LECTURES

ON

THE COMPARATIVE PHYSIOLOGY OF
MENSTRUATION.

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LECTURE II.

GENTLEMEN,—We may now examine the evidence furnished by observation upon the females of the lower animals at their periods of heat. It will be apparent that there is singular accord in the statements of competent observers upon the phenomena as they present themselves in the various animals; and that, in all the creatures subjected to inquiry, some more or less conspicuous flux or exudation occurs; the majority exhibiting manifestations partaking in varying degrees of a sanguineous character.

In observing domesticated animals, and still more those in a state of captivity, the same allowances for individual variations should be made as would be made in regard of women; in whom we find laborious life and hard fare to some extent diminish the flow; while ease, luxury, and plenty (not excess) promote it. Again, racial peculiarities, with the lower animals as with the human species, may unquestionably affect the character of the flow.

Very slight changes in normal conditions affect the capacity for reproduction in all animals; hence, many creatures fail to breed in captivity, while, on the other hand, domesticable creatures have augmented powers. Mr. Darwin's statements to this effect are numerous and weighty. In *Animals and Plants under Domestication*, vol. ii, pp. 143-4, he says: "It would appear that any change in the habits of life, whatever these habits may be, if great enough, tends to affect in an inexplicable manner the powers of reproduction. The result depends more on the constitution of the species than on the nature of the change; for certain whole groups are affected more than others; but exceptions always occur, for some species in the most fertile groups refuse to breed, and some in the most sterile groups breed freely.....Changed conditions of life have an especial power of acting injuriously on the reproductive system. The whole case is quite peculiar, for these organs, though not diseased, are thus rendered incapable of performing their proper functions, or perform them imperfectly." *Ibid.*, p. 256: "We know that certain groups of organic beings, but with exceptions in each group, have their reproductive systems much more easily affected by changed conditions than other groups; for instance, carnivorous birds more readily than carnivorous mammals, and parrots more readily than pigeons; and this fact harmonises with the apparently capricious manner and degree in which various groups of animals and plants vary under domestication."

Analogous susceptibility is displayed by the human female in the disturbance, mostly arrest, of menstruation that so often attends change of residence. I have met with innumerable instances of this. Nothing is more common than for maid-servants coming from the country to London to have amenorrhoea for some months. Among ladies, many instances of disorder have come under my notice from foreign travel; but the effects are not always injurious. Making due allowances, then, we may now review the evidence at our disposal.

Mr. Simpson's statements, based upon observations made on his own cattle, are as explicit as they are reliable. He states that his heifers usually arrive at puberty at from six to nine months, and sometimes even earlier; and that, after the establishment of the symptoms of heat, or "bulling," the rut recurs, when the bull is not allowed access, with strict regularity every twenty-one days, or three weeks. Oestro-menstruation is shown by swelling of the vulva, which at first weeps an odorous mucus, but soon this becomes quite red from the presence of blood; and when that stage is attained, the heat rapidly subsides, intercourse being then refused. Mr. West, Mr. Simpson's excellent veterinary surgeon, emphatically confirms these observations, and adduces his very large acquaintance with analogous phenomena, personally observed, in other animals, as the mare, female ass, bitch, cat, etc., as well as in cows.

Mr. West made a statement to me which is amply corroborated by remarks of Mr. Darwin's, namely, that, in the rougher Welsh and Highland cattle, which lead harder lives, maturity, or the epoch of puberty, arrives much later than in Alderneys or shorthorns; but he adds that a flux of sanguineous character equally occurs in the females of those breeds at the time of the rut. I am indebted to Mr. West for information respecting a remarkable case of "impervious vagina in a heifer," which occurred in his practice, and which illustrates the occurrence of sanguineous menstruation in the heifer. Mr. West was called to see a heifer supposed to be in labour, and unable to calve. On examination, he found the vagina to end in an impervious canal three inches from the vulva. Thinking the foetus must be dead and abortion prevented by the state of the vagina, Mr. West advised that nothing should be done, hoping the pains might subside. They continued, however, and the heifer lost flesh. Four months afterwards, Mr. West determined to cut through the obstruction. This he did, but having passed it, he found the os uteri contracted; accordingly, into this he inserted a whalebone sound, and dilated it a little, when a reddish-brown offensive fluid began to escape. About two quarts altogether came away, but no signs of a foetus. The beast recovered. Mr. West concludes with the remark that the fluid "should have come away as a periodic discharge, but was prevented by the impervious state of the vagina, which must have also rendered impregnation impossible."

