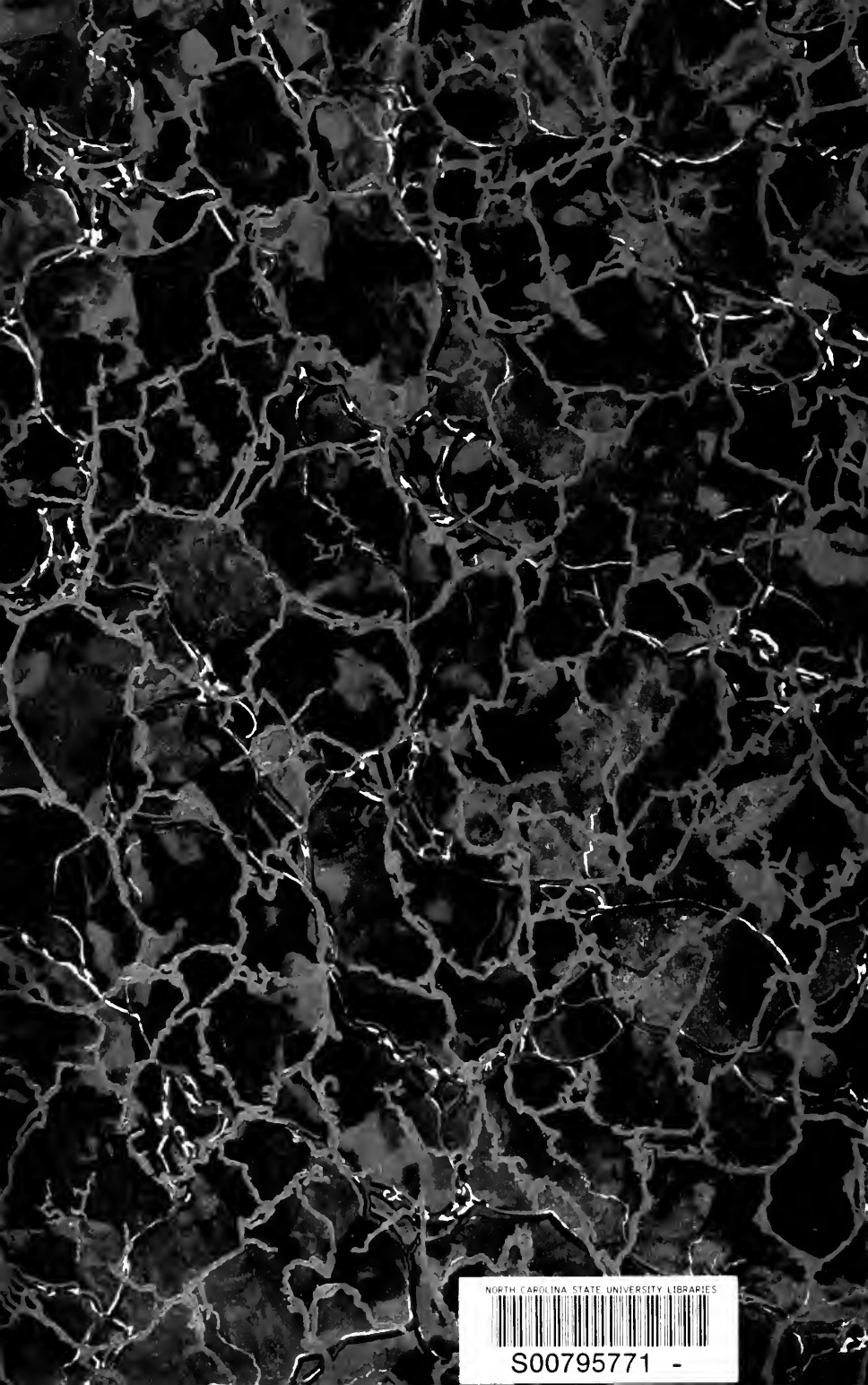
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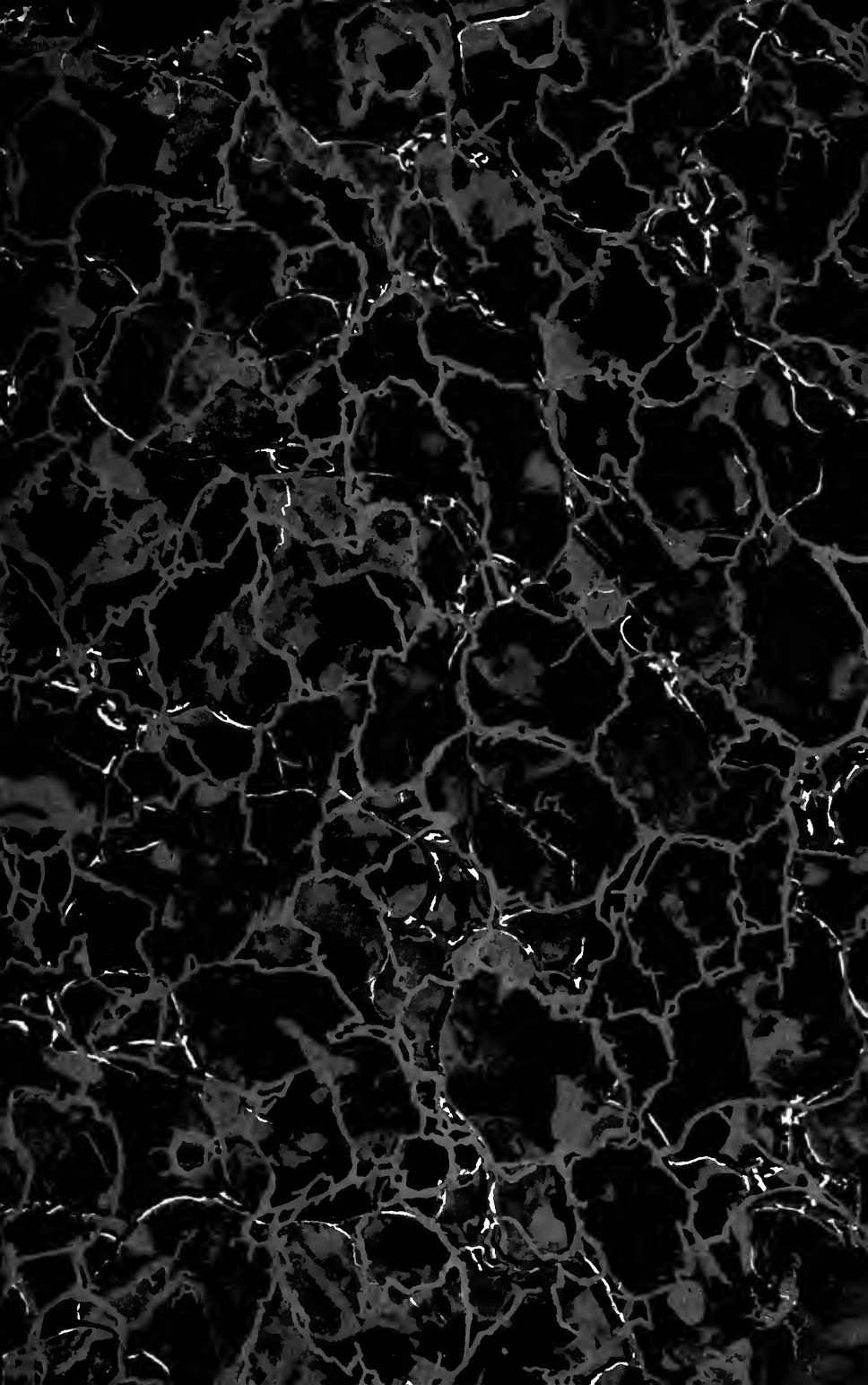

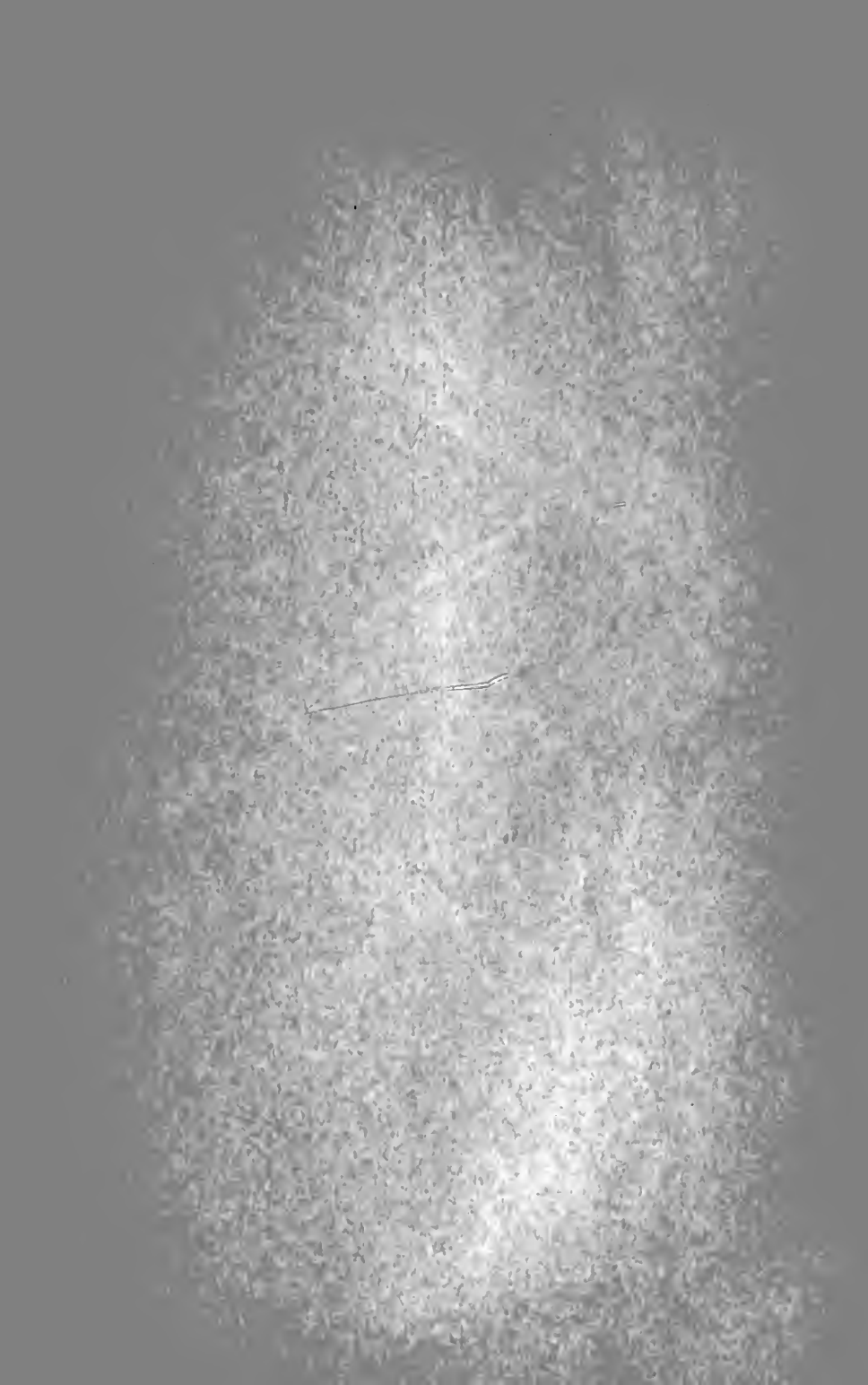

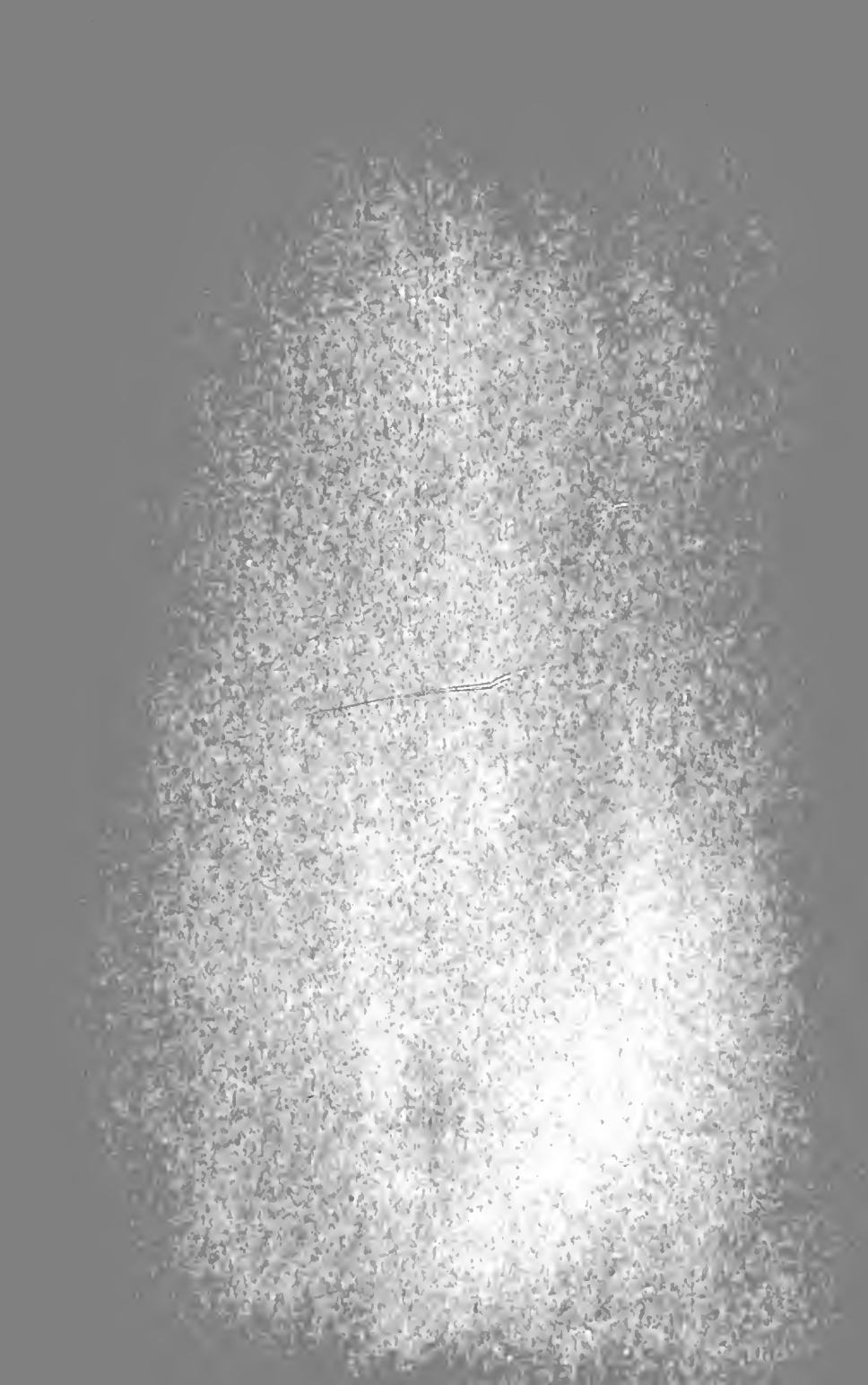

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PREFACE

The International Library of Technology is the outgrowth of a large and increasing demand that has arisen for the Reference Libraries of the International Correspondence Schools on the part of those who are not students of the Schools. As the volumes composing this Library are all printed from the same plates used in printing the Reference Libraries above mentioned, a few words are necessary regarding the scope and purpose of the instruction imparted to the students of—and the class of students taught by—these Schools, in order to afford a clear understanding of their salient and unique features.

