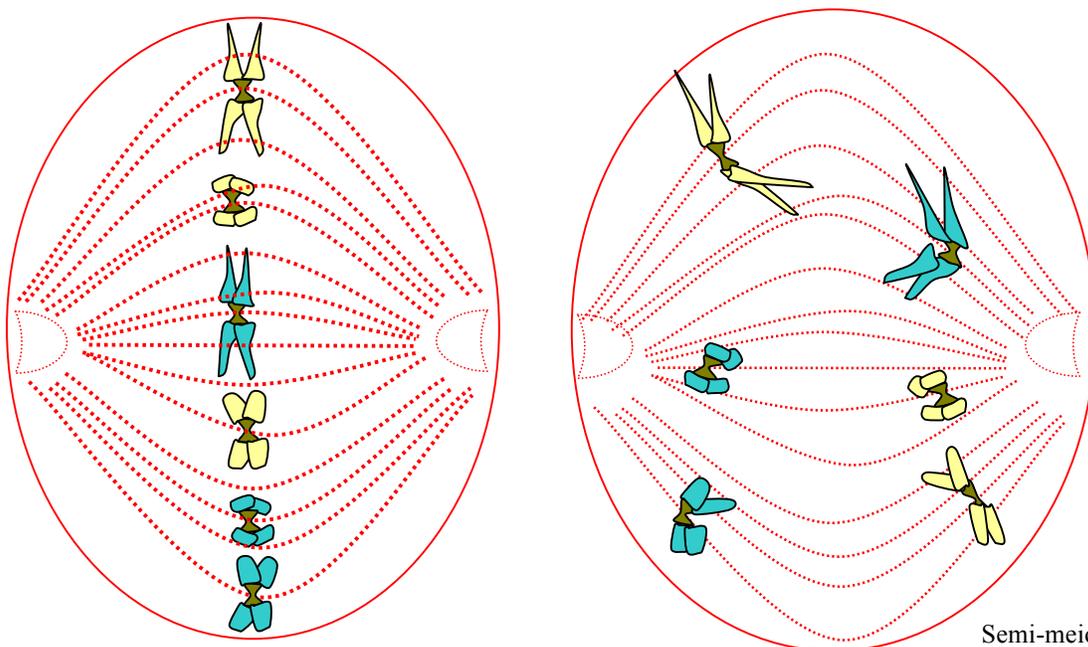
Semi-Meiotic hypothesis: Producing new species

Let us begin by reviewing the crucial moment in which mitosis and meiosis differ.

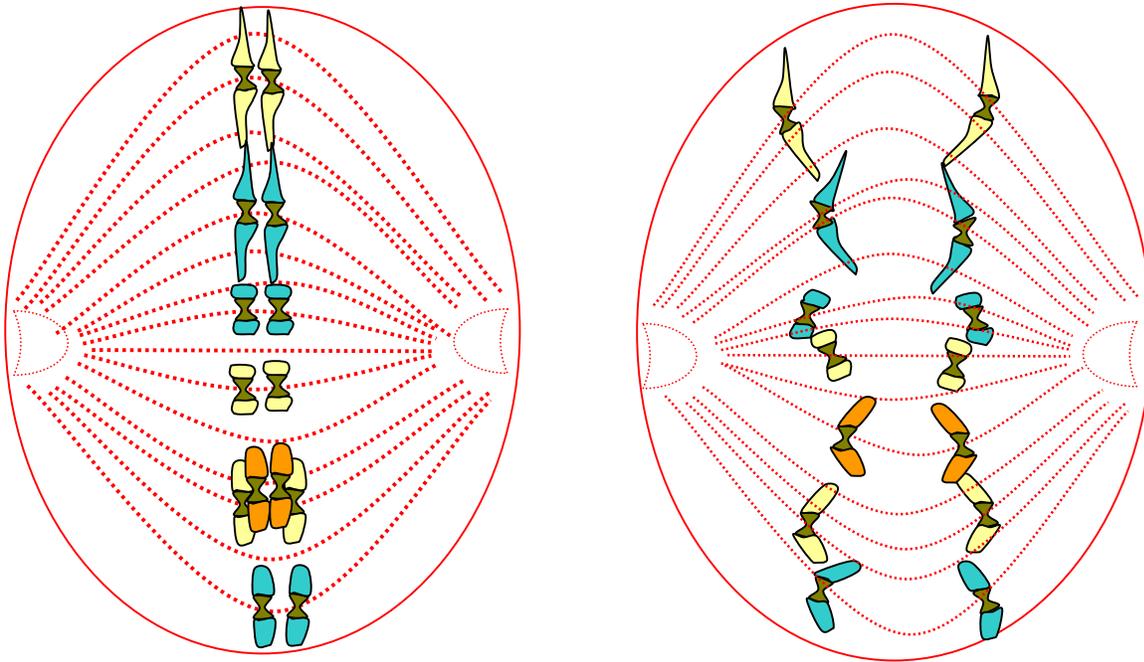
***Mitosis: Each chromosome replicates itself;
one of each goes to the new cell***



