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HORSE-BREEDING IN CANADA

By JOHN D. DUCHENE, D. V. S.

QUEBEC, 1903 — Press of THE DAILY TELEGRAPH

HORSE-BREEDING IN CANADA

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Fig. No. 1.—The Horse.

HORSE-BREEDING IN CANADA

HISTORICAL SUMMARY

The horse is a mammiferous animal belonging to the family Solipeda. "The horse," writes Gayot, "has been and will remain a potent factor of civilization. Man's indebtedness to this animal gives him an exalted rank in the animal hierarchy and

in the scale of usefulness. Without the horses' help how many undertakings could not possibly have been carried out.

Writers do not agree as to the early history of the horse, nor as to the nations who first conquered and utilized him, or as to the different successive epochs of his adoption as an auxiliary by the divers nations of antiquity. The most erroneous opinions are expressed every day on this subject. We can give space here to only the briefest summary of the information furnished by science of the horse's early history.

In prehistorical times, there already existed several natural breeds of horses living in absolute liberty. Paleontologists are continually finding traces of the early existence of the horse, and this in America as well as in Europe. Fossil remains are not scarce and seem to belong to various races of horses, to a variety of breeds, perhaps, which consequently were already inhabiting the old continent at the periods when the stratas in which their remains were found, have been formed. It is also known that horses were to be found in Europe when man made his appearance ; it is even demonstrated that in that portion of the world, the horse was a contemporary of the human beings of the tertiary period.

Before his domestication in Europe, the horse had for a long time been hunted, killed and used

as food by man, exactly as is now done with our deer.

Europe is, beyond doubt, thanks to progressive science, in a better condition to furnish data as to the origin of species ; but if it is desired to reconstruct the early history of the horse after domestication, it becomes necessary to glean information among the nations of the East.

The notions furnished by history demonstrate the following facts :—The Aryans, the Indus ancestors, have conquered and utilized a race of horses indigenous to Central Asia, and this, long anteriorly to the Christian Era. Under the rule of Yao, about the year 2,350 before Christ, horses were numerous in China.

The hippologists who believed the Arabian horse to be the most primitive, and a native of Arabia, were erring, for it is known that horses were brought to that portion of Asia only a long time after their domestication on the high lands of Central Asia. These are beautiful horses coming from Persia and Trak, all of which are descendants of horses from Central Asia, or at least very much impregnated with their blood, and which have furnished the admirable race of Arabian horses which steadily acquired all possible perfection under the protecting influences of Mahomet's precepts, and which has sent to all parts of the world its solid and brilliant qualities. I shall refer to them in a special chapter.

As to the race of Western Europe, we can safely admit that they also have a distinct and primitive origin, and the best proof is found in the anatomical differences with regard to the number of vertebrae and ribs, etc., etc., found by Lauzon to exist between the Eastern and Western horses.

The origin of the horses of North Africa is anterior to that of the Arabian horse; as, already during the quaternary period that country contained a race of wild horses characterized by the remarkable slenderness of their limbs, an indication of great speed.

In America, there exist inconstable paleontological traces of the early existence of horses, but their domestication is subsequent to the arrival of Europeans.

In the wild state, horses are much coarser than the domesticated ones, their heads are much larger, their ears long and the bony eminences are more prominent. They are generally found in herds, headed by a stallion who, as a spirited leader, is the first to face danger.

In certain portions of Asia, in North and South America and in Africa, numerous herds of wild horses are still to be found.

Fig. 2. — Situation of the centre of gravity in the horse.

ORGANIZATION OF THE HORSE

The body of the horse is composed of solids and of liquids.

The solid portions or tissues are found to be either hard or soft. They form the outlines of the animal structure and are the agents or means of motion.

The liquid portions facilitate the different movements by lubricating the points of friction,—or entertain life by carrying the nutritive fluids into

all parts of the animal system. These metamorphosis, or changes, are taking place continually and are so closely blended together that it would not be possible to exactly state their proportions. An unaccountable phenomena, called *Life*, directs their reciprocal action.

Life is of two kinds:

1. *Organic* or *Vegetative* :—This form of life is indispensable, its cessation is death.

2. *Relative* :—This form of life is only collateral.

The number of years of organic life attained by horses in their natural state, that is in the wild state, may be computed at six or seven times the length of time required for the animal's complete development. Thus the longevity of horses who take about six years to attain maturity, would be about forty years. Domestication, however, has reduced this rule by about half, bringing it to an average of twenty years.

The principal tissues are: the muscular, fibrous, osseous, nervous, bony, cartilaginous, serous, cellular or connective and the integument.

We call *muscular tissue*, those masses of fibres, ordinarily red, soft, capable of contraction and of relaxation, which form the muscles and constitute the meat that we place on our tables.

The *fibrous tissue* is found in the shape of lamina, under which form it goes to form sacks or solid protecting textures for certain organs, or to help their action. The fibrous tissue assumes also the form of ligaments for the purpose of connecting bones or to transmit to any portion of the body the

power of contraction or relaxation developed by the muscles. Under this last form, the fibrous tissue takes the appellation of tendons, vulgarly named *cords*.

The *vascular tissue* furnishes the arteries, whose task it is to carry the blood from the heart to the different portions of the animal system, from which it is brought back by the veins. These are also furnished by the vascular tissue.

The *nervous tissue* furnishes the nerves. These are found in the form of small white cords which, emanating from the brain and spinal marrow, send numberless ramifications in all the other tissues. They establish connections between the brain and each of the organs, to which its mandates are transmitted, or their various impressions reported.

The *integument* covers the whole body, and is ordinarily known under the name of *skin* and folding inwardly, covers the natural cavities and canals, such as the intestinal canal and the respiratory tract, etc., etc. This lining takes the name of *mu-
cous membrane*.

The *bony tissue* furnishes the bones. These are solidly connected together and form the basis of the animal construction.

The *cartilaginous tissue* which, whilst hard, is essentially elastic, takes the place of bony tissue wherever solidity allied to flexibility are required.

The *serous tissue* furnishes closed sacks, in the interior of which are secreted either gases or an oily liquid for the purpose of lubricating the articular surfaces of the bones, at the joints, or the gliding of the tendons within their sheaths, or again to facilitate the play of the lungs within the chest or of the bowels within the abdomen.

The *cellular tissue* serves to connect all the organs without in any way restricting their individual actions.

The natural physiological apparatuses are divided in according to the tasks assigned to each into fourteen principal classes, viz :

1. Locomotion ; 2. Digestion ; 3. Circulation ;
4. Respiration ; 5. Nutrition ; 6. Secretion ; 7. Absorption ; 8. Reproduction ; 9. Enervation ; 10. Feeling ; 11. Taste ; 12. Smell ; 13. Hearing ; 14. Sight.

TEMPERAMENTS—DISPOSITIONS

We will confine ourselves to the four principle classes of temperaments, whose well defined characteristics are easily recognized.

1. Sanguine ; 2. Nervous ; 3. Moderate ; 4. Lymphatic.

1. *Sanguine temperament*.—This form of temperament is due to the predominating influences of the circulatory and respiratory organs. Horses of a sanguineous disposition are generally found to possess medium bone-development but well developed muscles, rounded forms, shining coats, the apparent mucous membranes are highly colored, ample play of the lungs and a full and strong pulse. Their athletic power are disclosed by splendid proportions and display of energy. They usually render excellent service for long years.

The diseases attacking these horses are usually of the acute form, as a rule of a short duration, either to a prompt recovery or a fatal termination. The horse endowed with this type of temperament

Fig. 3. Regions of the Horse seen in Profile.

are the Arabian, the horses from Barbary and Navarre, English, and those from Brittany.

2. *Nervous Temperament.* — This is the result, or the consequence of the abnormal development and susceptibility of the nervous system. It is more particularly noticed on slender bodied animals, with long slim limbs. The respiration of this class of horses is usually hurried, their pulse quick and their appetite irregular and capricious. Attentive to the least noise, they seem for ever on the alert and uneasy, and ready to defend themselves, conveying the impression of having received habitual ill-treatment. Easily irritated and over excitable, these outbursts of temper are generally followed by reactive periods of dullness and general depression.

The diseases attacking the animals belonging to this class are usually of a serious nature. They are accompanied by nervous super-excitation. Well bred horses, such as the English thoroughbreds, are of that class of temperament, whereas these characteristics are seldom met with in commoner breeds.

3. *Moderate Temperament.* — This type, presenting the best equilibrium of the different organs is the nearest to perfection. It is derived from a normally developed nervous system, impressionable to such a proper extent that the exact amount of sensibility is present, but not exceeded for the correct working of the divers organs. This type is becoming scarcer among our horses, because they are becoming too far removed from their natural state, and that instead of looking among naturally perfect breeds for our regenerating types we search

the artificial sources, whose appearances are frequently misleading.

Horses endowed with this type of temperament are easily recognized by their graceful attitudes, development, and beauty of form, the elasticity of their movements, the kindness of their disposition, and the friendliness of their eye-glance. Their respiration is free and easy, pulse regular, their bones are small but of compact texture, the muscles are hard and well defined, the skin soft. Of sober disposition and apt to undertake the most fatiguing journeys, they are always ready to resume work as soon as their spent strength has been somewhat restored by a short rest and a little food. Seldom ill, they are attacked only by the regular diseases.

4. *Lymphatic temperament* :— This form of temperament is the unfortunate result of the inertia of the different organs. The horses coming under their type are easily recognized by the coarseness of their forms, the flabbiness of their muscles, the large size of their bones, their ill-defined parts. Their respiration is usually labored, the circulation slow, the apparent mucous membranes are pale, their coat long and lustreless. Their least exertions are listless and seem to fatigue them overmuch. They seem desirous to rest their weight on anything within their reach, as though they could hardly bear their own weight. Unsuitable for any active work, they should be debarred from the cavalry service.

The lymphatic temperament is predisposing to glanders, farcy, and to all the chronic diseases. This form of temperament is more commonly observed on prairie-bred horses than on stabled and grain fed stock.

Hygienic measures, may in some cases, through prolonged and intelligent care, modify to a great extent the natural disposition of this class of horses, and almost substitute a new form of temperament. In such a case, this new temperament is said to be acquired to distinguish it from the former.

Finally, the breeding of horses possessing this form of temperament is to be carefully avoided, more especially in the Northern climates, as these animals can but ill-resist the influence of cold. On the other hand they do very well in warm and dry climates.

THE SEXES

The differences existing in the organs of generation of the two sexes, exercise very distinctly a physical and moral influence on both.

The male has been endowed by nature with a greater development of the anterior portions of the body and with a more sanguineous temperament. His proud bearing, animated look and his impetuosity, which must at all times be quieted, denote an unnecessary expenditure of energy.

The mares have a wider rump, quieter habits, are more docile, and possess a more moderate temperament. They are kindlier and, whilst weaker than the male, seem to store up energy for emergencies. It is only exceptionally, such as are during the period of heat, that a few temporarily become as fiery as the males themselves and this, through the natural and imperious need of joining with them.

AGES

The term *Ages* is employed to designate the several periods in horses lives, during which notable changes and modifications take place, and which extend from the birth till the end of life.

The ordinary life may thus be divided into three principal periods as follows, viz.: 1. The *Young Age* or period of growth: 2. The *Adult Age* or stationary period: 3. *Old Age* or period of decrease of powers.

The length of these periods or ages vary with individuals and is dependent to a great extent on the breed, temperament, the kind of labour to which subjected, and the care bestowed.

Whenever the horse has reached its full prime, i.e., the fullness of his powers, then his stationary or adult age has been reached. This epoch in life is not positively defined, and in some cases it is reached at five years of age, whereas with others, maturity is reached on the sixth, seventh or eighth year. It is regrettable that it cannot be more positively defined, as only when it is reached should we require the animals to perform the full amount of work for which they are intended.

The extreme difficulty of knowing when maturity is complete has been the cause that the fifth year has been generally adopted as the most suitable year for the beginning of ordinary work.

Old age is announced by stiffness of the limbs, diminution in the volume of the muscles, impairing of strength. The abdomen hangs, the back hollows, the head whitens, general weakness, etc.

STUDY OF THE AGE

The teeth are the only positive indications by which the age of horses can be determined. Nearly all horse fanciers pretend to be able to tell the age by this peculiarity or that ; such as when the eye is sunken, or when the edge of the lower jaw-bone becomes thinner, or by the number of vertebrae in the tail. But all these alleged infallible ways of knowing the age are worthless : it may be that they might give an approximate idea of the age, but, as I have already said above, the only reliable means of determining the age of horses is by a thorough and practical study of the "incisor" teeth.

The following plates will give a general insight into how to determine the age of horses.

The horse has 12 incisors, 6 in the upper and 6 in the lower jaws. They are subdivided into pincers, intermediates, and corners.

On colts the pincers make their appearance before or a few days after birth ; the intermediates from 4 to 6 weeks after birth ; the corners 6 to 9 months after birth.

II

The lower jaw at three years and a half. The "intermediates" are replaced.

REPLACEMENT OF THE INCISORS

The pincers	at $2\frac{1}{2}$ year.
The intermediates	at $3\frac{1}{2}$ "
The corners	at $4\frac{1}{2}$ "

The pincers are levelled at 6 years ; the intermediates at 7 years ; the corners at 8 years.

After this age has been reached, the Veterinarian is the only competent authority who can determine the age.

VII

The lower jaw at eight years. The external cavity disappears from the corners. The "dental table" is then said to be "levelled."

EXTERIOR

In hippology, by the word "exterior" is meant the study of all the external parts of the horse, under the three fold consideration of their correct and beautiful conformation, defects, and of the accidents and blemishes which may take place.

In order to become competent to judge of the value of a horse, after an ordinary examination, it is necessary to possess certain notions of anatomy and physiology. The study of these two subjects will be joined to the descriptions of the most important regions of the horse.

THE SKELETON

The skeleton is the assemblage of the passive apparatus of locomotion. It is divided into two very distinct portions, namely: the *trunk* and the

Fig. 4.—The Head.

1. Mouth	6. Face	12. Temples.
2. Superior lip.	7. Forehead.	13. Ear.
3. Inferior lip.	8. Inferior Maxilla.	14. Parotid region.
4. Chin	9. Cheeks.	15. Throat.
5. Extremity of the nose.	10. Eye.	16. Neck.
6. Nostrils.	11. Supra-orbit.	

members. The trunk contains and protects the various organs indispensable to the maintenance of life and is composed of the head, the vertebral column, the pelvis, the ribs and sternum. The members are exclusively intended for the support of the body and by their movements transport it from one place to another. They are veritable columns of support and levers of motion.

THE HEAD

The Head is situated at the anterior extremity of the trunk. It exercises a great influence on the general equilibrium. Representing a resistance placed at the extremity of the arm of a lever formed by the neck, it forms or constitutes a resistance whose relative situation, on account of the extensive movements which it executes has a great influence in changing the position of the centre of gravity and controlling the movements during locomotion.

The study of the ever varying expressions of the physiognomy furnishes us with an exact analysis of the qualities and defects in the character and conformation of individuals.

The head is divided on the median line in : 1. The Poll ; 2. Forelock ; 3. Forehead ; 4. Face ; 5. Extremity of the nose ; 6. Mouth and secondary regions ; 7. Chin ; 8. Tuft of the chin ; 9. Intermaxillary space ; 10. Throat.

Fig. 5.—Correct conformation of head viewed in front.

The lateral faces present: 1. The Ears; 2. Parotids; 3. Temples; 4. Supra-orbits; 5. Eyes and secondary regions; 6. Checks; 7. Inferior maxilla; 8. Nostrils;

In all animals the head is the seat of intelligence, without which it is impossible to have a good servant.

Figs. 6 and 7.—Defective conformations of head, viewed in front.

The head should be small, as the width of the forehead constitutes an absolute beauty. The height of the body measures from the withers to the ground, should be two and one-half-times the length of the head.

Well dilated nostrils, well situated eyes, ears well apart, a wide intermaxillary space are characteristics which generally coincide with a wide forehead, whereas, the narrowness of the forehead is usually accompanied by long ears, situated *too high*

Fig. 8.—Defective conformation of head, viewed in profile.

and *too closely* together, small eyes, small nostrils and narrow intermaxillary space.

The fineness and nobility of the ears and eyelids, amplitude of the nostrils, thinness of the lips, vivacity of the eye, and frank expression of the physiognomy are generally co-existent beauties.

THE EAR

The ear is situated at the superior extremity of the lateral face of the head to one side of the forehead. Diverse beauties are looked for and eagerly sought in this region which are dependent upon its length, thickness, situation, direction and movements.

1. *Length*.—Some nations prefer a long ear, others a short one. We do not approve of an excess of length ; but rather that the ear should be proportionate to the head. But it is a fact worthy of remark, that horses in which they are short are usually energetic and courageous. In this respect the Arabian horse has much the advantage over the English horse.

2. The *thickness* of the ear denotes the nobleness of the race. When the skin of the concha is thick, and garnished on the inside with numerous long and coarse hairs, we have evidences that the subject is soft, lymphatic and of common issue.

3. The *situation* of the ear merits consideration. Its distance to one side of the median line, allows us to appreciate, to a certain degree, the width of the cranial cavity. But is also dependent upon the muscular development of the region. If this separation gives more expression to the head and presages greater intelligence, it is nevertheless necessary to guard ourselves against according to this character more importance than it deserves. The same argument applies to ears situated too high ; they have an unpleasant effect on the eye and are often an index of a timid and sulky disposition.

