# SEXUAL SCIENCE.

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SCIENCE has had its say on most modern questions; but, in relation to the great movement for "women's rights," it has been singularly dumb. We are not of those who believe that science can solve every social problem. We want something decisive for political action; but science knows of no dividing line. We may, as a matter of fact, assert that there is day, and be as positive that there is night; but there is also a time when it is neither day nor night, — a twilight which some will class with one or with the other, according to the different optical power with which they may be blessed. It is the province of common-sense, not science, to set that matter at rest.

But though we would not appeal to science as an unerring guide in all the affairs of life, a knowledge of its leading principles will so expand our views and guide our judgment, that we are far less likely to err in our practical efforts to have things right, than if we go blundering along in the dim light of tradition and past experience. It may help us in this matter of the relations of the sexes. Let us see what light it will give us. And first, why are we created of two sexes? What separate purposes do these divisions serve? Separate sex is not confined to man. Nature will not answer us in this limited field. The division exists in high and low organisms; in the vegetable as well as in the animal world. Those who do not look far beyond men might answer that sex had for its object the continuation and reproduction of species or individuals; but this can scarcely be the leading object of nature, because in plants and the lower orders of animal life reproduction is carried on quite independent of any sexual organization. Many things, such for instance as some grasses and herbaceous plants, increase themselves year after year by underground suckers or shoots. In some cases all behind the leading point dies annually, and a new plant appears a short distance from the original starting-point. Take a potato, for instance; a thread-like production pushes from the parent-stem for perhaps a foot, and at the end appears the "potato." If this remain in the earth without disturbance, the thready connection would die, and the potato grow as before, gaining another foot, and so forth, until, after a period of twenty years, it would be twenty feet away from the starting-point, and have given birth to twenty new individuals. This may go on for an indefinite number of years, and for any thing we know forever, without any sexual agency whatever. In gardening we know how we can go on year after year continually reproducing a plant by grafts, cuttings, buds, offsets, and other ways. The red Dutch currant has probably been reproduced in this way for many hundreds of years. In the lower order of animal life also the original will break apart, and each separate piece grow; and we may get even up to a crustacean where we find, that, though a broken-off limb will not reproduce the original, the animal can reproduce the broken limb. We see from these

considerations that whatever was Nature's object in the creation of sex, reproduction was not the primary consideration.

There is one observation we may make as we go along, in regard to these modes of propagation, which may help us hereafter. Each individual born, so to speak, in this way, is for the most part an exact reproduction of the original. A graft from a seckel pear-tree produces a tree which bears seckel pears; and the red Dutch currant is the same currant still; and a bunch of fruit from one tree is just the same as if taken from the other. A sprig from the dwarf box-edging reproduces edging-box; and the tree-box produces in the same way the tree-growing kind. If Tom Thumb or Daniel Lambert could be reproduced in this style, there would be scores of large or small people so exactly alike that their own mothers would not know them apart. This recognition is unnecessary in plants and the lower animals. Each part can take care of itself as soon as it is detached from its parents. Here it does not concern Nature whether the mother knows its own child or not. But in the higher orders of animals, where identity is of the utmost importance in enabling a mother to care for her young, the races could not exist on the same principle of increase which marks the lower ones.

But we go back to the plant. Besides all its powers of reproduction by extension and division, it bears seed. Here, however, the results differ. They do not reproduce exactly the same plant. In a bed of seedlings no two are exactly alike; and it is through this law that we have so many varieties of flowers in our gardens. The florists preserve the most striking variations, and destroy the rest. So in fruits. The seeds of the seckel pear will produce something like seckel, but not seckels exactly; and if we raise fifty trees from fifty seeds in this way, there will be fifty varieties, all resembling seckel, and yet all varying from one another. Hitherto botany has regarded the seed as created for the chief purpose of *distributing* the species or individual.

But although distribution is certainly more readily effected in this than any other way, we have seen that it is not the essential difference. The production of variety, thus securing identity, is the leading office of the seed.

No doubt the close reasoner will stop us here. A tree can reproduce itself by buds and cuttings where identity is not necessary. If variation is to provide for identity, what is the use of identity to it? This is a case of *twilight*, before referred to. We suppose we are on the boundary here of a transition. All we can positively know is, that seed is not essential to reproduction, and that with the introduction of seed-variation dates its vigorous origin. We can further see, that, in the higher organisms without variation, identity, so far as mutual recognition is concerned, could not exist.

