horse science

4-H HORSE PROGRAM

UNIT 2

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4-H HORSE PROGRAM

HORSE SCIENCE

This educational material has been prepared for 4-H use by the Cooperative Extension Services of the U.S. Department of Agriculture and State Land-Grant Universities in cooperation with the National 4-H Council and the American Quarter Horse Association.

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Since the time of ancient civilizations, the horse has served man well. He was first a war machine and that was his principal role until World War II. Likewise, the modern age has also relieved him of heavy duty as a beast of burden. But, the horse is not yet about to be turned out to pasture. He is now serving man in a greater way than ever before as a means of recreation and escape from pressure and tension of present-day living. This great versatility is possessed only by the horse because of his (1) anatomical structure and function, (2) speed and endurance, and (3) fear of being hurt. The combination of these characteristics has made it possible for man to obtain performance from the horse far beyond what is possible with any other animal.

ORIGIN OF THE HORSE

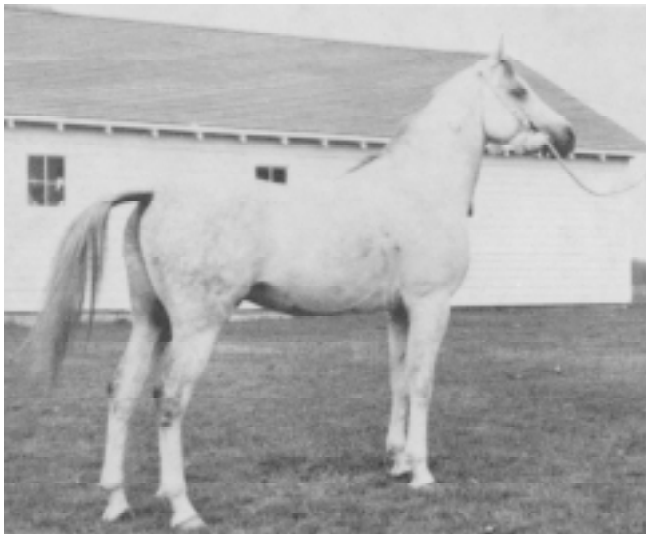
The horse had his beginning about 58 million years ago. His original home was in what is now the Great Plains area of North America. He evolved in three stages into his present form. The original ancestor (eohippus) was only about 12 inches high with four toes on each front foot and three toes each on each hind foot. He had a short neck, even teeth and was well-adapted to living in a forested and swampy environment. As the earth underwent geologic changes, the horse evolved into his second stage (mesohippus). Here he became larger (about 24" high), developed longer legs with only three toes on each foot. The middle toe was the largest. He also developed teeth suitable for grazing on the prairie and greater speed and endurance for finding forage and water and for protection and survival. These changes resulted from gradual adjustment to changing surroundings over millions of years.

Fossil remains have definitely established that the horse originated in North America beginning with eohippus. There may have been an earlier five-toed ancestor but no fossil remains have so far been found.

The third and final stage in the evolution of the horse into his present form (equus) also took place in North America but this species completely died out for reasons yet unknown. Fortunately, some of the population escaped to Asia during the Ice Age (about one million years after eohippus) by way of what may have been a land bridge in the Bering Strait area between Alaska and Siberia. It was, therefore, in Asia and Europe that the horse completed his development and was domesticated. He did not return to North America until brought here by the Spaniards in the Sixteenth Century.

An important point is not how the horse developed into his present form but why. Besides having to go further in search of feed and water the horse also had to be able to run further and faster to escape his enemies. The horse is not the fastest animal on foot but possesses great endurance. The horse is, therefore, a creature of the open country and, to this day his first reaction to any strange or frightening object or situation is to panic and run away. This great fear of the unusual, plus the speed and endurance he has developed at the gallop, has made the horse a most valuable animal to man. But, it has also made him one of the most dangerous. Unlike a bull or lion, the horse seldom attacks directly. In an instant of fright, he can become completely unreliable and even pay no attention to his own safety. It might, therefore, be said that the modern horse must depend on man for his safety.

