

Talk to Niagara Secular Humanists

February 16, 2011

On

Charles Darwin's Descent of Man and Selection in Relation to Sex

Introduction:

Let's start by making it clear that I'm not an expert on biology, evolution or indeed Darwin: a deeply interested but not particularly gifted amateur perhaps. My only claim to fame is that I have now actually read both Darwin's greatest work, *The Origin of the Species* and its sequel, *The Descent of Man and Selection in Relation to Sex*, something by no means all actual experts have done. Two years ago I read *The Origin of the Species* and gave a talk about it to this very group at this very place. At the time I considered reading *The Descent of Man and Selection in Relation to Sex* as well and at the same time but wisely decided against it. Now I have read it (although as you will later learn not every word of it) and tonight I'm going to talk about it.

I'm going to give you Darwin's main ideas and argument but also to give you the flavour of the book. I've read the book. After this talk, because you've listened to it, you won't have to. Two years ago I did recommend people read *Origin of the Species* but there are so many better books on evolution than *The Descent of Man and Selection in Relation to Sex* and particularly books based on more up-to-date facts. The wonderful thing about Darwin is, of course, that he came to his wonderful theory without so much information which became available only after his death and which confirms it so thoroughly. He died before the work of Gregor Mendel was widely known, before most of the major fossil discoveries, before any fossils of ancient human species were found, long before the discovery of DNA.

Darwin was, of course, a man of his times and, because of that, he had ideas about the human races that many today find difficult to hear. He held assumptions that today would be decidedly politically incorrect. Indeed many of these ideas have quite simply been proven incorrect. But in his time he was actually a progressive. The theory of scientific racism that he held was up against the then more accepted idea that the different races were actually different species. Both sides of Darwin's family, the Darwins and the Wedgewoods had been active opponents of the slave trade and then of slavery. I'll remind any Unitarians in the crowd that the Darwins had abandoned Unitarianism because of threats of violence during the wars with revolutionary France. Darwin had known an African during his years as a student in Edinburgh and this shaped his understanding but it was also shaped enormously by his visit to Tierra del Fuego during the famous voyage of the Beagle. Based on his descriptions, the people who lived there do seem to be among the most degraded on earth.

I am going to expose you to all his ideas and views
When information is not available, Darwin will speculate.

#1. "Many of the views which have been advanced are highly speculative, and some no doubt will be proved erroneous."

Chapter 1 deals with the evidence that man descended from some lower form. Numerous rudimentary features show connections between man and many other species. Some of these features are more developed in rare individuals. Some suggestion of differences in the “darker races”. Darwin cites Julian Huxley, his good friend and probably second only to Darwin at the time:

#3. “Huxley, who after asking does man originate in a different way from a dog, bird, frog or fish, says, “The reply is not doubtful for a moment: without question, the mode of origin, and the early stages of the development of man, are identical with those of the animals immediately below him in the scale: without a doubt in these respects he is far nearer to apes than the apes are to the dog.”

Chapter 2 deals with how man evolved including real or imagined effects of climate and local conditions on human bodies. He makes frequent comments on different races. Effects or increased use and disuse of parts and arrests of development and reversions are suggested as possible source of adaptation. He gives many examples of features found in humans of little or no use to us which are also found in lower species and are useful to them:

#4. “He who rejects with some scorn the belief that the shape of his own canines, and their occasional great development in other men, are due to our early forefathers having been provided with these formidable weapons, he will unconsciously retract his “snarling muscles” so as to expose them for action, like a dog prepared to fight.”

Chapter 3 he compares the Mental Powers of Man and the Lower Animals. The love of a dog for his master is notorious: as an old writer quaintly says, “A dog is the only thing on this earth that loves you more than he loves himself.”

In the agony of death a dog has been known to caress his master, and every one has heard of the dog suffering under vivisection, who licked the hand of the operator; this man, unless the operation was fully justified by an increase of our knowledge, or unless he had a heart of stone, must have felt remorse to the last hour of his life.

#5.”It may be freely admitted that no animal is self-conscious, if by this term it is implied, that he reflects on such points, as when he comes or whither he will go, or what is life and death...On the other hand...how little can the hard-worked wife of a degraded Australian savage, who uses very few abstract words, and cannot count above four, exert her self-consciousness, or reflect on the nature of her own existence.”

Darwin discusses Belief in God and religion and says:— There is no evidence that man was aboriginally endowed with the ennobling believe in the existence of an Omnipotent God. On the contrary there is ample evidence...that numerous races have existed and still exist, who have no idea of one or more gods, and who have no words in their language to express such an idea. The question is of course wholly distinct from that higher one: whether there exists a Creator and Ruler of the universe; and this has been answered in the affirmative by some of the highest intellects that have ever lived.

If, however, we include under the term “religion” the belief in unseen and spiritual agencies, the case is wholly different; for this seems to be universal with the less civilized races.

Darwin discusses various bad things that can be associated with religion: “Slavery, although in some way beneficial during ancient times, is a great crime; yet it was not so regarded until quite recently, even by the most civilized nations.” As barbarians do not regard the opinion of their women, wives are commonly treated as slaves.

Of celibacy he says, Chastity eminently requires self-command; therefore, it has been honoured from a very early period in the history of civilized man. As a result of this, the senseless practice of celibacy has been ranked from a remote period as a virtue.

How many absurd rules of conduct, as well as many absurd religious beliefs, have originated, we do not know: nor how it is that they have become, in all quarters of the world, so deeply impressed on the mind of men; but it is worthy of remark that a belief constantly inculcated during the early years of life, whilst the brain is impressible, appears to acquire almost the nature of an instinct; and the very essence of an instinct is that it is followed independently of reason.

Sympathy beyond the confines of man, that is humanity towards the lower animals, seems to be one of the latest moral acquisitions. The virtue, one of the noblest with which man is endowed, seems to arise incidentally from our sympathies becoming more tender and more widely diffused, until they are extended to all sentient beings.

In Chapter 5: On the development of the intellectual and moral faculties during primeval and medieval times: includes many citations of Galton and a description of a human evolutionary trends which might make eugenics seem like a good idea. I will return to the later. He regularly cites Wallace, the man whose own work on evolution pushed Darwin into publishing *The Origin of the Species*:

#6. "Mr. Wallace ... argues that man after he had partially acquired those intellectual and moral faculties that distinguish him from the lower animals, would have been little liable to bodily modifications through natural selection or any other means. For man is enabled through his mental faculties "to keep with an unchanged body in harmony with the changing universe."

He has great power of adapting his habits to new conditions of life. He invents weapons, tools and various stratagems to procure food and to defend himself."

The earliest progenitor of man must have been covered with hair, both sexes having beards; their ears were probably pointed, and capable of movement; and their bodies were provided with a tail, having the proper muscles. Their limbs and bodies were also acted on by many muscles which now only occasionally reappear, but are normally present in *Quadrupana*.

Chapter 7: On the races of man: Darwin discusses the question of "so-called races" and speculates whether human groups are species, sub-species or races and finally but not strongly suggests that sub-species might be the right answer. Darwin believed, as did many at the time, in the extinction of the savage races. Darwin talks briefly about the ratio of male versus female births, find the excess of males a sign of decline which astonished me but completely reverses himself later in the book.(see quote below) Darwin talks about possible explanations for the colour of different races. He still thinks the possibility that exposure to the sun may lead to colour change worth considering and then dismissing. He also discusses possible immunity to certain diseases. He discusses "correlated development", how one physical characteristic seems to be associated with another. He quotes at length from F.R.S. Huxley who goes to some lengths to show the close relationship between the ape brain and the human brain, far closer than, for example, the relationship between ape and monkey brains.

Although the existing races of man differ in many respects, as in colour, hair, shape of skull, proportions of the body, &c, yet if their whole structure be taken into consideration they are found to resemble each other closely on a multiple of points. Many of these are of so unimportant or so singular a nature, that it is extremely improbable that they should have been independently acquired...The same ... holds good with equal or greater force with respect to the numerous points of mental similarity between the most distinct races of man.

Darwin believed the American aborigines, Negroes and Europeans are as different from each other in mind as any three races that can be named; “yet I was incessantly struck, whilst living with the Feugians on board the Beagle, with how similar their minds were to ours; and so it was with a full-blooded negro with whom I happened once to be intimate.”

Monogenists believe that all humans had one common ancestor while polygenists believed that the different races might each have had its own ancestor. Your speaker finds this discussion rather silly. Darwin wrote: Finally, we may conclude that when the principle of evolution is generally accepted, as it surely will be before long, the dispute between the monogenists and the polygenists will die a silent and unobserved death.

Turning to the topic that makes up the second half of the title, Darwin writes: I do not intend to assert that sexual selection will account for all the differences between the races. He concludes the chapter with this quote from Huxley: ...the brain of a human foetus, at the fifth month, may correctly be said to be, not only the brain of an ape, but that of an arctopithicene or marmoset-like ape...

The book now leaves humanity for a discussion of animals in general.

In Chapter 8: Principles of Sexual Selection, he begins a general discussion of differences between sexes in various species. He reverses his earlier statement about the numerical relation between the sexes, now saying that male births usually slightly outnumber female which is what contemporary stats usually show and gives the same explanation that's usually given now, namely that males are slightly more likely to die than females. Certain women tend to produce more children of one sex or the other—inherited tendency.—infanticide may account for disproportionate numbers of males in some societies

Males struggle with each other in competition for mates. Females choose the most attractive males to mate with. The male is more eager for sex and this eagerness leads to developing more secondary sexual characteristics. It is probable that the ornaments common to both sexes were acquired by one sex, generally the male, and then transmitted to the offspring of both sexes. Darwin points out that the Laws of inheritance are extremely complex and many exceptions. Chapter IX: Secondary Sexual Characteristics in the Lower Classes of Animal Kingdom Sometimes the beautiful colours of animals (or deciduous trees) are of zero reproductive advantage. The cast-off arms on certain cephalopods must be classed primary sexual characteristic; these limbs act like a separate animal. In crustaceans, sexes can be different but because of this may be because of “wildly different habits of life”. One species of crustacean has 2 distinct male forms one with more scent threads, the other with a large grasping arm. However, in quite low orders, males and females who've paired off can recognize each other

Darwin speculates that spider males may become small to elude the female; reversing the usual order of things, one species of female has prehensile appendage at the extreme end of her body for holding the male.

Chapter X: Secondary Sexual Characteristics of Insects

Male and female insects differ “But we are chiefly concerned with the structures by which one male is enabled to conquer another, either in battle or courtship, through his strength, pugnacity, ornaments or music.” He quotes B.D. Walsh: #7. **“It is astonishing how many different organs are worked in by nature for the seemingly insignificant object of enabling the male to grasp the female firmly.”**

Darwin discusses a wingless, dull-coloured minute insects, with ugly, almost misshapen heads and bodies. Their sexes do not differ, but they are interesting as shewing us that the males pay sedulous court to the females even low down in the animal scale. Sir J Lubbock says,

#8 “It is very amusing to see these little creatures coquetting together. The male, which is much smaller than the female, runs round her, and they butt one another, standing face to face and moving backward and forward like two playful lambs. Then the female pretends to run away and the male runs after her with a queer appearance of anger, gets in front and stands facing her again; then she turns coyly round, but he, quicker and more active, scuttles round too, and seems to whip her with his antennae: then for a bit they stand face to face, play with their antennae and seem to be all in all to one another.”

Similarly about a fish species: **#9“Thus the male stickleback has been described as ‘mad with delight’ when the female comes out of her hiding-place and surveys the nest he has prepared for her. ‘He darts round her in every direction, then to his accumulated material for the nest, then back again in an instant; and as she does not advance he endeavours to push her with his snout and then tries to pull her by the tail and then side-spine to the nest.’”**

Darwin discusses many examples of courting style, males that prepare nests-some males look after eggs, young; some hold eggs in their mouths until they hatch. Male sticklebacks have to protect their young from female sticklebacks including their mother

Females never spawn except in the presence of males; males never fertilize the ova except in the presence of the female. Fish have some sound-producing capability developed by natural selection.

And regarding amphibians, I cannot resist this quote: **#11.“It is surprising that these animals have not acquired more strongly marked sexual characters, for though cold-blooded their passions are strong.”**

But there is one interesting difference: the musical powers possessed by the males.

Reptiles: Tortoises and Turtles do not offer well-marked sexual differences. Some slight differences in the shell are related to mating. The male of the Galapagos giant turtle is bigger than the female During mating season only some males utter a hoarse bellowing sound. In some species the males do engage in combat.