The only requirement for admission to any of the courses offered by the International Correspondence Schools, is that the applicant shall be able to read the English language and to write it sufficiently well to make his written answers to the questions asked him intelligible. Each course is complete in itself, and no textbooks are required other than those prepared by the Schools for the particular course selected. The students themselves are from every class, trade, and profession and from every country; they are, almost without exception, busily engaged in some vocation, and can spare but little time for study, and that usually outside of their regular working hours. The information desired is such as can be immediately applied in practice, so that the student may be enabled to exchange his present vocation for a more congenial one, or to rise to a higher level in the one he now pursues. Furthermore, he wishes to obtain a good working knowledge of the subjects treated in the shortest time and in the most direct manner possible.

In meeting these requirements, we have produced a set of books that in many respects, and particularly in the general plan followed, are absolutely unique. In the majority of subjects treated the knowledge of mathematics required is limited to the simplest principles of arithmetic and mensuration, and in no case is any greater knowledge of mathematics needed than the simplest elementary principles of algebra, geometry, and trigonometry, with a thorough, practical acquaintance with the use of the logarithmic table. To effect this result, derivations of rules and formulas are omitted, but thorough and complete instructions are given regarding how, when, and under what circumstances any particular rule, formula, or process should be applied; and whenever possible one or more examples, such as would be likely to arise in actual practice—together with their solutions—are given to illustrate and explain its application.

In preparing these textbooks, it has been our constant endeavor to view the matter from the student's standpoint, and to try and anticipate everything that would cause him trouble. The utmost pains have been taken to avoid and correct any and all ambiguous expressions—both those due to faulty rhetoric and those due to insufficiency of statement or explanation. As the best way to make a statement, explanation, or description clear is to give a picture or a diagram in connection with it, illustrations have been used almost without limit. The illustrations have in all cases been adapted to the requirements of the text, and projections and sections or outline, partially shaded, or full-shaded perspectives have been used, according to which will best produce the desired results. Half-tones have been used rather sparingly, except in those cases where the general effect is desired rather than the actual details.

It is obvious that books prepared along the lines mentioned must not only be clear and concise beyond anything heretofore attempted, but they must also possess unequaled value for reference purposes. They not only give the maximum of information in a minimum space, but this information is so ingeniously arranged and correlated, and the

indexes are so full and complete, that it can at once be made available to the reader. The numerous examples and explanatory remarks, together with the absence of long demonstrations and abstruse mathematical calculations, are of great assistance in helping one to select the proper formula, method, or process and in teaching him how and when it should be used.

This, the fourth volume in this library on agriculture, deals with swine, sheep, horses, ponies, mules, and asses. The first sections are devoted to the general care and management of swine, and will be found to be intensely practical; they were prepared originally by one of the most successful swine raisers in the United States. Sheep management in all its details follows, and the treatment in the volume will be especially valuable to those desiring to start in the business of sheep raising. Authorities are agreed that sheep farming as a business in America has not reached its proper development. Horses, ponies, mules, and asses are fully treated, ample space being devoted to the several types and breeds of the animals and to approved methods dealing with their feeding, breeding, and care. Directions are given for detecting all important unsoundnesses such as capped hock, curb, spavins, thoroughpin, sweeny, ring bone, side bone, thrush, etc.

The method of numbering the pages, cuts, articles, etc. is such that each subject or part, when the subject is divided into two or more parts, is complete in itself; hence, in order to make the index intelligible, it was necessary to give each subject or part a number. This number is placed at the top of each page, on the headline, opposite the page number; and to distinguish it from the page number it is preceded by the printer's section mark (§). Consequently, a reference such as § 16, page 26, will be readily found by looking along the inside edges of the headlines until § 16 is found, and then through § 16 until page 26 is found.

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CONTENTS

SWINE HOUSES AND EQUIPMENT

SWINE HOUSES

PORTABLE SWINE HOUSES

1. One of the most popular plans for the housing of swine is to keep them in small, portable houses. Houses of this kind are known as **individual swine houses,** or **swine cots.** They were designed and originally used for brood sows and their litters, but they can be used as shelters for any class of hogs, if desired. When used for the housing of brood sows, it is customary to keep but one sow in each house; although in some houses provision is made for two sows. An advantage of swine cots is that they can be transported to new locations with little difficulty if they are placed on a low wagon or a sled. They are usually placed in pasture lots and enough space is left about each house to provide sufficient pasture for its inmate or inmates. A few of the most popular kinds of swine cots are described in the following pages.

2. Lovejoy House.—The Lovejoy house, which is illustrated in Fig. 1, is a type of portable house that is widely used by swine raisers. An advantage of this type is that the houses are not easily blown over. Each house is 8 ft. × 8 ft. at the base. The sloping side boards are 9½ feet in length. The frame is constructed of 2″ × 4″ scantlings. Fig. 2 shows the same house in somewhat more detail. At the apex, the 2″ × 4″ scantlings are arranged so that a 2-inch air space

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for ventilation is left the full length of the house. This air space should be left open when the sides are covered. Above the air space is placed an inverted trough *a*, which is held in place at each end by a block of wood, the shape and position of which are shown at *b*. The frame is lined with building paper and is covered both inside and outside with matched flooring or other similar lumber. The floor *c* is constructed of common 1-inch boards. To prevent the sows from crowding the pigs to the wall and crushing them, a 2″ × 4″ scantling *d* is placed 12 inches from the wall and 9 inches above the floor along the sides and ends. A door 24 in. × 30 in. is provided at each end, and a window 22 in. × 28 in. at one

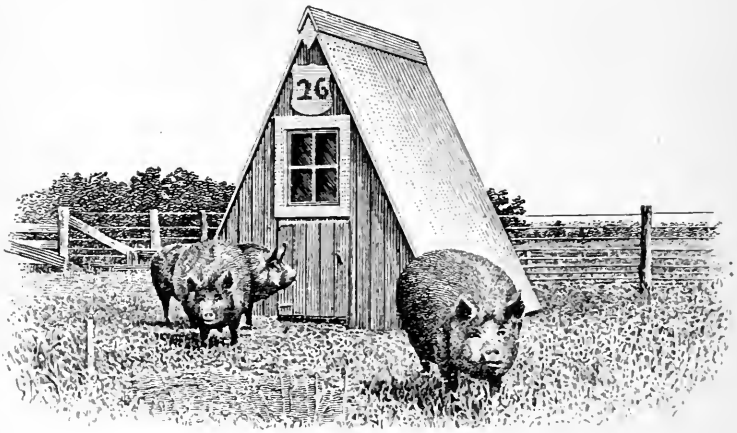

FIG. 1

end. The window is hinged at the top so that it will swing into the building, and is opened and closed by means of a weighted cord that passes through a pulley on the opposite side of the house. By means of the ventilator in the roof and the windows and doors, it is an easy matter to keep the house well ventilated in all kinds of weather.

These houses are usually placed with the window facing the south, as this position is the most favorable for obtaining an abundance of sunshine inside the house. One door, preferably the south one, should be left open in the daytime, except during driving storms, and it should not be closed at

night until after the evening feed has been given and the hogs are settled for the night.

The houses should be painted, and if many of them are used on a single farm, it is a good plan to have each one

FIG. 2

numbered, as this will facilitate keeping the records of the hogs.

3. Bonham House.—In Fig. 3 is shown a light-weight, cheaply constructed type of portable house, known as the Bonham house. The house is 5 feet high in front, 3 feet high in the rear, and has a floor space 5 ft. × 6 ft. The sills are made of 2″ × 4″ scantlings, and the frame for the sides and roof is of the same material.

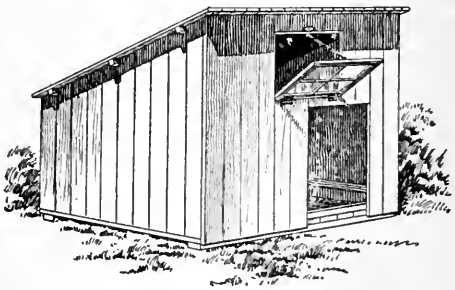

FIG. 3

The covering and flooring are of 1-inch boards. An opening 2 ft. × 3 ft. is provided in the front for a doorway, but no

door is used. A second opening 18 in. × 24 in. is fitted with a window sash, which is hinged at the bottom and has a cord at the top to hold it at any angle desired when it is open; a button holds it in place when closed. The roof is battened to prevent rain from entering the house. It is desirable that such a house should be painted to increase its durability. When used as a farrowing house, 2″×4″ scantlings should be placed around the sides, as described in Art. **2,** to prevent the sows from crowding the young pigs to the wall and crushing them. This house is designed especially for use during warm weather, but may be used in cold weather by covering the door opening with canvas and hanging a lighted lantern from the ceiling to supply heat.

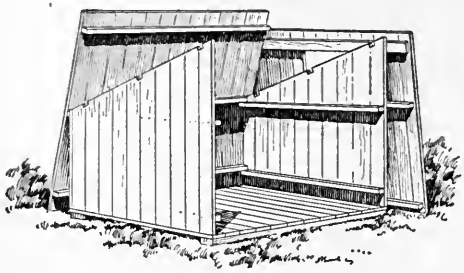

FIG. 4

The house is made in sections, as shown in Fig. 4, so that it can be taken apart and moved easily. It can, however, be left intact and transported on a wagon. The house is set up by nailing the sides and rear end together and then setting the floor in place, after which the front section and the roof are put in place and nailed.

4. Coolidge House. An inexpensive type of portable house, known, from the name of its designer, as the Coolidge house, is shown in Fig. 5. The house is 6 ft. × 6 ft. at the base, 4 feet high at the peak, 6 inches high at one side, and 2½ feet at the other. The door is usually made about 18 in. × 24 in., or sometimes 24 in. × 30 in., depending on

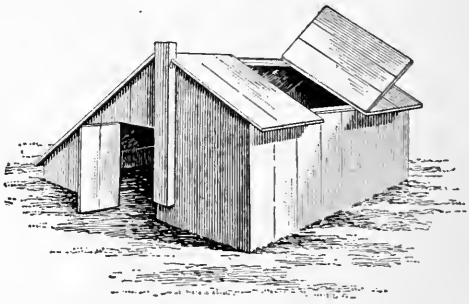

FIG. 5

the size of the swine to be sheltered, and is hinged. A hinged trap door for supplying ventilation is made in the roof as shown in the illustration. For ventilating the house during inclement weather, when the doors must be kept closed, a ventilating box, which may have inside dimensions of 6 in. × 6 in., is provided; this box appears in the illustration at the right-hand side of the end door. The box extends from a point about 6 inches from the ground, where it opens into the hog house, to a point about 5 inches above the peak of the roof.

5. Spillman House.—In Fig. 6 is illustrated the Spillman swine house. This type of house was originated and is used by Prof. W. J. Spillman, of the United States Department of

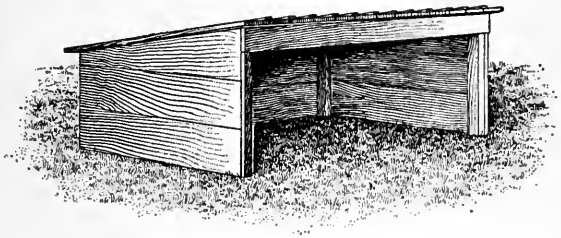

FIG. 6

Agriculture, on his farm in Missouri. Structures of this kind are used for the protection of swine from sun and rain when pasturing them in open fields, and as farrowing houses. The house shown in the illustration is 8 feet long, 5 feet wide, $3\frac{1}{2}$ feet high at the front and $2\frac{1}{2}$ feet at the back; other dimensions can, of course, be used if desired. The framework is constructed of 2″ × 4″ scantling, and is covered on three sides with 1-inch boards, the front being left open except for a board 6 inches wide at the top. The roof boards are 6 feet long and project over the front and rear and about 4 inches over the sides. The cracks in the roof are covered with weather strips 3 inches wide and $\frac{1}{2}$ inch thick. Being of small size, the houses can be easily transported from place to place on the farm.

The use of the Spillman house as a farrowing pen is more or less restricted to warm or to mild climates. Some swine raisers allow their sows to farrow in more protected enclosures and then transfer the sows and litters to Spillman houses when the pigs are about 2 weeks old. When the sows are allowed to farrow in Spillman houses, a guard should be provided around the sides as described before, to prevent the sows from crushing the pigs against the walls. It is advisable also to make a temporary yard around the front of the house by wiring three hurdles together and setting them in front of the open side. When the pigs are about 2 weeks old one of the hurdles can be moved away from the house a few inches so that the pigs can get through but the sow

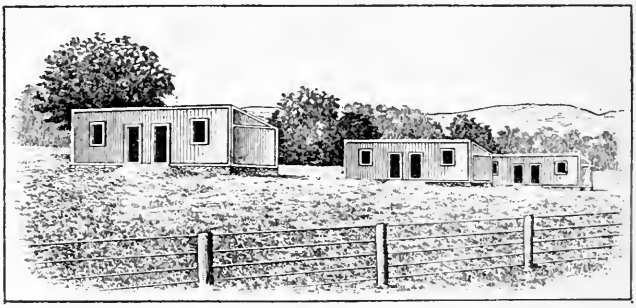

FIG. 7

cannot. This will give the pigs a chance to get plenty of exercise.

6. Double Portable Houses.—In Fig. 7 is shown a group of double houses, which, although portable, are often placed on a foundation of some kind. Houses of this type are used in the same manner as the single portable houses. An advantage of the double house is that it can be built at a much lower cost than two single houses having the same total floor area. If they are not to be moved often, houses of this type are built on stone, brick, or concrete foundations, but if they are to be moved often they are placed on piers or blocks of wood so that skids or runners can be easily placed under them. On account of the weight, two pair of horses will

usually be required to move one of the houses. These double houses are 8 feet wide, 16 feet long, 6 feet high in front, and 4 feet high in the rear. There is a double board partition separating the two divisions. The houses, when used in a cold climate, are lined with building paper and are covered both inside and outside with good, close-fitting lumber. The roofs should be shingled and the houses painted.

These houses are used both as shelters for young swine and as farrowing houses. One side of a house will accommodate from 8 to 10 swine that are nearly full grown. When used as farrowing houses, 2″ × 4″ scantlings should be placed around the sides on the inside, as already described. Only one sow with her litter should be placed in a side while the pigs are small, but after the latter are from 3 to 4 weeks old two sows and their litters can be placed in a side, provided, of course, that the sows are not quarrelsome.

STATIONARY SWINE HOUSES

7. General-Purpose House.—In Fig. 8 is shown a general-purpose stationary house that is designed especially for farms where only a few hogs are kept. The building should face

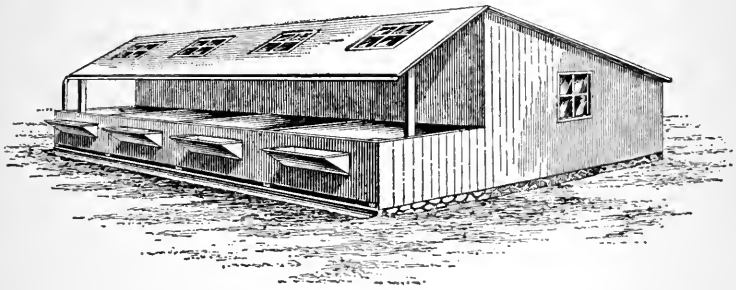

FIG. 8

the south and stand on a good cement or stone foundation. The floor may be of boards, but concrete will be better.

