they might otherwise have done. The bran lot was purposely fed two pounds a day more than lots 3, 4 and 5, because the larger proportion of bran, 25 per cent. of the ration, would have reduced somewhat the actual amount of corn fed that lot had all been fed the same number of pounds of the mixture.

The largest daily gain was made with oil meal, 2.52 pounds a day, while the smallest was made on corn and prairie hay without a supplemental food, 1.27 pounds a day. Lots 4 and 5, the former cottonseed meal and the latter alfalfa, each gained 2.29 pounds a day, while the lot fed bran gained 1.98 pounds a day, and that fed corn and cob meal gained 1.95 pounds a day. While a smaller daily gain was made on corn and cob meal than on shelled corn, less of the former was consumed for each pound of gain. The corn fed as corn and cob meal proved in this experiment to be worth 2½ cents a hundred more than shelled corn—not enough difference to pay for the grinding.

With wheat bran costing $15 a ton, oil meal and cottonseed meal each $32 a ton, and alfalfa and prairie hay each $6 a ton, with all other expenses except labor included, the net profit or loss on each steer by lot is as follows:

Lot 1, corn and prairie hay, loss 46 cents; lot 2, corn 75 per cent., bran 25 per cent., and prairie hay, profit 57 cents; lot 3, corn 90 per cent., oil meal 10 per cent, and prairie hay, profit $1.43; lot 4, corn 90 per cent., cottonseed meal 10 per cent., and prairie hay, profit 47 cents; lot 5, corn, and equal parts of alfalfa and prairie hay, profit $2.53; lot 6, corn and cob meal, and equal parts of alfalfa and prairie hay, profit $2.05.

It should be stated in this connection that the cattle were worth $4.15 a hundred at the beginning, and all lots except lot 1 $4.60 at the close, eight weeks later. The market value of lot 1 was $4.50 a hundred.

As compared with corn and prairie hay, without a protein supplement, the bran returned a value of $20.80 a ton, the oil meal $59.60, and the cottonseed meal $45.60. The fact that oil meal returned a value nearly three times as great as bran, may be partly accounted for by the higher protein content of oil meal, which amounts to nearly that difference. On the other hand, cottonseed meal is richer in protein than is oil meal, and in tests elsewhere it has sometimes proved the equal of oil meal. In this experiment, the pigs behind the cottonseed-meal lot made much smaller gains, which accounts for a part of the difference in favor of oil meal, inasmuch as the pork was included in the net profits on all lots.

This experiment, as has been true with former tests, emphasizes the importance of using a protein supplement with corn and prairie hay, but it indicates in a very pronounced manner that alfalfa, at its present market value, may be used instead of a protein concentrate, with greater profit.

Mendel's Law of Breeding.

A rediscovered law of heredity is that of Mendel, the Austrian monk, which he enunciated nearly fifty years ago. Since that time, the work of demonstrating the applicability of this law has been going on vigorously in many parts of Europe, with Cambridge University in the lead.

Commenting on this law, Prof. Hansen, the experimenter with native fruits to obtain hardy varieties, says: "In the exhibit from Cambridge University and elsewhere was shown a remarkable series of specimens, showing the applicability of this law in breeding of plants and animals, such as sweet peas, stocks, garden peas, corn, wheat, mice, sheep, horses, moths, snails, etc. Furthermore, the law applies to intangible things, like disease-resistance in plants, and to milling quality and high yield in wheat. It appears probable that the animal- and plant-breeding of the world will be greatly modified as to methods by the application of this law of heredity. Briefly, it may be stated that in the crossing of two distinct varieties of plants, say A and B, the opposing characteristics are either dominant or recessive, and arrange themselves by chance in equal numbers of AA's and BB's, say 25 of each, with 50 AB's. The AA's may be called dominant, the BB's recessive, and the AB's heterozygote. AA's or BB's are fixed in type at once; the AB's can never be fixed, because they split up again in the next generation. All are apparently alike the first generation, but the unknown character of each can be demonstrated only by testing their reproductive power. This shows at once which are true to type and which are not; in other words, the type is fixed at once, without going through a long process covering many years of laborious selection. It appears the law applies to animals also, and animal and plant-breeding in Europe and America will henceforth be put upon more of a scientific basis by this new law. In a visit to Cambridge University, I noticed some interesting work being done in the cross-breeding of sheep, showing that Mendel's law holds good for sheep as well as sweet peas; also in the breeding of poultry. The problem, however, becomes quite complicated at times because some qualities are inherited in pairs, or even higher numbers, so that considerable numbers are necessary to make clear the law.