Mr. West was also so good as to refer me to a similar case published by Mr. Macgillivray, in vol. iii of the *Veterinary Journal*, p. 443. In this case there was an impervious vagina in a heifer, which had never been put to the bull. The creature had severe bearing-down pains, and was thought to have obstruction of the bowels. A passage was forced into the generative canal, and dark brown offensive fluid escaped. Mr. Macgillivray regarded the case as proving "the existence of a menstrual discharge in the brute female, analogous to that in the human female." He considered that the "oestral" products had never found vent from the uterus. These views were combated by another veterinary surgeon, Mr. Gerrard, but his arguments, though plausibly advanced, were quite inconclusive. Mr. Gerrard points out that adhesion of the vagina sometimes arises from injury done in copulation; but admitting this as a possible though rare occurrence, it does not apply in Mr. Macgillivray's case. Nor is Mr. Gerrard's argument on the "sero-sanguineous" nature of the fluid valid; for, as will be shown, the sanguineous character of the fluid diminishes as we descend in the organic scale; even in women the catamenial discharge is sometimes abundantly mucous. Mr. Macgillivray replies to his opponent's strictures in the same volume (vol. iv), and conclusively shows that his case was one of impervious vagina. He goes on to express the very decided conviction that the lower animals do certainly have an "oestral" discharge resembling the catamenia of woman, though it is not so invariable, copious, or well defined as in woman. He then gives instances of excessive flow in the cow and mare, and concludes by saying: "The discharge of a more or less quantity of a blood-like fluid in heifers and cows during the cessation of 'heat,' is so common, and so well known to all herdsmen, as scarcely to require any notice here."

Mr. Gerrard, admitting that the "oestral" discharge is frequently more or less tinged with blood in the lower animals, considers that a sanguineous flow is the exception and not the rule; but it is obvious that he is opposed to authorities like Flomring and Saint Cyr, as well as to the observation of most competent inquirers. Probably, when it is understood that, in accordance with the law of evolution, the discharge in the lower females is normally less sanguineous than in woman, these discrepancies between undoubtedly honest observers will disappear.

Laycock (*Nervous Diseases of Women*, p. 42) says: "The menstrual period has been considered analogous to the heat of lower animals by numerous writers. Reaumur and others, down to Cruikshank and Blundell, have described the state of the organs of generation in brute females during this period; they have been found fuller than usual of blood, the fallopian tubes in a state of excitement; or applied to the ovary, the latter enlarged and studded with developed Graafian vesicles, and a serous blood-coloured fluid discharged from the vagina. There are various considerations which serve to support this opinion."

"The following may be considered as the true state of the case respecting menstruation: Since the uterus itself is not an essential organ of generation, but merely superadded, and since the influence of the ovaria and testes over all the other processes and organs connected with generation, including the existence of the uterus and its development during gestation, has been demonstrated, there