The building is 16 feet wide and 24 feet long; it is divided into four compartments approximately 6 feet in width by partitions 3½ feet in height. In each of these compartments

there is a similar partition about half way between the front and the back half that is provided with a doorway for the passage of the swine. This arrangement gives two divisions of each compartment of approximately 6 ft. × 8 ft. in size. The front division is used as a feeding room and the rear division as sleeping quarters. The floors of the feeding rooms slope toward the front of the house to a gutter that extends the entire length of the building, and through which all liquid manure is carried from the pens. This gutter, and the floors, if they are of concrete, can be flushed with water, and the pens easily kept clean.

A concrete floor in the sleeping quarters is considered objectionable on account of its being cold and hard. For

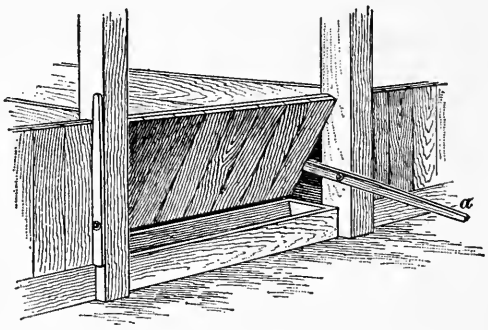

FIG. 9

this reason it is well, when concrete is the flooring material used, to make a removable section of board flooring to be placed over the concrete in the sleeping quarters. This section may be taken out when it is desired to clean the quarters. As shown in the illustration, the roof extends over the sleeping rooms and over a part of each feeding compartment. Windows are placed in the roof and sides, as shown, so that sunshine may enter the building, and a gutter is built along the south slope of the roof to prevent rain and snow water from dripping off of the roof into the pens. The front of the house is left open. The height of the sides that enclose this open part is 3½ feet. The feed is poured into troughs through openings as shown, or, if it is desired, each pen can

be provided with swing fronts that can be pushed back when the feeder wishes to put feed into the troughs. Fig. 9 shows

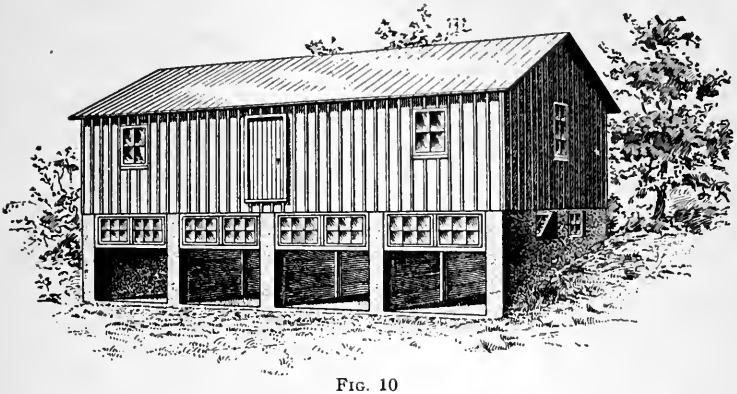

FIG. 10

how the swing front of a pen can be arranged. By lowering the lever *a* the lower part of the front is pushed back and the trough exposed. An upward pull on the lever allows the front part to come back into place.

8. Hillside House.—A good swine house can be built on a hillside. A convenient width for such a building is 16 feet;

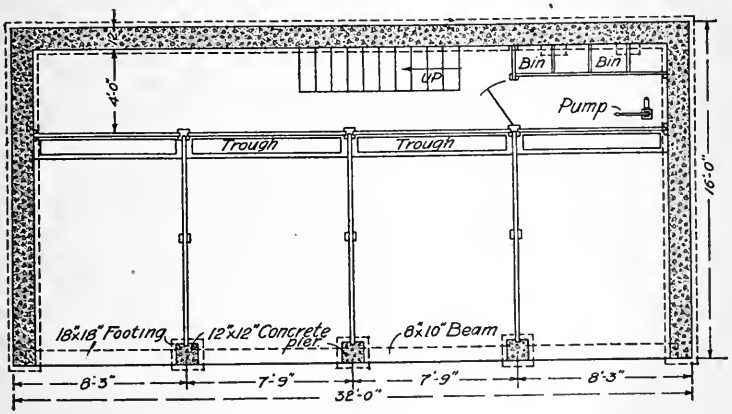

FIG. 11

the length can be any number of feet desired, depending on the requirements. A general exterior view of a four-pen

house is shown in Fig. 10. The hogs are kept in the basement, the open part of which faces the south. The second floor is utilized for the storage of grain.

Fig. 11 illustrates the floor plan and dimensions of the basement. The foundation and the basement floor are made of concrete. If a sufficient quantity of bedding is provided it will not be necessary to lay board floors over the cement, as was recommended in the case of a house previously described. In each end of the foundation there are two windows 2 ft. × 3 ft. in size, and a row of sash 2 feet wide extends along the south side. All of the windows are hinged at the top so that they can be fastened back. There are four

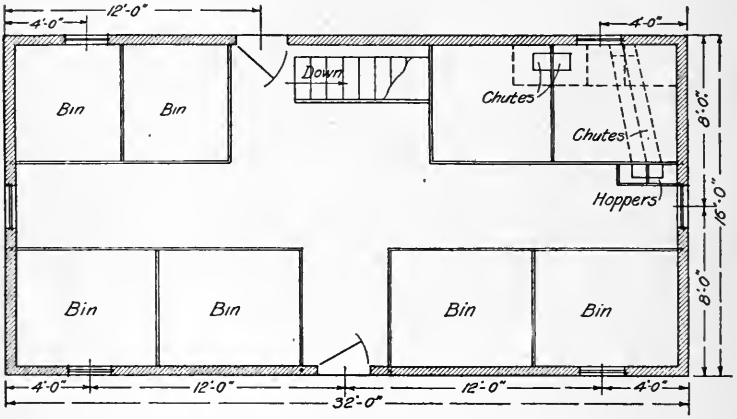

Fig. 12

pens, each of which is about the right size for accommodating a sow and her litter, or for from four to six hogs that are being fattened for market, the exact number depending, of course, on the size of the hogs. However, if it is desired to use the house for the accommodation of hogs that are being fattened, it is advisable to remove the partitions. An alley 4 feet wide extends behind the pens along the north wall. One end of this alley is used as a feed room. In this part there are bins into which feed is conducted through spouts from larger bins on the second floor. A pump is an added convenience to the feed room. The division between the alley

and the pens can be arranged as a swing partition, as shown in Fig. 9, or openings can be made in it through which feed may be poured into the troughs on the inside of the pens, as shown in Fig. 8. A stairway 2 feet in width connects the basement with the second floor. The height of the concrete supports at the front of the house is 6 feet.

The floor plan and dimensions of the second floor are shown in Fig. 12. There is a door and two windows in both the north and the south sides, and a window in each end. Bins for feed are provided as shown. Two of the bins are built

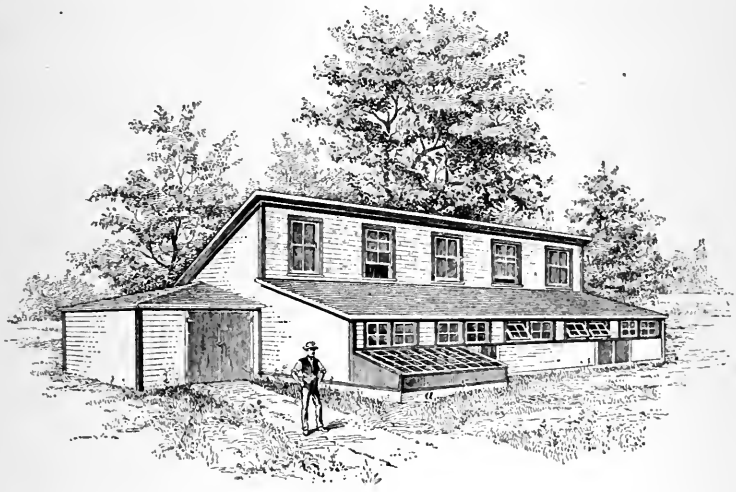

FIG. 13

with hopper bottoms, and chutes for conveying the feed to the room below. In addition, there are two hoppers, each of which is provided with a chute, into which feed from the bins not equipped with hopper bottoms can be placed for conveyance to the basement floor. An alley extends the full length of the building and there is another at right angles to this through the center, one end of the latter serving as a landing for the stairway. Over a part of the space above the bins a floor is laid to provide a loft in which bedding can be stored. The bedding, when desired for use in the pens, is thrown through the opening formed by the stairway.

If a larger building of this same type is desired, one 24 feet in width and 48, 56, or some other multiple of 8 feet in length will be found to be convenient and practical. In a building of such large dimensions it is advisable to make the alley 8 feet in width, the stairs 4 feet in width, and the basement 7 feet in height. The bins can be made 3 feet wider and the pens 4 feet longer than those described for the smaller buildings. A structure of these proportions will not cost very much more than the one shown in Fig. 10, but it will house a considerably larger number of swine.

9. Gregory-Farm House. — An exterior view of a practical swine house is shown in Fig. 13. This type of house is known as the Gregory-farm swine house because of the fact that it was originated and is used on the Gregory farms at White Hall, Illinois, where it has given excellent satisfaction. A distinctive feature of this house is the scheme for lighting the interior. As can be seen in the illustration, there are two rows of windows on one side, one row in a lower shed-like part and the other in an upper offset part. The lower row of windows admits sunlight to the front part of the house and the upper row provides light for the rear part. The bottom windows are fastened to the frames at the middle of each side. This arrangement makes it easy to open or close them to regulate the ventilation. The top windows are in two sections and are easily raised or lowered from the inside of the building by means of a pole. The abundance of windows makes thorough ventilation possible. A sun bath *a* for little pigs is built on the south side of the building. A more detailed description of the use of a sun bath is given later.

Fig. 14 shows the floor plan and dimensions of the same house. The house is 40 feet long and 27½ feet wide. Other dimensions, of course, can be used if desired. There are two rows of pens, which are separated by a driveway that runs lengthwise of the building. Each pen is 8 ft. × 10 ft. 4 in. in size, and the driveway is 6 feet wide. Removable partitions 2 feet 10 inches in height are between the pens. Swing

doors 2 feet in width admit of passage into the pens, and there is a sliding door 6 feet in width at each end of the alley. Posts along the alley help to support the roof. A shed

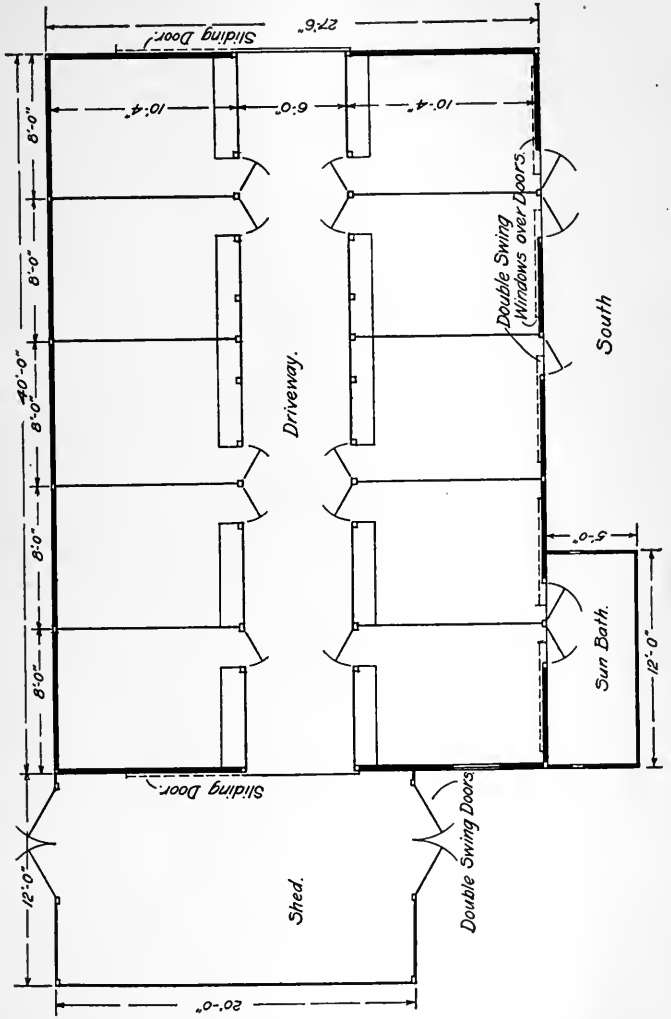

FIG. 14

12 ft. × 20 ft. in size is provided at the west end of the house. At the end of the shed are double-swing doors, which arrange-