4. It is considered a mark of *beauty* if a horse freely directs his ears to the front.

Ordinarily they are moved in various directions.

Animals in which the ears are motionless are sluggish and indolent or, what is more serious, suffer from deafness.

If the various movements and attitudes of the ears are closely studied, they will be found to furnish a reliable index to the animal's moral qualities, and give valuable clues as to whether the horse is skittish, irritable, or kind and trustworthy.

THE EYE

The eye constitutes a double region situated upon the lateral planes of the head, and on each side of the forehead.

Beauties of the Eye:—Whatever may be the service, the absolute beauty of the eye resides in the following phenomena :

1. Its separation from the median line, which coincides with a wide and well developed forehead.
2. Its degree of prominence over the surrounding regions, which indicates a fullness of the ocular cavity and the temporal fossa, the size and development of the muscular system, good general condition, and the amplitude of the field of vision.
3. Its perfect equality with that of the opposite side.
4. Its deep coloration.
5. Its freedom from blemishes of the cornea and the transparency of the media
6. In the dark coloration of the pupil.
7. A rosy tint of the conjunctiva.
8. Finally, the vivacity, changeableness, and frankness of the expression. Such are the beauties to be sought for in this region.

THE NECK

The neck is a single region, flattened from side to side, situated at the anterior extremity of the trunk and supporting the head.

This region is an important one to study, because it constitutes at the anterior part of the trunk the arm of a lever more or less long, whose

Fig. 9.—Good conformation of head, viewed in profile.

extremity gives attachment to the head, which is a kind of resistance that follows all its displacements and concurs with it to modify the situation of the centre of gravity during progressive movements.

The anterior extremity of the neck is limited by the head, the posterior extremity is limited superiorly by the withers, inferiorly by the breast and laterally by the shoulders.

The length should be proportional to the remainder of the body. However in saddle-horses the neck can never be too long unless it should be very slender.

The Arabs, who possess such a judicious instinct of the horses' absolute beauty, say that a horse, without bending his anterior limbs, should be able to drink out of a brook running at the level of the ground.

A short neck presents disadvantageous only for saddle-horses, from whom much suppleness and mobility is expected, especially in army service and manege work.

In draught horses, whose qualities reside in their immense power of traction and resistance a short neck cannot be considered a serious defect.

Driving horses should not have short necks, as this defect would greatly impair the animal's elegance, and the gracious carriage of the fore parts expected from him when under harness. In such cases the carriage of the head would not be in keeping with the remainder of the turn out, and the intended effect would be defeated.

It is readily seen that the neck is one of the regions exercising the most influence on general locomotion. Consequently its type should be selected in accordance with the kind of service to be expected from it. In all cases it should be slender, muscular, well defined ; then it will never appear heavy ; more especially if the conformation of the withers does not mar it.

THE WITHERS

This is a single region situated on the superior face of the trunk, behind the crest of the neck, in front of the back, and between the two shoulders.

The beauties of the withers are in the sharpness, elevation, extent, and freedom from blemishes thereof.

Fig. 10.—Correct conformation of fore part, viewed in profile.

The sharpness of this region indicates that its summit is formed only by the tissues which constitute its essential base. The superior border, however, should alone present the inert parts, as the bones and ligaments. At the base, on the contrary, the thickness denotes a large development of the muscles which separate it from the internal face of the scapular cartilages.

Thus should the withers have a fair elevation, but not excessive, be sharp and well defined instead of low and thick; and be well prolonged in an antero-posterior direction, that is, from the neck towards the region of the back. A horse possessing these characteristics will be in excellent condition for the production of speed.

The beauty of the withers, which is generally an indication of the nobleness and distinction of its possessor, seems to endow the animal with other important qualities. This region is somewhat analogous with that of the head, as in the case of the withers also a study of the region and knowledge of its correct conformation, may guide those knowing horses, in determining and appreciating the degree of nobleness of a horse as well as its value. It is seldom that beautiful withers are not accompanied by a beautiful shoulder, a deep chest, softness of the hair and coat, of a good foot, in short of all the characteristics which denote good breeding. Now, coarse and round withers are usually co-existent with the heavy and clumsy forms of massive and degenerate breeds. The exceptions to this rule are very few.

Consequently it will be wise to devote to the examination of this region all the care that it deserves, with a view of selecting its form in com-

Fig. 11.—Good conformation of rear part, viewed in profile.

pliance with the kind of service it is intended to obtain. In all cases it must be sharp, muscular at the base, well defined.

THE BACK

The back has no defined limits, it is limited anteriorly by the writers, posteriorly by the loins, and laterally by the ribs. The back is a single region situated on the superior part of the trunk.

To be of correct conformation, the back must be straight, short, wide and muscular.

The back is said to be *straight* when it describes almost a horizontal line from before to behind. It is the sign of great strength, for all the weight which the region supports is borne by the bones and tends to efface the rachidian arch. The saddle, pack and harness-saddle will, in this conformation, rest in a good position.

The horses who are *hollow-backed* or, as some prefer to say, *sway backed*, are not adapted to work which exacts much force and resistance of the back. They cannot be employed as hunters or runners, but should be reserved to draw light vehicles, four wheeled ones preferably.

Long Backs are much sought after by those riders anxious to secure pleasure saddle horses and who prefer easy reactions and rocking gaits accompanied by suppleness to great displays of strength and resistance.

Wide Backs are evidences of high development of the muscular system of the region. This characteristic marks that kind of back which is called *double*. It is a peculiarity observed in heavy and well muscled animals, whose chests are wide, the backs somewhat concave, and the withers low.

THE LOINS

This single region is situated behind the back and in front of the croup and the haunches, and limited on the sides by the flanks. The conditions denoting good loins are identical with those of the back and are easily explained.

The loins should be wide, short and muscular.

The width of the loins is directly proportional to the development of the costiform apophyses of the lumbar vertebrae; consequently a wide loin is to be regarded as a feature of absolute beauty.

Whatever may be the work the animal is destined to perform, the loins should be as short as possible, a condition of solidity.

As to the relation of the entire length of the dorso-lumbar region, the back should be *long* and the loins *short*, especially in saddle and pack animals. This point cannot be impressed too strongly.

As to their direction the loins should always be straight and become insensibly united to the croup and the back. When they are mal-attached, there exists in front of the former a depression of variable depth, which gives them such names as low, weak, false, and dipped.

The sensitiveness and suppleness of the loins, which it is well to test by pressure on the region to determine its flexibility, are often means of determining the state of health or sickness of the animal. Inflexible loins may characterize a more or less serious condition of disease, even a partial or complete ankylosis of the bones of this region. In cases where this condition is present it will be wise to seek the advice of some competent authority in the matter.

THE CROUP

The croup is a single region situated behind the loins, in front of the tail ; it is limited on each side by the thighs and the superior part of the buttock.

The croup can be considered as a lever facilitating locomotion and display of power, to a degree in relation to the length and angle of its arms, and the muscular development producing the motive force. The Arabs say: " As to the horse whose croup is as long as his back and loins united, you can safely choose him even with your eyes closed ; such a horse is a blessing."

For the production of speed, the croup, being considered as a lever, should be as long as possible ; it will then have the advantage of longer muscles, and consequently of a greater scope of contraction, which is a necessary condition in the production of speed. If a proportionate muscular development accompanies a long croup then this region will be endowed with the absolute beauty to be sought for, as in such a case the proper length and muscular development will be present.

The amateurs and self styled practitioners, who exercise but little judgment and powers, still less knowledge, are aware that a short croup is considered a defect. They cannot explain why, nor do they care much. We have repeatedly heard horse trainers and jockeys state that this horse or that could not possibly run or trot because the animal was not long enough. They were wrong ; the body of a horse is always sufficiently long when to a long croup there is joined a well developed and oblique shoulder.

Fig. 12.—Correct conformation of rear part, viewed from behind.

There has been much discussion over the directions of the croup, straight, horizontal, inclined. It is difficult to accord much preference to either type, and a choice is always difficult when otherwise the conformation is good. However, a croup of medium obliquity is the type which furnishes the best conditions for the production of resistance and speed.

Fig. 13.—Defective Conformation.
Cross-footed and bow-legged

Fig. 14.—Defective Conformation.
Cow-hocked or close hammed

THE BREAST

The breast is the symmetrical region situated at the anterior part of the trunk, and limited in front by the inferior border of the neck, behind by the axillae and the inter-axillary region, and on each side by the arm.

It is impossible to positively define what should be the dimensions of the breast; it should always be proportional to the general muscular development of the whole system.

In all cases the region should be well muscled and the width subordinate to the general development of the individuals.

Experienced practitioners will not err, as the breast is, of all the regions of the body, the easiest to judge, even for tyros.

The Arabs prefer a well developed and muscular breast and consequently a wide one. Narrow breasts and straight shoulders are characteristics of undesirable horses.

THE CHEST IN GENERAL

The chest is that part of the body which corresponds to the bony cage designated under the name of *thorax*. Bounded above by the *withers* and the *back*; in front by the *neck* and the *breast*; on each side by the *shoulder*, the *arm*, the *axilla*, and the *ribs*, below by the *inter-axilla*, the *xiphoid region*, the *abdomen* and *flanks*.

Although the chest wall is far from being observable over its whole extent from the outside, it is possible to judge of its capacity with much precision. This knowledge is of the greatest im-

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portance, for it furnishes information upon the essential elements of the value of the horse.

The chest is called *beautiful* when it is *high, wide, and long*.

The development of the lungs is in relation with that of the cavity formed by the ribs. Let us examine what characteristics will denote the best conditions. If, on the horse, the first ribs are straight, they will allow but little inter-space; they are about some six to eight centimetres apart and form the thin edge of the wedge shaped pectoral cage. Consequently this part of the chest offers but very little space to the lungs; and give room to the anterior lobes only, which are, as we know, but little developed, and also, to a portion of the tube conducting the air to the lungs. The development, in width, of this portion of the thorax is somewhat the same in all horses of the same size, the only difference being in the height of animals and in such cases the difference is due to the length of the ribs. Thus, what becomes of the generally accepted belief that a wide breast denotes a wide chest? Nothing can be more erroneous. Dissect two horses, one with a wide breast, the other with a narrow one. You will find exactly the same lateral space between the first ribs, or if there is a difference it will be very small. This width of breast which has erroneously been accepted as indicating vast chest capacity, is only the consequence of the large development of the pectoral muscles; and has nothing to do with that of the lungs. The same argument can be utilized to combat another frequent error.

It is vulgarly believed that the height of the chest is an indication of lung development. This is

Fig. 15. — Correct conformation of fore-hand,
Viewed from in front

an error, as the height of the chest, as understood, is simply the result of the length of the first ribs and the height or elevation of the withers. However, these conditions may exist in presence of a very limited development of the thorax, and besides the anterior lobes of the lungs constitute only a small fraction of the total volume of these organs. The anterior portion of the thorax having but a very

Fig. 16.—Defective conformation.
Horse too open in front.

limited power of dilatation, it is a foregone conclusion that the capacity of the lungs cannot be accurately judged by the width of the breast.

The pulmonary mass resides in the posterior lobes which are lodged in the space formed by the posterior ribs, behind the shoulders and in front of the flanks. It is the base of the triangle formed by the chest, as well as that of the lungs, and upon

Fig. 17.—Defective Conformation.
Horse cross-footed in front

the amount of development and capacity of the region depends the volume of the important organs it contains. The capacity of this region is dependent upon the degree of curvature of the ribs. The more accentuated the curve, the greater the intercostal space, and consequently the greater the chest development. On the contrary the straighter the ribs, the narrower the intercostal space and as a consequence we have a narrow and flat chest. Thus we can observe wide breasts accompanied by high chests containing small lungs, and, on the other hand, ample chest capacity with limited height and narrow breast.

Finally, we should at all times seek a wide breast, high and prominent, more especially of great height on horses intended for the saddle. Horses with low, narrow, and sunken breasts should be rejected, as these characteristics are indications of muscular weakness, and could not withstand active work for any long period, and very often fail the masters when most needed.

THE ABDOMEN

In exterior this region corresponds to the inferior surface of the abdominal cavity.

It would be superfluous to define the situation of this region, as it is well known to every one.

It is important to consider the region of the abdomen, for by its volume and its weight it greatly influences locomotion.

It should be proportional to the size and type of the horse. It varies according to the breed being larger in some and smaller in other strains.

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Fig. 18.—Correct conformation.
Viewed from in front.

Fig. 19.—Correct Conformation.
Viewed from behind.

The volume of the abdomen can be considered correct whenever this region continues the external form of the thorax, that is, when the latter becomes sensibly continuous with the arch described by the rump and the flank.

Fig. 20—Hind legs too far apart

When the abdomen is defective through lack of volume, it indicates an animal with impaired assimilative functions, whose digestive functions are irregular and incomplete.

A too voluminous abdomen denotes an animal of careless appetite, of common breeding, unsuited for rapid paces, on account of the large intestinal mass, and of constrained respiration caused by the distension of the stomach and intestines which, pressing against the posterior face of the diaphragm, compresses the heart and checks the lung expansion.

THE MEMBERS

The *members*, *limbs*, or *legs* are the supports and the *natural motors* of the trunk. They represent four articulated columns, segmented piece by piece, situated upon the lateral faces of the body in front and behind the centre of gravity, and distinguished, for this reason, as *anterior* and *posterior*.

ANTERIOR MEMBERS

The Shoulder :—Situated between the *neck* and the *sides of the thorax*, the *withers*, and the arm, the shoulder occupies, without any precise demarcation ; the lateral and anterior region of the chest. The most important feature to be looked for in the construction of the shoulder is its length, or, in other words, its development from the summit of the withers to its point.

The length of the shoulder will naturally give us the extent of the muscular development reacting on the arm to either bend or extend it. Consequently, as the amount of power of extension of a muscle is dependent upon its length, it will be readily seen that the longer the muscles of the shoulder, the more extensive will the movements of the arm and the shoulder be.

Let us bear in mind this fundamental principle that the greater the length and obliquity of a shoulder, the greater the facility of the forward movement, as well as the production of speed and the safety of the rider, providing, of course, that the muscular development of the region be proportionate.

However, this type of beauty is not suitable to all kinds of work. It may prove useless and even a defect in draught horses, of which only muscular strength, and not speed, are demanded.

For the more accentuated the obliquity of the shoulder, the further forward will its point be carried, offering but a very small surface to the pressure of the collar, exposing this region to wounds and galls, at the points of contact with the harness.

THE ARM

Slightly detached from the trunk, the arm is situated between the shoulder, with which it is confounded, and the forearm, from which it is separated by an oblique furrow behind and below.

The arm should be as long as possible, relatively; in order to give quarter length to its muscles which attach on the forearm. But its length would be defective if it became excessive.

While an exaggerated length of the arm constitutes a defect which is not always compensated, its shortness also produces deficiencies of an inveterate order, and both are hinderances in that which concerns the rapid gaits. If it is short, the elevation of the members, when the animal is in motion, becomes exaggerated, an elevation which is executed at the expense of the length of the step. This is called having "high-action" which however terminates a marked diminution in the total quantity of speed.

The beauty and correct conformation of the arm will consist in the degree of obliquity, which will be an indication of the extent of its play.

THE FOREARM

The forearm, situated between the arm and the knee, is related, above and behind, to the elbow.

Its beauty will consist in its length and muscular development, this in order to be in the most favorable conditions for the production of velocity. Examine the forearm where it is bent on the animal during the trot, and you will observe that its lower extremity will be carried forward proportionately to its length.

However, this consideration disappears when the pace is increased to a galop. In this case the whole limb is projected forward, with great force, during progression, and the results are not the same as at the trot.

Fig. 21.—Defective conformation. Hind legs too close.

The forearm should also be well muscled and possess strong and well developed tendons, sufficiently powerful to resist all the tractions and efforts to which they are continually exposed. I have frequently seen otherwise admirably constructed and powerful horses, rendered unserviceable, useless, completely worn out in the anterior limbs only, and this condition brought about by the defective conformation of the forearms which were slender and thin and could not consequently withstand the fatigues of arduous labors.

About the middle of the internal face of the forearm is found a horny excrescence to which has been given the name of *Chestnut*. It is small in animals of fine breeding.

THE KNEE

The knee is limited above by the *forearm* below by the *canon*. It should be disposed in a way as to produce a vertical direction of the *forearm* and the *canon*. All knees which deviate from the perpendicular line are to be classed as defective. The knee should be strong, wide, well developed and close to the ground. Whenever scars are observed on the anterior face of the knee, the horse is said to be *crowned*, this is a blemish, and denotes weakness of the fore limbs.

Fig. 22.—Two Defective Conformations—

THE CANON

The *canon* is the region of the members which extends vertically from the knee or the hock to the fetlock.

The canon, in order to be *beautiful*, must be vertical, short, wide, thick, fine, and neat of

line ; its posterior part, or the *tendon*, must also be fine, unblemished, firm, and well detached. It is defective in opposite condition.

We must guard against error with regard to the volume of the canon bone, as the finer it is the greater the indication of a noble ancestry. And in all other bony parts, the solidity of the region is due to the density of the bony texture rather than to its volume.