The name eohippus or “dawn horse” is derived from the Greek word “eos” meaning dawn. The word horse comes from the Anglo-Saxon word “hors” meaning swiftness.



ARABIAN

QUARTER HORSE

FUNCTIONAL DIVISIONS OF THE HORSE

The Head and Neck

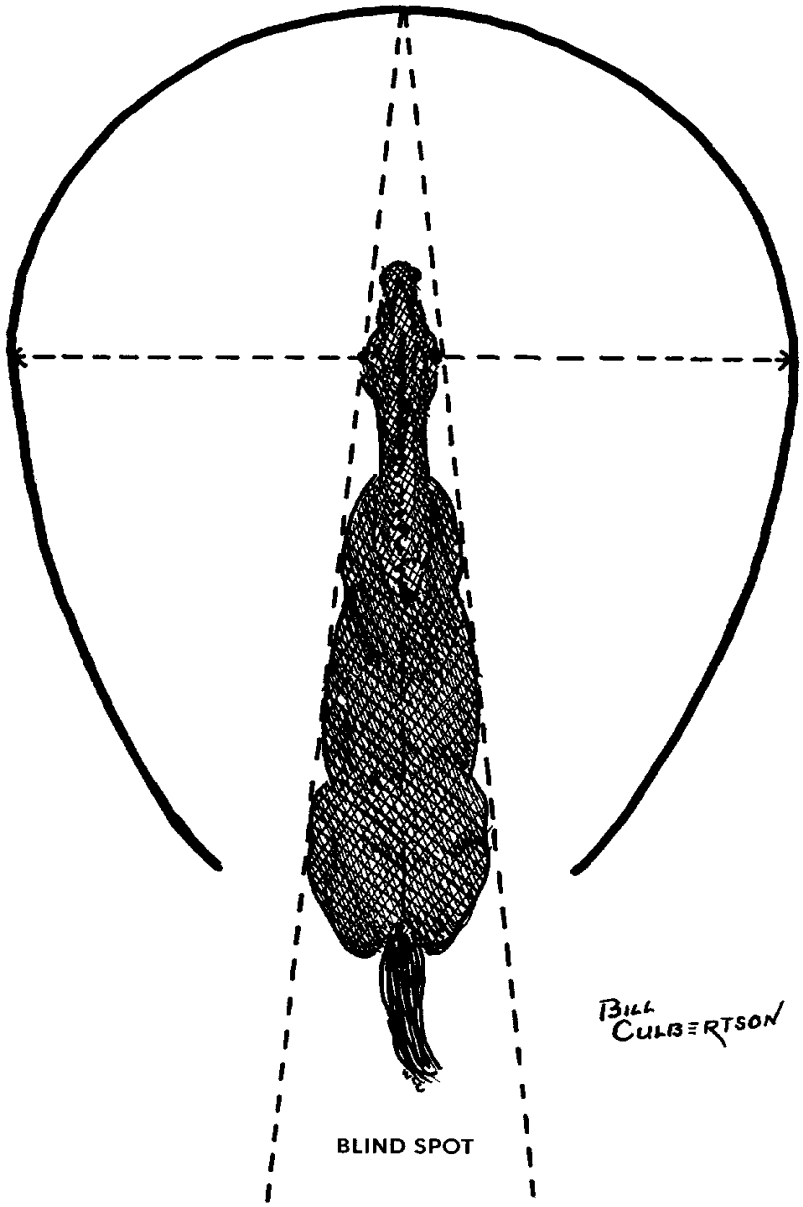
The head and neck serve the same purpose on the horse as on other animal species. So far as behavior is concerned, the most important feature of this portion of the horse's physical make-up is the eye.

The eyes of the horse are rather large and are set wide apart on the sides of the head. This gives the horse monocular vision or the ability to see separate objects with each eye at the same time. The horse can also see anything behind him that is not narrower than his body. The horse does not have binocular vision except when interested or excited enough to lift his head and point his ears forward. In such case, the object must be some distance away and not closer than four feet. Likewise, the horse cannot see directly downward and, therefore, can't see what he is eating. Neither can a high-headed horse see the ground directly in front of him.

