Agricultural Department

Mules vs. Horses.

A writer in an agricultural paper says: "While horse breeders are sounding the praises of thoroughbreds, trotters, Perchons, Clydesdales, and all the host of strains and breeds claiming untold good qualities for the one and the other, we seldom or never hear a single note in favor of that useful animal—the mule. On the road, amid the hum of cities, in the very bowels of the earth, these patient, persevering, long lived, hewers of wood and drawers of water', are plodding through their daily drudgery unhonored and unsung. We once overheard a farmer say, with a quaint expression, 'The best horse for a farm is a mule,' and we subscribe ourself a champion of his faith. Do you want an animal which will serve you faithfully without growl or balk, one which will keep fat on short commons, never need the veterinary, always be ready for work? Do you want a great big burly brute that will catch a coal wagon on his shoulders and tow it up a hill, or a little sprightly fellow to plough corn, or to do chores, or to make himself generally useful? If you do, get a mule. He will require less money, will do more work, will eat less corn, live longer, and pay you better than any horse we know of, on the farm. Now it will be said that mules move slowly, that they are tricky, that they are frequently breachy. Some mules have all these traits, and some have none of them, but their good qualities, taking them all in all, very far surpass their bad ones. Who ever saw a spavined mule, or a dead mule that had not been killed by an accident? A man may live a lifetime, he may have gone through the wars, where horses lay down and die by the score from bad treatment and starvation, but I venture to say he can count upon his fingers the number of mules he ever saw yield up the ghost under any ordinary pressure.

Destroying the Colorado Potato Beetle.

I noticed an article commenting on Prof. LeConte's address before the American Academy of Science on the subject of the use of Paris green in connection with the ravages of the Colorado potato beetle. Said article has prompted me to send my experience with the beetle. I have tried Paris green and found it very effective, but I tried another plan which worked equally as well and is much cheaper and takes less time. It is as follows:

In the spring of 1872 I planted about three-quarters of an acre of Peach Blows, in rows both ways, the same distance apart as corn. I cultivtaed them well and kept the ground free from weeds and paid no attention to the beetles until the first instalment of eggs were hatched and the young were well under headway; then, one day, the ground being dry and quite hot, and the vines well covered with bugs, I, with an assistant, armed each with an old broom, "went for" those bugs and brushed them on to the ground into the furrow in the center of the row, and it was encouraging to see them crawl a few inches toward a potato hill and then turn over on their backs, lie there a short time and then they would burst open; and in a half an hour you could not see the sign of a bug, except a few that fell near the vines and got into the shade before they were overcome by the heat. Two applications of the broom in the middle of very hot days saved my potatoes, and the bugs were as thick on the vines the first time, I think, as I ever saw them. I have not tried the plan since. In 1873 the bugs did not bother my potatoes, and in 1874 I was in Kansas where grasshoppers were more numerous than potato bugs. If you see proper to publish this, do so, for it may save some poor man's potatoes this year who cannot get Paris green: for I know there are such in Kansas.

Spare the Calves.

I wish to interpose a few words against the indiscriminate "slaughter of the innocents." The considerations advanced are entirely of a mercinary nature. From obvious causes the demand for cows in this vicinity will probably be greater next spring than for several years past, and quite likely the supply will not be abundant for some time to come. At all events, a very good cow is never a drug in the market.

A gentleman, formerly a resident of the western reserve, but now of Texas and president of an agricultural society there, the members of which wish to improve their milking stock, writes to me to ask if he could probably purchase one hundred heifer calves in this section next fall. He wants grades from animals that have been raised with special reference to their milking qualities. There is a growing demand for good cows and an increasing conviction that it don't pay to keep poor ones. By adhering to the theory of the "survival of the fittest," dairymen can immensely improve their stock, and I believe they can raise calves at a profit although the milk may be sent to a factory. My practice is to allow the best cows to calve in the month of March. To feed the calves new milk till they drink readily, then skimmed milk till the factory starts; then change gradually to whey, using a little oil meal and shorts from the first, and increasing as they are able to endure without scouring. When the weather gets warm I turn them to grass, continuing the whey until four months old. I can show some fine heifers and young cows.