The tendinous cord (tendon) must be free from all deviations from the straight line, and free in its action. In order to exercise the greater amount of power, it should be kept well apart from the canon by the pulley formed by the fetlock ; furthermore, it will be firm, and free from inflammatory enlargements. In opposite conditions, if it lies close to the canon, and presents enlargements and curves, if there is a lack of density and firmness, such a tendon will not stand much work, but will be predisposed

Fig. 23.—Correct attitude, a vertical line drawn down from the point of the shoulder, should divide all the articulations into equal parts.

to over-stretching and painful enlargements. Such a horse, whatever may be his other qualities, and the correctness of the remainder of his conformation, is to be considered as valueless, as he cannot be depended upon to perform suitable service.

THE FETLOCK

The fetlock is situated between the *canon* and the pastern. It supports, at its posterior part, the horny production, the *ergot*, and a tuft of hair which has been given the name of *footlock*.

As is the case with all the other articulations of the fetlock, in order to be of a correct conformation, must be wide, thick, well directed, fine and free from blemishes.

THE PASTERN

The *pastern* is situated between the *fetlock* and the *coronet*; it is the narrowest part of the leg of the horse, and owes without doubt to this characteristic the name *wrist*, by which it is also designated in ordinary language.

The *pastern* must be wide, thick, of medium length, well directed, fine and free from blemish.

It is impossible to assign an absolute length to the pastern. The experienced eye can, at a glance, judge the case, but it must be remembered that a short-jointed horse will last a long time, and his limbs remain perfectly sound, whilst the long-jointed animal will be undermined or broken down.

Long jointed horses are usually selected for saddle purposes, as the elasticity of the region has a tendency to lessen the reactions and the motion of a long-jointed horse is always more easy on the rider than that of a short jointed one.

THE CORONET

The *coronet*, a region rather difficult to delimitate, is situated between the pastern and the hoof.

The only points of this region are the width, the fineness, and the freedom from blemishes.

THE FOOT

The foot has always been considered as one of the most important regions to study. This will be

the better appreciated when we learn the important part it plays in station and in locomotion, the influence of its beauties and defects upon the aptitude of the animal for diverse services, and finally, the gravity of its diseases.

More than twenty-two centuries ago, Xenophon said that the limbs are the very first parts to be examined in the horse: "A house cannot serve any purpose, however perfect it may be in its superior parts, if it has not a good foundation; it is the same with a horse; he will be good for nothing if being perfect otherwise, he has bad legs, for he is unable to use whatever good points he may have."

"In the examination of the legs, look first at the foot." This is the same idea which is reproduced in our days, in the form of aphorisms in all treatises on the exterior.

"No foot, no horse!" said Lafosse.

"No foot, no horse!" repeat the English.

Fig. 24. — Defective conformation, horse too open in front.

ANATOMICAL DESCRIPTION OF THE HOOF

The wall: This portion is the most extensive of the whole foot and forms the circumference of the hoof. It is divided into several important regions bearing different names, viz: The *toe* which forms the anterior fifth of the circumference; each side are the *mammæ*, the *quarter* and the *heel*. The internal quarter is more upright, shorter and thinner than the external.

The Sole: This is a large horny plate filling the interval which exists between the inferior border of the wall and the bars. The horny substance forming it is softer than that of the wall, and the horny fibres, or tubes, have an oblique direction downwards and outwardly. The sole offers for study the following sub-divisions, viz: An external and internal branch, a superior and an inferior face, an external and an internal border.

The branches are triangular in form and fill the space between the bars, the quarters and the heels.

The Frog: The Frog is a wedge, or pyramid of soft horn, which covers the plantar cushion whose form it reproduces. Lodged in the angle formed by the bars and the posterior border of the sole, it is seen to be single in front and bifid behind; two faces and two extremities are thus assigned to it.

The color of the hoof is due to the presence of pigment in the horny tissue, and varies greatly.

The hoof protects the soft tissues which it contains, from all outside influences, more especially against undue pressure during normal locomotion and against concussions during fast or long journeys over hard roads. Should the hoof be removed, v

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would then have the different portions forming the soft part of the foot. Exposed thus we would find the *coronary*, *navicular* and *pedal bones*, the *plantar cushion*, the *coronary band* or *cutidure*, the *podophylous* or *laminated tissue*, and finally the *villous* or *velvety tissue*.

Fig. 25.—Defective Conformation, Knees are Arched Outward.

Fig. 26.—Defective Conformation, Horse Bow Footed.

A great deal more information could be added to these few anatomical rules, but the limited scope of this work will not permit our doing so.

The study of the foot is of the utmost importance to the shoeing smith which, having once acquired a sufficient knowledge of the anatomy of the foot should next devote his attention to the study of equilibrium, and ascertain if the horse to be shod interferes, forges, or stumbles. He should also examine carefully the sole, the heels, and the

frog ; ascertain the condition of the hoof, and should also be able to detect any abnormal length of hoof.

An examination of the old shoes will, as a rule, help the shoeing smith to detect any irregularities of equilibrium. If the shoe is worn evenly then the equilibrium is normal, it being remembered, however, that the wear is always greater at the toe. If the outer branch of the shoe is worn the more than the inner, then the horse is pigeon-toed. If, on the contrary, the inner branch is most worn, you have an outward-footed horse, or else, defective shoeing.

QUALITIES AND DEFECTS OF THE FOOT

Now that we have studied the different parts which enter into the conformation of the foot, it will be much easier to judge of its *beauties* and its defects. The foot has no absolute proportions. Experience alone can enable one to judge of proper size relative by the whole of the animal. But in all cases it should be round and present much more width at the bottom than at the top. It should have a smooth and shining surface, a convex sole but not to excess, a good size frog, and should continue in the direction given by the pastern, a region which has already been studied.

The *defects* of the foot can be natural or accidental. They depreciate the value of the animal in proportion to their gravity. It is important that we should be competent to detect them.

The principal natural defects are :

The *large foot* is one which is not proportionate to the remainder of the body, but presents an excess of volume. This defect is simply unpleasant to

eye and does not present any serious inconvenience, more especially if of otherwise good conformation.

The *small foot* is one where the contrary of the conditions related above exist. This is a much more serious defect than the preceding one and generally become more accentuated after a few years stabling, and to such an extent, in some cases, as to produce lameness of a grave character.

We can rightly say "small fetlock, small foot, bad service."

Next to shoeing, the nature of the ground over which the animal lives and works exerts the greatest influence on the volume of the foot

Horses born and raised in mountainous regions have always smaller and harder hoofs than those born and raised in valleys.

The *flat foot* is the deplorable consequence of breeding in marshy regions. This conformation is due to an excess of obliquity of the wall and convexity of the sole, it completes the weight of the body to bear upon the heels, which, ordinarily weak and sensitive, are thus easily bruised and contused and predispose the foot to corns. There results besides, a more marked inclination of the pastern, which fatigues the tendons.

The *pumiced foot* is an exaggerated type of the *flat foot*. The sole instead of being concave as in the normal state, is convex and bulges beyond the inferior border of the wall. This condition generally becomes complicated with sprung-knees, corns, and founder, all of which place the animal in such a condition that he cannot perform good service.

The *brittle foot* is the foot whose wall is dry and easily broken. They offer the great incon-

venience of being difficult, and sometimes temporarily impossible to shoe.

The *pincard* or *rampin foot* is characterized by the perpendicular direction of the wall and exaggerated height of the heels. This form of foot is normal in asses, is rather more disagreeable and harmful in horses.

The most important accidental defect to be observed is the *contraction of the foot*, this, where the heels are very much narrowed, almost parallel one over the other. This defect, noticed more frequently in the fore feet, is quite frequent in English-bred horses, who are, in a notable proportion, rendered unserviceable by this cause.

Finally, in closing the study of the foot, I must remark that all the defects and deformities are more frequently met with in the fore than in the hind feet. And this as the result of the heavy functions they have to perform.

SHOEING

It is evident that until now the question of shoeing has been sorely neglected. Most unfortunately, the capital importance, results, and benefits of that radical reforms, which might be wrought in the shoeing industry, would bring about, are as yet clearly understood.

In fact, the majority of our shoeing smiths do not realize the grave consequences that result from defective shoeing, more especially in young horses.

In order that a shoeing smith may be enabled to pursue his trade with intelligence, it is necessary that he should possess at least, the elementary anatomical notions which have been stated in the previous chapter.

CARE OF THE HOOF

The hoof should be oiled occasionally, say once or twice a week.

The following prescription is recommended :—

Pine Tar	1 Part
Turpentine	1 Part
Bees Wax	2 Parts
Lard	5 Parts

Melt over a slow fire until the whole is well mixed, then stir until cold. The hoofs should be washed before each application.

After a journey, or a day's work, when taking the horse to the stable, he should be allowed but very little water, but should be rubbed dry with either cloths or wisps of straw, after which the horse may be watered and fed.

RELATIVE PROPORTIONS OF DIFFERENT REGIONS ON THE HORSE

The breeding of horses, on the farm, is one of the most interesting parts of the work of agriculturists, and requires a wide scope of information.

In the foregoing chapter we have given sufficiently exhaustive notions of anatomy, physiology and normal physical conditions, on the horse, to permit all those interested in horse flesh, to become competent to judge as to the correct conformation of a horse as well as to correctly estimate the probable energy of the animal's character.

Still, it must not be forgotten that the relative proportion must necessarily vary according to the different kinds of work to which the horses are intended.

In the study of the exterior of the horse, must be borne in mind that the problem student a purely mechanical one ; and that in mechanics as well as in mathematics, the rules are non-elastic on the contrary they are positively absolute. In both cases, two and two makes four, and two right angles are always equal.

Thus the horse is to be considered simply as a machine, exception being made of his temperament or disposition ; it being well established that however good the conformation of a horse, if he is without “ nerve or soul ” such a horse will always be an undesirable animal. Consequently, it is necessary that taste be accompanied by *science*, and taste alone, but resting upon a solid bases, will never produce satisfactory results.

Now that we know what difficulties are comprised in the study of proportions, it is important to endeavor to establish the basis of these proportions, the more safely to lead those desirous of acquiring a knowledge of the horse.

A renowned veterinarian called Saint-Barthelemy, founder of the Veterinary School of Saint Pancras, endeavored to propagate the principles of Bourgelat in England. He thought that Eclipse, that extraordinary and always unconquerable horse, would be for English scholars the best type of the conformation of the beautiful horse, and he prepared with great care the scale of proportions of this noble animal.

We will confine ourselves to this mention.

The length of the head is supposed to be divided into thirty-two equal parts, which are used as a common measure for all parts of the body.

1. Height of the poll to the ground, 3 heads and 13 parts. (a, b).
2. Height of the withers from the ground, 3 heads (c, n d).
3. Height of the croup from the ground, 3 heads (e, f).
4. Whole length of the body, from the point of the shoulder to that of the buttock, 3 heads and 3 parts (g, h).
5. Height of the body at the level of the centre of gravity, 3 heads and 2 parts (i, k).
6. Elevation of the chest above the ground, 2 heads and 7 parts.
7. Height of the perpendicular falling from the point of the shoulder upon the hoof, 2 heads and 5 parts (g, l).
8. Height of the perpendicular from the point of the elbow to the ground, 1 head and 19 parts (m, n).
9. Distance from the summit of the withers to the stifle joint, 1 head and 19 parts (c, o).
10. Distance from the summit of the croup to the elbow, 1 head and 19 parts (e, m).
11. Length of the neck from the withers to the top of the head, 1 head and 11 parts (c, a).
12. Length of the neck from the top of the head to its insertion in the chest, 1 head and 11 parts (a, p).
13. Width of the neck at its union with the chest, 1 head (c, p).
14. Width of the neck in its narrowest part, 12 parts (g, r).
15. Width of the head taken above the eyes, 12 parts (s, t).
16. Thickness of the body between the middle

of the back and the middle of the abdomen, 1 head and 4 parts (u, v).

17. Width of the body, 1 head and 4 parts.

18. Distance from the top of the croup to point of the buttock, 1 head and 4 parts (e, h).

19. Distance from the root of the tail to stifle joint, 1 head and 4 parts (o, x).

Fig. 27.—The proportions of Eclipse, after Saint-Bel.

20. Distance from the stifle joint to the point of the hock, 1 head and 4 parts (o, y).

21. Distance from the point of the hock to hoof, 1 head and 4 parts (y, z).

22. Distance from the point of the buttock to the stifle-joint, 20 parts (o, h).

23. Width of the croup, 20 parts.

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24. Width of the anterior members at the level of the elbow, 10 parts (m, m').
25. Width of the posterior members at the level of the fold of the buttock, 10 parts (w, w).
26. Width of the hock at the level of its fold, 8 parts (y, y).
27. Width of the head above the nostrils, 8 parts (n' n')
28. Distance from the internal angle of one eye to that of the other, 7 parts.
29. Separation of the anterior members, 7 parts.
30. Width of the anterior face of the knees, 5 parts.
31. Width of the anterior member above the knee, 5 parts (r').
32. Width of the hocks, (anterior face) 5 parts.
33. Width of the fettick, 4 parts (s).
34. Width of the anterior face of the coronet, 4 parts.
35. Same width, but a little lower, $4\frac{1}{2}$ parts.
36. Width of the member in its narrowest part, 3 parts (t').
37. Width of the posterior pastern, (anterior face), $2\frac{3}{4}$ parts.
38. Width of the anterior pastern, $2\frac{1}{4}$ parts (o')
39. Width of the anterior canon, $2\frac{3}{4}$ parts.
40. Width of the anterior and posterior canons upon their anterior face, $1\frac{3}{4}$ parts.

Such are, as we understand them, the correct proportions in horses, and which are in harmony with the studies that have preceded this chapter; studies based upon the laws of physiology and mechanics.

The well proportioned horse should have short ears (many think the contrary) the bones slender

but dense, the cheeks thin, the nostrils wide, eyes beautiful, black, prominent, the neck the breast well out, the withers of a good elevation and sharp at the top, the loins short and muscular, the haunches powerful, the last ribs should be the first ones long, the croup well rounded

Fig. 28.—Defective conformation, hollow, effaced, or sheep like knee.

Fig. 29.—Defective conformation,—Arched Knee.

Fig. 30.—Defective equilibrium,—Knee.

testicles near the body, the upper portions of the limbs should be long and muscular, the artery on the internal face of the hock should be large and noticeable, the hoof uniformly black, the hairs of the mane and tail should be fine and abundant, the flesh hard, the tail should be quite large at the root, and slender at its extremity.

In short a horse should possess.

Four wide regions :

Four long regions :

Four short regions :

The Forehead.

The Neck.

The Loins.

" Breast.

" Upper part of limbs.

" Pasterns.

" Croup.

" Abdomen.

" Ears.

" Limbs.

" Hips.

" Tail.

All these qualities observed on a horse are evidences of good breeding.

THE COATS

The word *coat* is synonymous with *robe* and refers especially to the color of the hairs. It denotes the whole of the hair which cover the surface of the body.

The colors of the hair of the horse are : the black, the white, the red, the russet or reddish brown, the gray, and the yellow. Their numerous shades and diverse intermixing render the study of the coat somewhat complicated.

Thus in ordinary circumstances we say :

1. The *black coat*, which is the darkest of all coats, and of which there are two varieties, viz :

A. The *true or ordinary black*, dark, dull, uniform, and without any reflection.

B. The *rusty black*, dull, reddish in the sun, with a gradation of tints.

2. The *sorrel-coat* consists of golden, fawn, and reddish brown hairs, and recalls, more or less, the color of cinnamon bark.

A. The *light or fawn sorrel* has a yellowish tint which is similar to the coat of the deer.

wide, the neck long, and elevation muscular, should be short, rounded, the

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- B. The *bovine* or *washed* sorrel.
- C. The *dark* or *dull* sorrel, bordering up brown.
- D. The *cherry* sorrel, *burnt* sorrel, etc., etc.

COMPOSITE COATS

We call *composite coats* all those which formed by two distinct kinds of hair, the one yellow, red or gray, for the body, the other always black, for the mane, tail, and extremities.

They comprise the *Isabella*, the *Bay*, and *Mouse-color*.

1. The *Isabella* coat is characterized by hair of two distinct colors. Those of the body are yellow or yellowish ; those of the extremities, from the knees and the hock down, as well as the mane and tail are black.

According to its shade, it is *light*, *ordinary* or *dark*.

2. The *Bay* coat differs from the *Isabella* coat in so far that the yellow hairs are replaced by black hairs.

3. The varieties of the bay are as follows :

- A. The *Light Bay*.
- B. " *Ordinary Bay*.
- C. " *Cherry Bay*.
- D. " *Blood Bay*.
- E. " *Mahogany Bay*.
- F. " *Chesnut Bay*.
- G. " *Maroon Bay*.
- H. " *Dark Bay*.
- I. " *Brown Bay*.

4. The *mouse colored* coat is formed by an assemblage of two distinct colors ; the body is

ered with hair of an ashy gray analogous to those of the mouse ; as to the members they are black from the knee and hock down.

5. The *Louvet* or *fox color* coat is somewhat analogous to that of the wolf, it can be *light* or *dark*.

DERIVED COATS

They are four in number : the *gray*, the *white*, the *flea-bitten*, and the *roan*.

The *Gray coat* is excessively varied in its degrees ; it is a sort of chaos ; so many different shades of hair are there ; it borrows from all the colors.

