

among the females in the most lively fashion—evidently in a state of sexual excitement. In some, *e. g.*, the stickleback and salmon great pugnacity is manifest. The male salmon develops a special crook in connection with the lower jaw at this time, while the teeth enlarge, markedly. Among many amphibians also many changes affect the males, sexual desire becoming very marked. Among the reptilia similar changes occur, the male tortoise for example being fierce and noisy. In snakes the scent-glands become active during the pairing-season.

Among the birds the changes in the love-season are very marked. The male is altered in various ways and takes to dancing, coquetting and to vocal and instrumental music. His scent-glands grow active; his ornaments become more marked, and he develops strong fighting tendencies.

Among mammals the intensification of sexual desire in the males, accompanied with a feeling of jealousy and a keenness to fight, is universal. In all orders the voice is used in the rutting-time more than in any other season. Indeed, the porcupine and giraffe are said to be mute at all other periods. In stags the larynx and thyroid enlarge when rut comes on. The nose of the male sea-serpent becomes greatly elongated. In the bladder-nose seal the hood covering the head becomes markedly inflated. Scent-glands emit strong odours. In some cases the colour of the skin changes. *Among the great majority of females no such marked changes occur.* They play their normal role of passivity, the changes brought about by the wave of sexual excitement being mainly psychical.

In many mammalians the only physical changes recognizable at the œstrus are congestion of the soft parts in the pelvis, dilatation of the vulva and the vagina, and the free discharge of mucus which is often blood-stained. These differences between males and females in regard to the rutting period are in keeping with the organic distinction to which I have so often referred in this paper.

The manifold changes in the males are the outcome of their predominant katabolism.

The females need to conserve their energies, *i. e.*, their anabolic surplus, for the strain of pregnancy; consequently there is no waste in outward exuberant manifestations, except in very slight measure in the cases to which I have just alluded.

Finally, it may be stated that the relation of rut to menstruation in mammalian evolution is simply this—that when, owing to the various reasons which I have elaborated in an earlier part of this paper, menstruation appeared as a new variation, one of the factors in determining the escape of the anabolic overplus by way of the genital tract was the habit already fixed, in many of the mammalians with a bicornuate uterus of the periodic yearly pelvic congestion of the rutting time.