

ciency of the one will counterbalance the excess of the other. The same is true of any other faculty.

It must be remembered, however, when speaking of remarkable capacity, or genius, that a man may possess either, and yet not become eminent. Besides the faculty, he must have constitutional energy, strong will, perseverance, and the power of application, without which the brightest faculties may lie dormant, or be but half used. A man of transcendent intellectual gifts may transmit them all to his son, but if the son inherits from his mother, at the same time, a languid temperament, or constitutional inertness, he will make no use of them.

The law of heredity applies to the whole nature, bodily and mental—to every part individually, and to its whole collectively. In applying it practically, the influence of one part upon another must be considered, and also the influence of each upon the whole. It is only by doing this that we can succeed in working out what is undesirable, or reducing it to its lowest terms, and in raising to the highest possible pitch whatever is most worthy of being conserved.

In regard to moral qualities, there is no doubt but they are also transmissible, equally with the mental. Whole families have been noted, for many generations, with an inborn tendency to be criminals. Others show simply a tendency to vagabondage, and others again to certain pursuits and occupations. The Hebrews seem born with a capacity to handle money, and to appreciate the value of jewels. For centuries they were prevented being anything else but jewelers and money-changers, and no doubt the faculty thus acquired has been hereditarily transmitted.

Insanity, lunacy, and idiocy undoubtedly run in certain families, and may be always expected in them at intervals.

In 1,300 cases of insanity, Esquirol found 300 cases of hereditary transmission, and no doubt there were many others, if the family histories had been traced far enough back; for it must be remembered that insanity, like any other established trait, may miss several generations, and reappear again. It is still there, but lies dormant for a time. Insanity may also be partial, and in some cases exhibit itself only in eccentricities. Moreau mentions the case of four brothers, whose grandfather died insane. Their father was simply a shiftless man, incapable of applying himself steadily to any pursuit, while their uncle, an intellectual man, was noted for many oddities of character. One of the brothers was a raving maniac at intervals; another was melancholy mad; the third was irritable, with a tendency to suicide; the fourth was a natural artist, but exceedingly suspicious and timid.

The insane tendency, in all these cases, was modified by their respective mental and bodily constitutions, but it was there. One peculiarity of hereditary madness is, that it seldom shows itself till late in life, thus often giving rise to false hopes that it may not occur. In women, it is usually after the change of life, but sometimes occurs during pregnancy or child-birth. In men, as a rule, it occurs most frequently from fifty to seventy-five years of age, unless brought on earlier by intemperance or sexual abuse.

Idiocy usually shows itself in childhood or early youth. Puberty is a dangerous period when there is a tendency to idiocy, especially with those addicted to sexual abuse.

Idiots are rare among savages or semi-civilized people, probably because they seldom survive long, no one giving them that extra care which their unfortunate condition demands. In some communities, idiots are always left to perish, or are

destroyed. We nurse them, and even allow those with the taint of idiocy to marry and propagate a race of imbeciles.

The passion for *gambling*, like that for drinking, is often inherited, and dominates the whole character. There are born gamblers, born drunkards, and born thieves and murderers, beyond doubt; that is, there are people born with tendencies to these vices and crimes, so strong that all the ordinary influences cannot restrain them.

The conduct of society toward such erratic members must always be regulated by expediency, and not by abstract justice, nor by dogmas about moral responsibility. It is necessary for the welfare of society—nay, even for its very life—that such people should be restrained, or even put out of existence. And, above all, they should never be allowed to propagate! It is bad enough to have natural thieves, lunatics, murderers, or idiots, to care for and control, but it is infinitely worse to allow them to originate generations of such.

The original Jukes girl, on the upper Hudson, was not only thoroughly depraved herself, but she originated a family equally depraved. Of eighty descendants of hers, one-fourth are convicted criminals, and the rest nearly all drunkards, lunatics, paupers, and harlots.