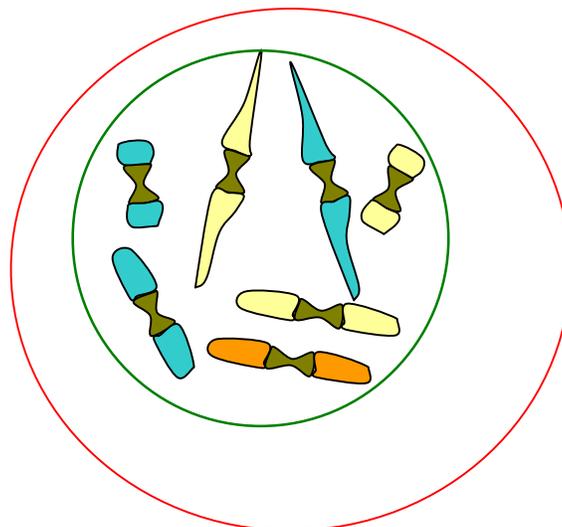
***Meiosis: Each chromosome replicates itself keeping new copy attached.
One attached pair goes one way; the other the other way.***



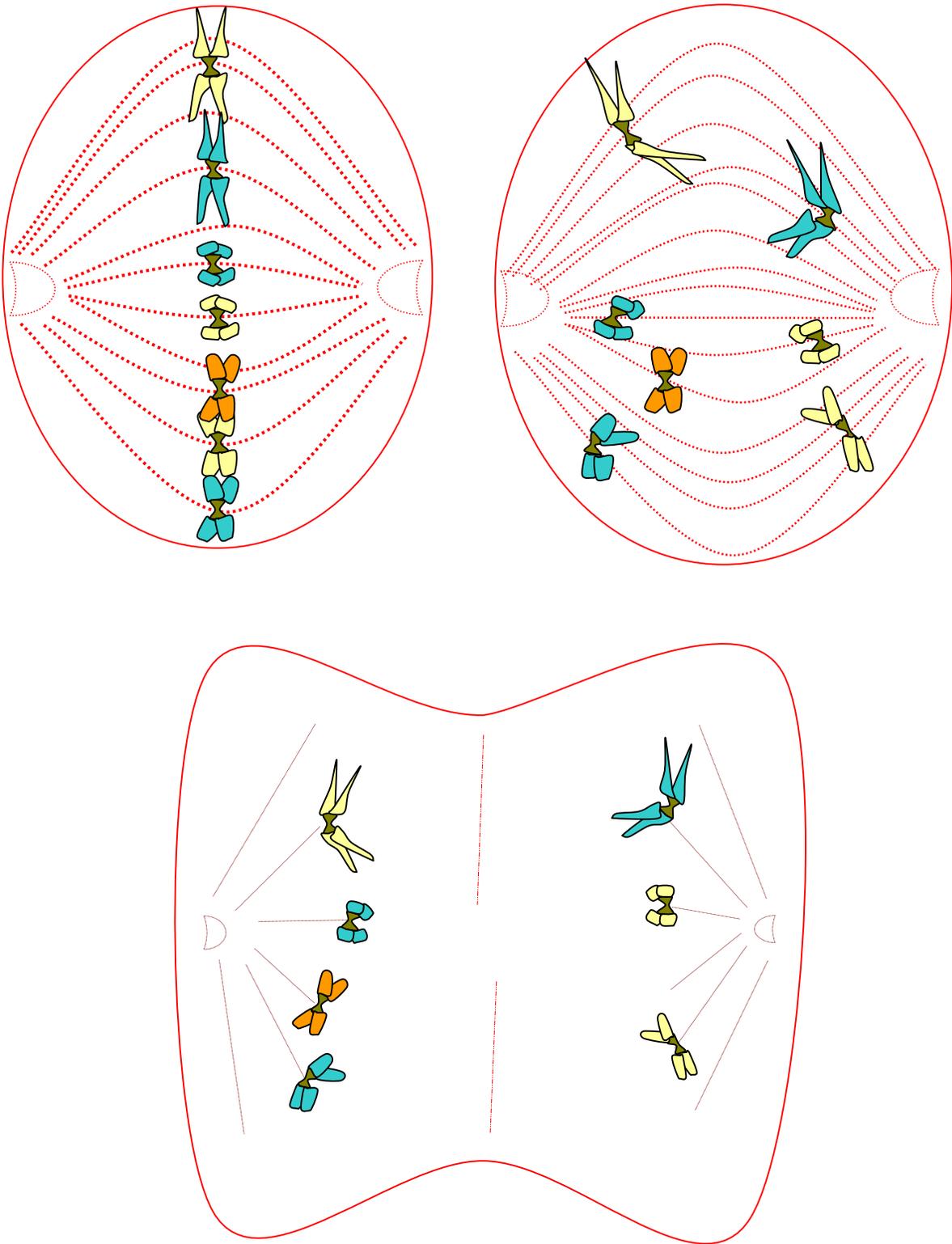
Now let us consider what would happen if there were (by any means) a second copying of one of the chromosomes during the earlier replication of the germ cell by mitosis. If this were to happen in a tissue cell, the abnormality would undoubtedly cause a disease condition, and be thrown out by the body's immune system, but we suppose that it takes place in a