The horse, because of his ability to make a quick getaway, has no need for acute vision as does man. However, his ability to see objects on either side at once, and to the rear, has been a prime feature of his ability to survive.

It is believed that horses do not all have perfect eyesight. No doubt, poor eyesight may have an effect on the behavior of certain horses. Shying at unfamiliar objects may be the result of faulty vision.

By reason of being ever alert to danger the horse, through his eyesight, is very sensitive to quick movements. Any training procedure involving quick motions, such as roping or polo must, therefore, be started slowly and speeded up only after the horse has become familiar with the motion.



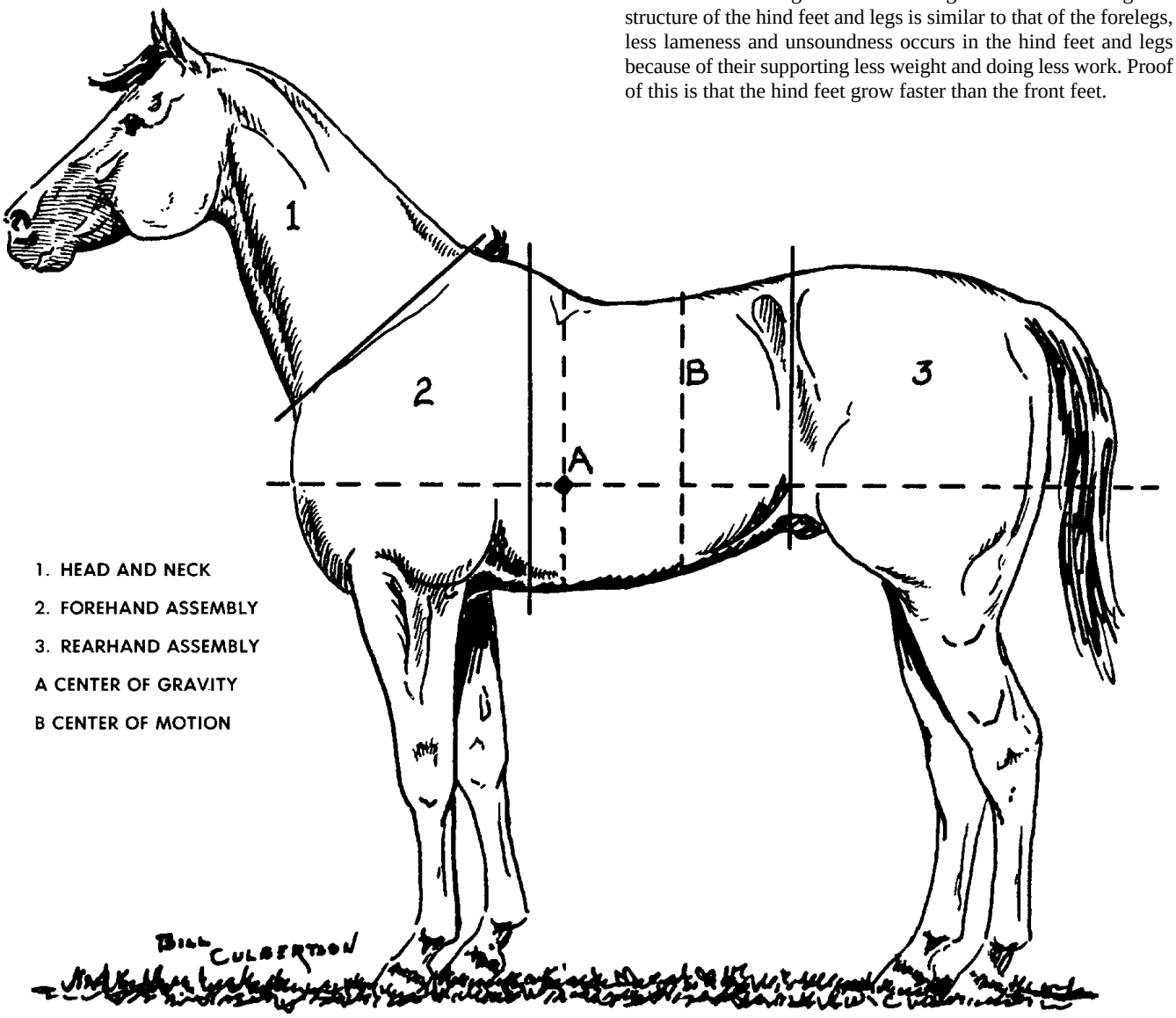
The Forehand Assembly

Although no one foot or leg has a single function, the front feet and legs serve primarily to support the horse at rest. In motion the front feet and legs also pull the horse forward. The horse's center of gravity is located at a point about six inches behind the elbow. At rest the front feet and legs, therefore, support 9 to 10 per cent more weight than the hind legs. The healthy horse at rest cannot shift his weight from one front foot to the other but is continually shifting weight between his hind feet. Only when one front foot is injured does the horse shift weight to the other foot. As a result, the healthy foot may go bad from lack of exercise necessary to promote circulation. To keep his feet healthy the horse must, therefore, have plenty of exercise. Stabled, or closely confined, horses often become nervous and this may well be due to their feet hurting from lack of exercise.

The horse is suspended between his front legs. The front legs are not attached to the main skeleton by any joints, but only held in position by muscular structures. This provides the horse with an almost perfect suspension system for his body. This, along with the elastic and expansive properties of the foot and the angle of the pastern joint, enables the horse to absorb and dissipate a tremendous amount of shock when in motion. For example, an 1100-pound horse carrying 200 pounds weight and running a quarter-mile in 45 seconds with a stride of 20 feet, will absorb and dissipate nearly a ton a second on his lead foot. In so doing, he leaves only a shallow footprint in the dust.

The Rearhand Assembly

This is the horse's powerhouse or propeller and serves to push the horse along in motion. The hind feet and legs also offer support at rest and catch weight at the end of flight in motion. Although the structure of the hind feet and legs is similar to that of the forelegs, less lameness and unsoundness occurs in the hind feet and legs because of their supporting less weight and doing less work. Proof of this is that the hind feet grow faster than the front feet.