No garden is complete without a supply of all the fruits. What an addition to the luxuries of the table are the lucious fruits of the garden throughout the entire summer! They promote health. The acids of the fruits separate the bile from the blood and ward off billious complaints, promote health and prevent doctors' visits. Every one should have a fine fruit garden.

TREES.—Trees, especially young ones, need looking after, to prevent injury by rabbits and mice. Fences and gates should be repaired and closed, to prevent cattle from entering and destroying the trees. When light snows fall, tread down around the trees to keep away mice. A mound of earth around the trees is useful for this purpose, as well as to keep newly set trees in their place during high wind.

The best variety of grapes for general cultivation is the Concord; but for some parts of Central New York and some parts of the New England States, the Hartford prolific may ripen better, it being a week earlier than the Concord, but not as good a grape.

Educational Department

COMMITTEE OF ASSOCIATE EDITORS:
E. E. QUINLAN, W. H. THOMPSON,
J. C. CRAWFORD, E. L. HILLIS,
A. A. KENEY.

[ALL communications intended to be inserted in this department, should be sent to the chairman of the committee, E. E. QUINLAN, at Towanda, and will be forwarded by him to the Editor in charge for the ensuing week.]

SCHOOL HYGIENE.

One of the most important items, we had almost said necessities of the school-room is a knowledge of the rules and principles of Hygiene. All realize its importance, yet how few understand its practical bearings. So important do we deem this subject that to the exclusion of other valuable matter, we present this week the able paper of Dr. A. N. Bell, of New York, Editor of the *Saitarian.* Dr. Bell is authority on the subjects which he has here discussed. The paper was read before the Department of Superintendence of the National Educational Association, at Washington, D. C., and was very favorably received by the intelligent audience of educational men attending the convention. We trust that the paper will receive a careful perusal. The amount of useful information will fully compensate for the time and effort;

MR. PRESIDENT, LADIES AND GENTLEMEN: The paper which I have the honor of reading to you this evening is entitled, "Brain-Culture in relation to the School-Room."

Education is a primary necessity of man. It is by education that the organs of the body acquire accuracy in their movements. The senses of sight, hearing, taste, and smell all learn to act. And the earliest charm of infant-life is to observe the progress of the education of the senses; to watch the study of a toy; to see the hands holding it at various distances, turning its different sides to view, tasting it, shaking it, and finally, when a little older, breaking it to see whence comes the noise. Who that has watched this process has not learned the first accomplishment of a teacher, to promote the education of the senses by the association of physical exercise, amusement, and study?

The passage from infancy to childhood is but an impreceptible step, marked by the continued expression of new experiences. Everything excites new impressions; everything must be examined with due deliberation; no hurry, no pressure, no fatigue. And during the while, ay, even during the whole period of waking hours there is incessant motion. Nature has implanted in the young of all animals a pleasure in exercise. Muscular action being not only necessary for strengthening the muscles, but also the bones to which they are attached, the actions of crying and laughing, the deep inspirations of sobbing and joy, both alike tend to develop and strengthen the lungs. And the active exercise of the lungs promotes and develops the action of the heart which, with increasing vigor, sends the blood to every part of the body. In all this the brain participates to an extraordinary degree, requiring that the young mind be exercised with the utmost care. By experience and habit the child acquires judgment, learns to compare one movement with another, to direct its organs to special objects, to produce this or that action, to take this or that attitude for the accomplishment of its purposes. And all the subsequent capacity of the brain will greatly depend upon the care with which it is cultured during the period of growth.

Imagination, perception, and memory—faculties which are always preceded and determined by the sensations—are all the subjects of education, enlarged and ments and impressions call them forth and give them application.