Crocodillia: In these species no colour differences are known, but many fight, some produce a musky odour

: Snakes. Males always smaller than females Males can be distinguished from females by colour. One Indian snake the male is green, the female bronze in colour. In many species the young snakes differ in colour from the adults. During breeding season the anal scent gland is active. Noises produced by snakes, including the rattle snake’s rattle, used to attract mates

12. “Male snakes are very amorous.”

Lizards

The males of many species fight. The males of some, probably many kinds of lizard fight together. Thus one tree-dwelling species in South America: **#13“During the spring and early part of summer, two adult males rarely meet without a contest. On first seeing each other, they nod their heads up and down three or four times, as at the same time expanding the frill or pouch beneath the throat; their eyes glisten with rage, and after waving their tails from side to side for a few seconds, as if to gather energy, they dart at each other furiously, rolling over and over, and holding firmly with their teeth...The conflict generally ends in one of the combatants losing his tail, which is often devoured by the victor.”**

Males are usually larger than females. The sexes differ greatly in various external characteristics. Chameleons exhibit the acme of difference between the sexes; in one species the male has 3 horns.

Now we come to the group in which secondary sexual characteristics really fly!

#14 “Male birds sometimes...possess special weapons for fighting with each other. They charm the female by vocal or instrumental music of the most varied kinds. They are augmented by all sorts of wattles, protuberances, horns, air-distended sacks, top-knots, naked shafts, plumes and lengthened feathers gracefully springing from all parts of the body. The beak and naked skin above the head, and the feathers, are often gorgeously coloured. The males sometimes pay their court by dancing, or by fantastic antics performed either on the ground or in the air. In one instance, at least, the male emits a musky odour, which we may suppose serves to attract or excite the female...On the whole, birds appear to be the most aesthetic of all animals, excepting, of course, man, and they have the same taste for the beautiful that we have.”

Law of Battle: Although almost all birds are pugnacious, some birds never fight. Some males bigger than females but some females are bigger than males and in some cases females fight for possession of males. “the season of love is that of battle:

#15. “When many males congregate at the same appointed spot and fight together, as in the case of grouse and various other birds, they are generally attended by females which afterwards pair with the victorious combatants. But in some cases the pairing precedes instead of succeeding the combat; thus, according to Audubon, several males of the Virginian goat-sucker ‘court, in a highly entertaining manner the female, and no sooner has she made her choice, than her approved gives chase to all intruders and drives them beyond on his dominions.’”

It does not, however appear that the females invariably prefer the victorious males. The female capercaillie sometimes steals away with a young male who has not dared to enter the arena.

Darwin, of course, talks about the importance of music, both vocal and instrumental in some species of birds. These males do not seek females but use songs to attract them.

The females of some species possess the power of song. Male birds continue singing for their own pleasure when the season of courtship is over. It is mainly small birds that have the power of song. With the common duck, the male hisses, the female quacks. Other bird: practice instrumental music, peacocks and birds of paradise rattle their quills, turkey cocks scrape their wings against the ground, the North American grouse drums by striking his wings above his head, the African black weavers, the males make a whirring when it flies during courtship, Some male birds make noise with beaks pounding on rocks or wood. There are a remarkable number of diverse sounds produced by birds during mating season.

#16 “Even with man, we should remember what discordant noises, the beating of tom-toms and the shrill notes of reeds, please the ears of savages. Sir S. Baker remarks that ‘as the stomach of the Arab prefers the raw meat and reeking liver taken hot from the animal, so does his ear prefer equally coarse and discordant music to all other.’”

Bright colours and the power of song seem to replace each other. In addition there are extraordinary appendages, air sacs, crests, top knots, plumes, complex vocal organs, differing in various degrees between males and females. These Decorations, Plume, various shaped feathers, ear tufts, heads covered in velvety down, necks ornamented with beards, wattles or coruncles vary from being found only on males to being found to a lesser extent on females to being the

same in both males and females. There are an enormous variety of different kinds of feathers, on head, wing, tail.

All birds replace their juvenile feathers, that is moult, but there are in every group of birds species with single or double moults. Usually in species with a double replacement, they have different feathers for the mating season. Even plain birds may change colour of feather in mating season. Some birds of paradise retain their nuptial feathers, other lose them after moult.

Darwin was particularly impressed with the Angus pheasant, I suggest you look it up on-line you will be just as impressed.: #17**“Many will declare that it is utterly incredible that a female bird should be able to appreciate fine shading and exquisite patterns. It is undoubtedly a marvellous fact that she should possess the almost human degree of taste. He who thinks that he can safely gauge the discrimination and taste of the lower animals may deny that the female Angus pheasant can appreciate such refined beauty; but he will then be compelled to deny that the extraordinary attitudes assumed by the male during the act of courtship, by which the wonderful beauty of his plumage is so fully displayed, are purposeless; and this is a conclusion which I for one will never admit.”**

In several different places in this section Darwin points out that the ornaments seem to be detrimental to adaptation to ordinary survival which is the whole point of sexual selection in evolution. #18.**“The various ornaments possessed by the males are certainly of the highest importance to them, for in some cases they have been acquired at the expense of greatly impeded powers of flight or of running.”** Colourful or ornamented male birds harder to approach, shyer than plain females and plain males.

Chapter XIV continues with the subject of Birds .

#19. **“When the sexes differ in beauty or in the singing, or in producing what I have called instrumental music, it is almost invariably the male who surpasses the female. These qualities are evidently of high importance to the male. When they are gained for only a part of the year it is always the breeding-season. It is the male alone who elaborately displays his varied attractions, and often performs strange antics on the ground or in the air, in the presence of females. Each male drives away, or if he can, kills his rivals. Hence we may conclude that it is the object of the male to induce the female to pair with him, and for this purpose he tries to excite or charm her in various ways.”**

Darwin returns to an important subject which is near the essence of sexual selection. “...does every male of the same species excite and attract the female equally? Or does she exert a choice and prefer certain mates? This latter question can be answered in the affirmative.”

In some species the male birds gather at places called leks where they show off their stuff for the females. Some of these birds are polygamous :#20.”**...it might have been thought that stronger males would simply have driven away the weaker, and then at once have taken possession of as many females as possible, but if it be indispensable for the male to excite or please the female, we can understand the length of courtship and the congregation of so many individuals at the same spot. Certain strictly monogamous species also hold nuptial assemblages.”**

Darwin often tells us interesting facts without trying to or being able to explain them. For example in 19th century England gamekeepers killed male magpies in great numbers because their courtship method made them vulnerable; the females were much more difficult to find and kill. It seems the killed males were quickly replaced by new mates. Females find new mates sometimes several times, sometimes on the same day. Female jays and falcons also replace mates

easily. When a caged finch's pair-male dies, another wild finch male was seen near the cage although the widow only has a barely audible song. Darwin asks the question are there more males than females? He makes no attempt to answer it. Nor do I know the answer.

#21. "as the courtship of birds appears to be in many cases long and tedious, so it occasionally happens that certain males and females do not succeed, during the proper season, in exciting each other's love, and consequently do not pair."

The main objection to the theory of sexual selection is that the lower animals lack the Mental Qualities or the taste for the Beautiful found in man in order to make these choices. **#22"Low powers of reasoning, however, are compatible, as we see with mankind, with strong affections, acute perception and a taste for the beautiful..."**

Birds have benevolent feeling and will feed adults of their species that became blind and there are cases of when they cared for birds of other species. Parrots exhibit curiosity and have good memories: birds recognize their young and mates and have been proven able to recognize individual humans and can distinguish their owner's pets from strange dogs and cats"

Bower birds are best evidence of taste for the beautiful. If you don't know about bower birds I again suggest you go on-line because they're both astonishing and fascinating.

Darwin discusses Preference for particular males by the Females. Darwin took a great interest in pigeon breeding and in *Origin of the Species* used information he gained from this to help prove evolution. Distinct species of birds occasionally breed in the wild and produce hybrids Ordinary pigeons prefer ordinary pigeons and drive away the improved breeds/
#23."A female pigeon will occasionally take a strong fancy for a particular male, and will desert her own mate for him. Some females are of a profligate disposition and prefer almost any stranger to their own mate. Some amorous males, called by our English fanciers "gay birds," are so successful in their gallantries, that, they must be shut up on account of the mischief they cause."

Males may lose their attraction when their ornaments are spoiled. Female birds occasionally court the male and even fight for his possession-in pea fowls, the female always makes the first advances

It was commonly believed that male birds (like other males) would breed with any females but there is some contrary evidence. The domestic cock prefers the younger to the older hens. "In all ordinary cases the male is so eager he will accept any female, and does not prefer one to the other; but exceptions to this occur in certain groups.

Variability of Birds, and especially of their secondary Sexual characters:

Colour vary gradually as you move across large land masses and differences are also seen on islands. In many species there are differences in eyes

#24."...we ought to be cautious in assume that knobs and various fleshy appendages cannot be attractive to females, when we remember that with savage races of man various hideous deformations—deep scars on the face with the flesh raised into protuberances, the septum of the nose pierced with sticks or bones, holes in the ears and lips stretched widely open—are all admired as ornamental."

Darwin devotes a few pages to the formation and variability of the Ocelli or eye-like spots on the plumage of birds and suggests that the eyespots on butterfly wings, peacock tails, etc. probably would have been acquired gradually

In the *Origin of the Species* Darwin had speculated that female birds such as peahens had not acquired the same ornaments as the male because the peacock's tail would be dangerous during

incubation of eggs, stopping transmission of this to the female by natural selection but has changed his mind and now thinks changes mostly remained in the sexes in which they first appeared

At this point Darwin says that the next section consisted of “a tedious discussion” on how characteristics are developed by bird breeders” and suggested that any reader with no compelling interest in this should skip it. I took him at his word. In the following section he discusses why in the wild females might have not developed some of the male ornaments. There is some evidence that spurs on females disturb the nest and would be eliminated. In most cases vocal ability is limited to males not because it might attract predators to the females but because it is of special use only to the males

: #25. “But if the development of the tail of the peahen had been checked only when it became inconveniently or dangerously great, she would have retained a much longer tail than she actually possesses...if it were consequently checked, she would have continually reacted on her male progeny, and thus have prevented the peacock from acquiring his present magnificent train.”

Those who heard my talk on *The Origin of the Species* will no doubt recall that Darwin was forced to publish that book because Wallace was about to publish his own version of natural selection. In *Descent of Man* Darwin often cites Wallace but rarely agrees with him. Wallace’s argument: #26. **“He believes that the bright tints originally acquired through sexual selection by the males would in all, or almost all cases, have been transmitted to the females, unless the transference had been checked through natural selection. .. Mr. Wallace rests his belief chiefly, but not exclusively, on the following statement: that when both sexes are coloured in a very conspicuous manner, the nest is of such a nature as to conceal the sitting bird, but where there is a marked contrast of colour between the sexes, the male being gay and the female dull-coloured, the nest is open and exposes the sitting bird to view.”**

Darwin disagrees because of the following: Some species in which the male helps incubate the eggs even though the male is much more brightly coloured than the female. The male house sparrow differs from the female while the male tree sparrow hardly differs at all but both build well-concealed nests. There are also examples of birds in which male & females are different but both equally conspicuous. Most birds that build nests in holes are beautiful, although the male is always finer than the female. Birds in which male and female indistinguishable include most species, also woodpeckers

Ch. XVI Birds cont.

Adults & young differ in colours, plumes. Darwin suggests that plumage of the young is probably the retention of a former character, that tells us what the progenitor of the various closely related species probably looked like. The young of several species resemble each other closely & resemble adults of other species

#27. “Young lions and pumas are marked with feeble stripes or rows of spots, and as many allied species both young and old are similarly marked...no believer in evolution will doubt that the progenitor of lions and pumas was a striped animal...The same principle applies to many birds belonging to various groups...the immature plumage approximately shows us the former or ancestral condition of the species.”

In other cases the young closely resemble the adults although the colours are usually less vivid and the feathers softer. I’m going to skip over the

RULES OF CLASSES OF CASES but left it in my paper in case anyone is interested.