appears not the slightest reason for withdrawing the phenomena of menstruation from their agency. It is in the ovaria, then, that we have to look for the causes of this process. There is every reason to believe that Graafian vesicles are coming forward at intervals during the whole period in which the reproductive organs are active; that these vesicles enlarge and burst in succession, and shed the contained ovula, whether sexual connection takes place or not; and that, from recent researches, these changes in them take place at each menstrual nisis. If we remember that, during the period of heat in the lower mammals, as the ewe and the sow, and of spawning and egg-laying in birds, fishes, reptiles, insects—indeed, of every class of oviparous animals—these ovula become developed and are shed, whether they be fructified or not, recurring at the same time to previous statements, we cannot help coming to the conclusion that the period of menstruation is precisely analogous to the period of heat; that there is, in fact, an excited state of the ovaria at each period when ovula are shed; and that the capability of performing this periodic function distinguishes the ovaria of the woman from those of the impubescent girl and virago. If, at this period, an ovulum be vivified by the male semen, conception takes place; and this hypothesis at once explains the doctrine that women more readily conceive at the menstrual period, maintained by Hippocrates, Galen, and their numerous copyists among the ancients, by Dr. Montgomery and others in later times, and generally believed by females themselves. When conception has taken place, a new action is set up in the ovaria, which may be considered as a permanent stimulus to the whole of the generative organs; and, although the usual nisis may and does occur during pregnancy, its effects are rendered less obvious from its permanency.* If, on the other hand, the discharged ovulum or ovula be unimpregnated, the same process is repeated at the next menstrual period, and so continues until age, disease, or conception interferes with the ovarian system. But we shall find that this periodic movement is not limited to the ovaria, but that it is an affection of the general system in which the ovaria partake; and that it is through these the secondary system in connection with them is influenced, and all the attendant phenomena (those of menstruation) excited."

"Recurring to our previous statements, it appears that in many animals the development of the testes and ovaria, and the shedding of the ovula and spermatic fluid, occur at definite seasons of the year, and, for the most part, in spring and autumn. The heat also of those animals, in which the genitals are in continuous activity, occurs at fixed periods, and these must be compared with the periodic movement of the human female. Again, the period of gestation in woman is a multiple of the menstrual period, and it will be useful to inquire into the relations of the periods of utero-gestation in animals generally to that of woman."

"Are the lower animals influenced by a periodic nisis, weekly or monthly? This question I shall attempt to answer in the affirmative, as well as my limited space will allow. It has already been remarked, that the change from foetal to uterine [extra-uterine] life is a phase in development which in man occurs at the end of the tenth menstrual period of the female. This is correct as regards the general fact; but it must be added that slight labour-pains occur at every menstrual period, but most particularly in the third, fifth, and seventh months of gestation; a foetus of the last-mentioned age being able to maintain an independent existence. The period of incubation of the egg is strictly analogous to the periods of utero-gestation in mammalia; and the same remark is applicable to that of the ova of fishes, reptiles, and insects, with due limitations. For example, in insects, the egg, larva, and chrysalis states correspond to the whole period between conception and puberty in mammalia. Mr. Kirby remarks that winged insects, many brachiopod crustacea, and the batrachian reptiles, in leaving the egg, only quit their first integument, answering to the chorion or external envelope of the human foetus; they, therefore, still continue in the foetal state." Laycock also quotes from the *Zoonomia* of the elder Darwin (Erasmus) that, "in mares and bitches, if the venereal orgasm be disappointed of its object, it recurs at monthly periods." (P. 60.)

Laycock adds many illustrations of the periodical recurrence of heat at brief intervals in the lower animals (pp. 60-61); and mentions an instance of a cow which, while in calf, was in heat every three weeks, and calved three weeks after the last time of heat. Kolbe and Buffon are quoted with reference to menstruation in monkeys, the latter asserting that the following monkeys men-

struate (besides the ourang-outang): "the Barbary ape, the ribbed-nosed baboon, the lion-tailed baboon, the pig-tailed baboon, the hare-lip monkey, the Malbrouck (*simia simica*), the white eyelid, the varied, the green, and the moustache monkey."

Laycock states that the rutting of the males is somewhat analogous to the heat of the females in respect of its periodicity, and remarks that "the ring-pigeon lays eggs for fourteen days after pairing, sits other fourteen days, and in fourteen more the young ones leave the nest. The goldfinch completes its nest in three days; it is left unoccupied four days, when the first egg is laid. Reviewing the whole of the preceding facts, it appears a legitimate deduction, that, in animals, changes occur in every three and a half, seven, fourteen, twenty-one, twenty-eight days, or at some definite number of weeks." In most of Laycock's statements I concur.