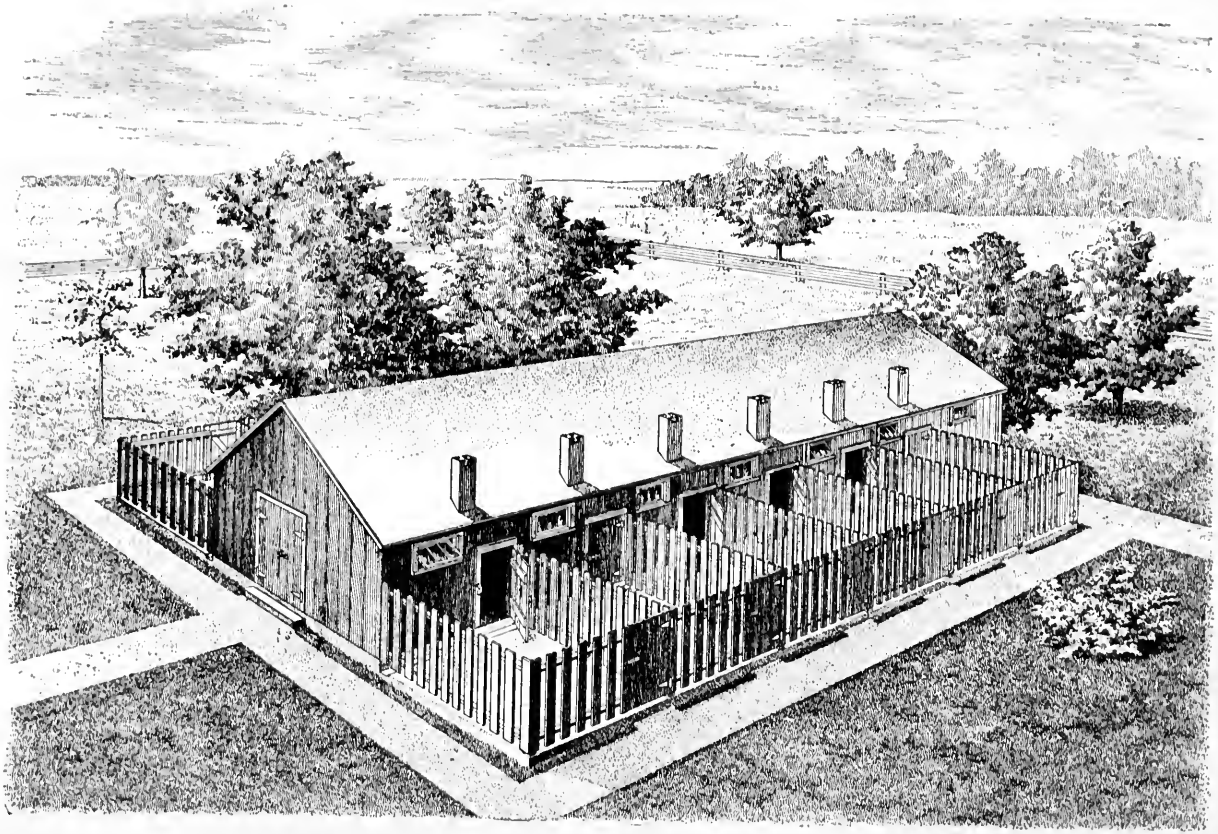

FIG. 15

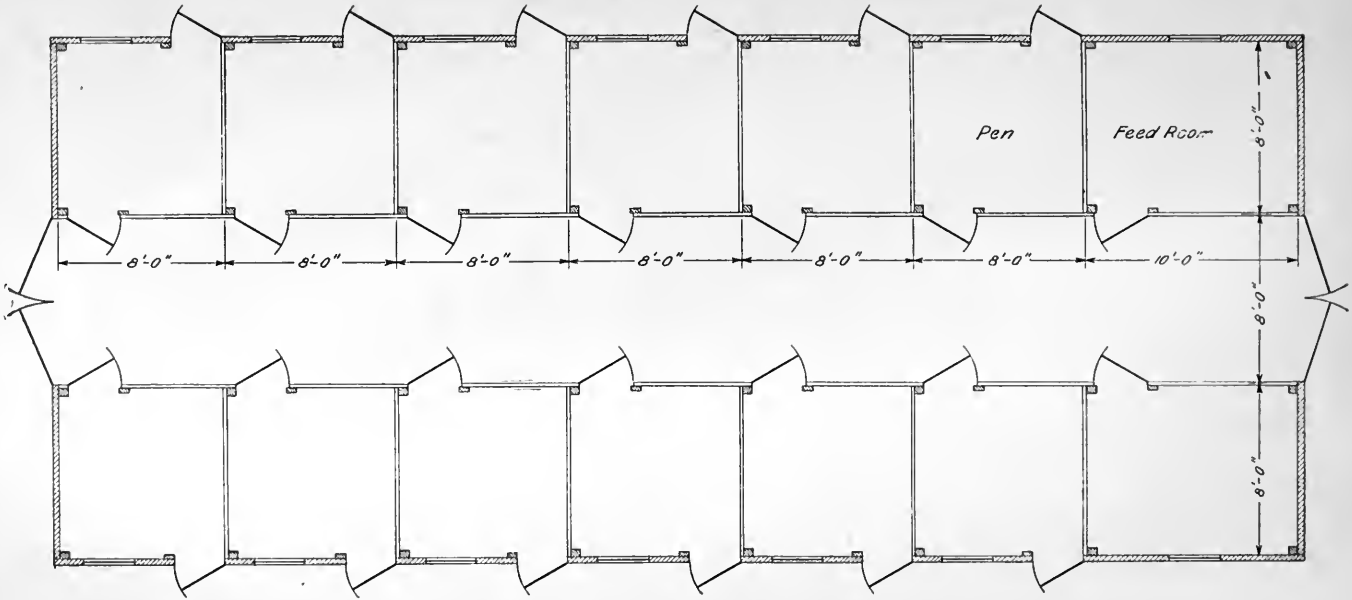

FIG. 16

ment makes possible a driveway through the shed. Such a covered driveway is convenient for the loading and unloading of swine in cold or rainy weather.

10. Cold-Climate House.—Fig. 15 shows a frame swine house that is designed for cold climates. It is 58 feet long, 24 feet wide, 12 feet high at the ridge, and 6 feet high at the sides. As this house is designed for a cold climate, the frame is lined with building paper and sheathed on the inside with good, close-fitting boards. The pens at the outside of the building are used as feeding floors. They are 8 ft. × 10 ft. in size, and have a concrete floor that slopes to a gutter near the building. Most of the manure and the dirt caused by feeding the hogs will be found in these outside pens, which can be flushed with water and thus kept clean.

The floor plan of the house is shown in Fig. 16. There is an alley 8 feet wide through the middle, lengthwise of the building, two feed rooms 8 ft. × 10 ft. at one end of the house, and six pens 8 ft. × 8 ft. on each side of the alley. Swing gates are provided between the alley and the pens, and each pen is provided with an outside door and window. The doors swing outwards and the windows are hung on bolts at the middle on both sides. The inside pens are generally used as sleeping rooms, and when so used a part of each is provided with a portable board floor above the concrete.

If it is found desirable, during very cold weather, to use a part of the space on the inside as feeding floors, a convenient arrangement can be made by removing alternate partitions and using a part of each of the large pens thus made as a feeding floor, and the other part as a sleeping place for the hogs. The portable wooden floors should, of course, be removed from the parts used as feeding floors. When the feeding is done inside of the buildings, as just described, the work can be facilitated by providing swing partitions. The house is ventilated by means of 6″ × 6″ bottomless boxes that extend from within a few inches of the floor in each pen to about a foot above the roof.

If a house of this kind is used for hogs that are being fattened for market, the partitions between the outside pens

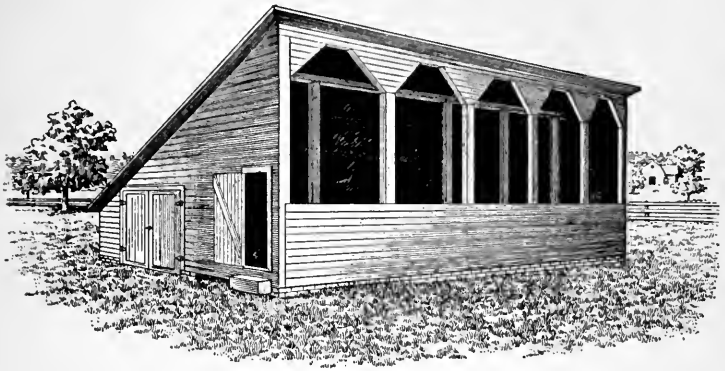

FIG. 17

should be removed and the hogs allowed the whole length of the enclosure as a runway and feeding floor.

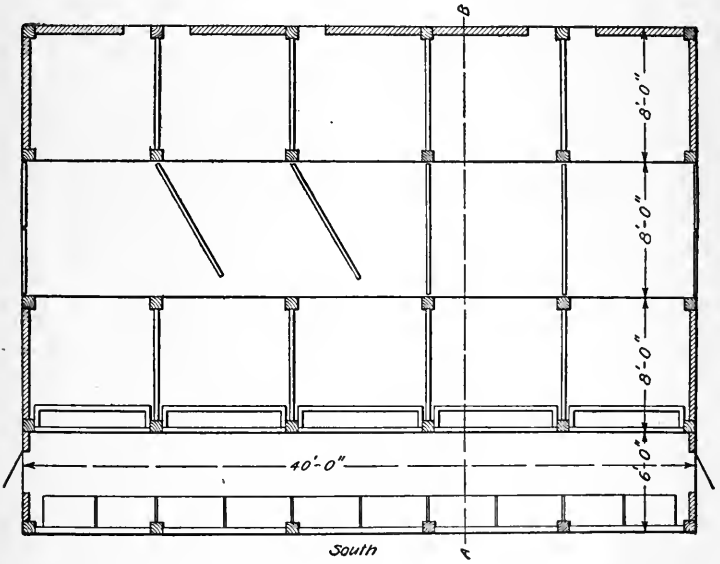

FIG. 18

11. Mild-Climate House.—Fig. 17 shows an end and a side view of a swine house that is suitable for a mild climate.

This type of house is in use on the experimental farm of the Maryland Agricultural College, and has been found satisfactory for the climatic conditions of that state. In a house of this kind, the front should be made to face the south so that an abundance of sunshine may enter the pens through the openings. The door on the side near the front is used as a passageway for the attendants that care for the swine, and the double door farther back opens into a driveway along which a cart can be driven when manure is to be removed from the house.

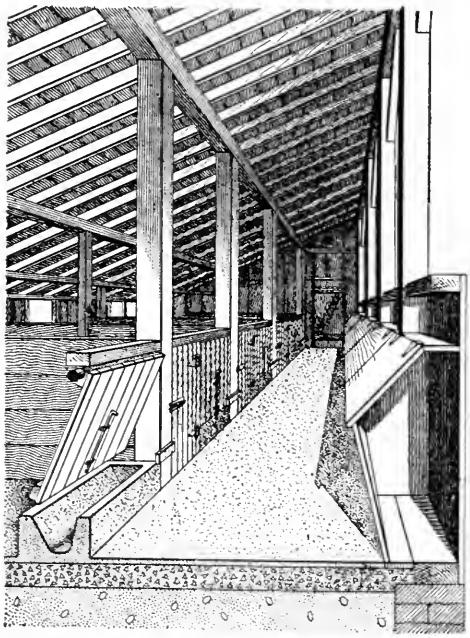

FIG. 19

In Fig. 18 is shown the floor plan of the same house. The floor dimensions of the house are 30 ft. × 40 ft.; the passageway along the south side is 6 feet wide, and the feeding floor, driveway, and sleeping floors are each 8 feet wide. The feed bins along the passageway are 1 foot wide at the bottom, and 2 feet at the widest part, which is 3 feet above the floor. The cover of the feed bin slants toward the wall to a height of 1 foot above the widest part. Gates are provided from one pen to another along the driveway. These are kept closed except when the pens are being cleaned. The floor is of concrete and in both feeding and sleeping pens slants slightly toward the driveway, in order to facilitate the cleaning of the house. Portable board floors are used above the concrete in the sleeping quarters. There are doors from each pen along the north side of the house that open into runways and yards.

The feeding troughs can be seen in Fig. 19, which shows a view through the passageway of the house. In front of each trough is a swing partition, which is pushed back when the feed is being placed in the troughs. The feed bins along the south wall can be seen in this view.

In Fig. 20 is shown a sectional view across the house on the line *A–B*, Fig. 18. The feed bin, passageway, swing partition, feeding floor, driveway, sleeping floor, and doors between the pens can be plainly seen. This house, being designed for

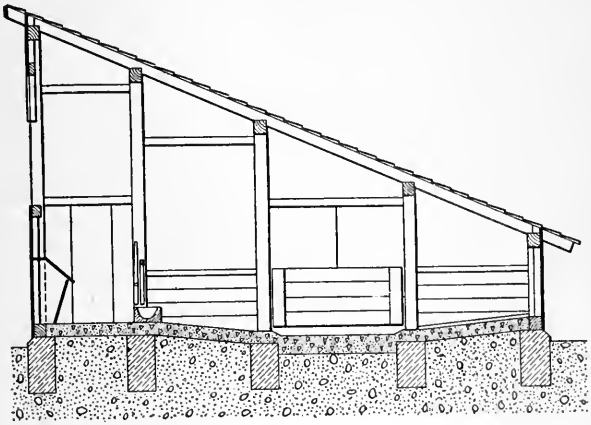

FIG. 20

a mild climate, is not sheathed on the inside, and is covered by only one thickness of boards.

12. Illinois Experiment Station House.—In Fig. 21 is shown an exterior view of a swine house that is designed for service and convenience regardless of expense. This type of house is used on the experiment station farm of the University of Illinois. The floor plan of the house and yards is shown in Fig. 22. The house illustrated is 30 feet wide and 120 feet long; the yards are of the same length as the house but can be made any width desired. The house faces the south, because a southern exposure for the side containing the windows is preferable to all others. There are two rows of

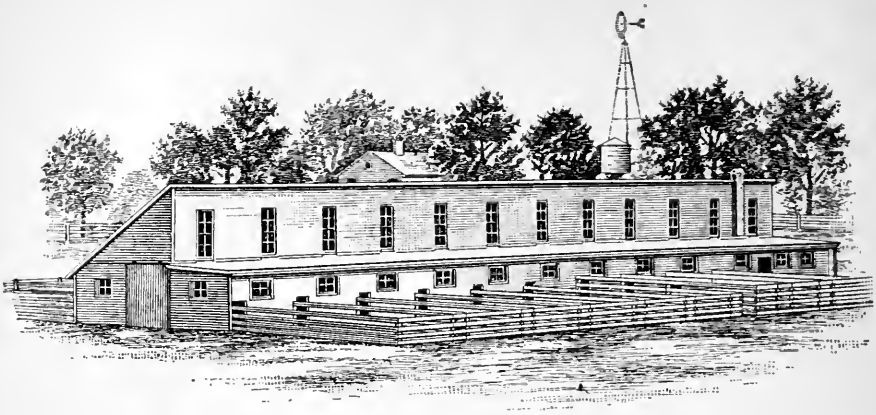

FIG. 21

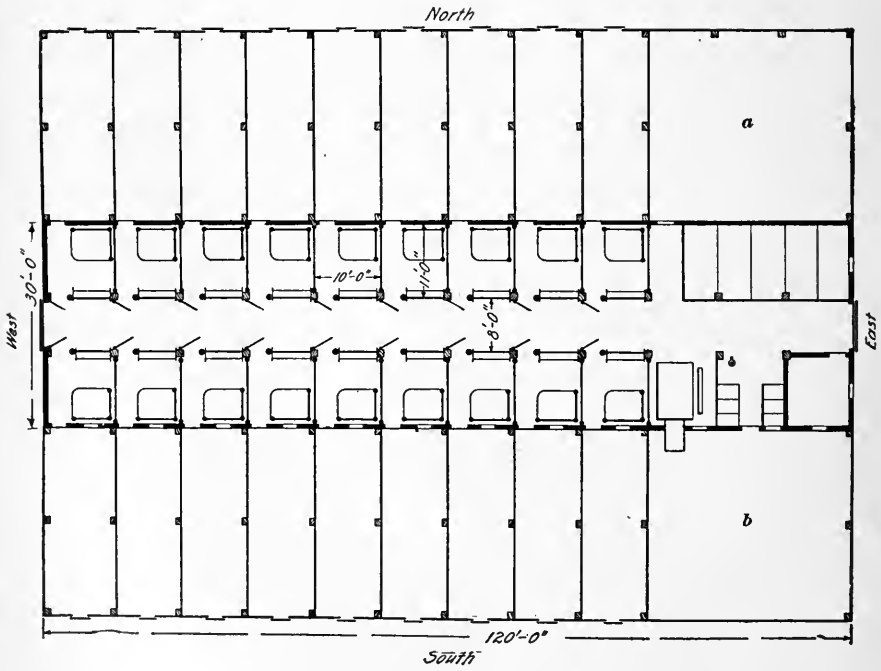

FIG. 22

pens extending lengthwise of the building and these rows are separated by an alley 8 feet wide. Each pen is 10 ft. × 11 ft. in size. At the east end of the building are located boar pens *a* and *b*, feed bins, office, scales, etc. Each inside pen opens into one on the outside that is used as a runway for the hogs. The equipment of the inside pens is illustrated in Fig. 23, which shows an interior view of the house. The floors and feeding troughs are of concrete. The pens are enclosed with a galvanized woven-wire fence supported on iron posts and iron pipes. The front of each pen is made to swing so that the troughs can be filled without the

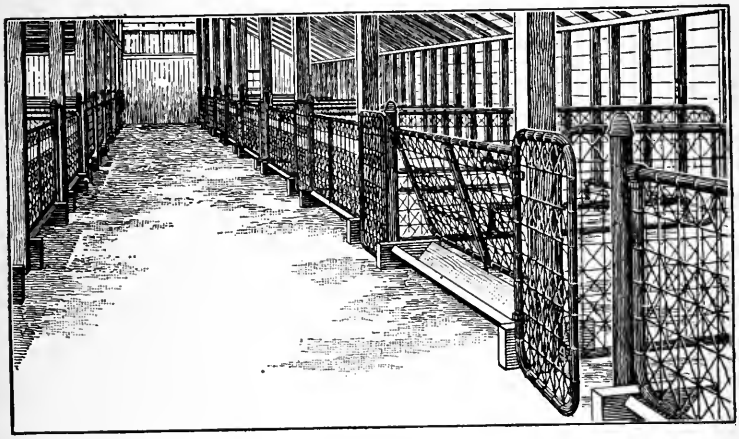

FIG. 23

attendant going into the pens. A portable board platform is placed in the corner of each pen diagonally across from the gate, to be used by the swine as a sleeping floor.