I: when adult male more beautiful than female, the young resemble the female

II: in the rare cases where the female more conspicuous than the male, the young resemble the male

III: when adult males resemble females, young have own peculiar plumage (eg. robin)

IV: when adult male resemble the female, young are similar to adults (kingfishers, parrots, crows)

V: when adults have distinct summer & winter plumage so do young

VI: In some cases the young differ in their first plumage according to sex but usually much less than the adults differ

The fact that when males and females differ, the young usually resemble the female, leads to the conclusion that only the male has been altered. In many closely related species change can be observed in closely allied species found in different areas; in some cases two species can only be distinguished from one another in their summer or nuptial plumage. Darwin suggests that changes caused by moving to new environment will provide choices for the female in sexual selection. Although it is usually the males of two related species that differ most there are rare examples in which it is the female that differs. No instances female dull and the young bright-coloured with the partial exception of some young woodpeckers. Where the adult female is more conspicuous than the adult male, the young of both sexes resemble the male: rare and difference not so great.

In the Tunix, quail-like birds, the females are bigger than male, noisier and more pugnacious; they are kept for fighting by natives; after laying eggs, they associate in flocks and leave the incubation and care of the young to the males. Similar situations exist in some species of painted snipe, dotted plover and the ostrich group. Only the male cassowary sits on the eggs and takes care of the young

#28 “The male has a slenderer frame and is more docile with no voice beyond a suppressed hiss. He not only performs the whole duty of incubation, but he must defend the young from their mother, for as soon as she catches sight of her progeny she becomes violently agitated, and notwithstanding the efforts of the father uses her utmost endeavours to destroy them. For months afterwards it is unsafe to put the parents together, violent quarrels being the inevitable result, in which the female generally comes out the conqueror. So with this emu we have a complete reversal not only of the parental and incubating instincts, but of the usual moral qualities of the two sexes: the female being savage, quarrelsome, and noisy; the males gentle and good.” There is some evidence such females drive away rival females and leave selection to the males.

There is a discussion of the role of protection as an explanation for difference in colour, etc. Wallace arguing for this; Darwin not convinced

When the adult male resembles the female, the young of both sexes resemble the adults: e.g. kingfishers, woodpeckers, jays, magpies, crows—similarity never complete and changes to some dissimilarity. In species such as parakeets—in one species the young resemble the adults, in another they don't.

#29. “Both sexes and the young of the common jay are closely similar; but in the Canada jay, the young differ so much from their parents that they were formerly described as distinct species.”

When adults of both sexes have distinct winter and summer plumage, whether or not the males differs from the female, the young resemble the adults in their winter dress or much more rarely in their summer dress, or they resemble the females alone or the young may have an intermediate character in both their seasonal plumage

The young in their first plumage differ from each other according to sex, young males more or less resemble the adults: mocking bird, forest and rock thrushes, some hummingbirds. Adults are mostly more brightly-coloured than the young; the appearance of the young may give an idea of progenitor's appearance, but in one species the young of are white and conspicuous, adults dull.

#30. "Many of the soft-billed birds are songsters; and a discussion in a former chapter should not be forgotten, in which it was shown that the best songsters are rarely ornamented in the brightest tints. It would appear that female birds, as a general rule, have selected their mates for their sweet voices or gay colours but not for both."

Aquatic birds have acquired white plumage so much oftener than terrestrial birds probably because their size, strength and powers of flight allow them to escape birds of prey. In the same group of species exist white, black and piebald species

#31. "It would even appear that mere novelty, or slight changes for the sake of change, have sometimes acted on female birds as a charm, like changes of fashion with us. Males of most species can be distinguished from males of the same species quite easily while the females are mostly indistinguishable from other females."

Darwin writes: "Several writers have objected to the whole theory of sexual selection, by assuming that animals and savages the taste of the female for certain colour or other ornamentals would not remain constant for many generations; that first one colour and then another would be admired, and consequently that no permanent effect could be produced. We may admit that taste is fluctuating, but is not quite arbitrary. It depends much on habit, as we can see in mankind; and we may infer that this would hold good with birds and other animals. Even in our own dress, the general character lasts long, and the changes are to a certain extent graduated. Abundant evidence will be given in two places in a future chapter, that savages of many races have admired for many generations the same cicatrices on the skin, the same hideously perforated lips, nostrils, or ears, distorted heads, etc.; and these deformities present some analogy to the natural ornaments of various animals."

]

Ch. XVII Secondary Sexual Characteristics of Mammals

#32. "With mammals the male appears to win the female much more through the law of battle than through the display of charms. The most timid animals, not provided with any special weapons for fighting, engage in desperate conflicts during the season of love. Two male hares have been seen to fight together until one is killed; male moles often fight and sometimes with fatal results..."

The law of battle prevails with aquatic as well as terrestrial animals. Mammals are furnished with special weapons: stags, elephants in musk-ox, stallions, antelopes, dugongs and others...

#33. "When the males are provided with weapons which in the females are absent, there can be hardly a doubt that these serve for fighting with other males; and they were acquired through sexual selection, and were transmitted to the male sex alone."

Female reindeer may appear hornless after giving birth; the males lose theirs earlier. Primordial species was surely hornless; fossil skull without horns of female of a species in which the females now have horns has been found. This reminds us of how few fossils had been discovered by the times Darwin wrote *Descent of Man*. The presence or absence of horns is not because of their usefulness but inheritance. In all wild species of sheep and goats, the horns are

larger in the males than the females and are sometimes absent in the latter—male horns are more developed at birth

#34. “We may infer as probable that horns of all kinds, even when they are equally developed in the two sexes, were primarily acquired by the male in order to conquer other males, and have been transferred more or less completely to the female.”

Darwin discussed the effects of castration; mainly it reduces or eliminates horns; in one species the castrated animal develops shaped like the horns female have in that species

:#35. “Although tusks and horns appear in all cases to have been primarily developed as sexual weapons, they often serve other purposes. The elephant uses his tusks to attack the tiger; he scores the trunks of trees until they can be thrown down easily; and he likewise extracts the farinaceous cores of palms...when the male wild goat of the Himalayas accidentally falls from a height he bends inwards his head, and by alighting on his massive horns, breaks the shock.”

Horns, antlers, fangs exclusively possessed by males may have a secondary sexual function. The antlers of stags are not efficient weapons; they may be ornamental.

Male quadrupeds furnished with tusks include walrus, elephants and wild boars. Male muntdeer have horns and exerted canine teeth, but in ruminants, the development of horns generally stands in an inverse relation with teeth; camels, guanacos, chevrotans, musk deer, which are hornless, have efficient teeth. Boars fight but seldom receive fatal wounds—blows fall on “shield”, a part adapted for defence; pig weapons were provided late in geologic time Boars tusks curve in such a way in older age to make them only useful for defence. These adornments represent a great investment to their possessors.

With mammals where, as is often the case, sexes differ in size, it is almost always the male that is larger and stronger. This is true of marsupials of Australia which continue to grow to a surprisingly late age. The most extraordinary example is one species of seal in which the female is one-sixth the size of the male. The polygamous species the males are larger than the females and fight a lot. The monogamous males do not fight as much and are near the females in size. Whales that fight are larger. The right whale, which does not fight, is smaller than the female right whale. Male quadrupeds are more pugnacious and courageous than the females.

#36 “There can be little doubt that these characters have been gained partly through sexual selection, owing to a long series of victories, by the stronger and more courageous males over the weaker.”

The mane of the male lion is a good defence against attacking by rival lions. The ruff of male lynx larger than female’s. Certain male seals have manes. The male Cape of Good Hope baboons have manes & large canines. Stallions have thicker manes than the mares

Now turning to a rather more interesting subject:

Choice in Pairing for either sex of quadrupeds

#37. “Does the female prefer any particular male, either before or after the males may have fought together for supremacy; or does the male, when not a polygamist, select any particular female? The general impression among breeders seems to be that the male accepts any female; and this owing to his eagerness, is, in most cases, probably the truth. Whether the female as a general rule accepts any mate is much more doubtful. In the fourteenth chapter, on birds, a considerable body of direct and indirect evidence was advanced, showing that the female selects her partner; and it would be a strange anomaly if female quadrupeds which stand much higher in the scale and have higher mental powers, did not generally, or at least often, exert some choice.”

Darwin quotes dog-breeder Mr. Mayhew remarks: 'he females are able to bestow their affections... Bitches are not always prudent in their loves but are apt to throw themselves away on curs of low degree.' the male, on the contrary, is rather inclined toward strange females."

#38. "it is improbable that the unions of quadrupeds in a state of nature should be left to mere chance. It is much more probable that the females are allured or excited by particular males, who possess certain character in a higher degree than other males; but what these characters are, we can seldom or never discover with certainty."

XVIII Secondary Sexual characters of Mammals—continued

Quadruped voices used for many purposes but in this book Darwin is only interested in differences between sexes, such lion v lioness, bull v cow. Almost all males use their voices more during rutting season. The throats of stags are enlarged during rutting season—young stags under three do not rear or bellow. Their combat is preceded by bellowing but they do not vocalize during actual fighting.

#39. "No doubt stags challenge each other to mortal combat by bellowing; ;but those with more powerful voices, unless at the same time the stronger, better-armed, and more courageous, would not gain any advantage over their rivals."

However there is no sign bellowing attracts female; they do not look for the males; the males eagerly look for them."

The voice of adult male gorilla is tremendous; gibbons among the noisiest and the Sumatran species has an air-sack but the male is no noisier than the female; it's used as a mutual call as does the beaver

:#40 "Another gibbon is remarkable, from having the power of giving a complete and correct octave of musical notes, which we may reasonably suspect serves as a sexual charm."

"The nose of the male sea-elephant becomes greatly elongated during the breeding season, and can then be erected. In another allied kind of seal, the bladder-nose, the head is covered by a great hood or bladder. The hood is clothed with short hair, and is muscular; it can be inflated until it more than equals the whole head in size! The males when rutting fight fiercely on the ice and their roaring 'is said to be sometimes so loud as to be heard four miles away.' The hood is rudimentary in the females."

Odour-animals like skunk, shrew-mice have bad smell for protection with glands same size in both sexes. In others confined to the male & almost always become more active during mating season. Rankness of the male goat & certain male deer – some can be smelled a km away. The young don't produce the smell nor do circumcised males. Some antelopes produce odour in tear-sacks on the face

#41. "In most cases, when only the male emits a strong odour during the breeding-season, it probably serves to excite or allure the female. If the most odoriferous males are the most successful in winning the females, and in leaving offspring to inherit their gradually perfected glands and odours."

Development of the Hair

Male quadrupeds often have hair on heads & necks more developed than females-more likely a result of sexual selection than an otherwise useful feature Males of many kinds have more hair or hair of a different characters on parts of their faces—some goats, rudiments, in the ibex, in some monkeys, the orang, or the beard is much larger in the male but with most monkeys the various facial tufts are more or less the same in both sexes—these are true secondary sexual

characteristics. The mane that develops in one African sheep breed does not develop if the animal is castrated

Colour of the hairs and of the naked skin: Among marsupials, the great red kangaroo, male red, female blue. Difference between sexes include some African squirrels, one Russian mouse and some bats—the males are always brighter, more colourful than the females. Such differences are rare in terrestrial carnivores and insectivores, the ocelot being an exception. Seals are often different in colour; the young are also different in colour from the adults

551-differences in colour between the male and female adults is most common in the ruminants including particularly antelopes—the Indian bull-buck, the male is black and the female fawn-coloured, the males darkening in shade during mating season, the young are indistinguishable

The Antelope niger, the male is black and the female and young brown. Similarly in the banding bull of the Malaysian peninsula the female is dun and so the male until age three when he turns black; the emasculated bull reverts to dun. Deer rarely exhibit much difference but in the wapiti the chest and legs of the male darken during the breeding season

Among Primates, the male lemur is black, female brown—many other similar examples among both New and Old world monkeys. Some baboon males have significant difference from females in colour of both hair and on bare skin

#42. “In all cases hitherto given the male is more strongly or brightly coloured than the female, and differs from the young of both sexes. But it is the female which is brighter coloured in the rhesus monkey. She has a large surface of naked skin round the tail, of a brilliant carmine red, which periodically becomes yet more vivid, and her face is also pale red. The male, on the other hand, and in the young, has neither on the naked skin on the posterior end of the body, nor on the face, a trace of red.”

Colours do seem to matter to quadrupeds

#43. “African elephants and rhinoceros attacked white or grey horses with special fury. I have elsewhere shewn that half-wild horses apparently prefer to pair with those of the same colours. It is a more significant fact that a female zebra would not admit the advances of a male ass until he was painted so as to resemble a zebra, and then, as John Hunter remarks, ‘she received him very readily. But the male did not require this, the female being an animal somewhat similar to himself was sufficient to rouse him.’”