1. The *very light gray*, which greatly resembles the *white*, and shows very few black or dark hairs.

2. The *Ordinary Gray*, which presents an almost equal mixture of white and dark or black hairs.

3. The *gray*, characterized by the predominance of dark or black hairs.

Relative to its particular *tint* or *color*, the gray is also called.

Iron Gray : *Slate colored gray* : *Clayez gray* : *Isabella gray*.

The *White Coat*, being so universally recognized, needs no definition.

The *Roan coat*, which is composed of three kinds of hair : red, white, and black.

A. The *light gray*, which contains a smaller number of dark hairs.

THE HORSE AT THE STABLE

STABLING, HYGIENE, HARNESSING, AND GENERAL CARE

The question of stable architecture and management is one of the highest importance, especially is this the case in rigorous climates such as ours, when rapid changes of temperature are of frequent occurrence.

The stable walls should always be of due thickness, and of tongued and grooved lumber. Windows of good size, to allow ample light, and doors to fit tightly into their sashes to avoid permanent draughts. How many sound beasts rendered incapable of furnishing the quota of work that can be expected of them, by the reason they are not given the comforts indispensable to the maintenance of good health. Often they are quartered in low, damp, and dark stables, with no ventilation, and often over-crowded consequently. I have thought this an opportune moment to draw to the attention of my readers, to this matter, without, however, going into a mass of details which would be out of place in a work like this.

The stable should be strictly *horizontal*. At present now it has become a universal custom to give a height of from 3 to 5 inches to the floor of a stable, about 9 or 10 feet. This custom is vicious, and

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far from accomplishing the proposed result, which is of draining the floor of the urine, and this explained by the fact that the animal, in attempting to restore his equilibrium on the inclined plane, is constantly stamping and moving about. This soon wears the flooring and the depression thus caused facilitates the imbibition of the urine and the soaking of the litter. At the same time the horse acquires a tendency to *stand under*, the ultimate consequences of which are spring knees. Besides, could the horse talk, he would, I am sure, most emphatically deprecate the use of a floor which compels him to ever stand on a false equilibrium, certainly most prejudicial to both his comfort and conformation. I may add, that in the course of my professional career, I have often had occasion to treat and cure cases of lameness by simply altering the defectiveness of the floor.

INTERIOR ARRANGEMENTS

The width of the stalls should always be proportionate to the height of the horses, so as to allow them to lie with their limbs fully extended. Thus, if the height of a horse is 5 feet 3 inches, the width of his stall should also be 5 feet 3 inches.

The stable door should be wide, and, if possible, should consist of two halves. The height of the stable, inside, should be from 8 to 9 feet.

It is advisable that a box-stall be provided in every stable ; it will be found most useful in cases of sickness or of prolonged inaction ; these boxes allow the horses more freedom and comfort.

TEMPERATURE AND VENTILATION

The normal temperature of a stable should be 60° F.

Ventilators should be located behind and not in front of the horses. The simplest and most economical ventilators are square wooden pipes, one end of which starts from the stable ceiling, goes up through the loft and out of the roof, like an ordinary chimney. The upper extremity should be covered by a cap.

Many agricultural economists recommend the use of more complicated and possibly more efficient systems of ventilation, but, remembering the old rule when asking too much one runs the risk of obtaining nothing at all, I have deemed it advisable to mention only the simplest mode, which, generally adopted, would certainly prove a considerable improvement to our rural constructions.

HINTS CONCERNING STABLE MANAGEMENT

The halters should be of a double tick leather, well sewn together and provided with ordinary buckles. The use of chains to tie the horse is not recommended. The use of ropes is not to be recommended, for whilst the advantage of being noiseless is claimed for them, this advantage is more than counterbalanced by the fact that they soon rot and are easily broken.

The method of fixing a weight at the end of the chain, which weight keeps it taught, is recommended and will obviate the danger of the horse becoming entangled in his chain.

LATION

ble should be In summer, the coverings should be of linen and in winter of wool.

ind and not To bed down the litters, the use of wooden and most eco- instead of steel pitch forks is recommended and en pipes, one will tend to diminish the possibility of accidents. ceiling, then

he roof, just With regard to the hay lofts, which are generally found over the stables, they should be kept in order as far as is possible with such places, one half of the space being reserved for the hay and the other half for straw. To avoid dampness, forage should not be in contact with the walls.

commend the Oats and bran are preferably kept in a shed, more effective in boxes of known capacity, and every time these ing that as are emptied, they should be thoroughly cleaned of s the risk of all chaff gravel, dust, etc., which might have d it advisable accumulated.

hich, if gen Every stable should be provided with an automatic measure which would measure the exact e a consider- ration of each animal. tions.

MANAGE-

e tickness o Another important detail, which is, however, led with or seldom appreciated, is that of the cleanliness neces- o tie with i sary to the welfare of the horse. This constitutes to be encour the elementary rules of hygiene and stable econ- g noiseless i any. All that which relates to the feeding of the more tha horses must also be the object of the most scrupul- soon rot an s cleanliness.

THE HARNESS ROOM

at the end o The harness room should be kept in perfect ht, is recom order and placed under the charge of a person who f the anima kes an interest in that sort of work.

The walls of the harness room should be provided with harness racks, and supports, placed sufficiently high to avoid any portion of the harness touching the floor.

Wooden, or cast iron bridle and saddle can be secured at low cost. Two supports are required for each harness, one of which to accommodate the bridle and collar, and the other the saddle and accessories.

When dealing with double harness, the saddles are to be placed one beside the other. The cross-locks are to be put through their rings, but not buckles.

When not in use the saddle should be covered with a piece of linen. The bits, curb chains and checks bits should be thoroughly dried after having been used.

The reins should be carefully coiled and kept in drawers, as well as all the wraps.

The whips should not be allowed to lean against the walls, which would soon bend them, but they should be hung by their tips.

Every harness room should be provided with a stove, which should, however, be placed at a certain distance from where the harness hangs, to avoid drying the leather.

If to these few rules we add the necessary working materials, such as a harness-horse, a cleaning board, a few hooks on which to hang bridles during the cleaning process, etc., etc., combs, hoof picks, sponges, brushes, polish, cleaning paste, a burnisher, chamois skins, old cloths and rags, the harness-room will then have all the necessary accessories to allow it being kept in good shape.

THE COACH HOUSE

The coach house should be separate from the stable, and this for the reason that the ammonia gases emanating from the stable would soon

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the paint and varnish on the vehicles. All vehicles should be kept covered with large cotton sheets. In the case of two-wheeled vehicles the shafts should rest on racks provided for the purpose, in order to keep them in a horizontal position.

CARE OF THE HORSE

Upon his arrival at the stable, in the morning, the groom should, first of all, look at his horses and note if any departure from the normal condition of things has taken place during his absence. He must see to the blankets, the mangers, note if the feed of the previous meal has all been eaten, then attend to the complete change of air in the stable without, however, allowing any draughts. Should he notice any horse appearing dull, with a standing coat or assuming an abnormal position, he must at once inform his master of the facts.

The groom should then attend to the watering of the horses and this before allowing any food. The watering is followed by the allowance of hay and this by the ration of oats. Once a week, it is well to give a warm mash of bran or ground oats; this mash should always be given at night.

The litter being removed, it should be placed (unless too much soiled by urine) in a place where it can dry. Useless to add that each day the stable must be carefully swept.

GROOMING

Horses stained by contact with urine or manure are to be washed with soap and water.

To thoroughly groom a horse is not without difficulties, unless one is quite familiar with the

handling of the brush. The curry-comb is most used to clean the brush, although it may be used in certain circumstances on some of the most muscular portions of the body, such as the neck and upper portion of the legs.

The corn brush is useful to clean certain portions of the head, such as the ears, the forehead, etc., etc.

The rubber brush gives an excellent finish to the grooming of a horse ; it makes the coat smooth and is an excellent substitute to the hay brush which is also used for the same purpose.

INFLUENCE OF THE CLIMATE

Horses living in warm countries, generally have a good muscular development, their flesh is soft, their bones of dense texture, a well-bred appearance, and much intelligence: such, for instance, are the horses of Arabia, Persia and Africa, etc.

In our climates, during the summer season when the atmosphere is moderately warm (25° to 75° F, or 68° to 77° F), this temperature has been found the most favorable to all horses, and especially to convalescents, weak, and lymphatic subjects. Under the influence of such mild temperatures, the animals seem to have a better digestion and put on flesh easily. If, however, the temperature raises above the indicated point, it becomes harmful, inconveniences the horses, and even bring about disastrous results. A very hot atmosphere is injurious to nervous and bilious constitutions, and can occasion diseases.

The influence of very cold air is still more harmful; by cooling the skin, it temporarily checks its functions, and through this may bring about very serious consequences; under the influence of cold the horse is chilled, becomes dull, then weak and insensible to its surroundings, the blood sent to the brain produces torpor, sleep, and finally death.

The horses which most successfully resist the influence of cold, are those endowed with a strong constitution, characterized by the predominance of the sanguine and nervous systems, the density of their muscles, and the energy of their movements. It was observed during the Russian campaign that horses coming from the warm sections could stand the influence of the cold much better than those coming from the northern and consequently colder regions. Identical results were noticed in the Crimea, where the Eastern horses were found to better resist the extreme cold than the horses coming from France, and these latter still better than the English bred mounts. In both campaigns was observed the fact that the adults were much less accessible to the influence of cold than the old or very young subjects.

Temperature:—In winter, the temperature of stables should not be too high, the consequence of having an habitually too warm stable being that it renders the horses too sensitive to the influence of cold, and predisposes them to those diseases which are generally caused by sudden exposures to the cold.

During the coldest portions of winter, a horse should receive up to 15 pounds of oats each day.

In certain cases, it is wise to avoid making use of cold water, or of snow-water, to quench the animals' thirst.

During exposure to extreme cold, the horse should not be allowed to remain standing still for any long periods.

Gentle exercise prevents stagnation of the circulation, stimulates the production of heat, and promotes the general functions of the organs.

Light :—Light has a powerful influence on the organized beings.

On horses the action of light is more especially centered on the blood, the nervous centres, the skin, and the eyes.

Light is an energetic stimulant of the system. It promotes the fulfilment of all the functions, stimulates nutrition, regulates the development and correct proportion of the form. Exposure to the rays of the sun is beneficial to all horses, regardless of age; it hastens the growth of colts and increases their strength. It will be readily understood, from the above, that a stable cannot possibly admit of too much light.

On the contrary, darkness, singularly enough, facilitates fattening, the development of lymphatic glands, and is a serious condition of the blood. Horses raised in foggy climates generally have soft and flabby muscles, and are generally of a lymphatic disposition; they are tall, heavily framed, but have little blood, and are predisposed to distemper, and glanders.

ACCLIMATION

The horse is endowed with the marvellous faculty of being able to live in all climates, and successfully resists excessive heat as well as the rigorous cold of the northern countries; but when he is changed from one region to another

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marked difference of climate, then certain changes take place, more or less promptly, after the change has been made, and this in proportion to the differences of external conditions, such as the air, the soil, water and stabling, existing between the two localities.

These changes are what is generally known as *acclimation* or *acclimatization*.

The influence of acclimation is not felt to the same degree by all subjects; the age, the hygienic conditions surrounding the animals, the manner in which they are reared, are as many causes modifying the effects.

The length and risks of the period of acclimatization vary greatly, and are to a great extent regulated by the conditions surrounding the raising of horses, and of colts.

The period of acclimation is invariably long and is frequently accompanied by serious disorders in all horses born and raised in liberty, in marshy regions, or prairie land, such for instance as are found in the Canadian North-West, etc.

The less marked the difference of climate in which the horse is born and raised, and the climate of the region to which he is brought, the shorter will the period of acclimation be, and the disorder accompanying it will be of a more benign character, and offer less dangers.

The length of time necessary for the complete acclimation of a subject, is variable. In some cases the change is operated in three months with perceptible effects, whereas, in other cases, it is completed only after twelve and even fifteen months.

The diseases which are observed during the period of acclimation are, according to importance

and gravity, the following, viz : those of the respiratory organs, such as pneumonia, distemper, &c. Then the feet are the seat of abnormal conditions, bringing about circular rings, narrowing of heels, contracted feet, and corns.

Horses whilst undergoing the process of recuperation must be subjected to a carefully regulated regimen. They must be quartered in stables well ventilated, where care is taken not to allow the temperature to become too high, and, when walking exercise twice daily, and, when turning to the stable they should be well covered and blanketed, should the temperature be cold and damp.

The feeding will consist of hay and a mixed and a great deal of soft mash (bran or oats), this to be continued for some four or five weeks, then the method of feeding can be gradually changed so as to begin giving oats, and as the ration of grain is increased, that of mash is reduced proportionately.

ALIMENTATION

Hay.—Hay is the grass of natural or improved meadows, which has been cut and dried, so as to be put away for future use.

Hay is classified as *good*, *medium* and *inferior*, according to the conditions of its harvest.

Good hay : The colour of good hay is a peculiar green, more or less dark, and lustrous. Its odour is pleasant, aromatic, but not pronounced. It is slightly sweet to the taste, the stems are flexible, hard to break, and quite heavy ; it is still furnished with their leaves and tops. The removal of hay of good quality produces a

of the resplendent noise, which is an indication that it was cut
 proper, and at the proper time and correctly cured. When
 in good condition it parts easily and leaves no waste.

As described above, hay constitutes an excel-
 lent food for the horse. The amount of nutritive
 matter it possesses is about midway between that
 of oats and straw.

To horses who do not perform much hard work
 hay is sufficient to keep them in good flesh and
 condition, but horses fed on hay only are not able
 to resist fatiguing labors. Hay has a tendency to
 increase the volume of the abdomen and to lessen
 the activity of the animal.

Hay should not be harvested too early. It is
 preferable to allow its full growth and to await the
 maturation of the seeds. Then will the hay possess all
 its nutritive properties.

Unmatured hay is recognized by its slender
 stems, and as it is colorless, odorless and without taste ;
 when shook it produces a hardly perceptible noise,
 and is not easily untangled.

Early harvesting of hay presents the serious
 drawback of undermining the power of the soil by
 removing the crops too easily ; as when the hay is
 cut before the seeds are ripe or even formed the
 plants cannot possibly be reproduced. The conse-
 quence of this is, that after a few years the
 meadows are divested of their best plants.

Over ripe hay also offers inconveniences, as it
 contains a proportion of its nutritive virtues, such as
 are contained in the leaves and summit and which
 are concentrated in the seeds.

Straw.:—Straw is the dried stems of grain pro-
 ducing plants, cultivated especially for their seeds.
 Wheat straw is the most nutritive ; compared to

that of hay, it is found to be in the proportion of 280 : 100.

Wheat straw is not sufficient for the maintenance of the working horse, and its exclusive use brings about a considerable increase in the volume of the abdominal organs, and extreme thinness. But joined to other alimentary substances, in reasonable proportions, and more especially to oats or barley, it acts as ballast, distends the digestive organs and prevents their contraction while the grains furnish the nutritive elements.

Oats :— Oats belong to the family of graminaceous plants, of which many species are known.

The odour of *good oats* is pleasant, it is farinaceous bordering on that of almonds, its kernels are heavy, polished, whole, and slipping through the fingers holding a handful of them. The outside surface is smooth, shining, and adheres to the kernel that it contains; the weight of oats is from 36 to 40 pounds the bushel.

In temperate climate, oats are the food of *excellence* for the horse. They contain a proportion of the elements necessary to the physiological phenomena of nutrition and the production of heat. At the same time they contain the digestive salts needed by the animal organism.

In addition to the above, oats contain "pericarp" an aromatic principle, found to be analogous to that of the essence of vanilla. This principle is the element which gives to oats the tonic and stimulative properties they are endowed with, and making 60 pounds of oats the equivalent of 100 pounds of hay, in nutrition power.

Oats as a food, are suitable to horse of all ages. They hasten the growth of colts, gives them

proportion of length, increases their vigor, gives firmness to muscles, increases the density of the bone texture, diminishes the amount of cellular or connective tissue, and gives a shining coat. Young horses who have been given fair rations of oats are generally in condition to begin steady work at 4 years of age. Without this food, horses are unable in our climate to resist the climatic influences, the variations of temperature and furnish a fair amount of work. Oats can be considered as one of the most effective means of bringing about the improvement of our breeds of horses.

According to the English proverb "To make a horse, three things are necessary : a stallion, a mare and oats."

HOW TO FEED THE COLT

The future qualities and worth of a horse depend to a great extent on the care received during the first years of its life.

In order to produce a good horse, it is essential that the colt should possess a good bony frame and good joints. Like any other animal issue, the bones grow and develop as a result of the assimilation of good food, and should the food taken not contain certain elements essential to the formation and growth of bone tissue, it is evident that portion of animal's organism will remain deficient.

The mother's milk contains a large proportion of these substances, such as phosphates and carbonate of lime, which are the most necessary to the development of bone. As the colt grows older, the amount of these substances needed is increased and the animal, in order to obtain the necessary

amount, is often seen to lick and sometimes actually eat the soil.