How to deal with this matter practically must, in each case, be left to every person's own judgment; but most certainly, in view of these facts, no one ought to marry and become a parent without giving them some consideration.

At present, society can do but little, even in the worst cases, and must, perforce, see crime, idiocy, and pauperism propagated, without the faintest attempt at interference. It will not always be so, I feel sure, and the first step toward improvement must be in giving the subject full discussion, and showing its importance.

About thirty years ago, a book was published in England, called "*Marcus on Painless Extinction*," in which were advocated the right, and even the duty, of parents to put undesirable children out of existence at birth, by a painless process. The work made an immense sensation, and was finally withdrawn, but it served the purpose of calling attention to a subject previously almost totally ignored. It was supposed to have been written by an eminent statesman, for the purpose of stimulating public inquiry and discussion. I mention it merely for its historical interest. The celebrated *Malthus* advocated simple *moral restraint* to effect the same ends—a means which it is obvious would be effective with very few, and not at all with those with whom it would be most desirable.

INTERMARRIAGE AND PAIRING.

These subjects are among those about which people generally know but very little, but upon which they have very decided and fixed opinions. It is only quite recently that any attempt at all has been made, systematically, to gather facts bearing upon them, and the facts show, most conclusively, that the popular notions are erroneous.

This is especially the case in regard to intermarriage, or the union of persons nearly related. Very few people, except those acquainted with the facts, doubt for a moment that the marriage of near relations always results in imperfect offspring, and it will surprise many to learn that there is absolutely no foundation at all for such a belief.

Ancient history shows that in early periods the nearest relations intermarried

freely, and it is not easy to say when, or why, the practice was first discontinued. It is probable that the church, during its most ascetic period, first began to interfere with the freedom of marriage, for its own profit and advantage. At best marriage was, in the early ages, only tolerated, as a concession to human weakness, and as a necessary means of continuing the race. The consent and sanction of the church was made imperative, on every union, and the church alone decided who should marry and who should not. At first only the very nearest relations were forbidden to intermarry, but gradually the prohibition became extended to first cousins, and then to the fourteenth degree, till finally any degree of relationship or affinity whatever, no matter how remote, or even god-parentage, was declared a bar to marriage. It was, however, distinctly understood that the prohibition was not absolute, in all cases. The church could grant a *dispensation*, where relations were determined to marry, and, *for a fee*, make it lawful for them to do so. This is the case even now in the Romish church, and cousins may marry providing the priest has been paid for his sanction. This proves that the objection is considered as merely ecclesiastical, and not natural, except by those who believe that the priest can really work a physiological miracle, and really change the blood.

These early theological notions, however, originated and perpetuate even now the prevailing notions in regard to intermarriage. Even where the church has lost its authority, the old dogmas it taught still rule over men's minds, and form their opinions.

It was formerly thought that the intermarriage of near relations (except with the special sanction of the church) was sure to entail the curse of heaven upon the spouses. Not only would their children suffer in many ways, but their orchards would be barren, their cattle would die, and in many other ways they would be accursed. That no real danger of these evils was apprehended is proved by the fact that they could be averted, in all cases, by a church ceremony, duly performed and paid for. In fact, near relations might marry, if they could afford the cost.

Even at the present day there are people who believe that a god-father and god-daughter ought not to marry, and that some punishment is sure to follow them if they do, though they may not be in any way related. Many churches also discountenance the union of first cousins, and some clergymen will not marry them. The civil law, however, fortunately, places no such restriction, and people can now marry without church sanction.

As before stated, it is only quite recently that any doubt was felt as to the necessary hurtfulness and immorality of the marriages of near relations. The old notion being fixed that they were so, every case where evil of any kind followed such marriages was carefully noted, while all those cases in which no harm resulted were passed by.