#44. “As the negro in Africa raises the flesh on his face into parallel ridges ‘or cicatrices high about the natural surface, which unsightly deformities are considered great person attractions’—as negroes and savages in many parts of the world paint their faces with red, blue, white, or blue bars,—so the male mandrill of Africa appears to have acquired his deeply-furrowed and gaudily coloured face from having been thus rendered attractive to the female.”

“No doubt it is to us a most grotesque notion that the posterior end of the body should be coloured for the sake of ornament even more brilliantly than the face; but this is not more strange than that the tails of many birds should be especially ornamented.” With mammals we do not at present possess any evidence that the males take pains to display their charms before the female: and the elaborate manner in which this is performed by male birds and other animals is the strongest argument in favour of the belief that females admire, or are excited by, the ornaments and colours displayed before them. There is, however, a striking parallelism between mammals and birds ... and considering this there can be little doubt that the same cause has acted on both mammals and birds; and the result, as far as ornamental characters are concerned, may be

attributed, as it appears to me, to the long-continue preference of the individuals of one sex for certain individuals of the opposite sex

Equal transmission of ornamental character to both sexes

Among mammals, the use of colouration for protection is not as common as in lower orders. The muskrat looks like clod of earth but rabbits' turned-up tail gives it away

Of course the white coats of Arctic animals suggests protection against predators or for predators sneaking up on their prey. Of course, skunks' white tails serves as a warning.

But more conspicuous colours and markings acquired through sexual selection.

#45. "After having studied to the best of my ability the sexual differences of animals belonging to all classes, I cannot avoid the conclusion that the curiously-arranged colours of many antelopes, though common to both sexes, are the result of sexual selection primarily applied to the male."

Part Three: Sexual Selection in Relation to Man and Conclusion

Chapter XIX: Secondary Sexual Characters of Man

"With mankind the differences between the sexes are greater than in most of the Quadrumana, but not so great as in some, for instance, the mandrill. Man on an average is considerably taller, heavier, and stronger than woman with squarer shoulders and more plainly pronounced muscles. Owing to the relation which exists between muscular development and the projection of the brows, the superciliary ridge is generally more marked in man than in woman. His body, and especially his face, is more hairy, and his voice has a different and more powerful tone. In certain races the women are said to differ slightly in tint from the men."

#46. "Man is more courageous, pugnacious and energetic than woman, and has a more inventive genius. His brain is absolutely larger, but whether or not proportionately to his larger body, has not, I believe, been fully ascertained. In woman the face is rounder; the jaws and the base of the skull smaller; the outlines of the body rounder, in parts more prominent; and her pelvis is broader than in the man; but this latter character may perhaps be considered a primary rather than a secondary sexual character. She comes to maturity at an earlier age than a man."

As with animals of all classes, so with man, the distinctive characters of the male sex are not fully developed until he is nearly mature; and if emasculated they never appear. Male and female children resemble each other closely.

Some of the species of Quadrumana, certain baboons, gorillas and oranges, the difference between males and females is greater than between men and women. All the secondary sexual characters of humans are highly variable even within the races—males differ more from males of other races than they do from females. This fact indicates that as to this characteristic is concerned, it is the males that has chiefly been modified, since the several races diverged from their common stock Growth of the beard and body hairs differs in various populations

Darwin suggests that when it comes to sex, the law of battle applies: the strongest man usually gets the woman. As man became more upright and fought with sticks and stones, male teeth became smaller and the difference between male and female teeth disappeared

#47. "There can be little doubt that the greater size and strength of man, in comparison with woman, together with his broader shoulders, more developed muscles, rugged outline of body, his greater courage and pugnacity, are all due in chief part to inheritance from the half-human male ancestors. "

. “It is not probable that the greater strength of man was primarily acquired through the inherited effects of his having worked harder than woman for his own subsistence and that of his family, for the women in all barbarous nations are compelled to work at least as hard as the men. With civilized people the arbitrament of battle for the possession of women has long ceased; on the other hand, the men, as a general rule, have to work harder than the women for their joint subsistence, and thus their greater strength will have been kept up.”

P 566 *Difference in the Mental Powers of the two Sexes*

#48. “With respect to the differences of this nature between men and women, it is probable that sexual selection has played a highly important part. I am aware that some writers doubt whether there is any such inherent difference; but this at least probable from the analogy of the lower animals which present other secondary sexual characters.”

“Man is the rival of other men: he delights in competition, and this leads to ambition which passes too easily to selfishness. These latter qualities seem to be his natural and unfortunate birthright. It is generally admitted that with woman the powers of intuition, of rapid perception, and perhaps of imitation, are more strongly marked than in man; but some, at least, of these faculties are characteristic of the lower races, and therefore of a past and lower state of civilisation.”

#49 “Woman seems to differ from man in mental disposition, chiefly in her greater tenderness and less selfishness; and this holds good even with savages.”

Males have acquired higher mental faculties by the necessities of defending his family and following the general principles this higher intelligence would have been passed on mainly to males

#50. “If two lists were made of the most eminent men and women in poetry, painting, sculpture, music, history, science, and philosophy, with half-a-dozen names under each subject, the two lists would bear no comparison. We can infer...that if men are capable of a decided pre-eminence over women in many subject, the average of mental power in man must be above that of women.”

#51. “It is indeed fortunate that the law of equal transmission of characters to both sexes prevails with mammals; otherwise, it is probable that man would have become as superior in mental endowment to woman, as the peacock is in ornamental plumage to the peahen.”

Darwin discusses the *Sounds emitted by animals* He suggests the vocal instruments were primarily for the propagation of the species. “All air-breathing Vertabrata, necessarily possess an apparatus for inhaling and expelling air, with a pipe capable of being closed at one end. Purposeless noises would almost certainly have been produced; and these, if they proved in any way serviceable, might readily have been modified or intensified by the preservation of properly adapted variations.” One species of gibbon has an extremely loud but musical voice which it may use to attract females.

#52. “This is not the only species in the genus which sings, for my son, Francis Darwin, attentively listened in the Zoological Garden to another whilst singing a cadence of three notes, in true musical intervals and with a clear musical tone.”

An ear capable of discriminating noises—and the high importance of this power is admitted by everyone—must be sensitive to musical notes. “As musical notes are useless to man in reference to his daily habits of life, they must rank as among the most mysterious with which he is endowed. Yet they are present in men of all ages, even the most savage; but so different is the

taste of the several races, that our music gives no pleasure to savages and their music is to us hideous and unmeaning.”

#53. “Poetry, which may be considered as the offspring of song, is likewise so ancient, that many persons have felt astonished that it should have arisen during the earliest age of which we have any record.”

“Music arouses in us various emotions, but not the more terrible ones of horror, fear and rage. It awakens in us the gentle feelings of tenderness and love, which readily pass into devotion. In the Chinese annals it is said, ‘Music hath the power of making Heaven descend on earth.’”

#54. “Even monkeys express strong feelings in different tones—anger and impatience by low—fear and pain by high notes.”

Darwin adds “articulate speech is one of the latest, as it certainly is the highest, of the arts acquired by man and it is surely acquired from musical powers,” and suggests that musical sounds afforded a basis for language.

The males of several quadrumanous animals have their vocal organs much more developed than the females. **#55. “It appears probable that the progenitors of man, before acquiring the power of expressing their mutual love in articulate language, endeavoured to charm each other with musical notes and rhythm. Women are generally thought to possess sweeter voices than men so we may infer that they first acquired musical powers in order to attract the other sex. But if so, this must have occurred long ago, before our ancestors had become sufficiently human to treat and value their women merely as useful slaves. The impassioned orator, bard or musician, little suspects that he uses the same means by which his half-human ancestors long ago aroused each other’s ardent passions, during their courtship and rivalry.”**

The influence of Beauty in determining the Marriages of Mankind—

“In civilized life man is largely, but by no means exclusively, influenced in the choice of his wife by external appearance....If it can be proven that the men of different races prefer women having various characteristics, or conversely the women...would this produce any sensible effect on the race?”

Darwin discusses tatoos, raised protuberances, teeth colouring, body painting, reshaping of body parts, perforations, face mutilation

: #56. “Hardly any part of the body, which can be modified, has escaped. The amount of suffering that cause must have been extreme...”

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Roy Blake show details Feb 17 (2 days ago)

to John

Hi John.

Thanks. I'm hoping to get time to update both NSH and UCN websites this weekend. It certainly seems that Darwin put most of his best thoughts into his first book I read about half of that one, still meaning to finish it sometime. Maybe when I retire (just gave official notice today, I'm out June 30!)

By the way, Penny and I just got back from watching *The King's Speech*. Great film!

Roy

- Show quoted text -

On Thu, Feb 17, 2011 at 5:22 PM, John Berry <john_cberry@hotmail.com> wrote:

- Show quoted text -

Talk to Niagara Secular Humanists

February 16, 2011

On

Charles Darwin's *Descent of Man and Selection in Relation to Sex*

Introduction:

Let's start by making it clear that I'm not an expert on biology, evolution or indeed Darwin: a deeply interested but not particularly gifted amateur perhaps. My only claim to fame is that I have now actually read both Darwin's greatest work, *The Origin of the Species* and its sequel, *The Descent of Man and Selection in Relation to Sex*, something by no means all actual experts have done. Two years ago I read *The Origin of the Species* and gave a talk about it to this very group at this very place. At the time I considered reading *The Descent of Man and Selection in Relation to Sex* as well and at the same time but wisely decided against it. Now I have read it (although as you will later learn not every word of it) and tonight I'm going to talk about it.

I'm going to give you Darwin's main ideas and argument but also to give you the flavour of the book. I've read the book. After this talk, because you've listened to it, you won't have to. Two years ago I did recommend people read *Origin of the Species* but there are so many better books on evolution than *The Descent of Man and Selection in Relation to Sex* and particularly books based on more up-to-date facts. The wonderful thing about Darwin is, of course, that he came to his wonderful theory without so much information which became available only after his death and which confirms it so thoroughly. He died before the work of Gregor Mendel was widely known, before most of the major fossil discoveries, before any fossils of ancient human species were found, long before the discovery of DNA.

Darwin was, of course, a man of his times and, because of that, he had ideas about the human races that many today find difficult to hear. He held assumptions that today would be decidedly politically incorrect. Indeed many of these ideas have quite simply been proven incorrect. But in his time he was actually a progressive. The theory of scientific racism that he held was up against the then more accepted idea that the different races were actually different species. Both sides of Darwin's family, the Darwins and the Wedgewoods had been active opponents of the slave trade

and then of slavery. I'll remind any Unitarians in the crowd that the Darwins had abandoned Unitarianism because of threats of violence during the wars with revolutionary France. Darwin had known an African during his years as a student in Edinburgh and this shaped his understanding but it was also shaped enormously by his visit to Tierra del Fuego during the famous voyage of the Beagle. Based on his descriptions, the people who lived there do seem to be among the most degraded on earth.

I am going to expose you to all his ideas and views
When information is not available, Darwin will speculate.

#1. "Many of the views which have been advanced are highly speculative, and some no doubt will be proved erroneous."

Chapter 1 deals with the evidence that man descended from some lower form. Numerous rudimentary features show connections between man and many other species. Some of these features are more developed in rare individuals. Some suggestion of differences in the "darker races". Darwin cites Julian Huxley, his good friend and probably second only to Darwin at the time:

#3. "Huxley, who after asking does man originate in a different way from a dog, bird, frog or fish, says, "The reply is not doubtful for a moment: without question, the mode of origin, and the early stages of the development of man, are identical with those of the animals immediately below him in the scale: without a doubt in these respects he is far nearer to apes than the apes are to the dog."

Chapter 2 deals with how man evolved including real or imagined effects of climate and local conditions on human bodies. He makes frequent comments on different races. Effects or increased use and disuse of parts and arrests of development and reversions are suggested as possible source of adaptation. He gives many examples of features found in humans of little or no use to us which are also found in lower species and are useful to them:

#4. "He who rejects with some scorn the belief that the shape of his own canines, and their occasional great development in other men, are due to our early forefathers having been provided with these formidable weapons, he will unconsciously retract his "snarling muscles" so as to expose them for action, like a dog prepared to fight."

Chapter 3 he compares the Mental Powers of Man and the Lower Animals. The love of a dog for his master is notorious: as an old writer quaintly says, "A dog is the only thing on this earth that loves you more than he loves himself."