germ cell. Germ cells do not affect the individual and they reproduce by mitosis until the sexual maturity of the individual. Only then do they take the meiotic path.



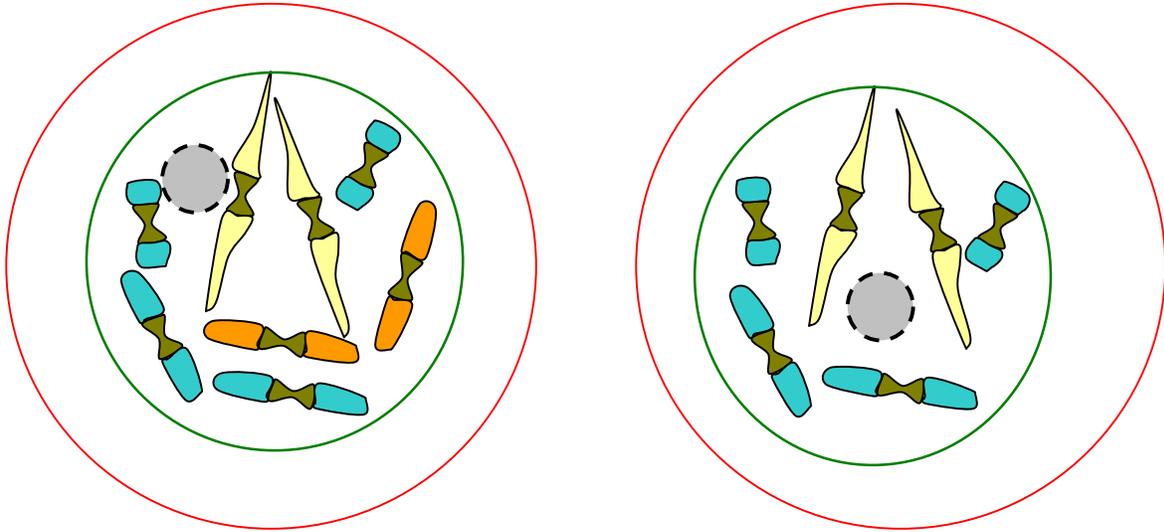
Here we can see that the new chromosome becomes involved in a new line of germ cells. In time, the potential mother may come to have many germ cells with an uneven number of chromosomes. This cannot be the correct chromosome number of any sexually reproducing species, since every such species has paired chromosomes, one from the mother and one from the father.