By degrees, however, independent observers began to present their facts, and to controvert the prevailing opinions, but they had a hard up-hill fight, the whole power of the church, of tradition, and of fixed prejudice being against them. It was only when statistics were collected, and experiments made with the lower beings and with plants, that the true state of the case came to be seen. Breeders of animals proved that when a really good kind was once obtained, they could breed in and in, in the closest manner, not only without harm, but with positive advantage. In cattle, for instance, the children have been crossed with their parents, and the resulting offspring back again with them both, the last generation being more perfect than the first.

The real point established by these experiments, and upon which the whole question turned, was this: Any character, or quality, good or bad, which is possessed by both the male and the female will, if they marry, and are prolific, probably become intensified in their offspring.

As a rule, however, marriages of near relations should be carefully considered, for this reason. There are few families without some taint, and therefore both may be reasonably supposed to be similarly affected by it. If they are, they should not marry. Very frequently, however, the nearest relations are quite unlike each other, and have no unfavorable tendencies whatever in common. Very frequently, in fact, first cousins are better adapted, naturally, to marry with each other than with strangers.

It should be borne in mind also that this law of double inheritance, by offspring, works two ways. Health, strength, beauty, mental power, and good moral tendencies, if possessed by both parents, may become doubled in their children, just as surely as disease, deformity, insanity, or immoral tendency. Whether the parents are nearly related or total strangers does not affect the result in either case. As remarked before, it is simply their fitness or unfitness, physical, mental, and moral, that should be considered, and not their relationship. If they are both similarly tainted, though they may be total strangers, their children will probably be doubly so; and if they are both healthy every way, though related in the nearest degree, their children will probably be healthy also.

It is a popular notion that two persons who are *alike* should not marry, whether related or not. But that all depends upon whether the peculiarities in which they resemble each other are objectionable or not. If so, that is a reason against the marriage, but it may be that the peculiarities are such as it would be desirable to perpetuate, or even intensify, and then the marriage would be one to be desired.

This subject of proper mating in marriage, is, beyond question, the most important that can engage human attention; and the almost total neglect of it, shows how slow man is to appreciate properly what most concerns him. By due attention to this matter, when the necessary facts have been gathered, disease and all vicious tendencies can be annihilated, and man's mental and physical power be increased far beyond anything we can now conceive!

At present it is all hap-hazard, with the chances the wrong way. Men of intelligence, who will not mate their horses, dogs, or cows, without the most careful scrutiny, in order to insure perfect offspring, will nevertheless marry their children to disease, vice, and insanity, without a thought!

In some future age, when man comes to be guided by reason and knowledge, instead of tradition and superstition, the propagation of children will be as carefully attended to as the propagation of animals is now. But that will not occur till man learns the fact that he is an animal himself, and subject to the same laws as his fellows.

The remarkable success which has been obtained by improvers of the breeds of cattle and other animals, shows how much can be effected in this way. These men have found out, practically, that by proper pairing they can breed *out* any undesirable quality, and increase any desirable one. The value of domestic animals has been increased in this way enormously, and there seems no obvious limit to the improvements. This applies not only to bodily characteristics, but to mental and moral ones also; our present domestic animals being from birth, incontestably more docile and teachable than their remote ancestors.

Much of this improvement has been effected by close in and in breeding, or by the mating of near relations; it being a rule with many breeders, when they have established a good breed, to keep clear of any outside intermixture. All they regard is the qualities of the animals they pair; if these are what they wish, relationship is not taken into account. If a stranger has the desired qualities in the greatest perfection, it will be taken, if not, a member of the same family will be chosen.

The same principles are established in regard to plants, as shown by Mr. C. Darwin in his work on *The Fertilization of Plants*. After giving the results of his numerous experiments and observations, he sums up with saying that there is no necessary intensification of taints, and that in and in breeding is harmless, so long as the sexual elements are sufficiently differentiated. If plants grow constantly in the same place, and under the same conditions, they gradually exhaust the needed elements, and thus become less capable of self-impregnation, because they cannot perfect the sexual element. In such cases, a cross from a plant grown in another locality, results in more vigorous offspring, but it matters not whether it be a stranger or one of the same family.