"Dr. Bateson, the Cambridge scientist, who described this new principle of breeding in 1902, has given it the name of 'Genetics.'"

THE FARM.

Barn-raising Photo Wanted.

"The Farmer's Advocate" is especially desirous of procuring a photo showing a barn-raising—not the mere skeleton of a newly-raised barn, but the actual process itself, with the men at work, either running up rafters or raising the bents or plates into place. We will pay for the photo that suits us best, and return it and all others to the owners. If you have such a picture on hand, you will oblige us very much by sending it on as soon as possible.

Heating and Ventilating a Schoolroom with a Furnace.

Our local tinsmith advocates heating our schoolhouse, the size of which is 24 x 40 feet, with a concrete basement and a large chimney running from top to basement, with a partition running down the center of chimney, the one flue having a foul-air duct leading into it above the schoolroom floor for ventilation. He advises heating in the following manner, by placing a wood furnace in centre of basement, with one hot-air register directly above furnace. He proposes bringing his cold-air supply for the furnace from three registers placed in the schoolroom floor.

1. Is one register sufficient to heat school?

2. Is one ventilating flue sufficient for school; if not, how should additional ones be put in?

3. Should any of the cold air to supply furnace be taken from the floor of the schoolroom?

4. Should all or any of the cold air to supply furnace be taken from outside of school? And if taken from outside of school, would it be more difficult to heat school than if the cold air were taken from the floor of school?

5. Would not his proposed plan of heating the school be injurious to the health and comfort of the pupils?

6. Please give plan of how school should be heated, the sizes of the different pipes, and where the different registers should be placed.

AN OLD SUBSCRIBER.

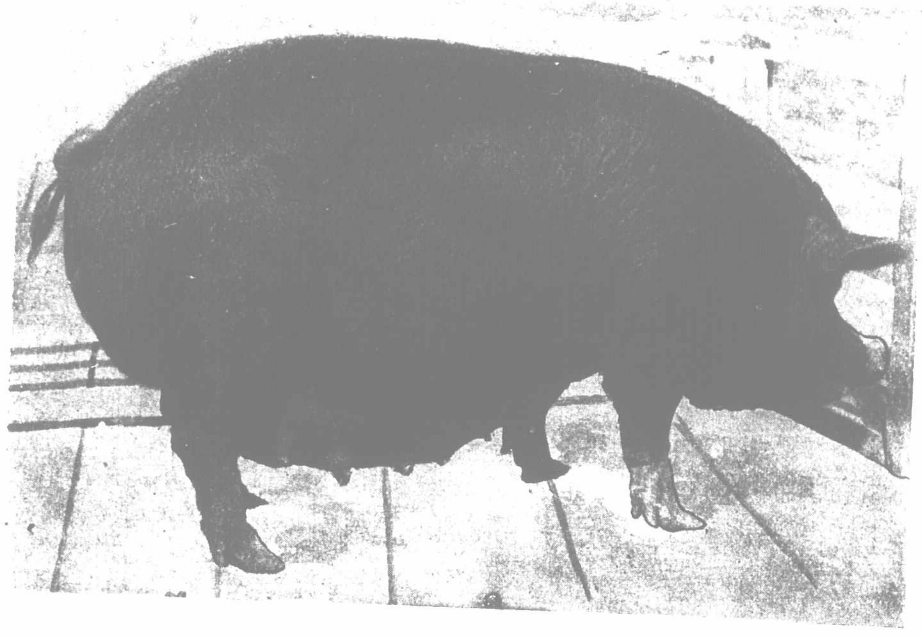
Subscriber's questions are explicit and important. We shall take them in their order, and try to give them explicit answers.