The valuable contributions of Pouchet to the subject of menstruation lend material support to the view that the function pervades the mammalian series, and is subordinate to the law of evolution already propounded.

He remarks (*Théorie Positive de l'Ovulation Spontanée*, p. 201) that the commotion excited by the maturation of ovules, not only excites the genital apparatus, but reacts upon the whole individual. "Sometimes it is manifested but once during life; the animal—suddenly exhausted by this concentration of all its vital forces—dies soon after having produced its ova; this is observed in the majority of insects. The beings of more robust organisation resist this act, and we see that during the middle period of their life they reproduce annually. The majority of fish, reptiles, amphibia, birds, and mammalia are in this case.....There exists in these creatures a species of periodic growth, as G. Saint-Hilaire has said, during which the blood flows constantly towards the ovaries and excites an expansive movement." He then points out the heightening power of domestication, but insists that, even when the periods are rendered more frequent, they still show intermittence, which in woman is monthly. In the lower vertebrata, the sexual disturbance is not so conspicuous as in higher creatures. In some mammalia the genital orifices and adjacent parts show conspicuous excitement, often accompanied by sanguineous emissions. The names of Aristotle, Linnaeus, Buffon, Cuvier, Blumenbach, Saint-Hilaire, and others are quoted in support.

Again: "If observation shows that ova are incontestably produced at fixed epochs in all invertebrate and vertebrate animals, since in them new generations appear constantly after regular and invariable periods, if, I say, that is admitted for all the zoological series, and it cannot even be contested as regards mammalia in a wild state, it becomes evident that the aberration observable in these latter that lived in our habitations, comes only from the new condition in which they are found; for attentive observation shows us that in them equally there are phases of excitation, and that it is during these that ovules are produced and that fecundation is possible. The condition of the human species enters entirely into this category, and if the periods when reproduction is possible are very frequent in women, that belongs manifestly to the amenities of social life."

"In animals the flow of blood is ordinarily less abundant, and the period of excitement returns at longer intervals. Notwithstanding, there exist in the domain of mammology species which are nearly as much regular as certain women, and in which the flow appears almost as frequently." Dugès and Jourdan also remarked these analogies.

Isidore Geoffroy Saint-Hilaire says (Breschet, *Recherches Anatomiques et Physiologiques sur la Gestation des Quadrumanes*, Paris, 1845, p. 4): "In monkeys the flow coincides in all the females with a swelling, more or less manifest, of the vulva and envolving parts. This swelling, moderate in the females of the apes, is, on the contrary, very considerable in the females of many species of macacus, and in all the species of cynocephalus. In all the latter it extends not only to the anus, but beyond, and it is so marked that all the orifice seems as if envolved by a large collar. The skin at the same time becomes deeply red. In the mandrill, G. Cuvier compares, for volume, to a child's head, the unequal red and inflamed looking protuberance which then forms around the anus. The same phenomena, though a little less pronounced, occur in the females of macacus; and even it often happens in these, for example, and in the females of rhesus and maimons, that the swelling extends to the inferior part of the tail, near the base." Again, Saint-Hilaire (*Histoire Naturelle des Mammifères*, Paris, 1824) says: "The females of apes, macacus, magots, cynocephalus, and probably of all other kinds of the first tribe, are subject to a flow periodically appearing from month to month. The matters emitted by the vulva are blood and mucosities, sometimes sanguinolent, sometimes white; the flow continues during

* Fleming (*Vet. Obstetrics*, p. 52) says: "Frañek has convinced himself, by post mortem examination of mares, of the possibility of ova being thrown off from the ovary during pregnancy."

six or eight days, and sometimes more. G. Cuvier fixed even at fifteen days the duration of the flow in a female mandrill which he made the subject of repeated observations."