In the planning of this building, special care was taken to arrange the windows so that during the winter months, when the days are short and warmth is needed in the hog house, a maximum amount of sunlight might fall into the pens. The sunshine passing through the lower windows falls on the pens on the south side, and that through the upper windows on the pens on the north side. In this way the house is kept much warmer than would be the case if no such provision were made, and on this account the sows that farrow early

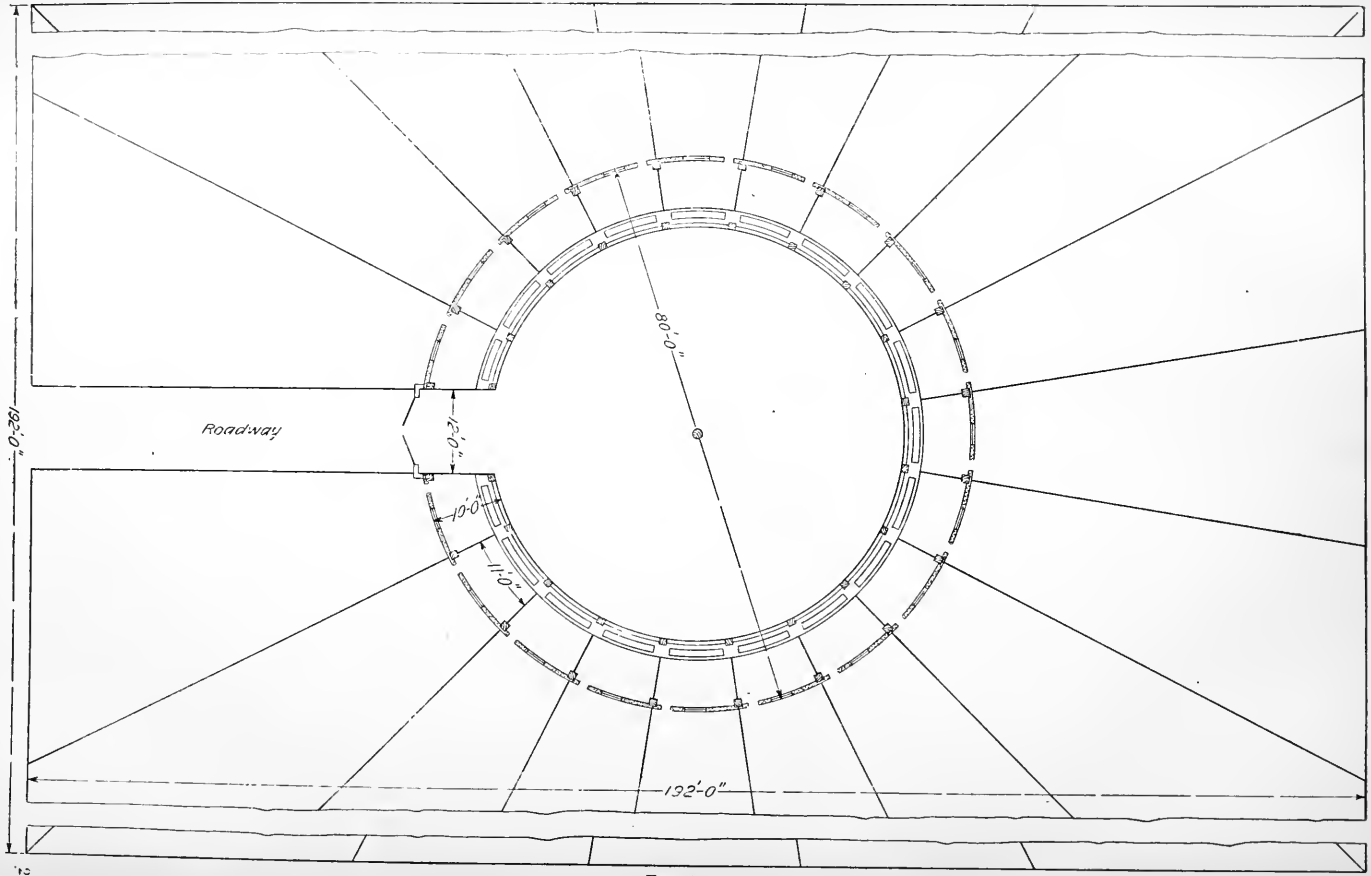

FIG. 24

in the season are kept sufficiently warm without artificial heat.

The total cost of this house with all the accessories was as follows:

Foundation, tile drain, floor, and chimney	$649.25
Lumber and windows	639.70
Iron posts, gates, panels, and fenders	244.80
Hardware	53.65
Paint and painting (two coats)	54.00
Labor	290.00
Tar-and-gravel roof	79.15
Scales	100.00
Total	$2,110.55

13. Circular Swine House.—In Fig. 24 is illustrated the floor plan of a circular swine house and the ground plan of the pasture lots surrounding it. This type of house has many desirable features, particularly for the raising of pure-bred swine, but is a comparatively expensive building to construct. Such a building can be used for housing the various classes of swine; but it is especially well adapted for the housing of sows at farrowing time and for the showing and public sale of breeding stock.

The plot of ground that contains the house and yards is 192 feet square. The house is 80 feet in diameter. The pens are arranged in a circle around the outer part of the building, each pen being 10 ft. × 11 ft. in size, as measured between two corresponding central points in each opposite side. This circle of pens surrounds a circular arena that can be used for a variety of purposes, such as for a sale ring, for a place for the storing of feed, or for a driveway. The troughs for feeding the swine are placed along the sides of the pens next to the arena. Feeding is done by driving a loaded truck around the area, the feed being distributed to the pens en route, or a feed carrier can be installed, if desired. The wall at the outer side of each pen is provided with a door that opens into a small pasture lot; each of these lots contains approximately

1,500 square feet, except the two adjoining the roadway, which are a little larger. The roadway is 12 feet wide and leads to a doorway in the barn that is provided with double doors.

Fig. 25 shows a sectional view and the front elevation of the circular house. In the sectional view is shown the dimensions of the central column and the posts. The central column is of cast iron and the remaining frame stuff can be of the same material or of wood, as desired. The roof is trussed as shown. The part of the house in which the pens

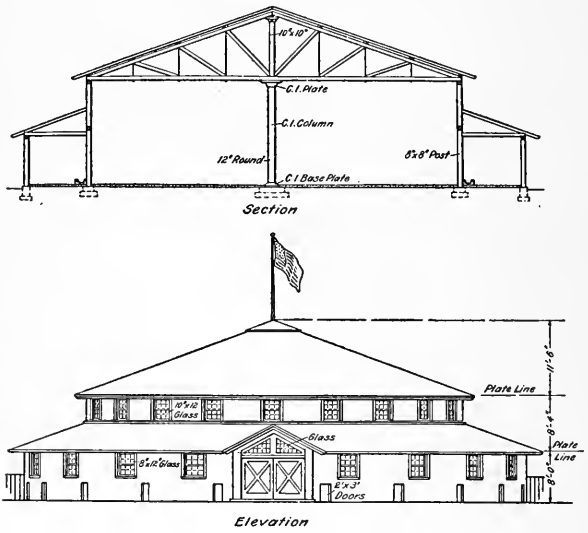

Fig. 25

are located is built around the central part in the form of a lean-to. In the elevation is shown the general exterior appearance of the house, with dimensions.

14. Open-Front Shed and Accessory Feeding Platform.—In the fattening of cattle, particularly if they are fed much corn, considerable feed passes through the digestive tract and out with the droppings. To utilize this feed, which would otherwise be wasted, it is a common practice to have hogs "follow" the cattle—that is, to keep them in the same enclosure in order

that they may get the feed in the droppings. When hogs are kept in this way, it is a good plan to provide an open-front shed, such as the one illustrated in Fig. 26. This shed is

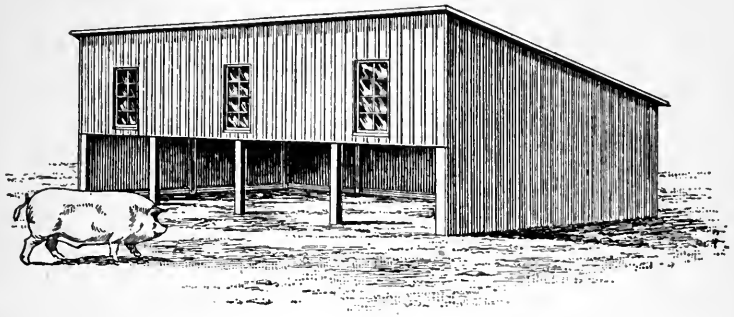

FIG. 26

built so that the hogs have free access to the enclosure, but the cattle do not. The shed illustrated is 16 feet wide, 32 feet long, 6 feet high at the rear, and 10 feet high at the front. Posts set 3 feet deep in the ground are used in the framing; to these, scantlings are nailed, and over this frame boards 1 inch in thickness are placed. The roof and sides are well battened. If the shed is to be used in particularly cold climates, it is advisable to board the shed on the inside, thus making a double wall. The front is boarded to within 4 feet of the ground. Such a shed will need no floor other than the earth. The building should face the south, when possible, so that plenty of sunshine may get into the pen through the windows in front.

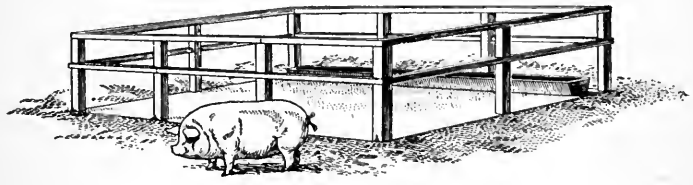

FIG. 27

In the same yard with such an open-front shed there should be a feeding platform where the hogs can be fed by themselves without being molested by the cattle. Fig. 27 illus-

trates a platform of this kind. It is of concrete and slopes slightly to one side so that it can be flushed with water and kept clean. It is surrounded by a fence that has rails of a sufficient height to prevent the cattle from entering the enclosure but under which the swine can pass. A trough is arranged at one side near the fence.

15. Brush-Covered Shed.—For use in hot climates, or during the hot months in temperate climates, a satisfactory shelter for swine can be made by using brush to cover scantlings that are held up by posts, as shown in Fig. 28. The posts at the corners are 3 feet above ground and those in the

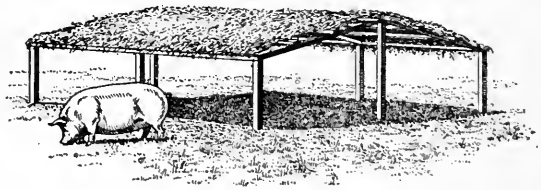

FIG. 28

center are 4½ feet. Scantlings are laid across the posts, and brush with green leaves on it is piled on top. The brush can be renewed as often as is desired. A brush-covered shed of this kind will protect hogs from the direct rays of the sun, and at the same time it will let air through. During a heavy rain, water will percolate through the roof, but this is an advantage, as it will keep down the dust that might otherwise cause coughing among the hogs. If these sheds are used in the same pasture with other houses, it will be found that whenever the weather turns cold the hogs will leave the shed and seek the houses.

ACCESSORY SWINE BUILDINGS

16. Headquarters.—When a farmer is engaged in breeding and feeding swine extensively he will have need of some sort of headquarters for the herdsman and attendants. These headquarters may be in a building by themselves or they may

occupy a part of some other building, just as the farmer sees fit. There should be a room that can be used as an office, where all correspondence, records, and memoranda pertaining to the business can be cared for. Adjoining the office, sleeping rooms for the herdsman and attendants are often provided, so that help will be at hand in case of emergency.

17. Feed Room.—A feed room where the feed for the hogs can be kept is a necessary part of the equipment for hog raising. This room, like the headquarters, may be either a separate building or a part of another building. In a number of the types of hog houses the feed room can be placed on the floor above the one where the hogs are fed. Such an arrangement is an advantageous one, as the feed can then be kept in bins that are provided with chutes through which the feed is conveyed to the feeding floors below. One thing that should not be neglected in planning a feed room is some source of water supply, as most feed for hogs is prepared by mixing it with water. Either a cistern or a well should be at hand, or a pipe line from a pressure system should be provided.

18. Farrowing Pen, House, and Box.—Every swine breeder should have either a farrowing pen in his piggery or a small farrowing house adjoining it where a sow can be placed when she is about to give birth to young. A convenient size for a farrowing pen is 8 ft. × 8 ft. A 2″ × 4″ scantling should be placed on all sides of the pen as previously described, to prevent the sow from crowding the pigs to the wall. In a cold climate, if the sow farrows early in the spring, artificial heat should be provided to keep the sow and litter comfortable. A stove in the same room with the pen, or, under some conditions, a lighted lantern hung in the pen will be found satisfactory. The farrowing house can be of any size desired, but it is advisable to have the pen for the sow about 8 ft. × 8 ft. in size. This house can be heated in the same way recommended for a farrowing pen. A steam radiator connected with the boiler used for heating water about the barn has been found convenient for heating a

farrowing house. It is a good plan to have in this house a lamp, table, and chair for the use of an attendant, who should be on hand during the farrowing.

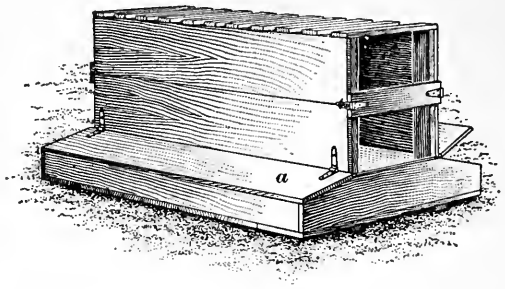

FIG. 29

19. If the sow that is about to give birth to young is inclined to be cross or abnormally restless, she should be placed in a farrowing box, such as shown in Fig. 29. In this box she can stand up or lie down but cannot turn around. The bottom is 4 feet wide and the top 2 feet; the top of the hinged cover *a* is about 9 inches above the bottom of the box. The height of the box will depend somewhat on whether a large or a small breed of swine is raised on the farm. As an average, 2½ feet is a good height. The sow is prevented from getting out of the box by slats on the top and ends that are arranged as shown in the illustration. In a farrowing box thus arranged there are two 12-inch spaces the length of the box in which the new-born pigs can stay without danger of being crushed by the mother. The sow is left in the far-

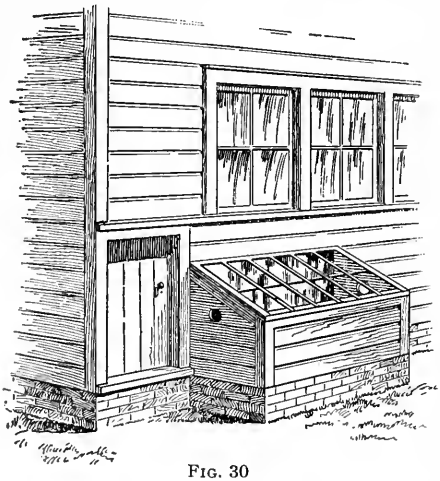

FIG. 30

rowing box about two or three days after the litter has been farrowed. During this time she should be turned loose for a short time each day for exercise.