The farmers have within their reach all that is necessary to the production of bone, and the substances are oats and bran. Let it be remembered that colts should not be under fed of these substances. As soon as a colt can eat and properly masticate oats, there can be no danger in giving him daily a pint of oats mixed with an equal quantity of bran. Naturally this ration is to be increased in proportion to the growth of the colt. Added to this ration of oats, the colt is given an adequate quantity of good hay, (which is a substance containing a large amount of proteine, which is a substance essential to the formation of bone and muscles, ligaments and tendons) we have all the necessary ingredients to help the production of a good colt. Nature will attend to the remainder.

AMOUNTS OF VARIOUS RATIONS: HAY AND STRAW

Oats : In London, cab horses are allowed 15 pounds of oats for every 8 hours' work.

I have made numerous experiments to determine what should be the proper amount of oats for a working horse, and I find that in winter the ration of oats, for a 15 hands to 15 hands and 3 years old horse, should be from 10 to 15 pounds of oats per day. During the summer season, half that quantity added to a liberal amount of green forage, is sufficient.

The ration of a race horse varies from 24 to 30 pounds of oats, divided into four or five meals. The ration of hay is divided into two portions of 6 to 6 pounds each.

Hay: The ration of hay varies in proportion to the size of the horse, and the work he has to perform: from 18 to 20 pounds of hay per day is considered a liberal ration.

Straw: Horses can do very well indeed without any straw at all, as this latter contains only about 3 per cent of nutritive elements, whereas hay contains 8 per cent. Consequently straw is to be considered more as a ballast for the stomach. From a nutritive point of view it is about useless. Accordingly straw should be set aside for hay, and used only to *litter* for bedding down.

Hours of Meals:—If at all possible feed four times a day, at any rate, not less than three times a day.

First thing in the morning attend to the watering, allowing every horse to drink all the water he wishes; half an hour after watering give the oats, then the forage.

Noon:—Same as in the morning.

In winter the evening meal should be at 6 P. M. In summer at 8. P. M.

It is necessary that the digestion of forages be slow and undisturbed.

The evening ration should be the most liberal, keeping in mind the adage that "The morning oats pass into the droppings, the evening oats into the croups."

Watering:—As to the amount of water a horse requires, it varies from 15 to 30 pounds per day. It should be given freely, but always before meals.

If the horse is very tired, or has been very warm it is recommended to take the *chill off the water*. It is also wise to lift the horse's head from

the water at every few mouthfuls, so as to prevent his drinking too rapidly and gorging himself.

Horses should never be watered immediately before resuming work. If, however, you are compelled to use a horse immediately after work, then start him slowly, preferably at a walk. This rule applies to horses who have just made a meal. Horses in such a condition should not be put to any very hard work, as it would interfere with the process of digestion, it being remembered that oats take about two hours to digest, and at least three hours.

Various Mashcs:—If you are desirous of improving the condition of a horse, or to combat inflammation of the bowels, you will find the following directions most useful :

Here is the most popular and generally adopted composition for a mash :

1. Oats $\frac{3}{4}$ parts; linseed meal $\frac{1}{4}$ part; salt small handful.

Place in a bucket and pour in boiling water, but not to excess, then cover tightly with a blanket and allow to stand three or four hours before using. Other grains, besides oats, are much recommended for the feeding of horses. Carrots are found to be refreshing and a tonick can be given to the amount of two to three pounds a day, but they must never be used as a substitute for oats.

BREEDS

In hippology, by the word *breed* is meant the horses born under a same climate, or under the same surrounding conditions. There is, as a consequence, the presence of striking characteristics.

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istics inherited from their ancestors and transmitted to their descendants. These characteristics, gradually impressed by climatic influences, or particular regimen, are the more positively set, and more easily transmitted, in proportion to the remoteness of their origin.

The mixing of several breeds gives us the advantage of rapidly producing new breeds, and this answers to the needs and whims of the times. I intentionally use the term *whim*, as I am convinced that, with few exceptions, only a very limited number of farmers possess correct notions concerning the breeding of horses. We are compelled to admit that here, within the limits of the Province of Quebec, the knowledge necessary for the intelligent breeding of stock, and more especially of the horse, still remains to be acquired. We trust that those holding the reins of authority and power, will adopt adequate measures to teach the class of breeders, that man possesses an almost unlimited power in the matter of regulating the products of the breeding establishments ; and that they have produced, unmixed and made over again all the different breeds of horses ; and that they have so hopelessly mixed the whole matter as to render the working out of the problem almost an impossibility.

However, it is as difficult as it is costly to interfere with nature's set laws, and the breeder, notwithstanding his knowledge and means, must always more or less compromise with her. He must adopt his mode of procedure to the atmospheric conditions surrounding him. From this spring the various breeds produced and maintained by climatic influences and the care of the breeder. We admit that in giving the name of *breed* or *race* to these

animals we somewhat stretch a point, as there are pure breeds known outside of those of the East, jealously guarded by the Arabs, the Turks, and the Persians, than the breed recorded in "*Stud book*" (if it is trustworthy, and this is doubtful) as descending, without any mixture, from Arabian lions and Barb mares, which were imported into England some two centuries ago. All other breeds are but a confusing mass or rather mixture, of horses from all parts of the world.

There exists an underlying principle which controls all the classifications of breeds; that is, aptitude, fitness.

The equine family is divided into three distinct classes which makes it so that the horse is adapted to such or such special work: these three classes may be resumed as follows, viz: 1, *Saddle horse*; 2, the *carriage horse*; 3, the *draught horse*.

The Saddle horse.—The correct type of saddle horse can be found in individuals differing widely in the matter of size and weight. They can be found among the tallest as well as the smallest breeds.

There are actually large numbers of horses being purchased daily within the limits of the Province. These horses are intended as remounts for South African service and we find that the minimum height required is 15 hands and 2 inches. This type of horse is the most suitable for, and best adapted to, the arduous duties devolving upon mounted infantry in South Africa, and this is exactly the type of horses that we have in the Province of Quebec.

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The saddle horse should have a small and light head, a long neck, well cut out at its attachment to the head; the hairs of the mane should be fine and silky.

The elevation of the withers, as we have already had occasion to state, is an absolute and more positively necessary beauty in the saddle horse than in any other kind.

Fig. 31.—Large Coach-Horse

The Coach Horse :— The large coach horse should have a height of at least 16 hands, and even more. His coat is nearly always dark bay. The horses of this class must be strong, with lots of

endurance, have a great width of breast, back and haunches, and should possess solid limbs. Their coats should be as brilliant as possible, including their eyes and action. Horses possessing these qualities are called *steppers*. The market price of such horses reaches very high figures in both London and America.

The coach-horse corresponds to the cavalry horse.

Those of greater height are still more eagerly sought after, more especially when added to the fact that there is proportional strength, distinction and a graceful roundness of form.

The draught-horse.—This is an altogether different type from the preceding.

In this case it is not a question of fine lines, long slender necks, silken hairs, tails carried high, but finally of all the characteristics denoting breeding.

With regard to conformation, preference is given to a body that is massive, low set; a short, thick neck, muscular neck, wide breast, wide loins with well developed muscles; solid, large and broad legs and good feet. To these physical perfections must be added obedience, energy and intelligence.

Wild Horses.—In the plains of Tartary and in some parts of South America, herds of wild horses are still to be found. In neither case can their origin be traced.

Travellers who have wandered from the shores of La Plata to Patagonia have met herds of wild horses numbering as high as 10,000 in a single herd. These herds are under the guidance of a chief selected for his nobleness, bravery and strength, and to whom is accorded the most implicit obedience. Their natural instinct teaches them that in union there is the strength necessary to resist

attacks of lions and leopards, which were ever their
greatest enemies. In these combats, the chief is
always foremost and the first to offer himself to
the dangers, and when prudence suggest retreat, it is
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Fig. 32.—Small Coach-Horse.

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horses which are still to be found in Central Africa,
the Island of St. Domingo, as well as in the Ara-
bian deserts and elsewhere, are far from being the
equals of our domesticated horses in the matter of
strength, conformation and speed.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)

THE BARB HORSE

The Barb horse is a native of the East especially of Morocco, and is frequently confounded with the Arabian horse. This horse is lower than the Arabian; his height rarely exceeding 14 hands and 1 inch; his shoulders are flattened, his chest well rounded, the joints are long, and as a general rule he has a beautiful head.

From the point of view of external form the Barb horse is decidedly superior to the Arabian, but he does not possess the latter's intelligence, speed, nor physiognomy. The Barb horse has contributed a large share in the improvement of the Spanish horse and also those of Great Britain. The very best racers of this latter country are descendants of Godolphin Arabian, a Barb horse.

THE ARABIAN HORSE

This breed belongs to the East. As a consequence of continuous importations it is too closely mixed with all of our improved native breeds that we are compelled to admit that the Arabian race of horses has been the improving medium of nearly all of the European breeds and that furthermore it has taken root, in all its purity, far from the sunny East, under the foggy skies of the United Kingdom.

The Arabian type of horse, considered in its purity, and free from any union with other breeds, is the most perfect.

The gray color predominates in the members of the Algerian family, whereas in Syria and Egypt other colors are also found.

The most perfect types are found in Egypt.

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Fig. 33.—Arabian racer, remarked for elegance, strength, speed, and his attachment to his master.

Syria, those of the latter country developing a greater ampleness of form.

The Arabian horse has a most intelligent head; a wide and flat forehead; large and prominent eyes; the ears are small; the face straight and wide; the nostrils well dilated; and the physiognomy, whilst expressing gentleness, conveys also the impression of high spirit and ardour.

THE THOROUGHBRED HORSE

The English horse, usually called *thoroughbred*, owes his origin to the eastern horse. Of this theory however, many historians are dubious, basing their suspicions on the fact that nowhere can any record be found of mares having been imported to British soil.

If the race has not been implanted in England by the importation of males and females intended for breeding, then how did it originate? On this point no doubt is possible; as it is more than evident that its origin is due to the breeding of the best native mares to stallions of noble blood. Following this first cross-breeding, it is likely that the course was again had to the paternal stock, which it was the intention of appropriating; and that it was only later that *in and in* breeding was indulged in, i.e., the union of members of the new family. If such is the case, the theory of the origin of new breeds, by cross breeding, and still more by the fixidness of half-breeds, would receive additional importance.

The most striking characteristics of the English bred race horses are: The height is above average; the head is square, with a wide forehead

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and well dilated nostrils; the neck is straight, long, and slender; there is a good elevation of the withers and obliquity of the shoulders; the limbs are slender, the fore limbs being frequently *sprung*; the canons straight; the abdomen well drawn up; the haunches are prominent, the skin is soft and thin; the hairs of the mane and tail are scarce; the coat is nearly always bay.

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Fig. 34.—English Thoroughbred Horse.

Notwithstanding the great interest that the history of the thoroughbred race horse offers, it is necessary to shorten it. This horse is not the most desirable type with which to cross our Canadian mares.

But if I seem, in some sort, to repudiate the English race horse, on the other hand I attach the greatest importance to the English *hunter*, which is certainly the most perfect and suitable type of horse with which to breed our Canadian mares.

This horse, descended from Arabian horse bred to English native mares, possess more stamina, compactness of conformation, more bone, and strength in his limbs than the former. His conformation denotes less speed perhaps, but a great deal more staying power and real vigor.

This is the only horse which should rightly be called *English* and this term should be synonymous with all that is perfect in relation to horse flesh. Judicious breeding of this horse, with the best of our Canadian mares, would give us a class of horse similar, and perhaps superior, in ending qualities, to the famous "Morgan" breed which is not likely to ever have any equal in the whole of the United States.

THE FRENCH HORSE

The Bolognese Breed :—This type is most certainly the handsomest and most powerful race of draught horses. Their characteristics are : height above average, square head, heavy lower jaw, short, the eyes appear small as they are partly hidden by long eye lashes, neck massive, mane coarse, breast very wide and muscular, the withers are usually low ; the back is straight, and the loins short ; the croup is rounded and double ; tail attached ; the limbs powerful ; good feet, the color is usually gray or chesnut-roan.

This horse possesses a sanguine temperament and is to be found in the Departments of the North

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Fig. 35. Justin Morgan, celebrated stallion which gave birth to the famous race bearing his name

the Straits of Dover, the Somme, the Oise, and the Seine Inferior. Those breeds in the departments of the Oise and Seine Superior are less massive and make excellent horses.

Fig. 36.—The Bolognese Horse. Heavy Draught.

They mature early, which fact permits their utilization the second year; the fifth year they have reached their full development and there remains nothing for them to gain either in size or strength.

As a powerful motor, this is the type "par excellence" among all the breeds of draught horses. It is also a magnificent artillery horse. His color is gray or roan.

THE PERCHERON

The Percheron horse is one of the best in the world, for medium draught, and omnibus work ; and is the best type known for light draught ; his head is long, with wide, and slightly busked cranium ; the forehead is slightly convex ; the neck is

Fig. 37.—The Percheron Horse.

heavy and high, but without excess ; the ears long and fine ; the eyes quick and expressive ; the nostrils are wide and movable ; the lips are thick ; the mouth large ; the shoulder long and oblique ; the mane fine and silky ; the chest is deep and muscular ; the breast wide ; the haunches are promin-

ent; the croup is horizontal; the thigh muscles the tail well attached; the canons are a little but the joints are strong; and the feet excellent. The coat of the percheron horse is gray, frequently white. His character is gentle, obedient, a puller, and endowed with great muscular strength and stamina. His gaits are as rapid as can be expected from a draught-horse.

The light weight percheron is to be found more especially in the Norman regions, in the district of Mortagne, the neighborhood of Courtois and particularly in the parishes of Messuire, et

THE NORMAN HORSE.

The origin of the Norman horse is not known. I mean to say that nowhere can traces of a Norman race of horses be found, nevertheless the breed exists. Born spontaneously on the shores of the British Channel, it is worthy of remark that the writers on the Norman horse, have always represented him as a degenerate animal. The Norman horse, regardless of what may be said, presents many defects and weaknesses; the head is too large, the shoulders too round; the withers too narrow and pinched; the loins soft; the haunches weak, the hocks full and vacillating, frequently blemished and working defectively; the chest is but slightly developed, allowing but little space to the heart and lungs. Still, the fact must not be overlooked that this breed has now been improved to such an extent as to be completely transformed, and is in this condition that it is found to-day in various parts of Europe.

The modern type of the Norman horse is supposed to possess a compact body, a rounded form

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shoulders showing a better obliquity than formerly. The disposition of the limbs is more proportionate. And, as the State has, during the past half century, given numerous inducements and encouragements in every way towards the improvement of breeds, I

Fig. 38.—Anglo-Norman Horse.

am sure that to-day, we can find in Normandy, the most improved types of horses, answering well to the needs of the times.

The crossing of Norman and English hunting stock has given very satisfactory results.

THE LIMOSIN HORSE

The origin of this breed is traced to the sojourn of Arabian cavalry in Southern France. It has been for a long time celebrated in virtue of the qualities it inherited from its ancestors.

The height of the Limosin horse is medium, his head is fine, perhaps a little long, slightly busked; his neck is gracefully curved, supple; the withers well defined; the shoulder oblique; his body correctly formed; the limbs perfect, and he is sure-footed.

This small horse possessed at one time a most astonishing vigor, accompanied by much rusticity and a rare longevity. To-day this breed has degenerated, this condition of things having been brought about by breeding to stallions of disproportionate size and weight, and this with the end in view of increasing the size. This practice has proved fatal to the Limosin horse. We have committed the same error with regard to our Canadian horse. However, such as he is to-day, the Limosin horse can still be considered as suitable and adapted for light cavalry service.

THE BRITANY HORSE

This breed of horses is to be found in the Departments of the Morbihan, the northern coast of Finisterre, and of Illes-et-Vilaine. It is one of the most valuable breeds in France.

The Brittany horse is of medium size; has a square head, with a wide forehead and heavy cheeks; the eyes are large; the neck short, massive, and with an abundant mane; the withers are low, the shoulder muscular; the body thick set, the lo-

are muscular; the croup is double, the tail is busky, the limbs vigorous, the pasterns are short, the feet slightly flattened; the coat is trout gray or wine roan.

No other region in France could possibly produce a better class of horses than those coming from Brittany.

Fig. 39. — The Horse from Brittany.

Different degrees of English bred horses, and the Arabian horses are utilized for the improvement of this race. Whenever judicious breeding is accompanied by intelligent care, more especially in the centre of Brittany, excellent saddle-horses of medium size and of pleasing conformation make their appearance.

THE CANADIAN HORSE

I do not intend to give here the history of the Canadian horse, and this, for the very excellent reason, that there exists no written history of the race of horses. Whether the Canadian can trace his origin to Brittany or Normandy is of very little importance, from our point of view, and the purpose of this work. However, I wish to remark casually, that I very strongly disbelieve the theory advanced by many, that the Canadian horse is a descendant from Percheron ancestors.

With the gracious permission of its author, Mr. Ernest Gagnon, I thought it opportune to insert here extracts of his very interesting study bearing on this subject, and published in 1892, in the *Journal of Agriculture* :

“ The first horse to canter on Canadian soil was landed in Quebec, June 25th, 1647. The *Compagnie des Habitants* had imported this animal as a gift for the Chevalier de Montmagny, the then governor, and it proved a novel sight, for the settlement of Quebec, (whose newly laid streets were still unnamed), to see their worthy governor riding over the pathways like Gustav Nadaud's *Gardarmes*.

“ The *habitants* of those early days were possessed of the same high-spirit as those of to-day, and justly considered that, to be a chevalier without having a horse, was devoid of common sense.