In the agony of death a dog has been known to caress his master, and every one has heard of the dog suffering under vivisection, who licked the hand of the operator; this man, unless the operation was fully justified by an increase of our knowledge, or unless he had a heart of stone, must have felt remorse to the last hour of his life.

#5."It may be freely admitted that no animal is self-conscious, if by this term it is implied, that he reflects on such points, as when he comes or whither he will go, or what is life and death...On the other hand...how little can the hard-worked wife of a degraded Australian savage, who uses very few abstract words, and cannot count above four, exert her self-consciousness, or reflect on the nature of her own existence."

Darwin discusses Belief in God and religion and says:— There is no evidence that man was aboriginally endowed with the ennobling believe in the existence of an Omnipotent God. On the contrary there is ample evidence....that numerous races have existed and still exist, who have no

idea of one or more gods, and who have no words in their language to express such an idea. The question is of course wholly distinct from that higher one: whether there exists a Creator and Ruler of the universe; and this has been answered in the affirmative by some of the highest intellects that have ever lived.

If, however, we include under the term “religion” the belief in unseen and spiritual agencies, the case is wholly different; for this seems to be universal with the less civilized races.

Darwin discusses various bad things that can be associated with religion: “Slavery, although in some way beneficial during ancient times, is a great crime; yet it was not so regarded until quite recently, even by the most civilized nations.” As barbarians do not regard the opinion of their women, wives are commonly treated as slaves.

Of celibacy he says, Chastity eminently requires self-command; therefore, it has been honoured from a very early period in the history of civilized man. As a result of this, the senseless practice of celibacy has been ranked from a remote period as a virtue.

How many absurd rules of conduct, as well as many absurd religious beliefs, have originated, we do not know: nor how it is that they have become, in all quarters of the world, so deeply impressed on the mind of men; but it is worthy of remark that a belief constantly inculcated during the early years of life, whilst the brain is impressible, appears to acquire almost the nature of an instinct; and the very essence of an instinct is that it is followed independently of reason.

Sympathy beyond the confines of man, that is humanity towards the lower animals, seems to be one of the latest moral acquisitions. The virtue, one of the noblest with which man is endowed, seems to arise incidentally from our sympathies becoming more tender and more widely diffused, until they are extended to all sentient beings.

In Chapter 5: On the development of the intellectual and moral faculties during primeval and medieval times: includes many citations of Galton and a description of a human evolutionary trends which might make eugenics seem like a good idea. I will return to the later. He regularly cites Wallace, the man whose own work on evolution pushed Darwin into publishing *The Origin of the Species*:

#6. “Mr. Wallace ... argues that man after he had partially acquired those intellectual and moral faculties that distinguish him from the lower animals, would have been little liable to bodily modifications through natural selection or any other means. For man is enabled through his mental faculties “to keep with an unchanged body in harmony with the changing universe.”

He has great power of adapting his habits to new conditions of life. He invents weapons, tools and various stratagems to procure food and to defend himself.”

The earliest progenitor of man must have been covered with hair, both sexes having beards; their ears were probably pointed, and capable of movement; and their bodies were provided with a tail, having the proper muscles. Their limbs and bodies were also acted on by many muscles which now only occasionally reappear, but are normally present in *Quadrupana*.

Chapter 7: On the races of man: Darwin discusses the question of “so-called races” and speculates whether human groups are species, sub-species or races and finally but not strongly suggests that sub-species might be the right answer. Darwin believed, as did many at the time, in the extinction of the savage races. Darwin talks briefly about the ratio of male versus female births, find the excess of males a sign of decline which astonished me but completely reverses himself later in the book.(see quote below) Darwin talks about possible explanations for the colour of different races. He still thinks the possibility that exposure to the sun may lead to colour change worth considering and then dismissing. He also discusses possible immunity to

certain diseases. He discusses “correlated development”, how one physical characteristic seems to be associated with another. He quotes at length from F.R.S. Huxley who goes to some lengths to show the close relationship between the ape brain and the human brain, far closer than, for example, the relationship between ape and monkey brains.

Although the existing races of man differ in many respects, as in colour, hair, shape of skull, proportions of the body, &c, yet if their whole structure be taken into consideration they are found to resemble each other closely on a multiple of points. Many of these are of so unimportant or so singular a nature, that it is extremely improbable that they should have been independently acquired...The same ... holds good with equal or greater force with respect to the numerous points of mental similarity between the most distinct races of man.

Darwin believed the American aborigines, Negroes and Europeans are as different from each other in mind as any three races that can be named; “yet I was incessantly struck, whilst living with the Feugians on board the Beagle, with how similar their minds were to ours; and so it was with a full-blooded negro with whom I happened once to be intimate.”

Monogenists believe that all humans had one common ancestor while polygenists believed that the different races might each have had its own ancestor. Your speaker finds this discussion rather silly. Darwin wrote: Finally, we may conclude that when the principle of evolution is generally accepted, as it surely will be before long, the dispute between the monogenists and the polygenists will die a silent and unobserved death.

Turning to the topic that makes up the second half of the title, Darwin writes: I do not intend to assert that sexual selection will account for all the differences between the races. He concludes the chapter with this quote from Huxley: ...the brain of a human foetus, at the fifth month, may correctly be said to be, not only the brain of an ape, but that of an arctopithicene or marmoset-like ape...

The book now leaves humanity for a discussion of animals in general.

In Chapter 8: Principles of Sexual Selection, he begins a general discussion of differences between sexes in various species. He reverses his earlier statement about the numerical relation between the sexes, now saying that male births usually slightly outnumber female which is what contemporary stats usually show and gives the same explanation that’s usually given now, namely that males are slightly more likely to die than females. Certain woman tend to produce more children of one sex or the other—inherited tendency.—infanticide may account for disproportionate numbers of males in some societies

Males struggle with each other in competition for mates. Females choose the most attractive males to mate with. The male is more eager for sex and this eagerness leads to developing more secondary sexual characteristics. It is probable that the ornaments common to both sexes were acquired by one sex, generally the male, and then transmitted to the offspring of both sexes. Darwin points out that the Laws of inheritance are extremely complex and many exceptions. Chapter IX: Secondary Sexual Characteristics in the Lower Classes of Animal Kingdom Sometimes the beautiful colours of animals (or deciduous trees) are of zero reproductive advantage. The cast-off arms on certain cephalopods must be classed primary sexual characteristic; these limbs act like a separate animal. In crustaceans, sexes can be different but because of this may because of “wildly different habits of life”. One species of crustacean has 2 distinct male forms one with more scent threads, the other with a large grasping arm. However, in quite low orders, males and females who’ve paired off can recognize each other

Darwin speculates that spider males may become small to elude the female; reversing the usual order of things, one species of female has prehensile appendage at the extreme end of her body for holding the male.

Chapter X: Secondary Sexual Characteristics of Insects

Male and female insects differ “But we are chiefly concerned with the structures by which one male is enabled to conquer another, either in battle or courtship, through his strength, pugnacity, ornaments or music.” He quotes B.D.Walsh: #7. **“It is astonishing how many different organs are worked in by nature for the seemingly insignificant object of enabling the male to grasp the female firmly.”**

Darwin discusses a wingless, dull-coloured minute insects, with ugly, almost misshapen heads and bodies. Their sexes do not differ, but they are interesting as shewing us that the males pay sedulous court to the females even low down in the animal scale. Sir J Lubbock says, #8 **“It is very amusing to see these little creatures coquetting together. The male, which is much smaller than the female, runs round her, and they butt one another, standing face to face and moving backward and forward like two playful lambs. Then the female pretends to run away and the male runs after her with a queer appearance of anger, gets in front and stands facing her again; then she turns coyly round, but he, quicker and more active, scuttles round too, and seems to whip her with his antennae: then for a bit they stand face to face, play with their antennae and seem to be all in all to one another.”**

Similarly about a fish species: #9 **“Thus the male stickleback has been described as ‘mad with delight’ when the female comes out of her hiding-place and surveys the nest he has prepared for her. ‘He darts round her in every direction, then to his accumulated material for the nest, then back again in an instant; and as she does not advance he endeavours to push her with his snout and then tries to pull her by the tail and then side-spine to the nest.”**

Darwin discusses many examples of courting style, males that prepare nests-some males look after eggs, young; some hold eggs in their mouths until they hatch. Male sticklebacks have to protect their young from female sticklebacks including their mother

Females never spawn except in the presence of males; males never fertilize the ova except in the presence of the female. Fish have some sound-producing capability developed by natural selection.

And regarding amphibians, I cannot resist this quote: : #11. **“It is surprising that these animals have not acquired more strongly marked sexual characters, for though cold-blooded their passions are strong.”**

But there is one interesting difference: the musical powers possessed by the males.

Reptiles: Tortoises and Turtles do not offer well-marked sexual differences. Some slight differences in the shell are related to mating. The male of the Galapagos giant turtle is bigger than the female During mating season only some males utter a hoarse bellowing sound. In some species the males do engage in combat.

Crocodillia: In these species no colour differences are known, but many fight, some produce a musky odour

: Snakes. Males always smaller than females Males can be distinguished from females by colour. One Indian snake the male is green, the female bronze in colour. In many species the young snakes differ in colour from the adults. During breeding season the anal scent gland is active. Noises produced by snakes, including the rattle snake’s rattle, used to attract mates

12. “Male snakes are very amorous.”

Lizards

The males of many species fight. The males of some, probably many kinds of lizard fight together. Thus one tree-dwelling species in South America: **#13“During the spring and early part of summer, two adult males rarely meet without a contest. On first seeing each other, they nod their heads up and down three or four times, as at the same time expanding the frill or pouch beneath the throat; their eyes glisten with rage, and after waving their tails from side to side for a few seconds, as if to gather energy, they dart at each other furiously, rolling over and over, and holding firmly with their teeth...The conflict generally ends in one of the combatants losing his tail, which is often devoured by the victor.”**

Males are usually larger than females The sexes differ greatly in various external characteristics. Chameleons exhibit the acme of difference between the sexes; in one species the male has 3 horns.

Now we come to the group in which secondary sexual characteristics really fly!
#14 “Male birds sometimes...possess special weapons for fighting with each other. They charm the female by vocal or instrumental music of the most varied kinds. They are augmented by all sorts of wattles, protuberances, horns, air-distended sacks, top-knots, naked shafts, plumes and lengthened feathers gracefully springing from all parts of the body. The beak and naked skin above the head, and the feathers, are often gorgeously coloured. The males sometimes pay their court by dancing, or by fantastic antics performed either on the ground or in the air. In one instance, at least, the male emits a musky odour, which we may suppose serves to attract or excite the female...On the whole, birds appear to be the most aesthetic of all animals, excepting, of course, man, and they have the same taste for the beautiful that we have.”

Law of Battle: Although almost all birds are pugnacious, some birds never fight. Some males bigger than females but some females are bigger than males and in some cases females fight for possession of males. “the season of love is that of battle:

#15.“When many males congregate at the same appointed spot and fight together, as in the case of grouse and various other birds, they are generally attended by females which afterwards pair with the victorious combatants. But in some cases the pairing precedes instead of succeeding the combat; thus, according to Audubon, several males of the Virginian goat-sucker ‘court, in a highly entertaining manner the female, and no sooner has she made her choice, than her approved gives chase to all intruders and drives them beyond on his dominions.’”

It does not, however appear that the females invariably prefer the victorious males. The female capercaillie sometimes steals away with a young male who has not dared to enter the arena.

Darwin, of course, talks about the importance of music, both vocal and instrumental in some species of birds. These males do not seek females but use songs to attract them.

The females of some species possess the power of song. Male birds continue singing for their own pleasure when the season of courtship is over. It is mainly small birds that have the power of song. With the common duck, the male hisses, the female quacks Other bird: practice instrumental music, peacocks and birds of paradise rattle their quills, turkey cocks scrape their wings against the ground, the North American grouse drums by striking his wings above his head, the African black weavers, the males make a whirring when it flies during courtship, Some

male birds make noise with beaks pounding on rocks or wood. There are a remarkable number of diverse sounds produced by birds during mating season.

#16 “Even with man, we should remember what discordant noises, the beating of tom-toms and the shrill notes of reeds, please the ears of savages. Sir S. Baker remarks that ‘as the stomach of the Arab prefers the raw meat and reeking liver taken hot from the animal, so does his ear prefer equally coarse and discordant music to all other.’”