It is quite possible this may be the case, to some extent, with human beings, in whom new conditions may effect favorable changes, as they do in plants. But all animals have this advantage, that they are not tied to one spot, as most plants are, and therefore can vary their surroundings at will.

That crossing is often an advantage there is no doubt, both in plants and animals, but it is so only when the cross brings some new good quality, or increases one already established. It makes no difference whether the cross is made with a stranger or with a near relation that has been raised under new influences.

Mr. Darwin planted cross-bred seeds and in-bred seeds of the same plants, on opposite sides of the same pot, and found that the cross-bred ones usually grew much more luxuriantly than the in-bred ones, but not always. The explanation, no doubt, was, as before stated, that, in the cross, the male fertilizer was grown under different conditions, more favorable for the elaboration of the pollen. A new plant raised from seed in a place well suited to it, would fertilize itself, or breed *in*, as perfectly as if it were crossed. It is the same with breeds of animals; adaptation is what must be considered, without regard to relationship.

Even if it should be found to be a law of nature that crossing should take place, to some extent, it would not show that intermarriage is necessarily hurtful; for the nearest relatives, among animals, cannot breed so close as the plant which constantly fertilizes itself; because animals are all the time changing their conditions, more or less, while the plant is always fixed in the same.

Mr. Darwin says, "From the facts given in this volume [*The Effects of Cross and Self-Fertilization in the Vegetable Kingdom*], we may infer that with mankind the marriages of nearly-related persons, some of whose parents and ancestors had lived under very different conditions, would be much less injurious than that of persons who had always lived in the same place, and followed the same habits of life. Nor can I see reason to doubt that the widely-different habits of life of men and women, in civilized nations, especially amongst the upper classes, would tend to counterbalance any evil from marriages between healthy and somewhat closely-related persons."

This remark may be sometimes of practical value. If a union be desired between

two very near relations, much alike, any possible evil may be much counterbalanced, as Mr. Darwin remarks, by having them reared apart, under different conditions, or, at least, kept so as long as possible. This, of course, applies to all animals, human beings included, and to plants also.

Even the different occupations, and mode of life during the day, of husband and wife, no matter how much they resemble each other, will help to differentiate them, and so counteract any possible evil from their near relationship.

Observations on individual cases show no more harmful results from intermarriage of near relations, than from the marriage of strangers; and statistics give the same result.

Mr. George Darwin was perhaps the first man who went into this subject systematically, for the purpose of getting at the real facts. He found that the prevailing notions were all based upon conjecture, imperfect observation, and tradition, and that there was really but very little positively known about it.

He first set to work to discover what proportion of all the marriages, in a given number, were between first cousins, and found it to be *three and five-tenths per cent.* in the middle and upper classes and landed gentry, and *four and five-tenths per cent.* among the aristocracy. He then got the statistics of numerous lunatic and idiot asylums in England and Wales, and ascertained how many of the cases therein were children of first cousins. The result was about *four per cent.*, or nearly *one-half of one per cent. less* than among the children of those not nearly related.

The inquiries were more especially directed to deafness, sterility, low vitality, and inferior mental and bodily vigor. The results proved that there is, to say the least, no more danger of either of these defects to the children of first cousins than to those of other people.

Mr. Darwin found, for instance, that among 366 families which furnished deaf mutes, only eight were unions between first cousins—that is, a little over *two per cent.* only!

He also found that in the peerage, and among the landed gentry, marriages between first cousins were more fertile than ordinary, and that their children were even more fertile than usual, whether they married relatives or not.

Statistics show that about *twelve per cent.* of all marriages, in England, are barren. But Dr. Bemis shows, from an analysis of 833 cases of marriages of near relations, that less than *seven per cent.* of them were barren.