“ M. de Montmagny left Quebec the ensuing year. What became of his horse? It is hardly probable that he was made to re-cross the ocean. Nevertheless, it is also about settled that this horse was gone from Quebec, in 1650, as the Huron

which came to that locality that same year, for the purpose of taking up their abode in the neighborhood, seemed to have never seen any animal of that kind when, fifteen years later, the first horses sent by the King of France, were landed in that region.

"The 16th July, 1665, twelve horses sent by the King of France, were landed at Quebec. On board the boat, carrying these animals, was also a poor little devil, who afterwards had a most advantageous career as a filibusterer. This man's name was "Jean Doublet" and the memoirs that he left behind him were published a few years ago (in 1883). According to his diary, the King of France had sent twenty horses to Canada, but as only twelve reached their destination, eight must consequently have perished during the voyage. These first horses—taken from the royal stables—crossed the ocean with a brilliant company. Doublet expresses himself thus :

"We found this ship extremely crowded by 18 mares and 2 stallions, from the King's stables, and the forage intended for their nourishment filled the whole space. Between decks were lodged eighty maids of honor, who were to be married on arrival at Quebec. In addition there was a crew of seventy, the whole forming a suitable Noah's Ark. The voyage was accomplished under auspicious circumstances, and was of three months and ten days duration.

"These animals multiplied with an astonishing rapidity.

"In the year 1667, the "Mère de l'Incarnation" wrote : "His Majesty has sent out more horses and has given us, as our share, two beauti-

ful mares and one male, intended for the plough and cartage.

"These horses were quick, hardy, not too heavy, and could easily go from the plough to the light vehicle, cross snow-drifts without sinking too deeply, face drifting snow, successfully, effect meeting with another vehicle on a narrow winter road, and accomplish all this with much agility and without any apparent exertion.

"In 1670, Louis the XIV caused still more horses to be sent to the colony. These were distributed amongst those noblemen of the country who had most encouraged and pushed the clearing and cultivation of the soil. Two mares and one stallion were given to M. de Chambly; two mares to M. de Lachesnaye; one to M. de Sorel; one to M. de Contreœur; one to M. de St. Ours; one to M. de Varennes; one to M. LeBer; one to M. de Latouch; one to M. de Repentigny; one to the intendant Talon; in all thirteen animals.

"The King held in particular esteem those who tilled the soil. In the patents of nobility granted by this monarch to a certain number of colonists who had been most zealous in the settlement of the country, he gives as the motive for the bestowal of these exceptional favors, "the earnestness they had shown for the cultivation of the soil."

"Relatively to the distribution of the horses sent here in 1670, the Abbot Taillon writes: "These are the conditions at which the King made the gifts to individuals. They were to feed them (the horses) for three years, and if, during that period, through any neglect of theirs, any of these animals died, the person to whom the animal had been given, had to pay the sum of two hundred *livres*

the King's receiver. On the other hand, after three years, the animals and such increase as there might be, could be sold, providing a yearling for each horse thus sold be handed in to the King's receiver, or else the sum of one hundred *livres*.

"It was also stipulated that when the colts which were being fed and raised at the King's expense, had reached their third year, they were to be in turn distributed to other individuals and on the same conditions. It will be readily seen that these stipulations were most advantageous to individuals, and to the country in general.

"Therefore, Colbert, who was so heartily anxious to see the colony in a most flourishing condition, wrote M. Talon, on the 12th February, 1671, as follows :

"I will see to it that mares and she-asses be sent to Canada, in order to have these animals, so necessary to the colonists, multiply." Of all the domesticated animals sent to New France by the King, the multiplication of the horse was the most rapid of any, notwithstanding the fact that the increase of the others was also astonishing with the exception of asses

"These useful animals have never been firmly implanted in Canada.

"It is very unfortunate.

"In his memoirs, M. de Gaspé speaks of a certain ass, 'a curious beast,' which he had in his youth and accompanied by a few comrades, gone to Lap Blanc to see. As the young wag that he was, he had, on that occasion, gravely asked the animal : 'How do you feel of your sojourn in Quebec?' The ass raised one ear and lowered the other. 'I quite understand you,' retorted the witty child ; 'your

raised ear means that 'Canada is a beautiful country and your lowered ear means 'that being the one of your species you are terribly lonely.' 'Comfort yourself,' added the future author of *Am Canadiens*, 'soon you will be able to discover that asses are more numerous than we think of the shores.'

"I do not quote; I narrate from memory.

"The Swedish scholar, Peter Kalm, who made a trip to Canada during the summer and fall of 1749, wrote the following on the 25th of August of the same year:

"All the Canadian horses are strong, and of good conformation, as large as our carriage horses, and descendants from horses imported from France. The inhabitants have adopted the custom of docking their tails, which is a downright cruelty as they are thus deprived of their only means of defence against the horse-flies, and gnats. This custom may, however, be due to the fact that the Canadians harness their horses tandem fashion, and to prevent the leader from injuring the eyes of the shaft horse, when switching his tail, they have adopted the method of cutting the tails of all horses.

"The Governor-General and a few of the prominent citizens (of the town of Quebec) have coaches, the remainder of the population have recourse to cabs. There is a general complaint that the country people are now raising such a large number of horses that the harvest of forage is insufficient to winter them.

The 27th September, 1749, Kalm, writing from Montreal, says: A horse of medium height worth forty francs, and even more. A be

ful country, horse is worth one hundred francs. The value of a
ing the only cow is fifty francs. . . . The actual price of a sheep
' 'Console is five francs ; whereas last year, when everything
of *Ancien* was high-priced, the value of a sheep was from
discover that eight to ten francs. A year old pig, weighing from
ink on our 150 to 200 pounds, can be purchased for fifteen
francs. . . . A chicken is worth from ten to twelve
emory. sous, a turkey-gobbler twenty sous. A bushel of
, who made wheat, which last year sold for three francs, can
and fall of now be purchased for forty sous. . . . A bushel of
f August of oats occasionally reaches the value of from fifteen
to twenty sous. The market value of peas is always
ong, active the same as that of wheat. Butter is ordinarily
our cavalry worth eight to ten sous per pound. Eggs are gen-
ported from erally to be had for three sous per dozen ; however,
the custom they are actually worth five sous (end of September).
ght cruelty There is no cheese manufactured in Montreal. To
y means of have any it is necessary to obtain it from elsewhere.

gnats. This "I was still very young when I heard, for the
act that the first time, the praise of the Canadian horses. In
em fashion those days there were no railways, no telegraphic
the eyes of communications, but there were English officers
, they have stationed in Sorel and Three Rivers, and almost
s of all the impassable roads everywhere.

of the mo "One of the officers of the Sorel garrison,—a
uebec) has captain at least,—was telling, one day, that, having
on have n left Berthier one morning, in January, to go to
mplaint the Three Rivers, he had been compelled to stop, on the
uch a large way, by a terrible storm, and had to leave his
orage is n thoroughbreds at Maskinongé, replacing them by
"marche-donc!" (sic) Canadian horses, the only
horses, said he, who could possibly follow the roads,
in such a storm and in such roads.

writing abo The Canadian farmer was formerly so proud of
eight is no his horse that, in order to exhibit his qualities, he
A beautif

took chances to run over people. An ordinance published by the Intendant Michel Bégon, dated February 29th, 1716, reads as follows :

“Owing to the reports which have been made to us that, on the main roads and more especially after church service, a part of the farmers race horses harnessed to their sleighs, or those they are riding, and this at such increased speed that it often happens that, losing the control of their animals, they upset the vehicles that they happen to meet in their way, and even the folks to whom they belong, not give the time to get to one side of the road. From this custom have resulted many grievous accidents, which, it being necessary to avoid, we strictly forbid all persons, either those who are driving sleighs or those who are riding their horses, to cause their animals to trot or canter when leaving the vicinity of the church, and not before a distance of ten acres from it has been reached ; after which they may allow their horses to travel at whatever gaits they may wish, providing, however, that there is no one before them on the road, with either carts or drag sleighs ; we further order that whenever they find anyone on foot, on the road, that they must stop and even pull to one side of the road in order to allow those on foot time to get out of the way, the whole, under penalty of twenty *livres*, for each infraction of this ordinance, these penalties shall be applicable in the parishes where such infractions of the law has been made.

“A similar ordinance, for the City of Quebec, was published on the 28th December, 1749, by the Intendant François Bigot.

Vanity, that vice common to all countries, was, without any doubt, the cause of the excesses

preference shown, by the farmers, to their horses, at the expense of their cows, nevertheless as useful and excellent. To-day, the Canadian farmer understands his own interests much better and bestows the same careful attention upon all his animals,—which does not mean, however, that vanity has vanished from the earth.

“ A few figures to close :

In 1665	Canada possessed	12	horses
1679	“	145	“
1688	“	218	“
1692	“	400	“
1695	“	580	“
1698	“	684	“
1706	“	1,872	“
1719	“	4,024	“
1720	“	5,270	“
1721	“	5,603	“
1734	“	5,056	“

In these statistics no account is taken of Acadia, where horses were sent from France as early as the year 1612.

General Murray's report, dated 1765, says that there were then in Canada 12,757 horses.

In 1784, there were 9,166 horses in the Quebec district ; 3,155 in the Three Rivers district, and 17,825 in the Montreal district—in all 30,146 horses.

In 1881 there were 225,000 horses in the Province of Quebec.

At the last census (1891) there were 344,290 horses of all ages in the Province of Quebec, and 1,470,575 in all the provinces forming the Canadian Confederation.

The uniformity of the Canadian bred horses, existing in Kalm's time, that is, about the middle

of the eighteenth century, is no more. The importations of foreign horses, various crossings, the transportation of a considerable amount of Canadian horses to the United States, have altered the nature and decimated the primitive race ; so to-day the "*marche-donc* !" without alloy, constitutes a small minority in the midst of the large number of horses of this section of the country. Fortunately the minorities lead happy lives, and are surrounded with all attention in the Province of Quebec.

The old Canadian horse possessed a short square head ; a very much developed lower jaw ; the withers were low and thick ; the croup powerful, wide and oblique ; the chest was well developed ; loins short and strong ; legs very hairy ; the mane and tail very heavy, long and bushy. Such was, in a few words, our old Canadian horse, now vanished for over forty years. To-day, it is but seldom that we meet with a horse possessing a faint but sufficient resemblance to the former Canadian horse, to make us realize that a memory only, remains of the spirited little animal who so willingly travelled his twenty leagues a day, and this over almost impracticable roads, over mountains and through snow drifts, in which the horse sank to the ears. Noble animals, who knew how to keep on the road, regardless of blinding storms, who were so sure-footed, and whose sense of smell never deceived. But since they had to disappear as a result of numberless crossings, either with Percherons, pacer horses, clydes, thoroughbreds, or American trotting horses.

Now we can ask ourselves if, in spite of the degeneracy of the former Canadian horse, we may entertain the hope of regaining that which

The impor- have lost, if we can, in a word, regenerate our
gs, the ex- Canadian horse. I believe, in my humble opinion,
Canadian that we can; and here are my arguments: We
tered the have in our Province some magnificent mares, pos-
; so that sessing all the qualities required to regenerate our
constitute breed, if we know how to proceed judiciously.

What we have most need of, in our Province,
are pure bred stallions, but we must guard against
the errors committed in the past, and which was
the selection of stallions of disproportionate size,
this, with the intention of rapidly increasing the
size of our horses. Such a procedure was not prac-
tical, as such a result cannot be attained without
allowing sufficient time, by a judicious selection of
stallions, and only after three, four, or even ten
generations. Let us suppose, for instance, that you
wish to produce a horse of say thirteen hundred
to fifteen hundred pounds or even eighteen hundred
pounds, by breeding a Canadian mare of 900 to
1,000 lbs. to a clyde stallion. You will not by these
means attain the desired result. On the contrary,
after two or three cross-breedings, the results would
be most disastrous, through the desire of wishing
to hasten things, and you will only have succeeded
in producing an animal with an enormous head, a
slender neck, a slim body, badly put together, lack-
ing stamina, and hardly worth anything.

To regenerate our Canadian horse, which is of
vital interest, this is the way that, in my humble
opinion, we should proceed.

IMPROVEMENT OF OUR BREED

The Mare :—As I have already stated above,
we have in our province matchless types of mares,
for breeding purposes. The first thing that should

be done, should be to make them undergo a examination, by an official government veterinarian. Then the manner of proceeding should be medical ; for instance, if it be resolved, in a county or a district, to raise horses for a special market, that of remounts for mounted infantry, we should guard against attempting to raise simultaneously horses intended for heavy artillery or draught. We must keep in mind that whilst the horses raised in a county would be especially adopted for mounted infantry, they could also be utilized for light pleasure driving, farm work, and hunting, etc. On the other hand, the intention was to produce artillery and cavalry horses, then it would be to confine our efforts to that type, which would answer for carriage or light draught, and work, and also, let me add, be quite suitable for saddle work.

In regions where small horses are raised, should never be attempted to breed the mares alternately to large and small stallions. This mode of procedure is most vicious and destroys in a short time the judicious work of many years. Such is the case in breeding very large and very small horses together. This practice should be studiously avoided.

As I have already said above, it is of the most importance that mares intended for breeding be carefully examined. Such an examination successfully passed, would entitle them to register under the name of *breeders*, and to a bounty on their production.

Mares brought before the veterinarian, for examination, would be considered as filling the necessary conditions to be registered as *breeders* if found free of bony tumours, if they possessed

ings ; no defects of conformation ; a medium or small head ; a wide forehead ; prominent eyes : ears short, but not to excess ; the neck long, but quite proportionate to the remainder of the body, and well attached to the breast and shoulders ; withers fairly high ; the hips wide ; a long shoulder ; a good bony frame ; good feet, and not too much daylight between the abdomen and the ground. The most preferred colors for the coats are the bay and chestnut-sorrel.

Five year old mares, exhibiting all of these qualities, would prove to be ideal subjects for breeding purposes.

The Stallion : — First of all, the stallion should be masculine in his whole ; he should be kind, obedient ; should have sound lungs, and be free from all redhibitory vices, should have a perfect conformation, and should be proportionate, as to size and weight, to the mares to which it is intended to breed him.

The acquisition of suitable stallions is so difficult a problem to solve, by the majority of people, that it is always wise, when contemplating such a purchase, to seek the advice of a veterinarian. He only will be a competent judge as to the correctness of the horse's conformation.

The study of the exterior of the horse is a most difficult one, and I dare to say that it is only after having made a special study of it that one becomes a sufficiently competent judge to pass on the merits of stallions intended for reproduction.

Stallions intended for the remount depots, should not be less than four years past, and in the case of imported stallions, they should not be utilized for at least four months after arriving in

the country. As to the number of mares that serve each season, it should never go below seventy, if due regard is to be held of his health and the quantity of his progeny.

THE RACES

Both trotting and running races, have warm partisans, and numerous determined enemies.

Nevertheless, racing contributes largely to the enhancing of the value of horses. Everyone must admit that the turf has been a powerful agent to England, in producing that wonderful breeding stock, of which that country is so proud, and of which all the other nations are envious. Now, the racing track is the best means of obtaining due appreciation of those horses which a great display of energy and much speed is expected and obtained. These encounters, and earnest trials, of the value of the horse, are subjected to them, are as a test-stone by which their qualities are gauged, in proportion to the amount of alterations to the general conformation brought on by these ordeals. They open a way to the just and correct appreciation of the merits and good organization of horses ; and enable the owner to correctly select those constituting the élite of the stud, and those which must be excluded from the stud.

Great speed in colts, is a sure indication of a noble birth, and of the extent of their faculties. but those who have shown good speed should be retained as stallions.

The successes obtained on the track are a true and positive indications of a strong organization and good temperament ; they imply width of chest, solidity of the limbs, and powerful muscles.

Racing has done much towards promoting interest in, and love for, horses, and to sustain a sharp rivalry among those engaged in it. It has been the principal motive for the introduction of the Arabian thoroughbred, and to a great extent for the very creation of the English thoroughbred.

Horse racing is held responsible as the cause of many serious accidents. It is true that horses are frequently sure to fall on the tracks, and even to fracture their heads, or again to have rupture of the heart and blood vessels, also to fracture a limb, &c. It is quite true that horse racing deserves most of the reproaches directed against it. But, on the other hand, it can also prove most useful, and contribute largely towards securing good remount horses, and the improvement of our horses generally, more especially so if the distances be increased and also the weights carried, and finally if only adult horses were allowed to enter the contests.

We will draw attention to the fact that running races are the best to determine the amount of energy and vigor of full blooded horses; whereas in the case of half bred horses, the trotting races are the best adapted for the same purpose.

HYGIENE OF STALLIONS DURING TIME OF SERVING

The leap should take place in the morning, after an exercise of some twenty or thirty minutes duration. Daily exercise is imperiously necessary during the season. The diet should be highly nutritive and be composed mostly of good oats and good hay. The oats should be divided into four equal rations, of at least two pounds each; and not less than twelve pounds of hay should be allowed

each day; in addition to the above, mashes composed of bran and crushed oats, should be given in the evening, two or three times a week; an occasional meal of green forage will be most beneficial to keeping the bowels in good condition.

The stallion should be kept in a loose box provided with an abundant litter. Great care should be exercised that the feet, especially the hind feet, be kept scrupulously clean, as a long sojourn on a dirty litter is generally accompanied by thrush, which constitutes a serious defect and materially depreciates the value of the animal.