Bright colours and the power of song seem to replace each other. In addition there are extraordinary appendages, air sacs, crests, top knots, plumes, complex vocal organs, differing in various degrees between males and females. These Decorations, Plume, various shaped feathers, ear tufts, heads covered in velvety down, necks ornamented with beards, wattles or coruncles vary from being found only on males to being found to a lesser extent on females to being the same in both males and females. There are an enormous variety of different kinds of feathers, on head, wing, tail.

All birds replace their juvenile feathers, that is moult, but there are in every group of birds species with single or double moults. Usually in species with a double replacement, they have different feathers for the mating season. Even plain birds may change colour of feather in mating season Some birds of paradise retain their nuptial feathers, other lose them after moult

Darwin was particularly impressed with the Angus pheasant, I suggest you look it up on-line you will be just as impressed.: **#17“Many will declare that it is utterly incredible that a female bird should be able to appreciate fine shading and exquisite patterns. It is undoubtedly a marvellous fact that she should possess the almost human degree of taste. He who thinks that he can safely gauge the discrimination and taste of the lower animals may deny that the female Angus pheasant can appreciate such refined beauty; but he will then be compelled to deny that the extraordinary attitudes assumed by the male during the act of courtship, by which the wonderful beauty of his plumage is so fully displayed, are purposeless; and this is a conclusion which I for one will never admit.”**

In several different places in this section Darwin points out that the ornaments seem to be detrimental to adaptation to ordinary survival which is the whole point of sexual selection in evolution. **#18.“The various ornaments possessed by the males are certainly of the highest importance to them, for in some cases they have been acquired at the expense of greatly impeded powers of flight or of running.”** Colourful or ornamented male birds harder to approach, shy than plain females and plain males.

Chapter XIV continues with the subject of Birds .

#19. “When the sexes differ in beauty or in the singing, or in producing what I have called instrumental music, it is almost invariably the male who surpasses the female. These qualities are evidently of high importance to the male. When they are gained for only a part of the year it is always the breeding-season. It is the male alone who elaborately displays his varied attractions, and often performs strange antics on the ground or in the air, in the presence of females. Each male drives away, or if he can, kills his rivals. Hence we may conclude that it is the object of the male to induce the female to pair with him, and for this purpose he tries to excite or charm her in various ways.”

Darwin returns to an important subject which is near the essence of sexual selection. “...does every male of the same species excite and attract the female equally? Or does she exert a choice and prefer certain mates? This latter question can be answered in the affirmative.”

In some species the male birds gather at places called leks where they show off their stuff for the females. Some of these birds are polygamous :#20.”...it might have been thought that stronger males would simply have driven away the weaker, and then at once have taken possession of as many females as possible, but if it be indispensable for the male to excite or please the female, we can understand the length of courtship and the congregation of so many individuals at the same spot. Certain strictly monogamous species also hold nuptial assemblages.”

Darwin often tells us interesting facts without trying to or being able to explain them. For example in 19th century England gamekeepers killed male magpies in great numbers because their courtship method made them vulnerable; the females were much more difficult to find and kill. It seems the killed males were quickly replaced by new mates. Females find new mates sometimes several times, sometimes on the same day. Female jays and falcons also replace mates easily. When a caged finch's pair-male dies, another wild finch male was seen near the cage although the widow only has a barely audible song. Darwin asks the question are there more males than females? He makes no attempt to answer it. Nor do I know the answer.

#21. “as the courtship of birds appears to be in many cases long and tedious, so it occasionally happens that certain males and females do not succeed, during the proper season, in exciting each other's love, and consequently do not pair.”

The main objection to the theory of sexual selection is that the lower animals lack the Mental Qualities or the taste for the Beautiful found in man in order to make these choices. #22“Low powers of reasoning, however, are compatible, as we see with mankind, with strong affections, acute perception and a taste for the beautiful...”

Birds have benevolent feeling and will feed adults of their species that became blind and there are cases of when they cared for birds of other species. Parrots exhibit curiosity and have good memories: birds recognize their young and mates and have been proven able to recognize individual humans and can distinguish their owner's pets from strange dogs and cats”

Bower birds are best evidence of taste for the beautiful. If you don't know about bower birds I again suggest you go on-line because they're both astonishing and fascinating.

Darwin discusses Preference for particular males by the Females. Darwin took a great interest in pigeon breeding and in *Origin of the Species* used information he gained from this to help prove evolution. Distinct species of birds occasionally breed in the wild and produce hybrids Ordinary pigeons prefer ordinary pigeons and drive away the improved breeds/
#23.“A female pigeon will occasionally take a strong fancy for a particular male, and will desert her own mate for him. Some females are of a profligate disposition and prefer almost any stranger to their own mate. Some amorous males, called by our English fanciers “gay birds,” are so successful in their gallantries, that, they must be shut up on account of the mischief they cause.”

Males may lose their attraction when their ornaments are spoiled. Female birds occasionally court the male and even fight for his possession-in pea fowls, the female always makes the first advances

It was commonly believed that male birds (like other males) would breed with any females but there is some contrary evidence. The domestic cock prefers the younger to the older hens. “In all ordinary cases the male is so eager he will accept any female, and does not prefer one to the other; but exceptions to this occur in certain groups.

Variability of Birds, and especially of their secondary Sexual characters:

Colour vary gradually as you move across large land masses and differences are also seen on islands. In many species there are differences in eyes

#24. “...we ought to be cautious in assume that knobs and various fleshy appendages cannot be attractive to females, when we remember that with savage races of man various hideous deformations—deep scars on the face with the flesh raised into protuberances, the septum of the nose pierced with sticks or bones, holes in the ears and lips stretched widely open—are all admired as ornamental.”

Darwin devotes a few pages to the formation and variability of the Ocelli or eye-like spots on the plumage of birds and suggests that the eyespots on butterfly wings, peacock tails, etc. probably would have been acquired gradually

In the *Origin of the Species* Darwin had speculated that female birds such as peahens had not acquired the same ornaments as the male because the peacock's tail would be dangerous during incubation of eggs, stopping transmission of this to the female by natural selection but has changed his mind and now thinks changes mostly remained in the sexes in which they first appeared

At this point Darwin says that the next section consisted of “a tedious discussion” on how characteristics are developed by bird breeders” and suggested that any reader with no compelling interest in this should skip it. I took him at his word. In the following section he discuss why in the wild females might have not developed some of the male ornaments. There is some evidence that spurs on females disturb the nest and would be eliminated. In most case vocal ability is limited to males not because it might attract predators to the females but because it is of special use only to the males

: #25. “But if the development of the tail of the peahen had been checked only when it became inconveniently or dangerously great, she would have retained a much longer tail than she actually possesses...if it were consequently checked, she would have continually reacted on her male progeny, and thus have prevented the peacock from acquiring his present magnificent train.”

Those who heard my talk on *The Origin of the Species* will no doubt recall that Darwin was forced to publish that book because Wallace was about to publish his own version of natural selection. In *Descent of Man* Darwin often cites Wallace but rarely agrees with him. Wallace's argument: **#26. “He believes that the bright tints originally acquired through sexual selection by the males would in all, or almost all cases, have been transmitted to the females, unless the transference had been checked through natural selection. .. Mr. Wallace rests his belief chiefly, but not exclusively, on the following statement: that when both sexes are coloured in a very conspicuous manner, the nest is of such a nature as to conceal the sitting bird, but where there is a marked contrast of colour between the sexes, the male being gay and the female dull-coloured, the nest is open and exposes the sitting bird to view.”**

Darwin disagrees because of the following: Some species in which the male helps incubate the eggs even though the male is much more brightly coloured than the female
The male house sparrow differs from the female while the male tree sparrow hardly differs at all but both build well-concealed nests. There are also examples of birds in which male & females are different but both equally conspicuous. Most birds that build nests in holes are beautiful, although the male is always finer than the female.

Birds in which male and female indistinguishable include most species, also woodpeckers

Ch. XVI Birds cont.

Adults & young differ in colours, plumes. Darwin suggests that plumage of the young is probably the retention of a former character, that is tells us what the progenitor of the various closely related species probably looked like. The young of several species resemble each other closely & resemble adults of other species

#27. “Young lions and pumas are marked with feeble stripes or rows of spots, and as many allied species both young and old are similarly marked...no believer in evolution will doubt that the progenitor of lions and pumas was a striped animal...The same principle applies to many birds belonging to various groups...the immature plumage approximately shows us the former or ancestral condition of the species.”

In other cases the young closely resemble the adults although the colours are usually less vivid and the feathers softer. I'm going to skip over the

RULES OF CLASSES OF CASES but left it in my paper in case anyone is interested.

I: when adult male more beautiful than female, the young resemble the female

II: in the rare cases where the female more conspicuous than the male, the young resemble the male

III: when adult males resemble females, young have own peculiar plumage (eg. robin)

IV: when adult male resemble the female, young are similar to adults (kingfishers, parrots, crows)

V: when adults have distinct summer & winter plumage so do young

VI: In some cases the young differ in their first plumage according to sex but usually much less than the adults differ

The fact that when males and females differ, the young usually resemble the female, leads to the conclusion that only the male has been altered. In many closely related species change can be observed in closely allied species found in different areas; in some cases two species can only be distinguished from one another in their summer or nuptial plumage. Darwin suggests that changes caused by moving to new environment will provide choices for the female in sexual selection. Although it is usually the males of two related species that differ most there are rare examples in which it is the female that differs. No instances female dull and the young bright-coloured with the partial exception of some young woodpeckers. Where the adult female is more conspicuous than the adult male, the young of both sexes resemble the male: rare and difference not so great.

In the Tunix, quail-like birds, the females are bigger than male, noisier and more pugnacious; they are kept for fighting by natives; after laying eggs, they associate in flocks and leave the incubation and care of the young to the males. Similar situations exist in some species of painted snipe, dotted plover and the ostrich group. Only the male cassowary sits on the eggs and takes care of the young

#28 “The male has a slenderer frame and is more docile with no voice beyond a suppressed hiss. He not only performs the whole duty of incubation, but he must defend the young from their mother, for as soon as she catches sight of her progeny she becomes violently agitated, and notwithstanding the efforts of the father uses her utmost endeavours to destroy them. For months afterwards it is unsafe to put the parents together, violent quarrels being the inevitable result, in which the female generally comes out the conqueror. So with this emu we have a complete reversal not only of the parental and incubating instincts, but of the usual moral qualities of the two sexes: the female being savage, quarrelsome, and noisy; the males gentle and good.” There is some evidence such females drive away rival females and leave selection to the males.

There is a discussion of the role of protection as an explanation for difference in colour, etc. Wallace arguing for this; Darwin not convinced

When the adult male resembles the female, the young of both sexes resemble the adults: e.g. kingfishers, woodpeckers, jays, magpies, crows—similarity never complete and changes to some dissimilarity. In species such as parakeets—in one species the young resemble the adults, in another they don't.

#29. “Both sexes and the young of the common jay are closely similar; but in the Canada jay, the young differ so much from their parents that they were formerly described as distinct species.”

When adults of both sexes have distinct winter and summer plumage, whether or not the males differs from the female, the young resemble the adults in their winter dress or much more rarely in their summer dress, or they resemble the females alone or the young may have an intermediate character in both their seasonal plumage

The young in their first plumage differ from each other according to sex, young males more or less resemble the adults: mocking bird, forest and rock thrushes, some hummingbirds. Adults are mostly more brightly-coloured than the young; the appearance of the young may give an idea of progenitor's appearance, but in one species the young of are white and conspicuous, adults dull.

#30. “Many of the soft-billed birds are songsters; and a discussion in a former chapter should not be forgotten, in which it was shown that the best songsters are rarely ornamented in the brightest tints. It would appear that female birds, as a general rule, have selected their mates for their sweet voices or gay colours but not for both.”

Aquatic birds have acquired white plumage so much oftener than terrestrial birds probably because their size, strength and powers of flight allow them to escape birds of prey. In the same group of species exist white, black and piebald species

#31. “It would even appear that mere novelty, or slight changes for the sake of change, have sometimes acted on female birds as a charm, like changes of fashion with us. Males of most species can be distinguished from males of the same species quite easily while the females are mostly indistinguishable from other females.”