In addition to this we have many instances of small communities, isolated from the rest of the world, where close intermarriage has been the rule for generations, without any special bad results, if not sometimes with advantage.

Dr. Voisin tells us that the commune of Batz, situated on a peninsula, and separated from the main-land by a salt marsh, is almost entirely isolated, the inhabitants having very little intercourse with the main-land. They number about 3,300, and have intermarried amongst one another for many generations. Dr. V. did not find amongst them, however, a single case of deaf-mutism, albinism, blindness, malformation, or mental disease, although almost everybody was related. The number of children amongst them was over the average, and they were unusually healthy. The average of barren marriages was only four per cent., which is very low indeed.

They are a simple but intelligent people, habitually sober, and crime is almost unknown amongst them.

Among the Jews, as is well known, marriages of very near relations are common, and yet they are among the most healthy people in the world, and the most free from defects, both bodily and mental.

This subject has been treated upon more fully because it is advisable the truth should be known. It would often be advantageous for first cousins to marry, and it would be a pity that an unfounded notion should prevent it. Of course there may be family or other reasons why near relations should not marry, but there is no natural reason why they should not.

In the case of the commune of Batz, above referred to, the founders were probably all sound, healthy people, and close intermarriage has been advantageous, by keeping their offspring like them. Had some of their forefathers been deaf, or imbecile, the intermarriage might have been a great misfortune, by intensifying their bad traits and perpetuating them.

All which proves, as before remarked, that in marriage it is the sound and healthy condition of the parties that should be considered, and their mutual adaptation; it will then be of little moment whether they are related to one another or not.

IMPROVEMENT OF BREED.

To show the importance of a proper attention to pairing, in the breeding of animals, we may mention the fact that with sheep, the improvement of the *breed* has practically doubled the amount of mutton from a given number of animals! The same result has also followed the improvement of cattle, from whom double the amount of milk, butter, cheese and beef are now obtained, compared with those of former times. In horses, pigs, and all other domestic animals, it is the same; they have all been doubled or trebled in value by systematic improvement. So expert have breeders become, that they will produce almost any form, size, or color that may be desired, by proper attention to pairing.

It cannot be too often repeated, that the same laws apply to human beings, and that, beyond doubt, man can be improved every way, physically and morally, as certainly as the lower animals, and by the same means!

At some future day this will be acknowledged and acted upon, and society will rightly attribute all cases of vice, malformation, and disease, to its own neglect, and not to any inherent defect in human nature itself.

Those who would like to see what can be accomplished in this way, even by unenlightened people, should read the history of the ancient Spartans, with whom the admiration of physical perfection was a real passion.

Nature herself, by the process of evolution, is constantly at work perfecting our race. By the agency of natural selection, the strongest and those of acutest intellect multiply faster, and endure longer, on the average, than those less fortunate. They crowd them out, override them, and push them to the wall. It is in this way that man has emerged from the savage state, and become what he is. Age after age, the superior ones have overcome the inferior, and their offspring have inherited their superiority. Gradually, but surely, by natural means alone, the breed of human beings has improved, but very slowly, compared with the improvement which can and will be effected when man pays as much attention to his own propagation as he now does to that of the animals he controls.

It should be borne in mind, further, that when an improved breed is once obtained,

constant care is needed to keep it pure and to perpetuate it. Neglect brings contamination, and degeneration speedily follows, as breeders, both of plants and animals, have found to their cost. None but the finest and most perfect males and females should be allowed to propagate, and they must be paired with special reference to the particular qualities we wish in the offspring.

Many physiologists have gone so far as to say that our extreme care of the sick, and our medical art, is a real misfortune to the race. It keeps alive the sick and feeble, and so allows them to propagate their debility and disease, whereas, if left alone, they would die off, and their infirmities would die with them. They say this may seem cruel to the individuals, but would it not be better so, than that thousands of others should be born to suffer in the same way? Would it not be better to end all this, than to make it permanent? to purify the race, than to keep it tainted?