1. One register, if large enough, is sufficient. Heat expands air; the heated air is rarer and lighter than cool air, and rushes to the ceiling. Its warmth is given out, not as it ascends, but as it comes down. When the register is directly over the furnace there is no loss of heat by radiation from basement pipes; neither is there arrest of the current of hot air by corners and elbows. Some authors on school sanitation strongly advise that the hot air be admitted at a level above the children's heads. The chief objection to the opening in the floor is that a certain amount of sweepings is sure to find its way into it, to be dried, carried up into the room, and breathed by the children. One plea for the floor register is that it gives children who come in cold and wet a chance to stand over it to get warm and dry; but sanitarians say that air is vitiated by passing through wet garments and around children's bodies on its way into the room. The situation is compromised by setting the registers in or against the wall in a vertical position at or near the floor. Your tinsmith's plan gives you the maximum amount of heat, but not the sweetest air. A desk or seat should never be placed near enough a floor register to intercept any part of the upflowing current.

2. With regard to the size of the register. If placed directly over the furnace, one with an area of 240 square inches would be capable of passing, with a moderate fire, the amount of air into a 24 x 40-ft. room which is required by the school law. A large furnace, with moderate fire, heating a large quantity of air moderately, is more economical and more healthful than a small furnace, kept red-hot, and raising a smaller quantity of air to a very high temperature. The foul-air outlet should be of nearly the same capacity as the warm-air inlet.

3. A furnace properly installed in a schoolroom makes provision for exclusively INTERNAL as well as exclusively EXTERNAL circulation. There is no need to bring in outside cold air from 4 p.m. until 9 a.m. the next morning. During these hours one or more floor registers should be open into the air-chamber. From 9 a. m. to 4 p. m.—in other words, while the children are at their studies—the inside supply should be shut off, and the circulation should be exclusively of fresh air drawn through the heater from outdoors.

4. The vilest condition imaginable is one in which the children's breath is drawn down into the fresh-air chamber, to be heated and breathed over and over again. Where such conditions exist, parents whose children are obliged to go to school, and teachers, should protest to the inspector and board of health. If the attendance is small and the schoolroom large and airy, the foulness of the atmosphere in such cases is less pronounced. During school hours, the air supplying the furnace heater should be pure outside air. Let there be no doubt or question about this condition.



Cherry Lane Blossom 10338.

Bacon-type Berkshire sow, dam of a dozen healthy piglets born at Toronto Exhibition, 1906. Property of Samuel Dolson, Alloa, Peel County, Ont.

5. It takes more fuel to heat frosty, outdoor air than an indoor mixture of warmed air, human breath and gaseous exhalations from skin and clothing. But robust health and effective physical growth of the children are worth far more than the extra cost of the fuel. One sanitarian, Prof. G. B. Morrison, in a work on "Heating and Ventilation," declares that children can learn as much in one hour in pure air as in six hours in air heavy with the waste products of their own bodies.

6. Not a foot of pure air can come into a room unless there is some way of getting a like quantity out. This fact explains why tinsmiths so generally favor the drawing of the inside air into the heater. It takes more skill, trouble and expense to empty the room in any other way so efficiently. An effective exhaust may be constructed beside or around the smoke flue of a wood furnace. At equal distances from the fire, the smoke from wood is warmer than that from coal.

The ventilating flue should have an area in cross-section not less than that of the hot-air flue. To keep up positive action, the ventilator must be warmed.

A single schoolroom of the "chalk-box" shape can be satisfactorily heated and ventilated by setting the furnace near one end of the basement and admitting the warmed air by the shortest flue possible through a vertical register in the wall, or setting the furnace in the middle of the basement and admitting the air by a pair of vertical registers, covered over the top to look like a seat or reading desk. The foul air is drawn out of the room by a pair of flues, one running along each side of the room, under the floor, to the well-warmed flue in the smoke chimney, and communicating with the room by three registers. There should be one of these registers very near the front door (if two doors, one near each).