"Glancing broadly at the whole range of psycho-physical phenomena," observes Dr. Tuke, "it is clear that it would be taking a very contracted view of the relation between mind and body, if we did not include in this relationship a reference to the inseparable *nexus* existing between the two, arising out of the fact that the organ of the mind is but the outgrowth and ultimate development of the tissues and organs of which the body itself is composed; that it not only unites them in one bond, but is, in truth, a microcosm of the whole." Of all parts of the human body the brain is the last to gain maturity. According to Owen, "the brain has advanced to near its term of size at about ten years, but it does not usually obtain its full development till between twenty and thirty years of age." While the brain has not usually more that one-fortieth of the weight of the body, it receives about one-fifth of the whole volume of the blood, and that upon the supply of it, and the condition of it, nutrition and development for weal or woe depend. During the period of growth there is not only the development of new parts, but in the brain especially, a change of structure going on until that degree of perfection has been attained which is necessary to the exercise of all the functions. Hence this period is characterized by extraordinary functional activity in every part of the body. It is this which makes the demand for food so much greater during the period of groth than in after years. Not, however, that the larger proportion of food in demand is wholly required as new material applied to actual increase, for that bears a very small proportion to the amount required for constant renewal which the increase involves, but the extraordinary functional activity in disposing of it and the corresponding necessity for replacing the waste in the building-up and perfecting the structure according to the original plan. For it is characteristic of every living thing to follow out a certain inherent type or pattern, subject, of course, in some degree, to modification under the influence of external conditions or, when these are aggravated, to acute disease and death; but such circumstances do not effect a permanent change in the original design. During the period growth and change of structure the modifying influence of external conditions is most strongly marked. The constitution of the individual adapts itself to the circumstances and becomes fixed for the life time. So that, if a child of originally healthy constitution be subject for any considerable length of time to such injurious physical conditions as produce a tendency to disease, unless the conditions are speedily changed, the effect is to establish a constitutional weakness or disease, not only during the life of the individual, but, it may be, a *diathesis*, with hereditary qualities for several generations. For when the modification of the individual is once fixed in the growing brain, it becomes part of the general fabric; the different organs adapt themselves to the change and the condition is maintained by nutritive substitution. On the other hand, constitutional vices contracted during the period of growth may be gradually overcome in the progress of new generations, and, by a continued subjection to healthy surroundings, the normal type regained. It is apparent, therefore, that these changes of growth and structure are all affected by and through the circulation of the blood; its condition depends upon the air we breathe.

Air, everybody knows, is the absolute necessity of every living thing. It is the very first element of our bodily tissues, and breathing affords three-quarters of the nourishment of our bodies; and the other quarter, which we obtain in the form of solid and fluid aliment, is also in great part composed of oxygen, nitrogen, and carbonic acid—the elements of the atmosphere.

Chemically, the air consists of a mixture of two kinds of gases, oxygen, or vital air, and nitrogen, in the proportion, by volume, of one-fifth of the former to four-fifths of the latter, and, besides these carbonic acid or fixed air, which exists in the free atmosphere in the proportion of about four parts to ten thousand.

In the small proportion in which carbonic acid exists in the free atmosphere it produces no evil effects; but in larger quantities it is not only dangerous, but frequently fatal. Being heavier than the other gases of the atmosphere, it is usually found in excess in low or confined places, such as mines, grottoes, and wells, and in the holds and steerages of ships, and in unventilated apartments generally. Under all such circumstances it is more or less dangerous to life. The bad air at the surface of close rooms is carbonic oxid, the product, usually, of burning gas and bad arrangements for warming. This, being the lightest of the deleterious gases, in close rooms rises to the surface.