Nature herself follows this course. She makes no provision for the sick and feeble, but allows them to die off at once, instead of becoming the parents of others like themselves. All wild animals cast out and shun the sick and injured of their own kind, and so prevent them from propagating. This is, no doubt, one great reason why diseases of any kind seldom become permanent or constitutional among animals in a state of nature.

Common humanity will, however, always make us care for the sick and feeble of our kind, mitigate their sufferings, and keep them alive as long as possible; but it is not necessary nor advisable that they should propagate. That concerns society more than it does them.

It certainly is a public calamity when people afflicted with mental or bodily disease, or moral defects, become parents! and they never ought to do so.

This is a matter that concerns society at large more than it does individuals, and society will one day take charge of it. At present, ignorant and thoughtless people can go on propagating disease, insanity, and criminality, and no one has the power to hinder them. It is even considered an offense to speak to them about it, or to question their right to do as they choose in the matter.

It will not always be so, however, I feel sure, and perhaps these few remarks may assist in bringing about the much-required change.

Many interesting instances are well known of transmitted tendencies in families, for many successive generations; the notorious Jukes family, for instance, already referred to, almost every member of which is a criminal or pauper from birth, all of them being descended from one vagabond pair. On the contrary, other families have been as noted for eminence in other ways. The Napiers, for several generations, have been distinguished as mathematicians, the Candolles as botanists, and the Darwins as naturalists.

The true policy of society is to encourage this family transmission of qualities, even though it may lead to close intermarriage, for by this means the capacity for particular pursuits is increased, and the special tendencies intensified.

A natural-born scientist, in any department, is rare, and of inestimable value. Under proper conditions, such a man attains the very highest rank, and makes his influence felt in all subsequent generations. Mr. Charles Darwin is a man of this kind, and a striking instance of the influence of hereditary descent. He is, in fact, the elder Darwin more fully developed; and his children are already treading close upon their father's heels. What some future Darwin may become, if the family tend-

ency continues, we cannot conceive, although it would seem very difficult to surpass the one we now have.

It becomes a duty, in the members of such a family, to be extremely careful in regard to marriage, so that the brain development and stored-up mental habits of their great ancestors may not only be maintained and transmitted, but, if possible, be even improved upon. In such a case, intermarriage may be extremely desirable, if it tend to preserve or increase the family capacity and tendency, while marriage with strangers, if it led to a contrary result, would be a real misfortune to society.

CHAPTER XLV.

HYBRIDS, HYBRIDIZATION, AND CROSS-BREEDING.

Hybrids.

As a rule, only animals of the same kind breed together, and their progeny is of the same kind. But sometimes animals of different kinds will mate, and their progeny will then be a mixture of the two, or a hybrid, as when the horse and ass breed together, and produce the hybrid called a mule. It was formerly thought that animals of different species could not breed together, and that when any two did breed it proved them to belong to the same species. This, however, is now conceded to be erroneous, for not only different species, but even different genera will cross, and it is only those of different orders which are incapable of intermixing. At what precise point intermixture between two different animals becomes impossible we do not know, but it is certain that it becomes rarer the more remote they are from each other.

It is possible that hybridization would be more frequent, even among widely separated beings, if it were not for differences of structure, which interfere with copulation and gestation. The male sperm and the female germ, even in those of different orders, might intermix and form a hybrid, if they could be brought together under proper conditions. The generative elements are the same in all kinds of beings, but each kind has a particular mode of congregation and gestation.

We see this exemplified both in plants and animals, many kinds of both being crossed by artificial aid which never are naturally. Different kinds of fishes, for instance, are crossed this way.

One of our previous articles has explained how the human female may be impregnated artificially, by throwing the semen into the womb with a syringe, and it is quite possible that in this way animals might be crossed who cannot copulate.