20. Sun Bath for Young Pigs.—Adjoining the regular swine building or the farrowing house a small glass-covered lean-to similar to the one illustrated in Fig. 30 should be built. The roof is of a glass sash about 2 ft. × 4 ft. or 2 ft. × 6 ft.; it is placed slantwise, on walls about 1½ or 2 feet high. A circular hole about 4 inches in diameter is made in each side of the house for ventilation. The floors are of boards, over which is scattered fine-cut straw or chaff. As soon as possible after the new-born pigs have nursed they should be placed in the sunshine underneath the glass and left there for an hour or so. This lying in bright sunshine underneath glass is very invigorating to young pigs, especially in cold weather.

YARDS AND FENCES

21. The yards used for swine are of three general kinds: *pasture fields* and *lots*, *barren lots*, and small enclosures commonly called *pens*, or *sties*. These yards are used in various ways by swine raisers. **Pasture fields** are relatively large areas that are used either for the pasturing of a large number of swine or, more frequently, for the pasturing of swine with other livestock; **pasture lots** are smaller areas than fields and are used, as a rule, for the pasturing of swine by themselves. **Barren lots** are small enclosed areas devoid of herbage that are used for confining swine at such times as it is desired to keep them off of the pastures. Many swine raisers feed, water, and shelter their swine in small barren lots near or adjoining the pastures. The **pens**, or **sties**, the smallest of the yards for swine, are usually used in connection with a hog house and are intended to give the animals that are kept in the latter a place in which to get fresh air and exercise. Formerly, hogs were fattened for market in such enclosures, but this practice is becoming obsolete.

For the pastures and barren lots, woven-wire fences are satisfactory. Such fences are less expensive than wooden ones and will confine the hogs in the enclosures just as well.

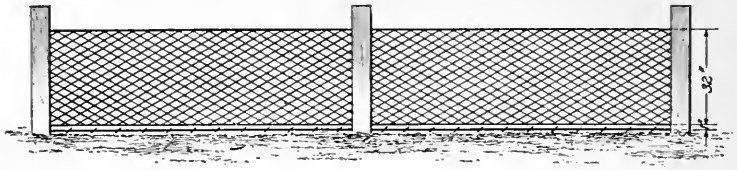

Fig. 31

Where only hogs are kept in the lots, the height of the fences need not be more than from 30 to 32 inches. It is a good plan, when making a fence of this kind, to stretch a strand of barbed wire about ½ inch above the surface of the ground, fastening it to each post with a wire staple, and then above this a strip of 30-inch or 32-inch woven-wire fencing, leaving a space of about 1 inch between the bottom of the woven wire and the barbed wire. A section of a fence made in this way is shown in Fig. 31. The purpose of the barbed wire is to prevent the hogs from rooting their way underneath the fence.

In pastures where cattle or horses are kept with hogs, the height of the fence should be about 52 inches. An economical fence for such a pasture can be built by stretching a strand of barbed wire just above the ground, as already described, then above this a strip of 36-inch woven-wire

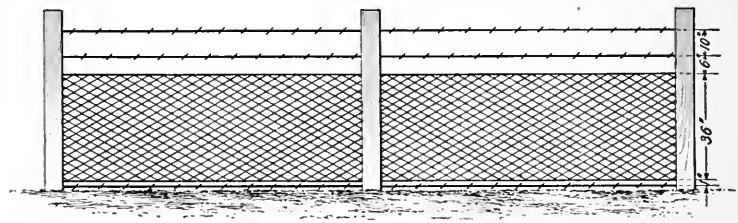

Fig. 32

fencing, and still above this two strands of barbed wire, one being placed 6 inches and the other 16 inches above the woven wire. A section of such fence is shown in Fig. 32.

For the outdoor pens, or sties, tightly boarded fences from 30 to 36 inches in height are the most satisfactory. Woven

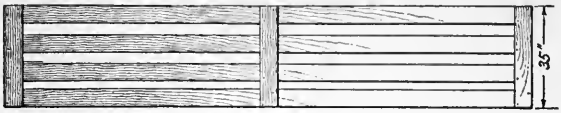

Fig. 33

wire for such fences is out of the question, as the length of the sides is too short to permit of convenient stretching of the wire.

It is often desired to enclose hog lots or small pasture fields by a portable fence. For this purpose one made of wood is more satisfactory than one of woven wire. A good portable fence can be made of panels of fencing fastened to posts driven into the ground. A convenient panel is made of four $1'' \times 6''$ boards 16 feet in length, the four boards being nailed together by cleats, as shown in Fig. 33. A 3-inch space is left between the two bottom boards, and 4-inch spaces between the others. Each panel is therefore 35 inches high, which is a practical height of fence for the enclosing of hog yards. In setting a fence made of these panels, holes about 12 inches deep are dug in the earth at intervals of 16 feet and in these are driven posts sharpened at one end; about 24 inches of the post should be below ground when the holes are filled. To these posts the panels of fence are fastened with heavy wire, as shown in Fig. 34. A stout stake driven into the ground at the middle of the

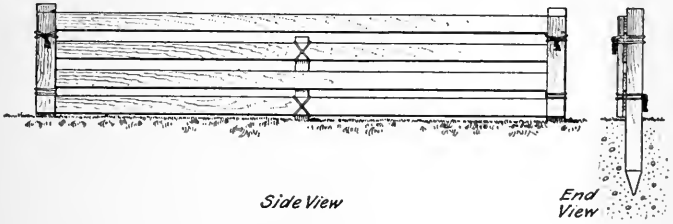

Fig. 34

panel, and the panel wired to this stake, as shown in the illustration, is an added protection for keeping the fences in place.

MISCELLANEOUS EQUIPMENT

22. Feeding Utensils.—Troughs or other feeding vessels for water and liquid feed are needed in enclosures in which swine are fed. Of these there are many kinds in use, some of which are convenient and sanitary; others are cumbersome to handle and difficult to clean. In Fig. 35 is shown one of the most convenient, sanitary, and durable feeding vessels on the market. It is made of iron and is divided into compartments by partitions and heavy iron rods. The liquid is poured into the hopper at the center, and about an equal quantity passes to each of the eight compartments. This vessel accommodates eight hogs of any size without crowding. It weighs about 120 pounds, and can be over-

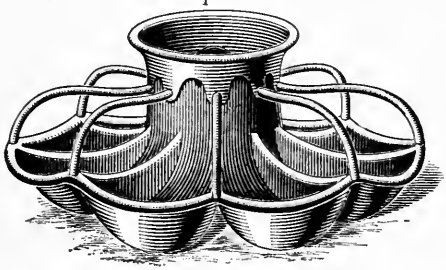

FIG. 35

FIG. 36

turned easily when it is desired to remove dirt from the compartments, but at the same time it is heavy enough to prevent

the hogs from moving it. A vessel of this kind is not easily broken or worn out, and is not expensive, considering its usefulness. The cost is about $4.80 each.

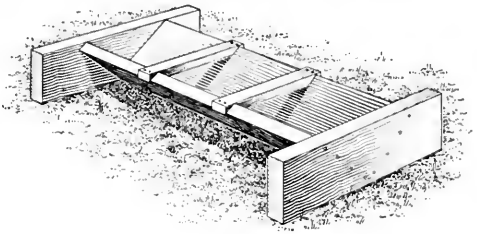

FIG. 37

23. In Fig. 36 is shown a convenient outfit and method for the feeding of swine when a vessel such as the one just described is used. It is placed near a low fence and the feed or water is hauled as near to it as possible on the opposite side of the fence. Then by means of a dipper with a long handle, as shown in the illustration, the liquid is transferred to the vessel. This method of feeding prevents the hogs from crowding and jostling the attendant.

24. Wooden troughs are used extensively by swine raisers, although they are without doubt the most unsatisfactory type of drinking and feeding vessels used on farms. They are difficult to keep clean, are easily broken, and it is almost impossible to prevent the hogs from getting their

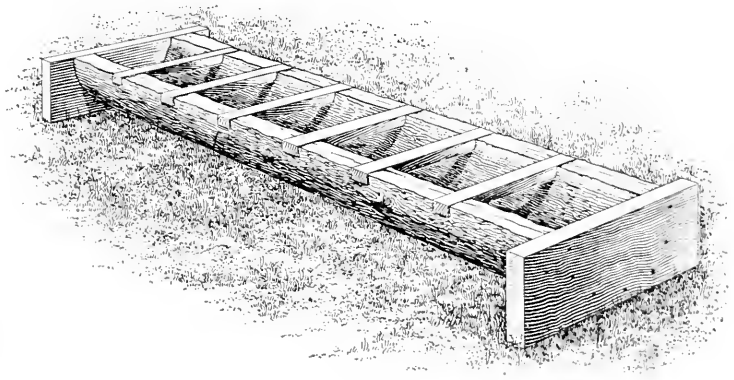

FIG. 38

feet in them while drinking. In Figs. 37, 38, and 39 are shown some of the common types in use. Fig. 37 illustrates

a V-shaped trough made of 2-inch plank. The ends extend several inches beyond the sides, so that it is rather difficult for the hogs to overturn the trough. The crosspieces, which are 12 inches apart, prevent the hogs from lying in the trough, but they do not prevent them from getting their feet in it. In Fig. 38 is illustrated an inexpensive trough made by nailing ends and crosspieces to a section of a hollow log. Such a trough, provided the log portion is of solid wood, can often be made to answer the purpose of a feeding vessel as well as a V-shaped trough. For young pigs, a flat-bottomed trough like the one shown in Fig. 39 is often used. It is 12 inches wide and 4 inches deep. Crosspieces are used the same as in the other types shown.

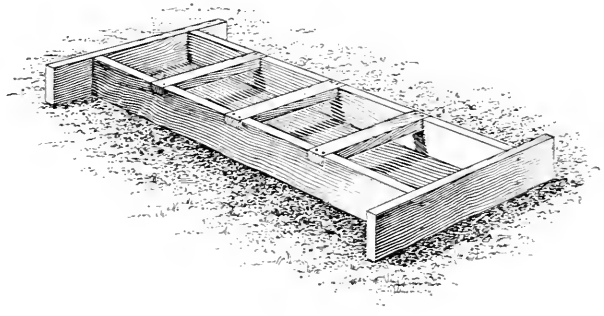

FIG. 39

25. Concrete troughs, unless connected with a sewer or drain, are not very satisfactory. Large portable concrete troughs, although durable, are so heavy that it is inconvenient to turn them over when cleaning them. Stationary concrete troughs that are connected with a sewer or drain are often used in expensive hog houses; if arranged so that they can be cleaned by flushing them with water from a hose they are satisfactory. Small portable concrete troughs are sometimes used where but one animal is kept. They are round on the bottom, about 4 inches in depth, and usually from 1 foot to 1½ feet in width across the top. Such a trough can be tipped over easily when being cleaned.

26. A combined feed hopper and trough for dry feed, such as corn meal and shorts, can often be used to advantage

in the feeding of swine. In Fig. 40 is shown a type that has given good service. The bottom part, or trough, *a* is 4 inches deep, 18 inches wide at the bottom, 24 inches wide at the top, and 16 feet long. It is protected by a hinged cover, which is kept closed when the trough is not in use. The hopper part is 24 inches high, 24 inches at its greatest width, and of the same length as the trough. It is divided by a partition, which arrangement makes it possible for the feeder

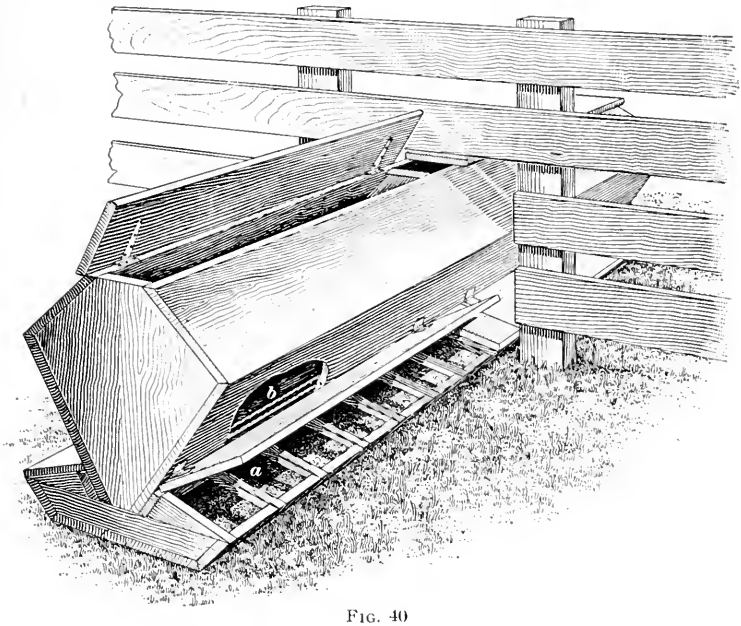

FIG. 40

to be used in two feed lots separated by a fence as shown in the illustration. The grain is placed in the hopper at the top, which, like the trough part below, is protected by a hinged cover. The opening at the lower part of the hopper through which the feed falls to the trough is $2\frac{1}{2}$ inches in width. Lengthwise of this opening flexible strips of wood $\frac{1}{2}$ in. $\times$ 2 in. are set edgewise $\frac{1}{2}$ inch apart as shown at *b*. These strips project below the opening, and whenever the nose of a pig in search of food touches them a small quantity

of grain falls into the trough. With such an arrangement there is little danger of feed being wasted.

27. **Dipping Vat.**—On all farms where swine are kept there should be at least one dipping vat in which hogs can

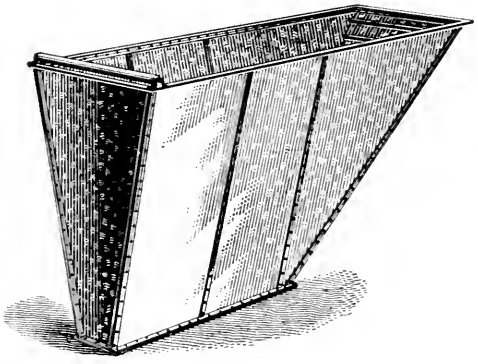

FIG. 41

be plunged into some kind of a dipping solution. This treatment is usually necessary to keep the animals free from vermin and skin diseases. Dipping vats are usually made of galvanized iron, although wood or concrete is sometimes used in their construction. One of the galvanized-iron tanks is shown in Fig. 41. Tanks like the one illustrated are for sale on the market and can be had in a number of sizes.