Pure oxygen will sustain life but a short time, owing to its stimulating qualities; it requires dilution, which seems to be the purpose of nitrogen, which cannot sustain life at all, and alone is deadly from its negative qualities. Carbonic acid pure is not respirable. If an attempt be made to inhale it, the glottis closes and prevents it from entering the lungs. When diluted with twice as much or more of air, it ceases to produce that effect upon the glottis, and is permitted to enter the lungs and the blood, and acts as a narcotic poison directly upon the brain. It is not possible to state how large a proportion of this gas may be present in the air without danger; it doubtless differs with different individuals. By experiments on animals it has been shown that an atmosphere containing 5 per cent. of carbonic acid is fatal in about thirty minutes.

Facts abundantly prove that respired air, or the air of occupied apartments containing of carbonic acid more than one volume per 1,000, is dangerous to health. Such air contains, besides the excess of carbonic acid, not infrequently the more deadly carbonic oxid, dead and decomposing animal matter, and other mephitic gases and exhalations arising from defective sewerage or vaults, but it is deficient in its very first life surtaining property—oxygen—conditions predisposing to and frequently the cause of many fatal diseases.

The average amount of oxygen consumed by a healthy individual is half a cubic inch to every respiration, which in a day amounts to upwards of 25 cubic feet; and, as oxygen constitutes but one-fifth of the volume of the atmosphere, a single individual renders 125 cubic feet of air unfit for respiration every 24 hours by the abstraction of oxygen alone. Meanwhile there is exhaled by the lungs about 15 cubic feet of carbonic acid, 30 ounces of watery vapor, and an indefinite amount of organic matter, variously estimated at from 10 to 240 grains.

The whole quantity of air actually respired in 24 hours by a healthy person, is about 400 cubic feet. This contains, when once passed through the lungs, $5\frac{1}{2}$ per cent. of carbonic acid, or more than one hundred times as much as it did when it entered them. It is plain, therefore, that in order to reduce respired air to the same standard of purity it had before it was respired, and to keep it so, the supply of fresh air must be at the least equal to one hundred times the volume of that which is thrown out, and upon this condition rests the importance of air space, the space required depending upon circumstances. For various practical purposes the limits of space may vary from 300 to 4,000 cubic feet, the smallest proportion being the exaction for lodging-houses and the largest for hospitals, making due allowance in all cases for space occupied by furniture. And no deviation whatever should be made on account of children, whether in regard to the different members of a family or a school-room.

The smaller the space, the greater necessity of, and the larger opening required for, the admission of fresh air. If two or three hundred cubic feet only be allowed to the individual, thh air must be changed every fifteen or twenty minutes, provision for which necessitates a draught and in cold weather great waste of heat. Hence it is evident that the danger of taking cold in a small room, if it is kept ventilated, is much greater than in a large one. To reduce the gaseous components of respired air to their natural proportions and to neutralize its deleterious qualities, every person requires from 2,000 to 2,500 cbbic feet of fresh air every hour.

To admit this amount of fresh air into a room is not as difficult as persons generally suppose. It has been calculated that with ordinary exposure an open space equal to five inches in the square will admit the passage of 2,000 cubic feet of air hourly; this, of course, implies that there should be an equal amount of space for the escape of the air displaced. If therefore, an ordinary window of three feet wide be open about an inch and a half at the top, and there be chimney-flue in the room, the purpose is accomplished. Or the same by two windows on opposite sides of the room; or, it may be by crevices equal to this space about a door, in co-operation with one window. The multiplication of persons, it is plain requires a corresponding multiplication of means.

In the aeration of the blood the organs of circulation and respiration are both no less essential to the maintenance of life than they are to each other. Their combined functions must co-operate and be maintained, without ietermission for one single minute, from birth until death. And yet, they have rest; the heart reposes about one-fourth of its time, and the lungs about one-third, but the periods of repose are too short to allow of any escape from a dangerous atmosphere.

The amount of blood in the human body constitutes about one-eight of its entire weight, but it is variable within certain limits, depending upon the time and amount of food taken. Air is drawn into the lungs through the windpipe or trachea, which divides and sub-divides into numerous smaller tubes leading to the air-cells, which, in the aggregate, constitute the lungs, situated one on each side of the chest and the heart between.

(Concluded next week.)