body, with hard, clean bones and extra large, strong joints, cords, and tendons; short from the knees and hocks down; pasterns upright, fetlocks thin; hoofs full size, solid, open, tough, and well set up at the heels. Height 15 to 16½ hands, weight 1,300 to 1,700 lbs. Colour various, as with other horses. but a clear dapple grey is preferred, as the best of the original breed were thus marked. Aetion bold, square, free, and easy, neither fore-reaching nor interfering; the walk four to five miles an hour, the trot six te eight, on a dry and moderately level road, but capable of being pushed much faster on the latter gait when required. Temper kind, disposition docile, but energetic and vigorous; hardy, enduring, and long-lived; precocious, able to be put to light work at eighteen to twenty-four months old; possessing, when fullgrown, immense power for his size, never baulking or refusing to draw at a dead pull; stylish, elegant, and attractive in appearance; easy, elastic, and graceful in motion. No tendency to disease of any sort, and especially free from those of the legs and feet, such as spavin, splint, curb, ringbone, grease, and founder. An easy keeper and quick feeder.—*Agricultural Gazette*

VETERINARY DEPARTMENT.

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The fattening of Cattle.

In compliance with a request that we should give a few articles on the interesting and important subject of cattle feeding we commence in this number with a description of the digestive organs of the Ruminants, and the process of digestion in them as differing from other animals: this we consider necessary before entering on the subject of feeding.

Observe an ox in the pasture field or in the byre; notice the enormous quantity of food he hurriedly gathers up, and passes with but little mastication into the stomach; observe that when he has filled the large receptacle to repletion he seeks a retired spot, and leisurely proceeds to chew the cud—in other words he, by a process known as rumination, returns the food into the mouth, and there submits it to a thorough mastication and incorporation with saliva, before its final deglutition.

The digestive organs are admirably arranged for the thorough digestion of the food, and, as we shall afterwards show, under favourable circumstances the whole nutriment of the food is extracted, and readily utilized by the body for the manufacture of flesh, fat or milk; and under a wise Providence, man, by a study of animal physiology, has in a great measure succeeded in being able to direct the ntilization of the food to the production of beef or milk at will, by systematic breeding and a correct knowledge of the science of feeding, for a science it has come to be.

The Gastric apparatus of the ox is remarkable for its enormous development, and its division into a true digestive stomach, and three preparatory compartments.

"These cavities represent a considerable mass that fills the greater part of the abdominal cavity, and the medium capacity of which is not less than fifty five gallons: one of them, the rumen or paunch, into which the œsophagus (gullet) is inserted, constitutes nine tenths of the entire mass" (*Chauveau*).

The rumen or paunch, is a very large reservoir occupying about three fourths of the abdominal cavity: it is lined by a rough membrane studded by numerous papillæ, and divided by strong muscular bands into compartments: into its upper end opens the gullet; by this opening the food enters, and just below, and opposite this opening, is the opening into the second compartment.

The second compartment is called the *Honey comb:* this is the smallest of the four; its interior is lined by a membrane raised into ridges forming polyhedral cells, from which it receives the name of *honey comb.* This sac communicates with the first, and opens into a groove, which is a continuation of the gullet, and by means of this groove communicates with the third compartment.

The third sac, called *Many-plies* (Feuillets), from the very peculiar laminated arrangement of its interior it being filled with the unequally developed leaves of its lining membrane all of which are covered by papillæ. These leaves are attached by their convex border to the walls of the sac, and their concave border is free: they are of different lengths, and between these leaves there is always a quantity of finely divided food sometimes soft or semifluid, at others dry and flakey.

The fourth sac, "la caillette," is the true digestive stomach, and corresponds both in its structure and functions to the single stomach of the omnivora and carnivora. It is in this stomach the first real process of digestion takes place by the chemical action of the gastric juices.

The intestinal canal consists of a long cylindrical tube divided, by difference of calibre and disposition, into large and small intestines, averaging about 49 yards in length, folded and festooned in the cavity of the belly by means of a thin transparent membrane—the peritoneum.

The interior of the intestines is covered by numerous villosities and glandular orifices or follicules. The whole arranged so that, while the nutriment of the food has been prepared by digestion for absorption which takes place in the intestines, the indigestible matters and effete products are mixed with fluids poured on to the surface of the bowels, rendered soft, and the outward passage facilitated.

THE PROCESS OF RUMINATION.—The food being gathered by the lips and tongue, is roughly masticated and swallowed, passing in this bulky form into the Paunch (Panse), while according to *Owen*, "water that may be drunk, finds its way mainly, as in the Camel, into the cells of the second cavity."

The food is subjected to a rotatory or churning motion in the paunch successively in this course to be moistened by the fluid of the reticulum.

When rumination commences, the coarse food in the paunch is brought within the grasp of the muscular walls of the œsophagean groove or canal (Canal Œsophagien), where it is moulded into a bolus and, by an antiperistaltic action of the œsophagus. it is carried upwards, and by a motion, partly voluntary and partly involuntary, it is thrown into the mouth where it undergoes a longer and more thorough mastication and a more complete incorporation with saliva, and is again swallowed. By contraction of the muscular walls of the groove the opening into the paunch and honey comb closes and the soft food is carried direct into the third or *manyplies*, the fluid portions passing direct into the fourth stomach.

The food after having been compressed between the leaves of the manyplies, triturated, comminuted, and diluted by fluids, is passed on to the fourth or true digestive stomach, where it is subjected to the action of the gastric juices, and the essential process of digestion commences. The food is here converted into a pultaceous mass called chyme and is passed into the first portion of the bowel (the Duodenum) where it is further acted upon by the secretions from the pancreas and liver and the chyme is converted into a milky fluid called chyle and is not prepared to be absorbed by the villi (Follicules) of the intestines, and by the lacteals carried through the lymphatic glands, and thence to the blood, to enrich it with nutrition, and by it to be carried to each tissue in the body, to repair waste, and build up the tissue.

While the nutriment is thus circulated through the system, the waste products and effete matters are carried out of the system by the peristaltic action of the bowels.