FUNCTIONAL DIVISIONS OF THE HORSE

While the horse's center of gravity is located about six inches behind the elbow, the center of motion, however, is located approximately over the 15th vertebra. This bony structure is the most upright member of the spinal column and on a mature horse is about 10 inches back of the center of gravity. The horse in motion goes with these two centers in their relative positions. The position of the center of gravity, however, can be altered by the rider shifting his weight from side to side or front to rear. The horse himself can even shift the center of gravity by raising, lowering or extending his head. In contrast, the center of motion appears to be rather fixed. A rider's weight, positioned as nearly as possible over the center of motion, offers the greatest stability and interferes with motion the least. Weight too far back lessens the horse's propelling power.

The Power of Association

In the struggle to survive through the ages, the horse has learned to avoid or escape situations in which he might get hurt. He has, therefore, developed a great power of association. *This is the basis of horse training.*

To capitalize on the horse's power of association, signals or cues and punishment in training must be in proper sequence. For example, to teach a horse a particular movement or response, the appropriate signal must first be given and then followed immediately with some stronger force or punishment which will result in the horse responding in the desired manner. Once the horse has learned the lesson, the punishment must be stopped and not used again except as a necessary reminder. Reversing the sequence of signal and punishment will only confuse the horse.

Horses are born with a certain amount of intelligence which must be developed by training and good habits. What a horse knows he must be taught by man and, depending on training, this can either be good or bad.

The horse may shy at unfamiliar objects. He may also shy at familiar objects not in their usual place. Regardless, the horse must never be punished in such situations or due to his power of association he may develop the bad habit of shying at every strange object he sees. With his attention focused on the unfamiliar object the horse, if he can think at all, blames the object for the punishment. It is, therefore, better to let the horse study the object until he learns he will not get hurt and thereby gain confidence in the rider. This may be a rather new idea to many present-day horsemen but the fact was observed by Xenophon, the Grecian soldier and scholar about 350 B.C.

STEADY A FRIGHTENED HORSE — DON'T PUNISH HIM!

NOTES