

ected prejudicially by the tree roots or shade, but in any case he spared the tree.

Probably nowhere else in the world has afforesting been carried out on a scale so vast and with results so beneficial as near the seacoast in the southwest of France. The formation of plantations there by the sowing of seed on downs of drifting sand "was begun by M. Bremontier in 1789 and for many years now vast forests of pinaster have occupied what was originally loose sand destitute of vegetation." The shifting sand has been fixed in its place, the climate has been modified, and homes and employment and income have been created for multitudes of industrious citizens.

THE HORSE.

Thinking Horses.

At a recent meeting of the Society of Psychical Research, held in London, an interesting report on the "thinking horses" of Elberfeld was made (says the Times) by two gentlemen specially deputed by the Society to inquire into the real or supposed powers of these animals.

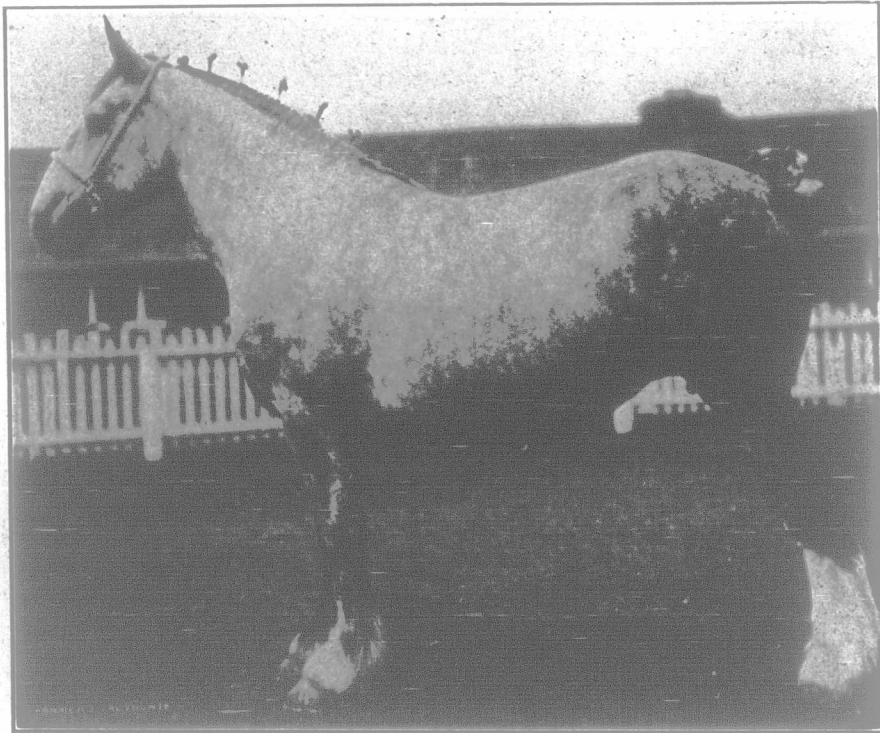
Edward Bullough, in his communication, made a cursory retrospect of the "thinking horse" problem. He explained how, in 1890, a certain Herr Von Osten, a retired mathematical schoolmaster living in Berlin, observed that a horse which he used to ride and drive responded apparently intelligently to demands. He took up the idea of perfecting his rudimentary education. After a short period of training he succeeded in obtaining perfect responses to orders such as "stop," "turn to the left or right," "walk," "trot," etc., and was able to drive his horse, without touching the reins, by vocal directions alone, along even the crowded thoroughfares of Berlin. The success of this teaching suggested to him the idea of putting his horse through a regular course of instruction, when the horse, subsequently known as Hans I., died.