In some cases of hybridization, the male and female of both kinds intermix either way, and this is called *bilateral*, or two-sided crossing. Thus we have a mule either from the male ass and female horse, or from the male horse and female ass. In other cases the male of one kind can cross with the female of the other, but the process cannot be reversed. This is called *unilateral* or one-sided crossing. Thus the male goat will breed with the female sheep, but the male sheep cannot impregnate the female goat.

One-sided hybrids are the most common, and even in the two-sided, one way always produces a more perfect being than the other. The mule, for instance, which has the horse for father, is a larger and more perfect animal than the *hinny* which has the ass for father. Mules are also more readily and certainly obtained than hinnies.

We have no means of judging beforehand whether any two different animals

will cross, for some that seem very near together will not do so, while others, apparently very remote, will.

Although it is laid down as an invariable rule that different orders will not intermix, still there are some alleged cases of their having done so. The *jumart* for instance, was said to result from the union of the horse and cow, either way, and this was believed down to the time of Buffon. Thorough investigation however showed that the so-called jumarts were only hinnies, from the union of a horse with a female ass.

All the different species of equus, the horse, zebra, ass, and quagga, breed together; the dog will breed with either the fox or the wolf; the lion with the tiger; the male sheep with the female deer; and the hare with the rabbit. A mastiff dog has also bred with a lioness.

Among birds the swan and the goose; the grouse and the black cock; the pheasant and the common fowl; the canary and the goldfinch will intermix, as also many others.

Among reptiles, the toad and the frog will cross. And among fishes many curious intermixtures have been obtained.

Hybrids may be of either sex, but the generative system is usually imperfect, so that they are either totally barren, or procreate only to a limited extent. Even when they do procreate, it is usually with one of the parent stock, and but very rarely with each other. The male hybrid is more usually sterile than the female. The female mule, for instance, sometimes has a foal by a male horse or ass, but never by a male mule. In fact, the semen of the male mule usually contains no animalcules, as before explained, so that it could not impregnate.

One very remarkable exception, however, must be named.

M. Roux, of Angoulême, France, has successfully crossed the hare with the rabbit, and the hybrid, called a *leporide*, is found to be both prolific and valuable.

These and similar experiments have been thought to prove that there is not, naturally, any such thing as difference of species.

It has been asserted that all hybrids gradually lose their fertility, and thus, if left to themselves, they would die out in a few generations. This is undoubtedly true of most of them, but there are exceptions.

I have been assured by those who have carefully observed, that even the mulatto, the cross between the white and the black of the human species, is not nearly so prolific by itself as it is with either the pure black or white. While lecturing in Washington, I had much conversation with the late Mr. John C. Calhoun on this subject, and also with Governor Tazewell of Virginia, and many others. The universal testimony was that two mulattoes, when married, scarcely ever had the average number of children, and that their offspring, if they married, had a still smaller number, while theirs again, when married, were almost invariably barren. At the same time, either generation would regain its prolificness by connecting with either black or white.

Mr. Calhoun informed me that it was once a law in the West Indies, as he had been told, that all mulattoes of the fourth generation of regular descent were declared free, but that none were ever found. And it is certain that children of mulatto descent are very rarely to be met with.

In my visit to the South, by favor of the above-named gentleman, and others, I had an opportunity of examining a large number of cross-breeds, between black and white, of various degrees, and the result fully satisfied me that few of them were

sexually perfect. In the male the testicles are generally small, and lack firmness, while in the female the ovaries and womb are also small. The quadroon, and octoroon, are more perfect than the offspring of two mulattoes, because of the pure white parentage.

Some cross-breeds seem to be an improvement, in certain particulars, upon their parents, but as a rule it is the reverse, although it is occasionally advantageous to breed a certain amount of one kind into another.

The crossing of different vegetables, fruits, and flowers, has undoubtedly given us many improved and valuable varieties, some of which are capable of continuing their kind by self-fertilization, while others are not.