Darwin writes: “Several writers have objected to the whole theory of sexual selection, by assuming that animals and savages the taste of the female for certain colour or other ornamentals would not remain constant for many generations; that first one colour and then another would be admired, and consequently that no permanent effect could be produced. We may admit that taste is fluctuating, but is not quite arbitrary. It depends much on habit, as we can see in mankind; and we may infer that this would hold good with birds and other animals. Even in our own dress, the general character lasts long, and the changes are to a certain extent graduated. Abundant evidence will be given in two places in a future chapter, that savages of many races have admired for many generations the same cicatrices on the skin, the same hideously perforated lips, nostrils, or ears, distorted heads, etc.; and these deformities present some analogy to the natural ornaments of various animals.”

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Ch. XVII Secondary Sexual Characteristics of Mammals

#32. “With mammals the male appears to win the female much more through the law of battle than through the display of charms. The most timid animals, not provided with any special weapons for fighting, engage in desperate conflicts during the season of love. Two

male hares have been seen to fight together until one is killed; male moles often fight and sometimes with fatal results...”

The law of battle prevails with aquatic as well as terrestrial animals. Mammals are furnished with special weapons: stags, elephants in musk-ox, stallions, antelopes, dugongs and others...

: #33. “When the males are provided with weapons which in the females are absent, there can be hardly a doubt that these serve for fighting with other males; and they were acquired through sexual selection, and were transmitted to the male sex alone.”

Female reindeer may appear hornless after giving birth; the males lose theirs earlier. Primordial species was surely hornless; fossil skull without horns of female of a species in which the females now have horns has been found. This reminds us of how few fossils had been discovered by the times Darwin wrote *Descent of Man*. The presence or absence of horns is not because of their usefulness but inheritance. In all wild species of sheep and goats, the horns are larger in the males than the females and are sometimes absent in the latter—male horns are more developed at birth

#34. “We may infer as probable that horns of all kinds, even when they are equally developed in the two sexes, were primarily acquired by the male in order to conquer other males, and have been transferred more or less completely to the female.”

Darwin discussed the effects of castration; mainly it reduces or eliminates horns; in one species the castrated animal develops shaped like the horns female have in that species

:#35. “Although tusks and horns appear in all cases to have been primarily developed as sexual weapons, they often serve other purposes. The elephant uses his tusks to attack the tiger; he scores the trunks of trees until they can be thrown down easily; and he likewise extracts the farinaceous cores of palms...when the male wild goat of the Himalayas accidentally falls from a height he bends inwards his head, and by alighting on his massive horns, breaks the shock.”

Horns, antlers, fangs exclusively possessed by males may have a secondary sexual function.

The antlers of stags are not efficient weapons; they may be ornamental.

Male quadrupeds furnished with tusks include walrus, elephants and wild boars. Male muntdeer have horns and exerted canine teeth, but in ruminants, the development of horns generally stands in an inverse relation with teeth; camels, guanacos, chevrotans, musk deer, which are hornless, have efficient teeth. Boars fight but seldom receive fatal wounds—blows fall on “shield”, a part adapted for defence; pig weapons were provided late in geologic time Boars tusks curve in such a way in older age to make them only useful for defence. These adornments represent a great investment to their possessors.

With mammals where, as is often the case, sexes differ in size, it is almost always the male that is larger and stronger. This is true of marsupials of Australia which continue to grow to a surprisingly late age. The most extraordinary example is one species of seal in which the female is one-sixth the size of the male. The polygamous species the males are larger than the females and fight a lot. The monogamous males do not fight as much and are near the females in size. Whales that fight are larger. The right whale, which does not fight, is smaller than the female right whale. Male quadrupeds are more pugnacious and courageous than the females.

#36 “There can be little doubt that these characters have been gained partly through sexual selection, owing to a long series of victories, by the stronger and more courageous males over the weaker.”

The mane of the male lion is a good defence against attacking by rival lions. The ruff of male lynx larger than female's. Certain male seals have manes. The male Cape of Good Hope baboons have manes & large canines. Stallions have thicker manes than the mares

Now turning to a rather more interesting subject:

Choice in Pairing for either sex of quadrupeds

#37. "Does the female prefer any particular male, either before or after the males may have fought together for supremacy; or does the male, when not a polygamist, select any particular female? The general impression among breeders seems to be that the male accepts any female; and this owing to his eagerness, is, in most cases, probably the truth. Whether the female as a general rule accepts any mate is much more doubtful. In the fourteenth chapter, on birds, a considerable body of direct and indirect evidence was advanced, showing that the female selects her partner; and it would be a strange anomaly if female quadrupeds which stand much higher in the scale and have higher mental powers, did not generally, or at least often, exert some choice."

Darwin quotes dog-breeder Mr. Mayhew remarks: 'he females are able to bestow their affections... Bitches are not always prudent in their loves but are apt to throw themselves away on curs of low degree.' the male, on the contrary, is rather inclined toward strange females."

#38. "it is improbable that the unions of quadrupeds in a state of nature should be left to mere chance. It is much more probable that the females are allured or excited by particular males, who possess certain character in a higher degree than other males; but what these characters are, we can seldom or never discover with certainty."

XVIII Secondary Sexual characters of Mammals—continued

Quadruped voices used for many purposes but in this book Darwin is only interested in differences between sexes, such lion v lioness, bull v cow. Almost all males use their voices more during rutting season. The throats of stags are enlarged during rutting season—young stags under three do not rear or bellow. Their combat is preceded by bellowing but they do not vocalize during actual fighting.

#39. "No doubt stags challenge each other to mortal combat by bellowing; ;but those with more powerful voices, unless at the same time the stronger, better-armed, and more courageous, would not gain any advantage over their rivals."

However there is no sign bellowing attracts female; they do not look for the males; the males eagerly look for them."

The voice of adult male gorilla is tremendous; gibbons among the noisiest and the Sumatran species has an air-sack but the male is no noisier than the female; it's used as a mutual call as does the beaver

:#40 "Another gibbon is remarkable, from having the power of giving a complete and correct octave of musical notes, which we may reasonably suspect serves as a sexual charm."

"The nose of the male sea-elephant becomes greatly elongated during the breeding season, and can then be erected. In another allied kind of seal, the bladder-nose, the head is covered by a great hood or bladder. The hood is clothed with short hair, and is muscular; it can be inflated until it more than equals the whole head in size! The males when rutting fight fiercely on the ice and their roaring 'is said to be sometimes so loud as to be heard four miles away.' The hood is rudimentary in the females."

Odour-animals like skunk, shrew-mice have mad smell for protection with glands same size in both sexes. In others confined to the male & almost always become more active during mating

season. Rankness of the male goat & certain male deer – some can be smelt a km away. The young don't produce the smell nor do circumcised males. Some antelopes produce odour in tear-sacks on the face

#41. "In most cases, when only the male emits a strong odour during the breeding-season, it probably serves to excite or allure the female. If the most odoriferous males are the most successful in winning the females, and in leaving offspring to inherit their gradually perfected glands and odours."

Development of the Hair

Male quadrupeds often have hair on heads & necks more developed than females—more likely a result of sexual selection than an otherwise useful feature. Males of many kinds have more hair or hair of a different character on parts of their faces—some goats, rudiments, in the ibex, in some monkeys, the orang, or the beard is much larger in the male but with most monkeys the various facial tufts are more or less the same in both sexes—these are true secondary sexual characteristics. The mane that develops in one African sheep breed does not develop if the animal is castrated

Colour of the hairs and of the naked skin: Among marsupials, the great red kangaroo, male red, female blue. Differences between sexes include some African squirrels, one Russian mouse and some bats—the males are always brighter, more colourful than the females. Such differences are rare in terrestrial carnivores and insectivores, the ocelot being an exception. Seals are often different in colour; the young are also different in colour from the adults

551—differences in colour between the male and female adults is most common in the ruminants including particularly antelopes—the Indian bull-buck, the male is black and the female fawn-coloured, the males darkening in shade during mating season, the young are indistinguishable

The Antelope niger, the male is black and the female and young brown. Similarly in the banding bull of the Malaysian peninsula the female is dun and so the male until age three when he turns black; the emasculated bull reverts to dun. Deer rarely exhibit much difference but in the wapiti the chest and legs of the male darken during the breeding season

Among Primates, the male lemur is black, female brown—many other similar examples among both New and Old world monkeys. Some baboon males have significant difference from females in colour of both hair and on bare skin

#42. "In all cases hitherto given the male is more strongly or brightly coloured than the female, and differs from the young of both sexes. But it is the female which is brighter coloured in the rhesus monkey. She has a large surface of naked skin round the tail, of a brilliant carmine red, which periodically becomes yet more vivid, and her face is also pale red. The male, on the other hand, and in the young, has neither on the naked skin on the posterior end of the body, nor on the face, a trace of red."

Colours do seem to matter to quadrupeds

#43. "African elephants and rhinoceros attacked white or grey horses with special fury. I have elsewhere shewn that half-wild horses apparently prefer to pair with those of the same colours. It is a more significant fact that a female zebra would not admit the advances of a male ass until he was painted so as to resemble a zebra, and then, as John Hunter remarks, 'she received him very readily. But the male did not require this, the female being an animal somewhat similar to himself was sufficient to rouse him.'"

#44. "As the negro in Africa raises the flesh on his face into parallel ridges 'or cicatrices high about the natural surface, which unsightly deformities are considered great person attractions'—as negroes and savages in many parts of the world paint their faces with red,

blue, white, or blue bars,--so the male mandrill of Africa appears to have acquired his deeply-furrowed and gaudily colour face from having been thus rendered attractive to the female.”

“No doubt it is to us a most grotesque notion that the posterior end of the body should be coloured for the sake of ornament even more brilliantly than the face; but this is not more strange than that the tails of many birds should be especially ornamented.” With mammals we do not at present possess any evidence that the males take pains to display their charms before the female: and the elaborate manner in which this is performed by male birds and other animals is the strongest argument in favour of the belief that females admire, or are excited by, the ornaments and colours displayed before them. There is, however, a striking parallelism between mammals and birds ... and considering this there can be little doubt that the same cause has acted on both mammals and birds; and the result, as far as ornamental characters are concerned, may be attributed, as it appears to me, to the long-continue preference of the individuals of one sex for certain individuals of the opposite sex

Equal transmission of ornamental character to both sexes

Among mammals, the use of colouration for protection is not as common as in lower orders. The muskrat looks like clod of earth but rabbits' turned-up tail gives it away

Of course the white coats of Arctic animals suggests protection against predators or for predators sneaking up on their prey. Of course, skunks' white tails serves as a warning.

But more conspicuous colours and markings acquired through sexual selection.

#45. “After having studied to the best of my ability the sexual differences of animals belonging to all classes, I cannot avoid the conclusion that the curiously-arranged colours of many antelopes, though common to both sexes, are the result of sexual selection primarily applied to the male.”

Part Three: Sexual Selection in Relation to Man and Conclusion

Chapter XIX: Secondary Sexual Characters of Man

“With mankind the differences between the sexes are greater than in most of the Quadrumana, but not so great as in some, for instance, the mandrill. Man on an average is considerably taller, heavier, and stronger than woman with squarer shoulders and more plainly pronounced muscles. Owing to the relation which exists between muscular development and the projection of the brows, the superciliary ridge is generally more marked in man than in woman. His body, and especially his face, is more hairy, and his voice has a different and more powerful tone. In certain races the women are said to differ slightly in tint from the men.”

#46. “Man is more courageous, pugnacious and energetic than woman, and has a more inventive genius. His brain is absolutely larger, but whether or not proportionately to his larger body, has not, I believe, been fully ascertained. In woman the face is rounder; the jaws and the base of the skull smaller; the outlines of the body rounder, in parts more prominent; and her pelvis is broader than in the man; but this latter character may perhaps be considered a primary rather than a secondary sexual character. She comes to maturity at an earlier age than a man.”

As with animals of all classes, so with man, the distinctive characters of the male sex are not fully developed until he is nearly mature; and if emasculated they never appear. Male and female children resemble each other closely.

Some of the species of *Quadrumania*, certain baboons, gorillas and orangs, the difference between males and females is greater than between men and women. All the secondary sexual characters of humans are highly variable even within the races—males differ more from males of other races than they do from females. This fact indicates that as to this characteristic is concerned, it is the males that has chiefly been modified, since the several races diverged from their common stock Growth of the beard and body hairs differs in various populations

Darwin suggests that when it comes to sex, the law of battle applies: the strongest man usually gets the woman. As man became more upright and fought with sticks and stones, male teeth became smaller and the difference between male and female teeth disappeared

#47. “There can be little doubt that the greater size and strength of man, in comparison with woman, together with his broader shoulders, more developed muscles, rugged outline of body, his greater courage and pugnacity, are all due in chief part to inheritance from the half-human male ancestors. “

. “It is not probable that the greater strength of man was primarily acquired through the inherited effects of his having worked harder than woman for his own subsistence and that of his family, for the women in all barbarous nations are compelled to work at least as hard as the men. With civilized people the arbitrament of battle for the possession of women has long ceased; on the other hand, the men, as a general rule, have to work harder than the women for their joint subsistence, and thus their greater strength will have been kept up.”