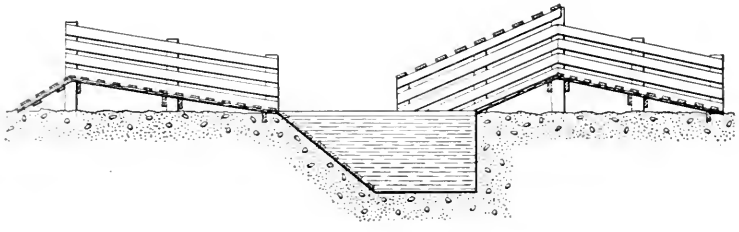

FIG. 42

For average-sized hogs, one that is 10 feet long and 30 inches wide at the top, 5 feet long, 12 inches wide at the bottom, and 4 feet deep will be found satisfactory. The vats are sunk into the ground to within about 5 inches of the top and

the ground is tamped all around to prevent them from warping. A runway about 30 inches wide arranged as shown in Fig. 42 is built about 21 feet back from each end of the tank. When hogs are to be dipped they are driven one at a time up the incline of the receiving end. When a hog reaches the top of this incline it slides down the short incline into the tank, which is filled with the dipping solution. The hog then swims to the inclined end of the tank and walks up the incline of what is called the dripping pen and down the short incline to the ground.

28. Hog Wallow.—Many swine breeders make use of a device known as a **hog wallow** as a means of keeping hogs free from parasites and skin diseases. Its use does not require the supervision that is necessary in the use of the dipping tank. A hog wallow may be made of wood or cement. A wallow should be not less than 8 feet square, but it is not necessary to make the depth more than 10 inches. The size may, of course, be varied to suit individual conditions. One side should be sloped at such an angle as to make it easy for pigs to walk in and out. This sloping end furnishes a means by which young fowls that may fall into the wallow can make their escape, and it is also an aid in cleaning out filth and rubbish that may accumulate. The material used for a wooden wallow should be 2-inch planking. All joints should, of course, be made as tight as possible, but it is not necessary to have them water-tight, for, after the planks have been placed in the ground, sediment will quickly stop practically all leaks. If the wallow is made 10 inches deep it should be set in the ground about 9 inches, thus allowing the upper edge to project about 1 inch above the ground line.

A cement wallow involves somewhat more labor in its construction than a wooden wallow, but its greater durability will, in most cases, warrant the additional expense. The first step in its construction is the excavation of a pit. The excavation for a cement wallow must be made considerably larger than for a wooden one, since allowance must be made

for walls and the bottom of the wallow. The side and end walls should be about 4 inches thick. The floor may be made of the same thickness and it should be laid on a 6-inch bed of gravel or cinders. Thus, if it is desired to build a cement wallow 8 feet square and 10 inches deep, it will be necessary to make the pit 8 feet 8 inches square and 20 inches deep. After the bed of cinders or gravel has been laid and tamped to a firm condition, the floor of cement,

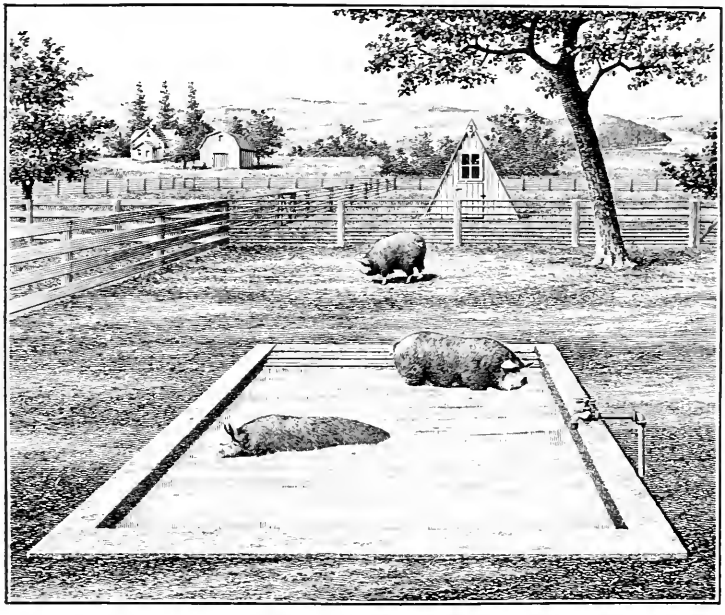

FIG. 43

4 inches thick, may be laid over the bottom of the entire pit. Across three sides of the pit 10-inch boards should be placed on edge, 4 inches from the earth wall. By filling cement into the spaces between these boards and the earth three side walls are formed. The wall on the remaining side may be constructed in the same way, but a better plan is to slope it from the ground line to the bottom of the wallow, for the reasons mentioned in considering the plank wallow.

In laying walls and floor, it is well to embed in the cement several loops of ordinary fence wire or pieces of woven wire for reinforcement. A mixture of 1 part of cement to 5 or 6 parts of good clean sand will be found satisfactory for the above work, but after the wallow is completed and the cement fully set, the inside should be washed with pure cement, which treatment renders it water-tight. As soon as this coat is thoroughly dry, the wallow is ready for use.

No matter which kind of wallow is chosen, it should be located convenient to a water supply. If possible, a supply

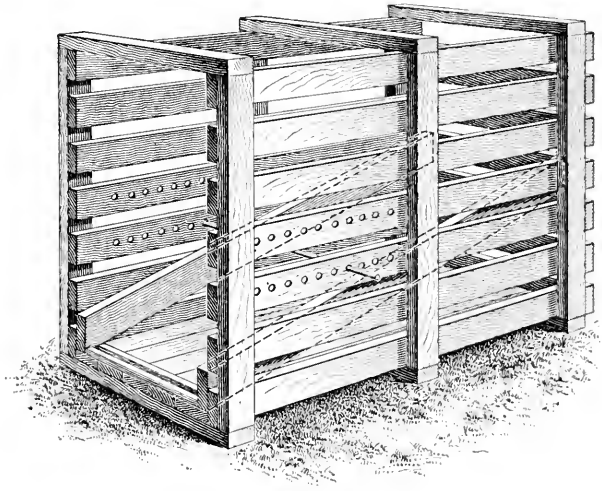

FIG. 44

pipe should be brought to the wallow so that the latter can be filled by simply opening a valve. The general appearance of a cement wallow is shown in Fig. 43.

When completed, the hog wallow is filled with water, a concentrated dipping solution is added, and the pigs are allowed free access to it. During hot weather the animals will spend much time wallowing in the bath, but during spring and fall it may be necessary to resort to the dipping tank, if the pigs become lousy, as they will probably not go into the wallow of their own accord. The solution that is used in the wallow must be much weaker than that used in

tanks, for some pigs will remain in the wallow for hours at a time. A solution that would be entirely satisfactory for use in a tank would be likely to have a more or less injurious effect if animals were to remain in it for several hours.

29. Boiler.—A boiler of some kind in which steam can be generated should be part of the equipment of a hog farm in a cold climate. The steam is useful for cooking some of the feed for the swine and can be used for heating the farrowing house in extremely cold weather. In purchasing a boiler, it is advisable to get as good a one as the farmer can afford; a cheap one soon becomes unfit for use.

30. Breeding Crate.—When a small sow is to be bred to a heavy boar, it is advisable to use a breeding crate, such as the one shown in Fig. 44, to prevent injury to the sow. Also, some sows, although in heat, will not take the boar readily, and the use of a crate in such cases insures a service.

FIG. 45

The sides, top and bottom strips, and one end of the crate are made of 2″ × 4″ scantlings; the floor is of 1-inch plank. One end of the crate is made open and the other closed. Holes are bored in the sides of the crate and a rod is provided that can be run through the holes after the sow has been placed in the crate; the rod should pass behind the sow at a point just above the hocks. A 2″ × 4″ strip is fastened slantwise to each side of the crate, as shown in the illustration. In serving a sow the boar's feet will rest on these strips.

31. Feed Truck.—For the hauling of feed and water about the swine yards and houses, a low truck, such as the one shown in Fig. 45, is convenient. A truck of this kind can often be made by the swine raiser from materials at hand on the farm. It should be as low as possible and have

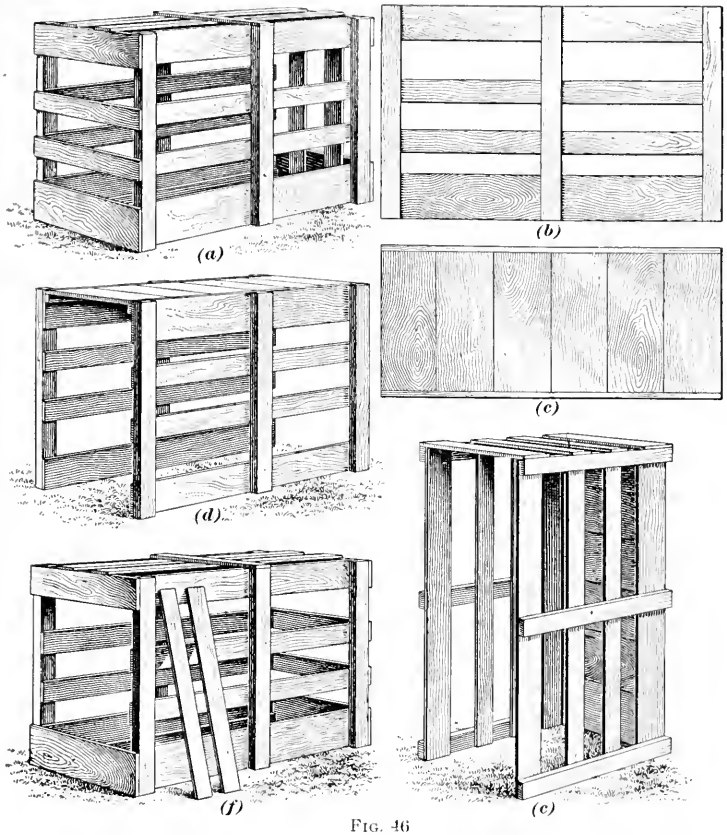

FIG. 46

a substantial platform of sufficient size to hold about three barrels. When loaded, such a truck can be pulled about by one horse without difficulty.

32. Shipping Crates.—When individual hogs are to be shipped, use is made of shipping crates, one of which is

illustrated in Fig. 46 (*a*). A crate should be light in weight, but at the same time it should be strong enough to prevent the animal from breaking out in transit. Strips of lumber $\frac{1}{2}$ inch thick and 4, 6, and 8 inches wide are used in the construction of a crate. Elm or basswood are good materials to use, as they are likely to be free from knots. However, pine or hemlock of good quality is often used. The size of the crate needed will depend on the age of the animal to be shipped. The sizes given in Table I are inside measurements and will generally be found satisfactory.

TABLE I

SIZES OF CRATES FOR SWINE OF VARIOUS AGES

Age of Animal	Length Inches	Width Inches	Height Inches
3 months	36	12	22
6 months	46	18	26
8 to 10 months	54	20	30
Mature hogs of average size	60	24	38
Mature hogs of large size	72	30	42

In building a crate, two sides like that in Fig. 46 (*b*) are made first. The width of the bottom strip is 8 inches, that of the top strip is 6 inches, that of the two middle strips is 4 inches, and that of the standards is 4 inches. The middle standard is needed only when a crate 6 feet long or longer is built. The two bottom strips are placed closer together than those at the top, in order to prevent the hog from getting its feet between the strips. The bottom is next constructed as shown in (*c*); it is made of 1-inch boards nailed crosswise to $1'' \times 1\frac{1}{2}''$ strips. The sides are then nailed to the bottom as shown in (*d*). The crate is next stood on end and crosspieces are nailed on the upturned end as shown in (*e*). The end on which the strips are nailed crosswise is the front of the crate. At the rear end the strips are nailed crosswise at the top and bottom only, as shown in (*f*). For the top,

two strips are nailed lengthwise and a strip crosswise. Two strips the height of the crate are also cut to be used as end pieces; after the hog has been placed in the crate they are set in a vertical position as shown in (*a*), and are nailed in place from the inside.

FIG. 47

33. Hurdles.—Hurdles fastened together by hinges, as shown in Fig. 47, are a convenient accessory to have about a hog farm. Hurdles are useful when driving hogs, or when sorting them into groups. Four hurdles fastened together make a convenient temporary pen. For a small triangular pen three hurdles can be used. Hurdles should be made of $1'' \times 4''$ strips of lumber of light weight and good quality. They are made 2 feet high, and 12, 14, or 16 feet long, as is desired.

34. Loading Chute.—A chute for loading hogs into a wagon or other conveyance should be a part of every swine raiser's equipment. In Fig. 48 is shown a good type. It is 16 feet long, 2 feet wide, and the sides are 30 inches high. Iron hooks that catch into the end of the wagon and on the upper end of the chute are provided. Treads are fastened on

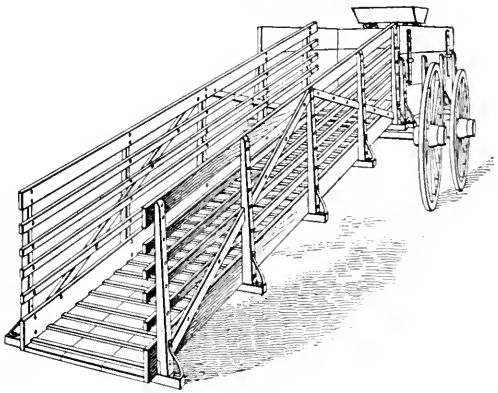

FIG. 48

the incline to facilitate walking up the chute. Such a chute should be built of hard lumber and put together with bolts.

TYPES AND BREEDS OF SWINE

INTRODUCTION

1. Swine possess sufficient differences in conformation to warrant swine raisers in recognizing and the market in accepting two distinct types, or classes: the *lard*, or *fat-hog, type* and the *bacon*, or *lean-hog, type*. The hogs of all breeds of swine, and all hogs of no particular breed, can be classed either as lard or as bacon hogs. In the following pages are given brief descriptions of both types of swine, and also of all the leading breeds in North America.

Several of the breeds of swine are native to North America. In this connection, it is interesting to note that more breeds of swine have originated in North America than of all other classes of farm livestock together. As may be learned in the subsequent pages, these American breeds of swine have been formed, in some cases, by crossing native hogs with those brought from Europe or Asia, and in other cases by crossing native stock with native stock and selecting the best of their offspring for breeding purposes. The breeds of swine described in this Section that are not native to America are native to Europe. All of the European breeds given are well established in the United States and Canada, and in these countries the interests of the breeds are fostered by American breeding associations.

The breeds of the lard type described are Berkshire, Poland-China, Duroc-Jersey, Chester White, Mule-Foot, Cheshire, Small Yorkshire, Victoria, and Essex; those of the bacon type are Large Yorkshire, Tamworth, and Hampshire.

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2. In describing the different breeds of swine, mention is made of certain parts of a hog, and in order that a clear understanding may be had of the location of these parts, they are designated by letters on the outline view of an animal shown in Fig. 1. In the illustration, *a* is the snout;

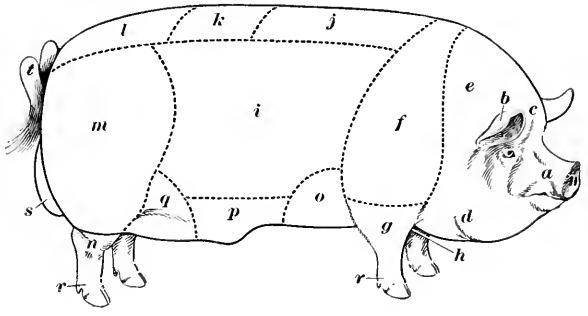

FIG. 1

b, the ear; *c*, the poll; *d*, the jowl; *e*, the neck; *f*, the shoulder; *g*, the front leg; *h*, the chest; *i*, the side; *j*, the back; *k*, the loin; *l*, the rump; *m*, the ham; *n*, the hind leg; *o*, the fore flank; *p*, the belly; *q*, the hind flank; *r*, the pastern joint; *s*, the scrotum; and *t*, the tail.