Every plant always prefers the pollen of its own species, and will take that alone, when mixed with other kinds. To effect a cross, therefore, of any flower, its own stamens must be cut away before their pollen is shed, or it will be sure to be taken in preference to that of the plant we wish to cross with.

It is the same with animals, the semen of each kind being always preferred to that of any other animal.

Generally, with plants, the hybrid resembles the male parent more than it does the female; and it is most frequently so with animals. Thus the mule is more like the horse, and the hinny is more like the ass. The mulatto by a white father is also whiter than the one by a black father.

In addition to the hybrids already mentioned, I also find a few others, which are deserving of notice.

M. C. F. Rafinesque, professor of botany in the University at Lexington, Ky., states that a cat was left alone, for some months, in a cabin in Kentucky, with no other cats within fifteen to eighteen miles, and yet was found by the owner on his return with five young ones. They were not young cats, however, but apparently hybrids between the cat and an *opossum*. The body, and fur, were like that of the mother, but the head, paws, and tail were like those of the opossum. These creatures lived some time, and were shown as curiosities, but they never propagated. In all probability the cat, when in heat, not meeting with a male of her own kind, associated with a male opossum. But if this were so it is a very remarkable case of hybridity, for these animals belong to different orders and types.

M. Rafinesque also says that hunters assure him that the raccoon will cross with the red fox, and he has even seen the skin of one of these hybrids, which apparently resembled much that of the raccoon, but was a real mixture of the two. In this case also the parents were of different orders.

The male buffalo, it is well known, will cross with the common cow, and the progeny will breed, but the domestic bull will not so readily cross with the female buffalo. These half-breed buffaloes are now quite common in the West, and are said to be quite valuable.

The Canada goose will cross with the domestic goose, and the progeny will breed; and the same is the case with the common duck and the muscovy duck, though all these are considered to be of different species.

In all probability many rare and unexpected hybrids could be obtained, by artificial means, and some of them might be valuable, as well as interesting.

When the pairing animals, or plants, are nearly related, so that their offspring is not very dissimilar to them, it is commonly called a *cross* only, and not a hybrid, but the distinction is only conventional.



FIGURE 118.—Remarkable Hybrid, from the New Forest. Drawn from life, by George Landseer.

A few years ago a remarkable hybrid was found in the New Forest, in the South of England, of which we give an illustration. The account given of it states that "this remarkable filly (seven months old) was found a short time since in the New Forest, and is evidently of a mixed breed, between the horse and the deer. Her mother (a pony mare) was observed to associate with some red deer stags in the New Forest for some months, and, at last, this foal was seen by her side. The nose shows a proximity both to the stag and horse; her forehead is round, like that of the deer; legs slender and distinctly double; hoofs pointed, and partly double; color brown, lighter under the belly, and tail like a deer.

"This extraordinary animal is the property of T. G. Attwater, Esq., of Attwater, at the village of Bodenham, three miles from Salisbury. Dr. Fowler, of that city, has inspected the hybrid, and is quite satisfied of the correctness of the preceding statement; and Colonel Buckley (a keeper of the New Forest) has likewise seen the animal, and is of a similar opinion."

This is one of the most remarkable and best-attested instances of hybridization, between animals very remote from each other, that I have ever met with, and proves that with due care, crosses may be effected to a greater extent than is usually supposed possible.

A gentleman who had lived many years in Africa, and traveled much in the interior, assured me that the people all fully believe in crosses between the chimpanzee and native women. They assured him that it was dangerous for a woman to go alone into the forest, if male chimpanzees were there, because they always seized and violated them. He said further that he had seen many children singularly monkeyfied in appearance, which are said to be the result of such forced unions. What was very remarkable, none of these children spoke. Certainly such hybrids would not be nearly so wonderful as many of those we have described, and there is no reason, structural or otherwise, why they should not be produced. The chimpanzee and the lowest negro are certainly as nearly related, structurally, as the lowest negro and the Caucasian, and they breed together, either way.