P 566 *Difference in the Mental Powers of the two Sexes*

#48. “With respect to the differences of this nature between men and women, it is probable that sexual selection has played a highly important part. I am aware that some writers doubt whether there is any such inherent difference; but this at least probable from the analogy of the lower animals which present other secondary sexual characters.”

“Man is the rival of other men: he delights in competition, and this leads to ambition which passes too easily to selfishness. These latter qualities seem to be his natural and unfortunate birthright. It is generally admitted that with woman the powers of intuition, of rapid perception, and perhaps of imitation, are more strongly marked than in man; but some, at least, of these faculties are characteristic of the lower races, and therefore of a past and lower state of civilisation.”

#49 “Woman seems to differ from man in mental disposition, chiefly in her greater tenderness and less selfishness; and this holds good even with savages.”

Males have acquired higher mental faculties by the necessities of defending his family and following the general principles this higher intelligence would have been passed on mainly to males

#50. “If two lists were made of the most eminent men and women in poetry, painting, sculpture, music, history, science, and philosophy, with half-a-dozen names under each subject, the two lists would bear no comparison. We can infer...that if men are capable of a decided pre-eminence over women in many subject, the average of mental power in man must be above that of women.”

#51. “It is indeed fortunate that the law of equal transmission of characters to both sexes prevails with mammals; otherwise, it is probable that man would have become as superior in mental endowment to woman, as the peacock is in ornamental plumage to the peahen.”

Darwin discusses the *Sounds emitted by animals* He suggests the vocal instruments were primarily for the propagation of the species. “All air-breathing *Vertabrata*, necessarily possess an

apparatus for inhaling and expelling air, with a pipe capable of being closed at one end. Purposeless noises would almost certainly have been produced; and these, if they proved in any way serviceable, might readily have been modified or intensified by the preservation of properly adapted variations.” One species of gibbon has an extremely loud but musical voice which it may use to attract females.

#52. “This is not the only species in the genus which sings, for my son, Francis Darwin, attentively listened in the Zoological Garden to another whilst singing a cadence of three notes, in true musical intervals and with a clear musical tone.”

An ear capable of discriminating noises—and the high importance of this power is admitted by everyone—must be sensitive to musical notes. “As musical notes are useless to man in reference to his daily habits of life, they must rank as among the most mysterious with which he is endowed. Yet they are present in men of all ages, even the most savage; but so different is the taste of the several races, that our music gives no pleasure to savages and their music is to us hideous and unmeaning.”

#53. “Poetry, which may be considered as the offspring of song, is likewise so ancient, that many persons have felt astonished that it should have arisen during the earliest age of which we have any record.”

“Music arouses in us various emotions, but not the more terrible ones of horror, fear and rage. It awakens in us the gentle feelings of tenderness and love, which readily pass into devotion. In the Chinese annals it is said, ‘Music hath the power of making Heaven descend on earth.’”

#54. “Even monkeys express strong feelings in different tones—anger and impatience by low—fear and pain by high notes.”

Darwin adds “articulate speech is one of the latest, as it certainly is the highest, of the arts acquired by man and it is surely acquired from musical powers,” and suggests that musical sounds afforded a basis for language.

The males of several quadrumanous animals have their vocal organs much more developed than the females. **#55. “It appears probable that the progenitors of man, before acquiring the power of expressing their mutual love in articulate language, endeavoured to charm each other with musical notes and rhythm. Women are generally thought to possess sweeter voices than men so we may infer that they first acquired musical powers in order to attract the other sex. But if so, this must have occurred long ago, before our ancestors had become sufficiently human to treat and value their women merely as useful slaves. The impassioned orator, bard or musician, little suspects that he uses the same means by which his half-human ancestors long ago aroused each other’s ardent passions, during their courtship and rivalry.”**

The influence of Beauty in determining the Marriages of Mankind—

“In civilized life man is largely, but by no means exclusively, influenced in the choice of his wife by external appearance....If it can be proven that the men of different races prefer women having various characteristics, or conversely the women...would this produce any sensible effect on the race?”

Darwin discusses tattoos, raised protuberances, teeth colouring, body painting, reshaping of body parts, perforations, face mutilation

: #56. “Hardly any part of the body, which can be modified, has escaped. The amount of suffering that cause must have been extreme...”

The idea of the beauty of women found in all races but the idea differs of what feminine beauty is differs. “the Chinese of the interior regard European women as hideous...”

#57. “With many Hottentot women the posterior part of the body projects in a wonderful manner...it is certain that this peculiarity is greatly admired by the men.” [corpse of Hottentot woman on display in London at around that time]

This chapter includes a discussion of the value and attention given to hair. Also differing attitudes to beards. “The New Zealanders had a saying: ‘there’s no woman for a hairy man.’

Different tastes in beauty shown in depiction of gods in different cultures. Some disagree that different cultures have different standards of beauty and that, for example, Africans men judge as beautiful the same African women and the same European women that Europeans find beautiful

#58. “The general truth of the principle that man admires and often tries to exaggerate whatever characteristic nature may have given him, is shown in many ways.”

This is illustrated in practices by which the skull, nose, and other parts are altered in childhood; one example is Chinese foot-binding. “As the great anatomist Bichat long ago said, if every one were cast in the same mould, there could be no such thing as beauty.”

Chapter XX continues the discussion of Secondary Sexual Character of Man cont.

#59. “We must next inquire whether this preference and the consequent selection during many generations of these women, which appear to the men of each race the most attractive, has altered either the character either of the females alone, or of both sexes....If any change has thus been effected, it is almost certain that the different races would be differently modified, as each has its own standard of beauty.”

“With respect to the opposite form of selection, namely, of the more attractive men by women, although in civilized nations women have free or almost free choice, which is not the case in the barbarous races, yet their choice is largely influenced by the social position and wealth of the men; and the success of the powers and energy.”

#60. “There is, however, reason to believe that in certain civilised and semi-civilised nations sexual selection has effect something in modifying the bodily frame of the members.”

The Causes which prevent or check the Action of Sexual Selection with Savages:

Darwin discusses marriage, monogamy, polygamy and possible reality of “community marriage” and the belief that in some ‘promiscuous’ societies, the line of descent is through the mother since the father may be uncertain Darwin, of course, didn’t know about the Trobriants, islands now part of Papua New Guinea. The people of the Trobriants are famous because they don’t believe males have any role in reproduction. They are also famous for being sexually active from a very early age. Parents are proud of the sexual precocity of their children. It is not impossible that the term “missionary position” was invented because it of one of the very few these people do not use. Trobriant women are supposed to nibble on their partners eyelashes during sex. I have experience this but not from a Trobriant woman.

Darwin is sceptical about the argument (Sir J Lubock) that promiscuity was the original sexual norm of humans. “Nevertheless, from the strength of the feeling of jealousy all through the animal kingdom, as well as from the analogy of the lower animals, more particularly of those which come nearest to man, I cannot believe that absolutely promiscuous intercourse in times past...” However Darwin didn’t know about the sexual behaviour of the other two species of great apes, Chimpanzees and Bonobos, which according to DNA are closest to humans. Their sex system could be called community marriage or complete promiscuity. With the Bonobos, the

species closest to humanity, the females are dominant. Fortunately for male Bonobos, female Bonobos like sex very much.

#61. “Although savages are now extremely licentious, and although communal marriages may formerly have largely prevailed, yet many practice some form of marriage, but of a far more lax nature than that of civilised nations.”

Darwin discusses things that may interfere with selection including infanticide, capturing brides and polyandry. Infanticide would reduce competition and, in many cases, unbalance the sex ratio. Early betrothal (in childhood) could prevent sexual selection on either side. Polyandry in which one woman has two or more husbands probably results from the presence of more men than women in certain communities. Darwin concludes: “...whatever influence sexual selection may have had in producing the differences between man and the higher Quadrumana; this influence would have more powerful at a remote period than at the present day, though probably not yet wholly lost.”

The Manner of Action of Sexual Selection with Mankind:

#62. “The strongest and most vigorous of men—those who could best defend and hunt for their families—would succeed in raising more children than the poorer and weaker members of the same tribe.”

And in many communities the more important men have more than one wife and thus more children. There is a claim that in eastern Asia the genes of Genghis Khan can be found in one person in three.

Once again, Darwin returns to one of his favourite sources of inspiration in *Origin of the Species*. Animals breeders consciously or unconsciously introduce changes into the animals they breed:

#63. “What reason, then, can be assigned why similar results should not follow from the long-continued selection of the most admired women by those men of each tribe who were able to rear the greatest number of children?”

Successful tribes occupy territory, spread up and split apart. The different conditions they live under gradually introduce differences between them. Darwin believed that in his time the Law of Battle still worked for sexual selection in human evolution; savages still fight for women. Think how important this competition has been human civilization as shown in Homer’s story of the Trojan War.

#64. “Man is more powerful in body and mind than woman, and in the savage state he keeps her in a far more abject state of bondage than does the male of any other animal; therefore it is not surprising that he should have gained the power of selection...As women have long been selected for beauty, it is not surprising that some of their successive variations should have transmitted to a greater degree to their female than to their male offspring, but transmit most of their characters, including some beauty, to their offspring of both sexes; so that the continued preference by the men of each race for the more attractive women, according to their standard of taste, will have tended to modify in the same manner all the individuals of both sexes.”

The selection of males by females, much the more common in lower animals, we have reason to believe that it formerly acted on our progenitors. Man in all probability owes his beard to this. And this form of selection may have occasionally acted in later times; “for in utterly barbarous tribes the women have more power in choosing, rejecting and tempting their lovers, or of afterwards changing their husbands, than might have been expected.” He refers to wives running away from or leaving their husbands. Women in West Africa fall in love “with savages the woman is often not in quite so abject state has been supposed.”

We return to the subject of race with The Characters that distinguish the races from each other: The absence of body hair in humans compared to our near relatives was surely gained through sexual selection; women always have less body and facial hair.

#65. “As the body in woman is less hairy than in man, and as this character is common to all races, we can conclude that it was our female semi-human ancestors who were first divested of hair, and that this occurred at an extremely remote period before the several races had diverged from a common stock. While our female ancestors were gradually acquiring this new character of nudity, they must have transmitted it almost equally to their offspring of both sexes while young.”

Both male and female foetuses have hairs near the mouth. “It appears probable that man has retained his beard from a very early period, whilst woman lost her beard at the same time her body became almost totally divested of hair.”

:#66. “For my own part I conclude that of all the causes which have led to the difference in external appearance between the races of man, and to a certain extent between man and the lower animals, sexual selection has been the most efficient.”

Ch XXI Darwin’s General Summary and Conclusion

#67. “Man is descended from some less highly organised form. The grounds upon which this rests will never be shaken, for the close similarity between man and the lower animals in embryonic development, as well as in innumerable points of structure are facts that cannot be disputed.”

“The close resemblance of the embryo of a man to that, for instance, of a dog—and a crowd of analogous facts—all point in the plainest manner to the conclusion that man is co-descendant with other mammals of a common progenitor.”

From the embryological structure of man we learn he must be descended from a hairy, tailed quadruped, probably arboreal in its habitat and an inhabitant of the Old World. This progenitor of man would have been included among the Quadrumana as surely as the more ancient progenitor of the Old World and New World monkeys.

#68. “The high standard of our intellectual powers and moral disposition is the greatest difficulty which presents itself, but every one who admits the principle of evolution, must see that the mental powers of the higher animals are capable of advancement.”

Darwin discusses the development of the intellect arising perhaps from language. “The development of moral qualities is a more interesting problem.” He suggests these arose from instincts including family ties. Social animals are impelled by a wish to aid the members of their community. Man is impelled by the same general wish to aid his fellows. Then he turns to topics we often discuss here.

He discusses topics he undoubtedly felt was necessary in the century society he lived in:

#69. “The moral faculties are generally and justly esteemed as of higher value than the intellectual powers. The moral nature of man has reached its present standard, partly through the advancement of his reasoning powers. With the more civilized races, the conviction of the existence of an all-seeing Deity has had a potent influence on the advance of morality.”