INFLUENCE OF THE SIRE AND PAI THE PRODUCTS OF FECUNDATIO

HEREDITY

Heredity is the power with which the progenitors are endowed and which permits them to transmit to their descendants, by means of fecundation, the characteristics which they possess.

The influence of heredity is exercised on the general conformation, the size, the inmost structural qualities and defects, the diseases, etc., and exerts a great influence on the individual constitution.

The types of external form are transmitted from progenitors to products. Hereditary conformation may be general and reach on every part of the body, or else partial, and limit itself to such or such region. In fact, we frequently see colts bearing striking resemblances to either their father or mother. There are mares and stallions who transmit their characteristics to their offspring to such a degree that any person, who is at all versed in the rudiments of hippology, can at the first glance, by exam-

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the external conformation of horses, detect the characteristics derived from their father or mother. Other progenitors transmit only one region to their descendants, and their products resemble their ancestors in this region only. The conformation of the head is the most frequently transmitted from ascendants to descendants. One of the most striking instances of the influence found is the introduction into Canada of thoroughbreds, whose square heads and wide foreheads are to be frequently found even in the most out-of-the-way sections of the country. And it is a source of wonder, how, after so many cross breedings, this type of head still retains its distinctive characteristics.

The conformation of the croup is also readily transmitted. The same thing might be said of the hock and of several other regions. The height also is transmitted by fathers and mothers by the way of heredity.

The temperament and disposition of progenitors are also transmitted to their products by means of heredity. The effects of education as well as the defects and qualities of character are transmissible by heredity. The kindness and obedience of the parents are generally to be traced in their offsprings.

The Arabian horse, so kind, so affectionate, so obedient, transmits his qualities to all his descendants. For the same reason, restiveness, wickedness, the vices of kicking and biting, etc., are also hereditary.

Certain diseases, certain blemishes are hereditary.

Amongst them are: Broken-wind, roaring, periodical ophthalmia, short-sightedness, cribbing, diseases of the bowels, the bladder, and of the liver,

the bony tumors of the limbs such as ring-bones, curbs, spavins, splints and constitutional contraction of the feet.

In the manifestations of the phenomena of heredity, the influence proceeds sometimes from the father and sometimes from the mother ; but occasionally further removed ancestors intervene.

Another fact worthy of remark is that in the transmission of hereditary diseases, one generation may be left unscathed.

What are the parts played by the father and mother in the fact of generation ?

If we couple together two individuals of a same specie, but of different breeds, we obtain a product which holds his general conformation, such as the head, limbs and his character from his father, whereas, the size, height, and volume of body are inherited from the mother.

The characteristics of the parents intervene in the product and at times the influence of the sire predominates, whereas in others, that of the dam predominates. Finally in other cases the products can hold from neither ancestors, or, from both simultaneously.

The circumstances causing the predomination of one sex over the other, are dependent upon the relative energy of the organization, the age, the condition of health, and of activity and exaltation of the individuals, etc. For instance, if we couple two individuals; one of which is strong and vigorous, and the other weak and extenuated by hard work, or privations, the product always bears a closer resemblance to the former of the progenitors.

If one of the two factors is an adult, and the

other either very old or very young, the descendant generally inherits from the first factor, not only his external conformation, but his very sex.

The conditions of the health of parents has a strong influence on the offspring and this latter generally holds from the healthiest ancestor.

In coupling two individuals of a same breed, but one of which is a thoroughbred and the other a half-breed, the product generally resembles more closely the full-blooded factor.

If two full-blooded individuals are coupled together, the offspring will bear a closer resemblance to the side whose ancestry dates further back, and whose stamp is transmitted to the product. This is the reason why the Arabian horse, which belongs to the purest of all races, always bestows on his descendants his character and conformation. Another peculiarity frequently observed is the striking resemblance of male offspring to their mothers, whereas the female offspring bear a closer resemblance to their fathers. Another most interesting phenomena belonging to heredity, is the influence exercised by the first stallion to cover a mare, over the subsequent gestations.

All of the above enumerated rules are applicable equally to wild and domesticated animals.

CHOICE OF PROGENITORS

That which we have just said on heredity as well as the roles of the respective progenitors should be sufficient to emphasize the importance of a correct and judicious selection of the animals intended for reproduction.

CHOICE OF THE STALLION

The stallion should be the very ideal of perfection ; consequently, the greatest care must be exercised in his selection. He should possess three orders of conditions : Proportion and symmetry of forms ; that he should belong to an ancient and noble race ; and he must have repeatedly given proofs of stamina and speed. The first condition that a stallion must be able to fill is that he must possess excellent health, and be absolutely free from all the hereditary vices and diseases enumerated above.

He must possess correct equilibrium. his size to be proportionate to that of the mare it is intended to couple him with, and this will also vary conformably to climate and diet. The introduction of large and heavy stallions in mountainous regions, where only small horses are to be found, would expose the breeder to disappointment, as he will likely obtain, from such cross-breeding, only wretched and ill-made products.

The most suitable age, for reproduction, is from the fifth to the fifteenth year. If horses are used for that purpose whilst still too young, they are likely to exhaust themselves, and yield only product with little vigor or energy, and of a lymphatic disposition. However, old stallions frequently yield excellent products.

We should reject from amongst progenitors, all those animals whose coat is very light. On excess of white about the head is not to be recommended, as these white patches have a tendency to increase from ascendants to descendants.

Horses possessing a sanguineous temperament are the best. Those of nervous temperament are

too irritable, and those of lymphatic temperament are too soft.

The animal should be neither too fat nor too thin. The stallion should possess a solidly built bony frame ; wide joints ; the bony prominences well defined ; a well developed muscular system, well defined in relief under the skin, firm to the touch and terminated by strong and well defined tendons.

Never use, for breeding purposes, vicious, wild, untameable horses ; whereas, frugality, rusticity, resistance to fatigue, are qualities to be eagerly sought for in, and should be possessed by all the horses intended for the breeding farm.

So much for the general conformation ; let us now study the details :

The head should be light and as much as possible resemble the type presented as the correct one. (See figure 18).

The conformation of the neck should be in relation to the kind of work the horse is intended for. A swan like neck is best adapted to manege horses ; a straight neck to race horses and a curved neck for the horses intended for the army.

The chest should be ample in all its diameters ; the withers should have a good elevation and extend well backwards ; the back and loins to be short, wide, straight and well attached ; the croup should be long, muscular and endowed with an ample scope of movement ; the forearm to be long and muscular ; the knee wide ; the canon short ; the tendons strong and well defined ; the pastern short and wide laterally and free from ring-bone ; the foot should be of good proportion, and free from diseases or defective conformation ; the hoof to be

neither too soft nor too brittle ; the leg well brought down and above all muscular ; the hock should possess not only strength and solidity, but also be absolutely free from all bony tumours such as spavins, curbs, etc., diseases which I have already described in my "Manual of Veterinary Medicine."

In selecting progenitors, great account must be taken of their pedigrees. The more ancient and pure the breed of a horse, the more likely he is to transmit, to his descendants, his qualities or defects ; and consequently the greater the prospect of obtaining offsprings resembling him.

A symmetrical conformation and a noble birth, are not sufficient to determine the selection of a stallion. In addition to these qualifications he must have given proof of a stamina and speed.

The Arabs prize their horses in proportion to the services rendered ; and the manner in which fatiguing journeys, during their long and difficult expeditions, are supported ; also from their docility and degree of education.

These people have succeeded in creating their valuable breed of thoroughbreds, by employing for breeding purposes, only horses of good extraction, and who exhibited the necessary requirements to fill the prescribed conditions.

SELECTION OF THE MARES

All that has been said, while speaking of stallions, relative to diseases, qualities, size and weight, disposition, equilibrium proportions of the bony and muscular systems, the coats, the conditions of health, is also applicable to the mares, consequently there remains only to treat of the characteristics peculiar to these latter.

A light neck, withers slightly low, loins a trifle too long if well attached, are not to be regarded as sufficiently serious defects, to cause the mares, on which they are observed, to be rejected as breeders.

The rear part must offer a greater development and more elevation than on the stallion; the croup must give all the indications of an ample pelvis, to allow the foetus ample room for development and comfort. When the mare's pelvis is narrow and short the foetus is crowded, and its growth is irregular; in such cases, the hard portions only are normally developed, whereas the soft portions and natural cavities, being unable to overcome the pressure caused by the mare's viscera linger and remain narrow.

A breeder, whose croup is narrow, suffers more during the period of gestation than the mare whose pelvis is spacious; for the foetus, working forward, impedes the play of the lungs and the normal movements of the heart. In addition to this the parturition is always more laborious.

The lower portion of the mare's limbs never present the same development as on the stallion, it being characteristic of the mares that the lower portions of their limbs and feet are slender and smaller than is the case with the males.

In order to be a good mother, during the gestation as well as during the period of suckling, the mare must be endowed with excellent digestive organs. A mare whose digestion is impaired, furnishes but a small quantity of blood to the foetus and a small quantity of milk to the new-born.

As is the case with stallions, absolute perfection of the genital organs is to be required on the mares,

it is well to guard against nymphomania, as the animals suffering from this disorder are generally always barren.

DIVERS MODES OF REPRODUCTION

Pairing :—This is the coupling of a male and a female of the same breed, but selected in such a way that the defects of one are corrected by the qualities of the other. This pairing must, however, be carried out according to certain laid down rules, of which these are the principal.

There must be, as much as possible, uniformity of height and weight, and the same amplitude of form on both progenitors. In effect, if a small mare is coupled with a much larger stallion, the consequences will be that the fœtus will have an abnormal and defective devolment, the bones and limbs will develop and increase in volume at the expense of the soft portions of the system and of the natural cavities. On the other hand, where the mare is larger than the stallion, the fœtus has an ample space to develop in, but also remains undersized. Consequently it is of the utmost importance that the size and weight of the father and mother, be about equal.

When it is desired to increase the size of a breed, it is better to have recourse to the mode of nurture than to the progenitors. Indeed the aliments only give increased size and stamina to animals. These it would be vain to expect from progenitors. Furthermore, these results can be attained only gradually, with occasional halts, as the volume of horses cannot, in certain localities, develop beyond a certain volume. The tendency is to the establishment of a relation with the climate

and the fertility of the soil, and this because the evolution of the organs is dependent, more especially, on the nutritive principles which furnish them their nourishment.

Whenever the same defect is observed on two animals, they should never be coupled together.

It is by the coupling of opposite defects that existing defects are corrected ; for instance, a too long loin is corrected by one too short ; a very large and heavy head by a small and light one, etc.

It may be kept in mind that nature does not accomplish its work by bounds. The desired results can be attained only progressively and slowly.

It is also to be recommended that horses of about the same age be coupled together. For instance, an old stallion should not be coupled with a young mare or vice versa.

CROSS BREEDING

Cross-breeding is the coupling of a male and a female of a same specie, but of different breeds, with a view to the creation of a new breed possessing the qualities and conformation of the superior breed. We call *crossed breed*, the breed it is intended to improve, and *crossing breed*, the breed utilized to effect the desired improvement.

Cross-breeding is a mode of reproduction frequently employed to effect the improvement of breeds and whose results are generally more speedily apparent than is the case with ordinary pairing. By this mode of breeding the qualities of horses are enhanced and new ones are added.

By continuing this cross-breeding during a varying number of generations, the essential characteristics of the cross breed can be altered to such

an extent that eventually no material differences remain between the improved and the improving breeds. It is well to bear in mind, however, that if cross-breeding be set completely aside, and there is no occasional recourse to the original improving strain, then the crossed breed will insensibly degenerate and finally fall back into its primitive state of inferiority.

Cross-breeding is equally useful to increase the height ; but in this case it is to be utilized more as an auxiliary to judicious nourishment than otherwise, it being a well recognized fact that size and the development of external forms is in direct relation with the quantity and quality of the food.

Let us recognize the fact, however, that if the judicious crossing of breeds is usually followed by satisfactory results, on the other hand ill-advised crossing is also generally followed by disastrous results.

The work of improving a breed must always be accomplished by the introduction of stallions of the improving breed.

The average yearly yield from one stallion is from forty to fifty colts. To obtain this result some sixty to seventy mares would be necessary.

Now remains the question to be settled, as to which breed is the best adapted for the improvement of our Canadian horses ? The English thoroughbred is by far the best in localities where an abundant nurture can be easily obtained, and the already existing breeds possess some resemblance to the English horses. In all other regions the full-blooded Arabian is to be preferred.

The French, Belgian and Irish horses are also to be much recommended.

A well established rule to be closely adhered to, in cross-breeding, is to carefully exclude from reproduction all the half-bred males, for the reason that they possess only a portion of the qualities belonging to the improving breed, or else, to couple them only with common mares, care being taken that the females of each generation be coupled only with pure bred stallions.

HALF-BREEDING

Half-breeding is the coupling of two individuals of different breeds, with a view to obtaining either a new breed, or an intermediary product, possessing characteristics, attitude, or utility, belonging especially to neither of the generating breeds.

Cross-breeding may be successfully effected between two individuals, one of which may be indigenous and the other foreign. In all cases this mode of reproduction is subjected to all the laid rules of cross-breeding. Half-breeding is a most advantageous mode of reproduction when it is desired to create new breeds. At the same time it presents difficulties and requires much nicety of execution, as, if the operations are carried on injudiciously, the consequences will usually prove most disappointing.

MATCHING

This is the union of two pure bred individuals, one male and one female, possessing to the highest degree the qualities that it is desired to introduce into a breed.

CONSANGUINITY

Consanguinity or "in breeding" is the union of males and females closely related; it is the coup-

ling of father and daughter, mother and son, brother and sister ; In-breeding is a mode of reproduction from which the English breeders have obtained, in certain cases, most advantageous results. By this means have been created splendid breeds of cattle and of sheep, which are now the admiration of the whole of Europe. It is by means of this mode of reproduction that Backwell has succeeded in creating the English breed of black horses, a breed most remarkable by the great development of its bony frame and muscular system.

However, if this mode of reproduction, judiciously employed, may give excellent results, an ill-timed use or an abuse of it is generally followed by disastrous consequences. It is the shortest and most direct road to the obtainment of exaggeration of defects, the loss of qualities, and rapid degeneracy of the breed. Consequently it must be employed with much caution and circumspection.

PERIODS OF HEAT

We call *heat* the temporary and periodical manifestations of sexual desires observed on horses.

The duration of these periods varies with individuals. On some they last 24, 36, 48 hours, on others from eight to fifteen days ; they then disappear to return after a lapse of from twenty to twenty-five days.

The spring time is the most suitable for coupling ; say from the first of March to the beginning of September. The number of days that should elapse from parturition to the first leap should be from seven to nine.

GESTATION, PREGNANCY

We call *gestation* the period of time during which the impregnated germ remains in the womb.

The amount of food, allowed a mare, is to be increased as soon as she becomes pregnant, the amount of work required of her is to be slightly diminished, avoid all sudden shocks, the amount of stable room is to be materially increased, and for a month or two before parturition no work should be required.

It is well to avoid giving large amounts of cold water at one draught, more especially in the morning on an empty stomach.

The duration of the period of gestation is not the same in all cases. The average length is of 335 days (eleven months), and the minimum duration being of 419 days (13 months and 29 days), and the minimum of 257 days (9 months and 17 days).

The mare, whose parturition is close at hand, should be quartered alone, with an abundant litter, in a large stable containing absolutely no objects against which she may injure herself.

Her diet should be in relation to her condition and state of health. If the animal is weakened, and the season is bad, then the diet should be tonic. If, on the contrary, the animal is in good condition and excellent health, then the rations may be decreased, and the diet be of a cooling nature. During the last days of pregnancy the animal should be closely watched, both day and night.

A short time after birth, the normally born, and well conformed colt, rises and directs his tottering steps towards his mother's udder. It is advisable, however, to help and guide him in his first attempt. It is necessary that the colt should get

the first of the mother's milk as it contains laxative properties which readily remove from the intestines the fecal matters they contain.

After parturition, about an hour's time should be allowed the mother, during which to fondle and dry her offspring, then she should be well rubbed down and given a thin mash.

ABORTION

Abortion is the premature expulsion of the fœtus, before it has attained the stage of viability.

This accident may be due to numerous causes: the cold, the rain, high winds, fogs, superabundance of nurture, unhealthy stables, blows, shocks, falls, indigestions, cold drinks, fright, the injudicious use of purgatives, and of bleeding. All these causes may produce abortion.

NURSING, SUCKLING.

Nursing is the act of nourishing an animal with milk.

Natural Suckling: We say that the nursing is *natural* when the young animal itself takes the milk from its mother's udder. The average duration of this period is usually six months; during its continuance both the colt and its mother should receive especial attention, viz: For the twelve days following birth, the colt should be confined to the stable; as it is during that period that he is most liable to intestinal disorders, or that hernias makes their appearance, etc.

Should the colt be constipated, warm water and soap injections should be given, or else a draught of from 45 to 60 grammes of sweet oil, or

30 grammes of soda sulphate should be administered. On the other hand, should diarrhœa be present, then the use of soothing injections is recommended, a warm woollen band is to be put around the abdomen, and great care must be taken to avoid any exposure to cold.