It is a self-evident proposition, that the first leading principle of all nature is the effort for *existence;* and, as all organic beings can exist for only a limited time, the second grand object of its care will be *reproduction.* There can be little doubt but that every action of every living thing, and indeed the form of every living thing, is in some degree connected, more or less remotely, with one or the other of these grand objects of Nature. *We,* of course, have our own

motives for what we do; and every animal is impelled in its conduct by some idea of pleasure or necessity. Plants we regard as unconscious, and probably they are; but they all act by laws tending to their own good in the same way as animated beings do. We do not stop to think of Nature as a whole. The individual seems rather a world unto himself, yet behind him and behind all is the one great idea, *nature;* and this Nature only caring for its one self, — its self-existence, and continued reproduction. The principle of variation is only secondary, and subservient to the other two prior and greater aims.

There can be no doubt that Nature will throw around the great reproductive principle a greater measure of protection than she will around the mere incidents thereof. Thus if sustenance failed to carry along variation and reproduction together, she would let the first go. In this event, all that appertains to the division into sexes of the present order of things would disappear; and only those lower orders would exist which can extend themselves without it. And this is all in accordance with what embryologists tell us: that with the failure of nutrition, the last organs in the usual order of structure are the first to die away.

It would hardly be correct to call the reproductive principle in Nature the female principle; and yet when Nature has advanced so far in the plant or the animal as to call for a division into sexes, it will hardly be denied that the female is in more intimate communion with this leading object than the male. The female must necessarily be the most favored of Nature. At the commencement of the division the female will be first provided for; and in the great struggle for life, all other things being equal, the chances will be largely in her favor. In plants the division into sexes is not made apparent until the flowering period arrives. Some are hermaphrodites; that is, they have stamens and pistils in the same flowers. Others are diœcious, or have the male flowers wholly on one plant, and the females on another. But it is seldom known, prior to flowering, which is the male plant or which is the female. Still the peculiar sexual principle in some cases, no doubt, pervades the whole plant, and exists long anterior to flowering; for a male or female plant once known will generally always remain so. Cuttings taken from either will be pretty sure to reproduce the same sexual flowers again, though not always; for the female silver-maple will not unfrequently put forth branches with male flowers. Still, as a general thing, sex is not determined in plants until near the flowering time; and is, as has been said, never known until the flowers have actually opened. In those plants which bear male and female flowers separate on the same plant, it is then seen that the male flowers only appear on the weakest branches or branchlets. This is best illustrated by a pine or spruce tree. The female flower is that which ultimately becomes the pine-cone. The male flowers gather in small clusters, and are those which produce the dust (pollen) in early spring. The female flowers or cones only appear at the ends of the healthiest branches. As the tree grows, of course the branches now at the end in time become the interior, and are then shaded by those which go beyond them. Shade always tends to lessen the vitality of a growing branch; and here we

see that branches once strong and bearing female flowers, as soon as thus partially weakened by shade bear only male ones. An inspection of any pine-tree in spring will show, that though male flowers are sometimes borne at the base of the shoots bearing female flowers, weak shoots never bear any thing but male ones. This will be found the case in all plants of a monœcious character. In the common *ambrosia*, or ragweed, the male flowers are on a sort of weakened, half-dead-looking, raceme; while the females are situated in the best position for receiving the highest amount of nutrition the plant can bestow. Those who have examined this matter in plants, see the truth of the position in the vegetable world, that nature's highest efforts in the formation of the sexes are invariably in the female line.[1]

The same facts appear to us in the animal world. In the very first struggle with life the males get the worst of it. The vast majority of all the children who die under five years of age are males. As the sexes approach maturity, the terrible strain on the female system begins, and the numbers of males and females again nearly equalize. The amount of nutrition over and above that required to sustain life passes in the male to brain and muscle, to mere physical strength and intellectual capacity; but in the female, to immense nutritive power for the support of another human being. Man is physically stronger than woman; that is, in cases requiring an immediate concentration of power, he is her superior. But in *vitality*, if by that we may understand the ability to endure circumstances tending to destroy life, he is below her. Not only can he not endure as much during the first five years of his life, but as an adult he sinks under pain that a woman would hardly faint with. Any of us can look around and see women with perhaps half a dozen young children which she must look after, a continual series of routine, monotonous housework which she must attend to, now roasting at the oven, steaming over the wash-tub, or freezing at the clothes-line, and continually with the worry of crying children ringing in her ears; and all this for years and years, with ailing infants and sick older children, and perhaps even a male specimen of an older cast to whom she is expected to be a "help-mate" besides all this; altogether for months and months giving her but three or four hours of sound sleep per night. Where is the man that could endure it? A year of such a life would kill the strongest of us. We find the same law of vital endurance outside of man. Cavalry officers in the late war found out the wisdom of selecting mares for arduous services; and we all know what a miserably dull animal the unsexed ox becomes. This branch of our topic need not be further pursued. It has been shown that naturally the reproductive principle should be endowed with the highest attributes of vitality, and the few instances cited will show its bearing in the world of facts.