Cuvier observed menstruation in carnivora, among others, in the genets; and Lesson and Garnot recognised it in the flying-fox (pteropus), which Saint-Hilaire says is periodical. Haller quotes many authors who thought monkeys, cows, deer and bitches offered evident traces of menstruation. Numann and Rainard made similar observations, while Pouchet had himself observed it in bitches, sows, cats, rabbits, and guinea-pigs, especially in the first. (Mr. Bartlett, the able superintendent of the Zoological Gardens, tells me that the discharge may be abundant in the bitch, and that the heat is sometimes long sustained in the carnivora). The wild pigeon produces only once or twice a year, while the varieties which it has given us through care, breed ten times a year, as Aristotle, Buffon, and Blumenbach have observed. Kuhleemann says sheep come to heat every fortnight; sows every fifteen to eighteen days. Kahleis and Numann, that cows come every month or three weeks; Greve, that mares come monthly; and Cuvier, that buffaloes, zebras, and monkeys, come also monthly. Courty also recognised the graduated relation of menstruation in the zoological series.

From his observations on sows, Pouchet concludes that the menstrual phenomena ordinarily precede the rupture of the Graafian follicles. (P. 262 :) "During menstruation the vagina of the sow offers a rosy tint, and the mucous fluid which it contains is slightly abundant. Microscopical examination showed me that the latter is composed of fragments of epithelium, cylindrical and pavement; mucus-globules, and blood-corpuscles in small number. . . . The womb, before its bifurcation, is reddened, and its capillaries are highly injected with blood. . . . The cornua are excessively injected with blood. Their mucosa is considerably thickened and spongy, and of a deep red, and, in certain parts, the abundance of blood wherewith it is engorged gives it even a violet coloration. . . . Thus, then, menstruation in the sow is a demonstrated fact. As in the human species, there is an emission of blood; but if this is not abundant, it is because this fluid is found in great part poured out in the immense extent of the internal generative apparatus." During the intermenstrual period, the vaginal and uterine mucous membranes are pale. Pouchet says that the appearances are absolutely similar in the rabbit, but that there is even more blood; and his observations upon bitches, cats, and other mammalia were equally confirmatory.

At p. 266, Pouchet says:—"In a work on the physical and moral system of woman, Roussel (*Système Physique et Moral de la Femme*, Paris, 1813, also edited by Cerise, 1860, Paris) pretends that menstruation is due to civilisation. We have expressed nearly the same opinion; only we think that the social state has not determined the essence of the phenomenon, but that it has only considerably augmented its frequency in rendering it nearly menstrual."

Auber also attributes the existence of the function to social advancement (Raciborski, p. 18). "Velpeau (*Tr. Comp. de l'Art des Accouch.*, t. I, p. 126) says that, in Lapland and Greenland, women are not more often regular than every three months; and Gardien (*Tr. d'Accouch. et de Mal. des Femmes*, t. I, p. 233) pretends that in women in Polar countries the menstrual flow takes place only twice or thrice a year." Pouchet, therefore, ably argues the physiological identity of the function in all the mammalian series, including woman; he says (p. 227):—"Menstruation consists in the appearance of a periodic and temporary excitement in the genital apparatus of woman. This function is declared by an afflux of blood in all the organs that share in it, and by the flow externally of a certain quantity of this fluid. Then it is essentially and ordinarily characterised by a swelling and maturation of one of the Graafian vesicles, and by the emission of the ovule which this latter contains."

Trousseau (*Clin. Med.*, p. 598), speaking of signs exhibited by the lower animals while breeding, says:—"Need I add that, during the period of rut in most female animals, the congestion of the genitals manifests itself by a flow of blood, and by an increase in the secretion of the glands, which are annexed to those organs?" Both Tarnier and Chantreuil (*Tr. d'Accouch.*), and Cazin, in his memoir on "Varices in Pregnancy and Parturition" (*Arch. de Zool.* 1880), quote Raimond as stating that "In the females of animals the vagina is coloured red at the epoch of heat; it takes a violet or brownish tinge during pregnancy, and the mucous membrane seems to thicken." Cazeaux says:—"In the rabbit it is tumefaction and almost varicose injection of the vessels of the vulva. To this colouring and tumefaction is added, in the bitch, an odorous secretion, which allures the males and puts them upon the track of the

females. Finally, in monkeys a more or less abundant hæmorrhage occurs, which, in the case of the macaques and the cynocephalus, coincides with so monstrous a swelling of the vulva, that, in certain cases, the surrounding parts are infiltrated, as though inflamed in consequence of the sting of bees."