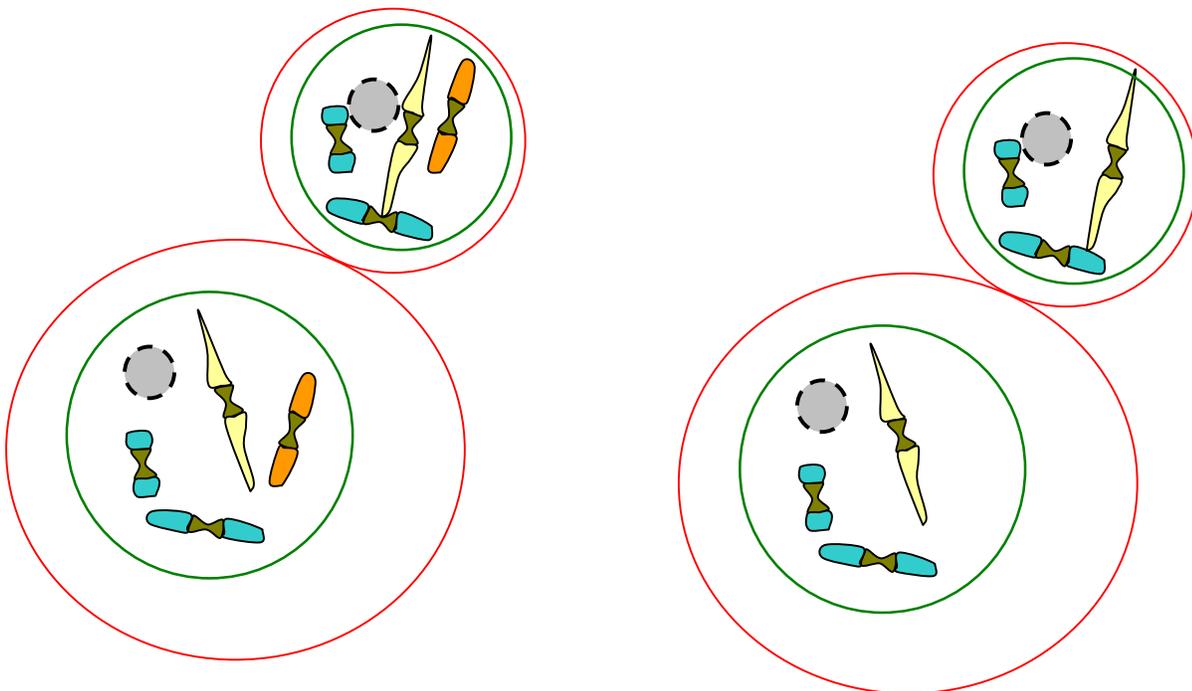
However, this awkward fact does not inhibit meiosis, and then watch what happens:



There we are. Now we have two cells, one with the correct chromosome number for the original species, and the other with the wrong number, but at least an even number. If this new chromosomal arrangement represents a viable body pattern, the new species will arise from the old in a single generation.



What ordinarily happens next is that these cells divide once more shortly before fertilization. But the division is not equal. One cell with the haploid (half) number of chromosomes has most of the cellular material, and the other, called a polar body, goes off to the side and with not much more than the extra (haploid set) chromosomes.



Now, the curious fact is that on rare occasions, the meiotic cells may mature without being fertilized; this is called parthenogenesis. They may simply do so on their own, or sperm may enter the cell and initiate the process of development, but never enter the nucleus and contribute genetic material. Instead, the polar body comes back and provides the second set of chromosomes to the cell it just left. In that case, a cell such as the one on the right would be the same species as its mother -- say a dinosaur -- while the one on the left would be a different species -- such as a bird. Same mother, same nest, different species of offspring!