And now why is this intellectual superiority and greater muscular strength given to man? If woman has greater endurance, and greater traits of general vitality, why not excel in all points? It is simply because he is to use these for the

[1] For fuller details of this matter, see papers by the author in the Salem and Troy Proceedings of American Association for the Advancement of Science; and in Rec. of Phila. Acad. Nat. Sciences, 1869-70.

benefit of the female. In the wild state in which man first found himself, it would be impossible for the woman with her young child to defend herself from the continual elements of warfare then everywhere about. Wild animals would soon end the whole human race. Moreover, she could not leave her young at home to hunt for food. Man thus appears as an essential aid to Nature's great reproductive principle. He is the ruler, the planner, the protector, but not for his own sake, but all in the cause of a greater and more beloved power in the economy of Nature.

In the animals below man, we find pretty much the same law to prevail: that the male animal is physically and intellectually the superior only in proportion to the weakness or incapacity of the female or the progeny to take care of themselves at certain periods of their existence. In many birds, where the young is difficult to rear, either the male is much the superior of the female, or else monogamy prevails. In the pigeon, for instance, and similar birds, where the young require constant attention for some time, both male and female seem nearly balanced in qualities. In the barn-door fowl, where the young can take more care of themselves, polygamy prevails. The young of the duck can take care of themselves also; but here, although we do not find strict monogamy, we find the female and male birds much more equally matched than they are in the case of the barn-fowl.

When we come to fishes, we find no difference apparently in the physical or intellectual capacity of male or female. The young take absolute care of themselves, and the mother requires no protection. Questions of relative strength of the sexes, or of monogamy or polygamy in fishdom, are therefore of no consequence. Both have to take care of themselves, both have equally to fight with enemies for their own preservation, both have an exhaustive strain on their vital functions at spawning-time, and hence they are about evenly balanced in every way.

It is curious to observe how soon the male disappears from the scene when he can in no way serve the great female cause. In plants, no sooner does the pollen from the stamens fertilize the pistils than they drop away; while in some cases, the pine for instance, the female organs continue alive for a couple of years afterwards. In the hemp and the spinach the whole male plant dies some weeks before the female one. In some spiders the female devours the male before she proceeds to lay her eggs, and when she has no further desire for his companionship; and a large number of male insects die immediately on the exercise of their special functions. The females live to deposit their eggs or to rear their young. It is clearly to be seen that it is necessary they should have this extra power. The extra vitality is given them for this purpose. Still, the simple fact remains, that the female possesses greater vitality than the male.

From these and similar considerations, which those who wish to follow the subject further can pursue for themselves, we may conclude that woman worship is not a mere poetical fancy, but has its seat deep down in the heart of Nature. When the youth asserts his beloved to be his queen, swears eternal allegiance, and vows forever to be worthy of, and to serve her, he is really following but the dictates of Nature, who wor-

ships the female as ardently as he does. She is undoubtedly the most favored, and in elementary constitution at least, if not in actual form, must claim a place in nature long anterior to the origin of man in the sexual sense of this term. For theological purposes she may have been formed of the rib of Adam; for Mohammedan or Mormon uses she may be but the mere slave and creature of man, without even a soul to be saved except through his sovereign will and pleasure; but the religion of nature demands rather the sacrifice of the other sex to her eternal law.

It will not be difficult to apply these principles to the great woman question of the day. Man is the great acting, working force; all that appertains to providing or protecting is his place in nature. The gun, the plough, the ship, the sword, — the elements of force whatever they be, and the ballot which is to direct and control that force, — all these are the essential prerogatives of man. At the same time these laws and forces should be used for the interests of woman; and where they are not, man is not fulfilling the purposes for which he was created.

And this brings us again to our starting-point. Science will not solve every practical problem, because we want absolute laws; while the laws of nature run into one another. As a general thing, it is the male bird which does the singing and the female the hatching; but there be hens which crow, and birds of the male persuasion which believe it to be a solemn duty to sit on eggs, and take the young under their protecting wings. These we can again compare to the twilight reasoning. One may assert it night, another that it is day; one that it is right in the hen to crow, another that it is not, — these boundary-line questions can never be solved. But the main question as to the natural duties and responsibilities, the relative rights and wrongs, of the sexes, these seem as clear as day and night; and, when clearly perceived, ought to render the subject of general legislation not so puzzling a question as it seems to so many of us.

In a special way there will always be men who will neglect their natural duties, and society itself may at times wander so far from the main purpose of its creation that its members may feel totally unable to perform duties which otherwise it would be their pleasure to do. Women left without natural protectors must take on themselves the duties of men in order to live at all. For all these aberrations from general law, special arrangements must be made. The only danger to society is when it takes the minor for the major proposition; seeks to adapt laws necessary to twilight, to every purpose of day and night; asserts the absolute equality of the sexes in every particular, instead of properly defining the main rights and duties of each, and endeavoring as far as the artificial state of society will permit to keep each sex to its own natural sphere.