Raciborski (*Traité de la Menstruation*, p. 43) remarks on the resemblance between the rut and menstruation in the matter of periodicity, and states that sows have symptoms every fortnight to eighteen days, heifers every twenty-one days, sheep every fortnight. Quoting from a friend having choice cattle, he says that the higher breeds require the male more often than inferior breeds; on which he exclaims, "*En voilà un singulier privilège de l'aristocratie dans la race bovine!*"

Generally, in most animals, there is swelling of the external genitals, and a discharge which is often sanguinolent, especially in the heifer, bitch, sow, and rabbit; while in monkeys, particularly in the great species, it often takes the proportion of a hæmorrhage.

[To be continued.]

THE TREATMENT OF SYPHILIS.

By J. MARION SIMS, M.D.

MORE than forty years ago, I practised medicine in Montgomery County, Alabama, near the Creek nation of Indians. Syphilis was then very prevalent among them, and their medicine-men had the reputation of speedily curing it. Their remedies were, of course, decoctions of native herbs. It was generally known that queen's delight (*Stillingia sylvatica*) was one of their principal agents. I had supposed that, when this tribe were removed west of the Mississippi in 1837, their secret of curing syphilis had gone with them; but, when I was in Alabama last year, I learned from my brother-in-law, Dr. B. Rush Jones of Montgomery, the following facts touching this question.

There were, he said, seven or eight years before our civil war, several obstinate cases of secondary syphilis in and around Montgomery, which resisted the usual remedies in the hands of our best physicians. They went the round of the doctors, and could not be cured. At last, one of these was advised to consult a coloured man, Lawson, belonging to Mr. N. D. Barnett, a cotton-planter residing in Montgomery County. In a state of despair, he went to see Lawson, put himself under his treatment, and in a few weeks he was perfectly cured. He returned to town rejoicing at his recovery, and soon others of his fellow-sufferers followed his example, went to consult the coloured man, Lawson, and were likewise cured. These cures by an obscure negro man, a slave, when the highest representatives of science had failed, were much spoken of in both town and country, and attracted the attention of Dr. George W. McDade, a very intelligent and accomplished physician, whom I have known since his early boyhood. Dr. McDade, feeling the greatest interest in the subject, went to see Lawson, who had made these marvellous cures, and obtained from him the formula he had been using so successfully.

Soon after this, Dr. McDade happened to meet Dr. James Freeny, who gave him the following history of the so-called Indian method of treating syphilis. Horace King, a mulatto slave, resided among the Creek Indians for several years before they were removed west of the Mississippi river (1837), and had learned from them their method of treating syphilis. While Horace was engaged in building a bridge at Tallassee, about twenty-five miles from Montgomery, in 1852, he heard that there were many cases of syphilis on Mr. Gipson's plantation near by, and that Drs. Freeny and Banks were the attending physicians; and he called on Dr. Freeny, and told him that he had learned a method of treating syphilis from the Creek Indians, which was universally successful, and that he would like to show it to him. And for this purpose he proposed to take the worst cases on the Gipson plantation for the experiment. Drs. Freeny and Banks selected a certain number of very bad cases, and turned them over to Horace; and they watched from day to day his method, while they continued their own plan with the other cases.

Horace's selected bad cases recovered more rapidly than Dr. Freeny's milder ones, and then Dr. Freeny adopted the Indian method in the other cases on the Gipson plantation, and has not pursued any other plan since.

So thoroughly convinced was Dr. Freeny of the superiority of the Indian remedy, that he wrote to Dr. Warren Stone, Professor of