In 1900, reverting to his plan, he bought a five-year-old Russian stallion, which, again called Hans, was destined to become the pioneer of equine education—"der kluge Hans." This horse achieved such remarkable proficiency in arithmetic, spelling, and so forth, as to excite great curiosity. A commission was appointed to investigate the phenomenon, and came to the conclusion that von Osten, while believing himself to be teaching Hans the rudiments of arithmetic, reading, spelling, etc., had really simply taught the horse to respond with astounding certainty and precision to certain unconscious and extremely small movements on his own part. In 1905, however, he came into contact with K. Krall, of Elberfeld. He had never handled horses, and only became interested in them in their educational possibilities and the scientific aspect of the matter through von Osten and his "clever Hans." He worked with Hans, became convinced that the animal possessed genuine intelligence, and decided to try experiments of his own on horses which, pedagogically speaking, were still virgin soil, and had not been spoiled by continual performances, experiments and investigations. He therefore bought, in 1908, two Arab stallions, Mahomed and Zarif, and began instruction on the lines of von Osten.

The horses received a systematic course of instruction, exactly of the character of elementary school teaching. Spatial relations, counting, addition and subtraction, the multiplication table up to twelve times twelve, and division, date reckoning, squaring, and the extraction of roots, reading, and spelling were successively explained and demonstrated. The progress of the horses was rapid beyond expectation. When the horses had made such progress in arithmetic, reading, and spelling as to suggest that they had become fairly familiar with language, Mr. Krall instituted object-lessons, at which pictures, portraits, and other objects were displayed, discussed and explained. He is of opinion that mere arithmetic performances in themselves are no satisfactory test of intelligence, since it is well known that even mentally deficient human beings are capable of performing the most remarkable calculating feats. He was, therefore, anxious to use arithmetic only as an avenue to mutual understanding and as a basis for spelling, reading, and especially of spontaneous utterances on the part of the horses.

The first step in the training was to tame the animal—i.e., to make him familiar with his master, and, above all, to captivate his attention by caresses, carots, and other signs of affection. The second and far more difficult stage was to teach the animal to control his movements so as to adapt them to responsive expressions, or rather, to render the animal conscious of them. This appears to be a step which some of the animals find great difficulty in taking. Another of the horses, Amasis, who has been taught for

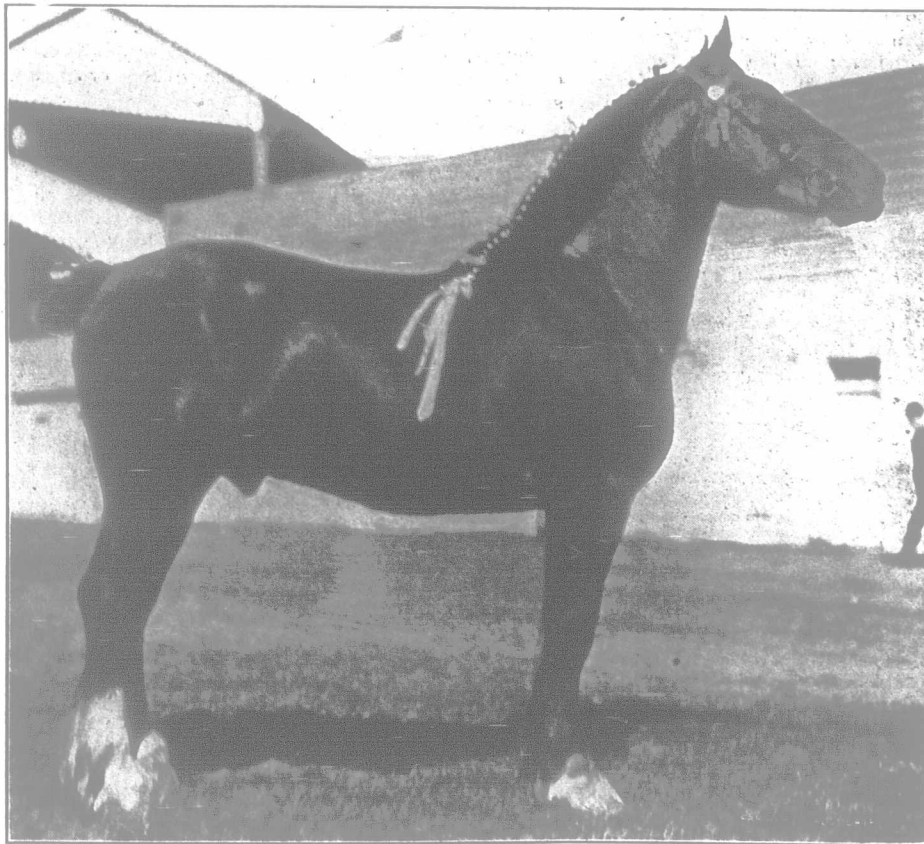
six months, seems to be constitutionally unable to acquire any such control. He stamped extremely well, and appeared very attentive, but could not get himself to stop at the right number, counting six or seven instead of five, eight or nine instead of seven, unless Mr. Krall counted aloud with him. Assuming that the horses had a conception of number, as the investigators were inclined to think after some rather striking performances they witnessed, it was developed during the stage of their education, in the form of