When the colt is two months old, the mother's milk alone ceases to be sufficient nourishment for it. In addition to the milk it is well to add other foods; such as oats or barley for instance; but preferably oats. A colt receiving a daily ration of oats soon gains in strength, has a rapid growth and development and inspires most promising hopes.

Should it be observed that whole oats are not well digested, it will be well to replace them by crushed or ground oats.

The ration of oats for a colt should be as follows: At two months of age give one pound per day; at three months of age give two pounds per day. Then increase gradually the ration on the basis of one pound a day per month, until a ration of six pounds a day is reached. This amount of oats must be fed in such a way that several small meals are made out of it each day. As soon as the colt is sufficiently strong to follow its mother to pasture, he should be taken there, providing the weather is suitable. It must be remembered that absolute freedom and open air life are most beneficial to colts.

It is well to begin the education of the colt during the period of suckling. He should first be taught to stand to be curried and brushed, to have his eyes, nostrils, anus, and genital organs sponged and cleaned, his feet should be raised and light blows struck on the soles.

About the fourth month it is well to put on a light leather halter. and the colt should be tied to the manger whilst eating his ration of oats, some one remaining near him all this time to prevent his pulling-back. He should also be blanketed, etc.

Two months before weaning, the colt should be taught to lead. Should he try to escape, it is unwise to oppose force to his efforts, but rather to take him kindly and to patiently endeavor to teach him what is wanted. As soon as he yields obedience he should be recompensed by giving him something to eat, that which he may be most fond of, such as sugar, apples, etc., etc.

The first condition necessary for the successful education of a colt is patient and gentle handling. By these means, the colt is soon made to understand what is wanted of him. Once he has understood he obeys without any difficulty and his progress is rapid. If at the beginning the colt is handled roughly, he soon loses his head, and his education is delayed in proportion.

HYGIENE OF THE MARE AFTER PARTURITION

The newly foaled mare requires to be kept in the stable for at least twelve days, in order to completely recover from the fatigues of parturition. After that she may resume work or return to pasture. The diet of nursing mares should be composed of those articles of food most adapted to increase the quantity and quality of milk. A meal of green forage, or of carrots, or again, a good mash, in addition to the ordinary ration of dried food, will be found most suitable. As to the quantity of each ration, it, of course, varies with

the size and condition of the mare, and is also influenced by the immediate surrounding circumstances.

ARTIFICIAL NURSING AND ADOPTIVE SUCKLING

Whenever a colt has lost its mother or that this latter does not furnish a sufficient amount of milk, it is necessary to find an adoptive mother, or resort to artificial nursing.

The greater draw-back to adoptive suckling is to accustom the mare to be suckled by a strange colt. Once this objection is overcome, the suckling goes on as in ordinary circumstances.

When it is impossible to find an adoptive mother, then the colt must be taught to drink milk in a vessel. To accustom him to this mode of feeding, it is well to begin with the use of a bottle loosely stopped with a piece of rag. From this the colt is insensibly brought to take his food from a vessel with a wide opening. Should the young animal persist in refusing to take food by the above indicated methods, then he must be compelled to drink milk poured into his mouth with a bottle.

Of course, mare's milk is the most suitable for the nourishment of colts; but as it is at times extremely difficult to secure any, it can then be replaced by cow's milk. When the latter proves insufficient to the colt's requirements, then wheat or barley flour may be added to it, or a decoction of four parts of wheat or barley flour, to one part of linseed meal, may be used with benefit. Artificial nursing is far from possessing the advantages of natural suckling. Colts raised artificially never

have the vigor, size, and the strength of those who have had the advantages of normal and natural nursing.

WEANING

At six months of age the colt may be weaned. This can be accomplished without experiencing much trouble, from either the mare or colt, if care be taken to separate them in such a way that they cannot see each other, or hear their neighing. They should also be given new companions.

In order to dry up the secretion of milk, it is advisable to milk the mare say twice the first day, once the second day, and once the fourth day. The rations may be diminished and the work increased. In certain cases it is commendable to administer a purgative, such as seven drachms of aloes for instance, or else powders composed of nitrate of potash and potassium bromide of each one drachm, this dose to be repeated twice daily for five days. The most convenient way of administering these latter is to mix them well in a warm bran mash.

REARING

The rearing of the young animals is one of the most important parts of the horse-breeding industry ; because, to produce good horses, it is not all sufficient to carefully select the progenitors, and have them well matched, but it is also imperiously necessary that judicious care be taken of their products. Indeed, a colt may spring from well formed and well bred parents, and be endowed at his birth with the most favorable dispositions, and still prove a disappointment to his owner, if judicious care and feeding does not come to nature's assistance and

prevent him from losing his natural endowments. On the other hand, a colt springing from very ordinary parents, himself very ordinary at birth, may develop into a very good horse if properly reared.

BRINGING UP, FROM SIX MONTHS TO ONE YEAR

After weaning them, the colts should be placed in pairs in the same stable or enclosure.

At this epoch of their lives it is wise to separate the sexes. The diet of recently weaned colts should be varied, abundant, and of good quality. The English breeders allow colts from six to twelve months of age, as much as 16 pounds of oats per day. We willingly admit that this seems a very large ration, but we also think that a colt during his first year, can, without any inconvenience, consume per day four meals of oats, each of one and a half to two pounds. To the rations of oats, hay and straw should be added green forages or carrots. All food stuffs should be given in small quantities and often.

The feet should be closely watched, as they are apt to grow unevenly. In such cases it is necessary to have them trimmed and paired by some competent men, as it is well established that many colts are lamed by ring-bones, themselves the consequence of allowing the hoofs to grow to an exaggerated length.

BRINGING UP, FROM ONE TO TWO YEARS

The routine to be followed during the second year differs but very little from that which has just been described, but let it not be forgotten, however,

that colts cannot be fed only on hay, carrots, or beets, etc., but that they must also receive an adequate ration of oats.

BRINGING UP, FROM TWO TO THREE YEARS

It is at this age that castration of the males should take place. And it is also the epoch in the horse's life when work begins on the farms. The work required from a colt should not be too arduous but rather proportionate to his strength and development. At this age the bones have not yet acquired all their strength and density ; the muscles are not sufficiently strong nor the joints sufficiently solid to permit the animal to perform very laborious tasks.

BRINGING UP, FROM THREE TO FOUR YEARS

The care and hygienic conditions required are about the same as those of the preceding year. The diet should be similar, but more copious.

At this epoch, the training, or education of the young horse, should particularly occupy the breeder's attention. The colt must be prepared to receive the bridle and saddle, to be mounted, and to carry the weight of the rider, and also to be harnessed to both summer and winter vehicles. As I have already said, great patience must be exercised in the breaking and training of a colt, as with kindness you will succeed in making your colt do anything you may wish, whereas harshness will only spoil him.

APPENDIX

ENCOURAGEMENT GIVEN TO THE HORSE-BREEDING INDUSTRY

It affords me much pleasure to be enabled to state, that there is a noticeable movement taking place, amongst the farming class, towards adopting adequate means to effect a radical improvement in our Canadian horses. The purchase, in America, of large numbers of remounts for the English army has convinced our farmers that the breeding of good horses would prove a remunerative industry; and, as Lord Strathcona, High Commissioner in London, has so justly remarked in his report dated May, 1901: "There is no country in the world as favored as is Canada with relation to the successful conduct of the breeding of horses, and more especially so in the Province of Quebec." But it must not be forgotten that, unless adequate means are adopted whereby the external conformation of our horses is improved, their bony structures altered, and more particularly unless we reject as breeding stock all mares unsound from spavins or other hereditary diseases, that we will never succeed in producing good horses, for it is not the quantity of horses which is lacking, but the quality.

BREEDING ESTABLISHMENTS

These establishments include the *haras*, *stallion depots*, *approved stallions*, *authorized stallions*, *ambulant stallions*.

The means of encouragement are furnished through the agency of *races*, *prizes*, and *bounties*.

HARAS

These are establishments in which stallions and mares are kept for reproducing purposes, and also their offsprings.

In these establishments, when the horses are continually under the supervision of men, the haras are called *domestic*; when without any superintendence they are called *wild* or *semi-wild*.

Wild Haras:—These are establishments in which the stallions, the mares, and the colts are living promiscuously, in immense tracts of land, in which they remain constantly exposed to the atmospheric influences, and without either receiving food or attention from their owners. The most extensive *wild haras* are to be found in America. None now exist in Europe, with the exception, perhaps, of amongst some of the Northern nations.

The wild horses are frugal, hardy, and support with ease the greatest fatigues and hardships; on the other hand, they are frequently intractable, difficult to break and train, and often are of a vicious disposition and treacherous character. These most annoying characteristics would be avoided by a judicious pairing and selecting of progenitors.

Semi-Wild Haras:—In these establishments, the horses live in complete liberty only a certain portion of each year. All the males which are not

proper for reproduction are set aside. This concourse of circumstances results in the fact that the horses produced in this class of establishments are vastly superior to those furnished by the *wild haras*.

These horses also are difficult to break and train, being usually skittish and timid; but once trained and acclimitized they are most remarkable by their frugality, resistance to fatigue, and hardiness.

Domestic haras :—In these establishments the horses are continually under the supervision of men, not only at the stable but also whilst at pasture. The stallions are kept and fed in stables. During fine weather the mares and colts spend a portion of each day in the pasture.

This class of breeding establishments are much superior to the preceding, and, with many nations it would be utterly impossible to have any other, considering the actual demands of agriculture and the division of the land.

The purpose of these haras is the production of horses suitable for all classes of work; also to engage in the improvement of breeds; or to solve certain complex problems relating to reproduction.

There are several private haras here which are proving most beneficial to the agricultural classes.

DEPOTS OF STALLIONS

These are establishments in which stallions are kept by the state, for the purpose of breeding to mares belonging to private individuals. The purpose of these depots is to furnish choice stallions to

breeders. As I have already had occasion of remarking, there should be just such a depot attached to the Compton Government farm, which could furnish suitable stallions to such counties as might apply for them. Of course the kind of stallions furnished would have to vary in accordance to the kind of mares they would be expected to be coupled with.

The selection of stallions intended for different counties, should be made with great caution and be based upon a thorough knowledge, not only of the class of mares, but also of the climate, the nature of the soil, the agricultural resources of the region, the methods of breeding employed, and the established customs of the breeders of the county or district. It must be kept in mind that if a judiciously selected stallion can improve the horses of a whole district, an unsuitable stallion can also bring about disastrous consequences and bring trouble and degeneracy in the horses of a whole county. Stallions should not be kept in the same localities more than three or four consecutive years; after that, it is wise to make a change in order to avoid the ill-effects of consanguinity. It is useless to add that the organization of such establishments should be conducted by highly competent men and under the direct supervision of the government.

APPROVED STALLIONS

We call *approved stallions* those animals which are deemed to possess fitness for reproduction. These horses belong to private individuals who, by keeping them for breeding purposes, receive an annual bounty, which will be explained later on.

AUTHORIZED STALLIONS

The *authorized stallions* are those which the departemental veterinarian has examined and found fit for reproduction. The very fact that these animals have been received by the authorities places them in great demand amongst breeders, consequently, the inspecting veterinarian can never be too strict in his choice, and must always bear in mind that the introduction of an undesirable stallion, in a province, may lead to the most regrettable consequences.

STROLLING STALLIONS

These are stallions which travel from village to village to cover mares; this method cannot be recommended, as these animals are frequently covered with blemishes which are transmitted to their products. It would be in the interest of the improvement of our horses that this class of progenitors be strictly prohibited.

ENCOURAGEMENTS CONFERRED ON THE HORSE-BREEDING INDUSTRY

We have much pleasure in stating that the Provincial Government is seriously considering the adoption of adequate means to help the farmers to improve our breeds of horses: We reproduce here, from amongst others, a self explanatory circular letter published February 1st, 1901:

DEPARTMENT OF AGRICULTURE,

Quebec, February 1st, 1901.

Sir:

I take the liberty of inviting your especial attention to a resolution passed by the Council of

Agriculture, tending to facilitate to the Agricultural Associations the means of effecting the improvement of the different breeds of animals in this Province, and which has been adopted by the Council at its sittings of the 23rd and 24th of January last.

“ In future, the Agricultural Associations will have the right, whenever they may deem it preferable not to hold any exhibition, to appropriate the Government grant to either the purchase of reproducing animals, or to the payment of conservation bounties to proprietors of such animals, and, in such cases, the directors of such Associations have the authority of reimbursing the members to the full amount of their subscription, by the issue of seeds or chemical fertilizers. The Agricultural Associations will thus be allowed all possible latitude for the recruiting of subscribers.

“ The Council of Agriculture in thus widening the sphere of action of our Agricultural Associations, has done so in response to the wishes so frequently expressed, and to the urgent needs that the whole agricultural class was unanimous in wishing to see fully satisfied.

“ The great importance of the movement of animal races, is admitted by all, and if there still exists conflicting opinions as to the most proper means to be employed to accomplish it, there is no more argument as to the merits of the problem to be solved.

“ The breeding of horses, in particular, should be the subject of much attention on the part of Agricultural Associations. England has lately made large purchases of horses, but, unfortunately, whilst we were enabled to sell to it large cargoes of hay, meats, and boxed fruits, we were unable to furnish

beyond a very limited number, horses filling the required conditions. We have barely furnished three per cent. of the horses purchased, and this notwithstanding the fact that Canada is recognized as a country very well adapted to the breeding of horses.

"We have thus lost an excellent opportunity of realizing large profits, and this, not because we had not horses, but because the horses we had were not deemed adapted and fit for the service for which they were intended.

"Consequently there is in the breeding of horses, suitable as army remounts, as also for general commerce, prospects of handsome revenue for the agricultural classes.

"If I have deemed it my duty to thus especially invite your attention to this decision of the Council of Agriculture, it is because I am fully convinced that it can, judiciously employed, render most important services to farmers, and, that yourselves will see your way clear to joining your efforts to those of your fellow citizens, who are interested in the welfare and progress of agriculture, which is the very basis of our national future.

"The new council regulations relative to conservation bounties and the purchase of progenitors will be forwarded to you shortly."

I have the honour to be,
Your devoted servant,

F.-G. MIVILLE DÉCHÈNE,
Commissioner of Agriculture.

As can be readily seen by this letter, the Department of Agriculture of the Province of Quebec is very favorably disposed towards the

farmers and will, we feel assured, make large sacrifices, if necessary, to insure the success of this, one of the most remunerative branches of commerce of our country, providing we promote the improvement of our horses and render them better adapted as army remounts or for the general commerce.

It is not without difficulties that we have succeeded in determining what bounties could be allowed as conservation bounties. We beg to submit the following gradation :

Whenever an Agricultural Association takes advantage of the privilege granted by the Department of Agriculture, it is in a condition to allow :

For a thoroughbred stallion approved.....	from \$250 to \$350
For a half bred.....	" 200 to 300
For a draught	" 2 0 to 250

However, in the case of stallions of exceptional value and merit it would be possible to allow as follows :

For a thoroughbred stallion.....	from \$350 to \$500
" half-bred	" 300 " 450
" draught	" 300 " 400

The average of bounties, for stallions, would thus be of \$250.00 which sum is, I believe, a sufficient encouragement.

BOUNTIES ON BREEDING MARES

The conservation bounties could be divided as follows :

For thoroughbred mare, with pedigree, 1st class, approved, from..... \$100 to \$150

For half-bred mares, without pedigree, but who would successfully undergo an examination and be rated as 1st class..... \$75 to \$100

For any other mares passing a satisfactory examination, from..... \$75 to \$100

For draught mares, from..... \$75 to \$100

The average of bounties on mares would thus be of..... \$100

EPITOME of what is being done by the Department of Agriculture of Ireland, relative to the Improvement of Breeds

In Ireland the Department of Agriculture is making strenuous efforts towards the improvement of horses and cattle. It has recently published in the *Farmer's Gazette*, the regulations adopted for the year 1902. These regulations are fully endorsed by the paper named, which is fully convinced that they will tend to bring about the happiest results.

The Department gives out that during the year 1902, no appropriations will be paid direct to exhibiting associations, but that it offers prizes and bounties for those classes of animals mentioned in the regulations. The local Agricultural Associations have the privilege of indicating, for their own districts, the breeds of stallions and bulls, to receive the bounties, also, the selection of the class of animals, the breeding of which should be encouraged by the giving of prizes at fairs. The Department reserves for itself the control of the carrying out of these schemes.

It grants yearly bounties to stallions and bulls, subject to such restrictions as it may see fit to impose. No bounty can be awarded to any progenator unless it has been previously examined

and approved of by a Veterinarian selected by the Department.

Bounties are also granted for the best mares, with the condition that the farmers who own them, keep them for reproducing purposes for a year or more.

The methods of the Irish Department of Agriculture are differing widely from that adopted by the Province of Quebec. Which are the best? If we take into consideration the very injudicious manner in which some of the Agricultural Association spend the appropriations granted them, we are led to believe that the methods in vogue in Ireland are vastly superior to ours.

The Council of Agriculture of Quebec has the authority to rule how one-half of the appropriations should be spent, and should insist more upon asserting its rights. Its action is much more free than are the Agricultural Associations from the influence of clans.

As in Ireland, the Associations could decide as to which breeds are best adapted to their respective districts, but the Department should retain the privilege of determining the values of bounties to be granted, and control their payment. The Agricultural class would gain by this arrangement.

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