(Of course, in most cases, errors of replication are diseased or weakened members of the species, incapable of life or if living incapable of reproduction, and if there is a change in chromosomes, that's the end of it.)

One might think that all these fatherless individuals must be female, but in fact they can be of either sex¹. Therefore we must conclude that if a new creature with a viable body plan were to be produced in this manner, it could be produced in both genders and could start a new species with its siblings.

In this hypothesis, we find a curious alloy of causes whereby an apparent accident is overlaid on a design which carries the transformation forward in an unexpectedly intelligent and productive manner. Surely this is the entire story of Israel, in which all mistakes are caught up in such a wise Providence that even sin is a "happy fault" -- bringing the story to the best of all possible conclusions, never detracting but always adding to the Glory of our Father.

Adam and Eve

Why not go for broke? Fools rush in where angels fear to tread...

If this were the manner in which evolution went forward from species to species, it would follow that the evolutionary drift towards sexual reproduction would be a drift away from the possibility of evolution. This may indeed be the case. In "The Blind Alley", John Davison quotes Robert Broom:

"There is, however, no doubt that evolution, so far as new groups are concerned, is at an end. That a line of small generalized animals should have continued on till in Eocene times the Primates originated and then ceased, and that except for specializations of Eocene types there has been no evolution in the last forty million years, and that the evolutionary clock has so completely run down that it is very doubtful if a single new genus has appeared on earth in the last two million years, ..." (BROOM 1933).

¹ The following quotation is taken from John Davison's paper, "An Evolutionary Manifesto": "In 1916, Jacques Loeb induced several thousand frog eggs to divide by pricking them with a fine needle. The vast majority of the embryos proved to be haploid and never completed larval development, but twenty were successfully raised to maturity and were shown to be diploid, undoubtedly due either to the occasional failure of the second meiotic division to take place or to the reentry into the egg of the second polar body nucleus (Wilson 1925). Thus these frogs were produced semi-meiotically. Of the 20 frogs, 15 were males, 3 were females and 2 were of uncertain sex."

If one accepts the notion that macroevolution involves the formation of new kinds (genera) of living things, [Davison continues] then Broom is saying that all macroevolution ceased about two million years ago.

Adam and Eve, by this account, would have been brother and sister, taken from the same germ cell. This is significant, because the doctrine of the Church does not require us to believe that Eve was taken from Adam's rib, but that Adam and Eve are the same species. The rib signifies the life, both because it implies the breath and because it covers the heart. The equality of man and woman is scripturally grounded in this oneness of their life.

For contrast, there is a popular bit of fiction, Clan of the Cave Bear, which presents another hypothesis: that the mating of Adam and Eve was a fortuitous hybridization of two primate clans (different species or varieties, actually) each separately evolving towards the human species in different but complementary ways. When the son of one marries (mates with) the daughter of the other, their offspring is superior to both and recognizably human.

This little tale is the competing paradigm of man's origin, and it is the sort of thing that the Church rejects, both because it gives male and female ancestry a permanent divergence and because it means early men and women were breeding with animals, since there was no species barrier. The girl and boy are of uncertain species -- it is not clear whether they are animals or men, and their child, though a man, would have been able to breed with either tribe, and, indeed, he does so. From a scientific perspective, this does not take into account that there is a difference in chromosome number between men and their presumed cousins, the great apes. Once a chromosomal leap is made, there is no possibility of interbreeding between the new and the old species, and until that leap is made, there is no new species.

The semi-meiotic hypothesis presents a way of leaping, yet an immediate species barrier. It alone takes into account the facts we actually know, and is also, as far as I understand it, in harmony with the teaching of the Church.

Finally, it is impossible, writing of these matters during the Christmas season, not to reflect that this hypothesis makes parthenogenesis the way forward for the entire domain of biology. It puts the Virgin Birth in its place, not as an anti-biologic curiosity, but as the last act in a long drama in which parthenogenesis (Greek for Virgin birth) is always the first act in a New Moment of Progress.