First-prize Shire Brood Mare.

Winner of medal of English Society, at Toronto, 1913. Owned and exhibited by J. M. Gardhouse, Weston.

movement-images. Mr. Krall explained to his horses all the rudimentary procedure of addition, subtraction, multiplication, and division, as he would to a child, and was greatly astonished at the ease and quickness of their understanding—for instance, in grasping the difference between 3 x 2 and 32. But he purposely did not go beyond the explanation of simple problems. He intentionally left the horses to themselves, to see what they would make of more complex ones.



King Darrel.

First in the class for two-year-old Clydesdale stallions at London. A Canadian-bred son of King Thomas. Owned by Hugh McDougall, Tiverton, Ont.

The same might be said of the spelling. With the aid of a simplified spelling table the horses learnt to spell, each letter being represented by a number. The association between each letter and a certain number being once formed, the spelling of words written on the blackboard was merely a matter of memory. Something far more interesting, but at present inexplicable, was achieved when the horses began to spell out spontaneous statements.

LIVE STOCK.

Measles in Cattle.

"Measles" as applied in veterinary medicine refers to condition resulting from presence of tapeworm cysts or cysticerci in flesh of food animals.

From the standpoint of public health the tapeworm cysts that appear in beef and pork are the most important, as these cysts are the intermediate stages of tapeworms that occur in man.

The cysts found in beef when swallowed by man developed into tapeworms of the species known as the unarmed or beef tapeworm (*Toenia saginata*), and those found in pork develop into tapeworms of the species known as the armed or pork tapeworm (*Toenia solium*). Cattle and hogs become infested with the intermediate stage as a result of swallowing eggs passed in the faeces of persons infested with tapeworms. The eggs of the unarmed tapeworm develop into tapeworm cysts only in cattle, and the eggs of the armed tapeworm as a rule develop into tapeworm cysts only in hogs. The eggs of the latter species may, however, develop into cysts in almost any mammal which happens to swallow them, but the hog is by far the most common host of the intermediate stage.

The pork tapeworm is a more dangerous parasite than the beef tapeworm on account of the fact that the intermediate stage may develop in man if the eggs are swallowed, and as the cysts may lodge in vital organs, such as the brain or heart, the consequences are liable to be serious. Fortunately the pork tapeworm and its intermediate stage are very rare in the United States, and this is explained by the fact that in this country raw or imperfectly cooked pork is rarely eaten. Though

cooking invariably destroys the vitality of tapeworm cysts, and consequently in this country there is little chance that tapeworm cysts in pork will reach a human host alive. Inasmuch as the limited use of raw or imperfectly cooked pork insures the rarity of pork tapeworm in man, it naturally follows that the intermediate stage in hogs will also be rare, because hogs become infested with the cysts only as a result of swallowing the eggs which occur in the faeces of human beings infested with the pork tapeworm.

The beef tapeworm and its cystic stage, unlike the pork tapeworm, are comparatively common in the United States, the explanation being

that raw or rare beef is very frequently eaten. Beef measles at the present time is thus of much greater importance in the United States than pork measles. Although less dangerous than the latter, it is more or less harmful to health, and consequently as a public-health measure the meat of cattle infested with measles must either be excluded from the market, or, in cases of light infestation, after removal of the few cysts found, must be so treated by refrigerating, cooking, or pick-