TYPES OF SWINE

LARD TYPE OF SWINE

3. Hogs of the **lard type,** as the term implies, produce large quantities of fat. The animals have, as a rule, well developed hams and shoulders, but they produce only a fair quantity of bacon. The lard type of hog has resulted largely from the abundance and general use of Indian corn as feed. Corn fattens hogs readily, but it is more conducive to the production of thick layers of fat than of alternate layers of fat and lean, such as is desired in bacon.

The animals of the different lard-type breeds are of the same general character, but differ in minor respects. An

animal of the lard type should show good width and fair length, and should be built low to the ground. The snout should be of medium length, the eyes full, mild, and bright, the face short, the cheeks full, the jowl strong and broad, and the neck thick and of a medium length. The shoulders should be broad and compact on top, the chest broad, the sides deep, the back broad and thickly and evenly fleshed, the loins wide and thick, and the bottom line straight and even. The hams should be heavily fleshed, plump, full, deep, and wide. An animal possessing the conformation just described will be broad, compact, low set, and well adapted to produce a large proportion of ham, shoulder, and lard, and still give a fair quantity of bacon.

BACON TYPE OF SWINE

4. Hogs of the **bacon type,** as the name indicates, produce relatively large quantities of bacon. Their bodies are long, deep, and narrow throughout. The shoulders and hams are not so well developed as in the lard type of hogs, but they should be smoothly covered with flesh and in line with the sides. The back should be of moderate but uniform width, and smoothly covered. The sides, as they are the parts from which the bacon is taken, should be long and deep, and have a good thickness of flesh. There should be no falling away at the flanks, and the flesh should be firm and free from wrinkles.

In general appearance, hogs of the bacon type are long and narrow, have long heads, and stand up rather high on their legs. There is really no use of the great length of the head and legs, so far as meat production is concerned, but it seems impossible to breed hogs without there being a certain correlation of parts, and it has been found that a hog with long legs and head will generally have a long and narrow body.

BREEDS OF SWINE

BREEDS OF THE LARD TYPE

BERKSHIRE SWINE

5. Origin and Development.—The **Berkshire breed** of swine originated in the southern part of England, particularly in the counties of Berkshire and Wilts. The foundation stock of the breed has been described in early records as being of a

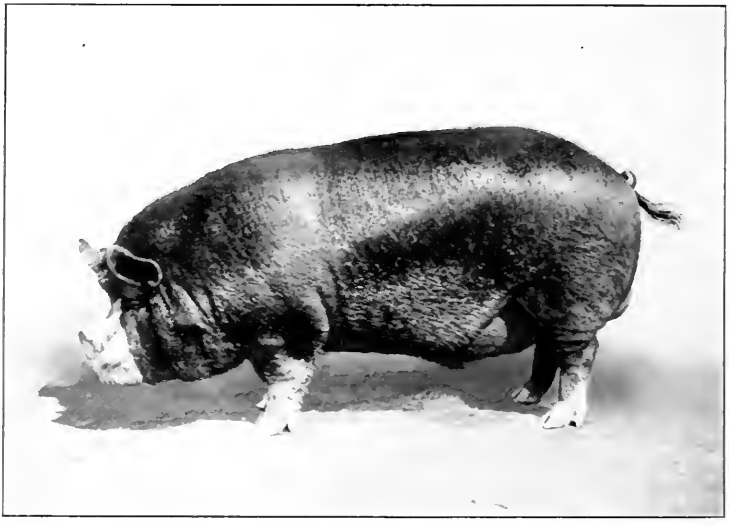

FIG. 2

reddish-brown color more or less covered with black spots, and having large ears, short legs, and small bones. Some of these early Berkshires were of exceptionally large size. Early improvement in the breed was accomplished by crossing this foundation stock with Chinese swine. After such crossing

FIG. 3

had been continued for several generations, the color became changed to a sandy or whitish brown, spotted with black. Later, the color became established as black with white markings on the head, tail, and legs, and sometimes on the body. In addition to changes of color, improvement has resulted in animals of the breed becoming somewhat smaller in size and much finer in quality. American breeders of Berkshires have done much to develop the breed since the importation of the first animals in 1823. In North America, the Berkshires have become developed to such a state of general excellence that they are found in all parts of the United States and Canada, and wherever kept are popular.

6. Description.—In Fig. 2 is shown a typical boar of the Berkshire breed. Fig. 3 shows a group of 12-months-old Berkshire sows owned by A. J. Lovejoy, of Roscoe, Illinois. The animals of this breed are black in color and usually show six white points, namely, on the face, on the tail, and on the four feet. A splash of white on the jowl, under the neck, or on the forelegs is often found and is not regarded by the American Berkshire Association as a disqualification. White ears are sometimes found, but they are not objected to by breeders and judges. The black of the Berkshires differs somewhat from the black of some of the other breeds in that it is a sort of blue-black.

The conformation of the modern Berkshire is typical of the lard hog. An animal of this breed has a short face that is gracefully dished; the ears are short, pointed, and usually erect; the back is broad and level; the hams are full; and the legs are short, strong, and straight. Trimness and smoothness throughout all parts is a marked additional characteristic of the Berkshire.

Berkshires are of medium to large size. The average mature boar in good breeding condition should weigh about 500 pounds and the sow about 400 pounds. Frequently specimens are found that weigh considerably more than these weights. The pigs can be made ready for market at from 6 to 8 months of age, if desired.

Among the general qualities claimed by Berkshire breeders for this breed are: The animals are as docile as those of any breed known, being quiet, tractable, and easily handled; they can be adapted to any climatic condition; they are vigorous and hardy, and work improvement on any other breed with which they may be crossed; the sows are excellent mothers and are very prolific, large litters of strong pigs being the rule rather than the exception. Further than this, it is claimed that Berkshires produce a larger proportion of lean to fat than the animals of the other lard-type breeds.

The following is a detailed description of an ideal animal of the breed as compiled from the standard of excellence adopted by the National Association of Expert Judges of Swine.

1. Head and Face.—Head short, broad, coming well forward at the poll. Face short, fine, and well dished; broad between the eyes; tapering from the eyes to the point of the nose; surface even and regular.

Objections: Head long, narrow, and coarse; forehead low and narrow; jaws narrow or contracted, the lower jaws extending beyond the upper. Face long, straight, and narrow between the eyes; nose coarse, thick, crooked, or ridgy.

2. Eyes.—Very clear, rather large, dark, hazel, or gray.

Objections: Small, dull, bloodshot, deep set, or obscure; vision impaired by wrinkles, fat, or other cause.

3. Ears.—Generally almost erect, but sometimes inclined forwards with advancing age; medium size; thin and soft.

Objections: Large, coarse, thick, round, or drooping; long or large knuckle; difference in form, size, or position; animals unable to maintain the normal position.

4. Neck.—Full, deep, short, and slightly arched; broad on the top; well connected with the shoulder.

Objections: Long and flat; lacking in fullness and depth.

5. Jowl.—Full, firm, and neat; carrying fullness back to shoulder and brisket.

Objections: Light, flabby, thin, tucked up, or wrinkled.

6. Shoulders.—Broad, deep, full, and not extended above the line of the back; as wide on top as the back; carrying size down to line of belly and having lateral width.

Objections: Lacking in depth or width; thick beyond the line of the sides and hams or extending above the line of the back; heavy shields on hogs under 18 months of age.

7. Chest.—Large, wide, deep, and roomy; full girth, breast bone curving well forwards and extending back on a level; not tucked up; broad between the forelegs.

Objections: Flat, narrow at the top or the bottom; small girth; lacking depth or fullness; breast bone crooked or tucked up.

8. Back.—Broad and straight, carrying same width from shoulder to ham; surface even and smooth, without creases or projections, and not too long.

Objections: Narrow, swayed, or hollow; dropping below a straight line.

9. Sides and Ribs.—Sides full, smooth, firm, and deep; carrying size down to belly and evenly from ham to shoulder. Ribs long, strong, and well sprung at the top and the bottom.

Objections: Sides flat, thin, or flabby; not as full at the bottom as at the top. Ribs weak; not well sprung at the top or the bottom.

10. Belly and Flank.—Wide, full, and straight on the bottom line.

Objections: Belly narrow or sagging. Flank thin or tucked up.

11. Ham and Rump.—Ham broad, full, and long; the lower front part of the ham should be full and the stifle joint well covered with flesh, coming well down on the hock. Rump should have a rounding slope from the loin to the root of tail, be of the same width as the back, and filled out on each side and above the tail.

Objections: Ham narrow, short, or thin; not projecting beyond stifle joint and coming down on the hock; cut up too high in the crotch. Rump flat, narrow, or too steep.

12. Legs and Feet.—Legs short, straight, strong, and set wide apart; hoofs erect and capable of holding good weight.

Objections: Legs long, slim, coarse, or crooked; muscles light; pastern long, slim, or flat; feet long or sprawling.

13. Tail.—Well set up, fine, tapering, and neatly curled.

Objections: Coarse or straight; too low.

14. Coat.—Fine, straight, smooth, and lying close to and covering the body well; not clipped; evenly distributed over the body.

Objections: Hair coarse, harsh, wavy, or curly; not evenly distributed over the body; swirled or clipped.

15. Color.—Black, with white on feet, face, tip of tail, and an occasional splash on the forelegs.

Objections: Solid black or black points, or white spots on body.

16. Size.—Large for age. Boar 2 years and over not less than 450 pounds; sow at same age, 400 pounds. Boar at 18 months, 350 pounds; sow at same age, 325 pounds. Boar at 12 months, 300 pounds; sow at same age, 275 pounds. Boar and sow at 6 months, 150 pounds.

Objections: Underweight, coarse, or not in good form to fatten.

17. Action and Style.—Action vigorous. Style graceful and attractive.

Objections: Dull, sluggish, or clumsy.

18. CONDITION.—Healthy; skin clear of scurf, scales, or sores, and soft and mellow to the touch; flesh fine, evenly laid on, and free from lumps; hair soft and lying close to the body; good feeding qualities.

Objections: Unhealthy; skin scaly, scabby, or harsh; flabbiness or lump flesh; too much fat for breathing; hair harsh, dry, and standing up from the body; poor feeders; deafness, partial or total.

19. DISPOSITION.—Quiet, gentle, and easy to handle.

Objections: Cross, restless, vicious, or wild.

POLAND-CHINA SWINE

7. Origin and Development.—The **Poland-China breed** of swine originated in the counties of Butler and Warren in Southwestern Ohio, as a result of crossing the mongrel hogs of the early settlers with Berkshires and other old breeds from Europe and Asia. Associated with Butler and Warren counties in the early improvement of the breed were Hamilton County in Ohio, and Union and Wayne counties in Indiana, the five counties constituting a region known as the Miami Valley. The first result of the cross-breeding was a breed of hogs that possessed many excellent qualities but lacked fixity of characters. In recent years, however, the desired characters have been made permanent by the practicing of careful selection in breeding, and now the Poland-China is noted as an economical pork-producing breed. Poland-China swine are raised extensively throughout the United States and Canada, but are found in larger numbers in the corn belt than elsewhere.

8. Description.—In Fig. 4 is shown a boar of the Poland-China breed, and in Fig. 5 a Poland-China sow. The Poland-China swine are black with six white points—white in the face, on the tip of the tail, and on the four feet. Splashes of white are sometimes found on the jaw, legs, flanks, sides, or back, and are not objected to by judges and breeders. The black should be jet black and not blue-black, as in the Berkshires.

Like the Berkshires, the Poland-Chinas possess the characteristic conformation of the lard type. They have short

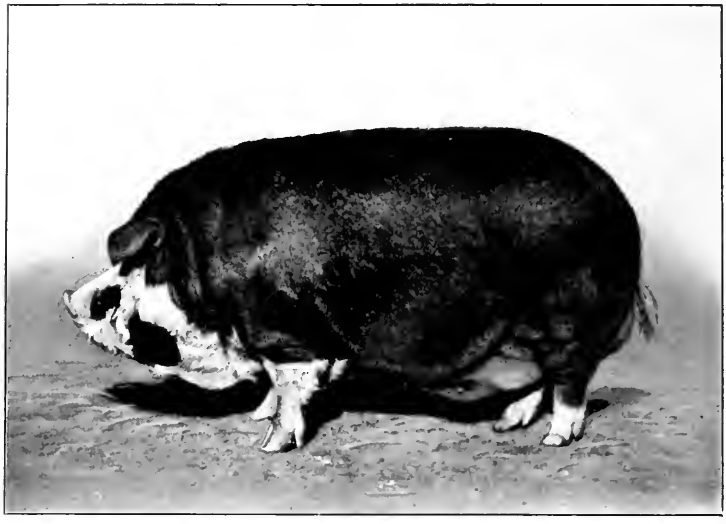

FIG. 4

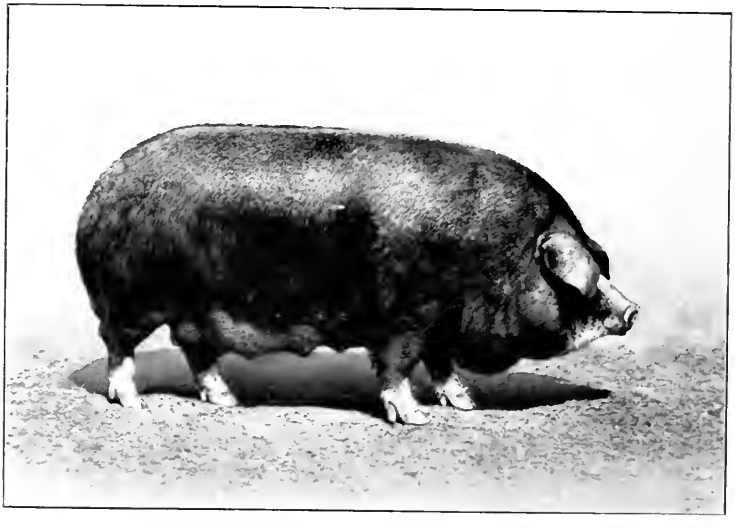

FIG. 5

heads, wide faces that are but slightly dished, full jowls, short and wide necks, broad shoulders, wide backs, well-sprung ribs, broad loins, full and broad hams, deep sides, and legs that are straight and of medium length. A distinguishing feature of the breed is the ears; these are rather small and on an ideal animal should stand up slightly at the base to within two-thirds of the tip, where a gentle break or drop should occur.

Poland-China swine are of medium to large size. A mature boar in breeding condition should weigh about 500 pounds and a mature sow about 400 pounds. Poland-China pigs that are fed for market can usually be made to weigh 200 pounds at 6 months of age, and 250 pounds is by no means rare at this age.

The Poland-Chinas are profitable hogs for farmers who feed corn, as the swine mature quickly and take on large quantities of fat. This fat is less streaked with lean than in the case of Berkshires, being arranged in thick layers. In fact, in recent years some objection has been raised to Poland-China pork as a meat for export, because of the excessive fatness of the bacon. The American market, however, does not make such a discrimination. Perhaps one reason for the ready-fattening quality of Poland-Chinas is the fact that they are less inclined to take exercise than animals of the other breeds.

The Poland-China breed has been somewhat severely criticized in recent years because of the lack of prolificacy in the sows. It is true that sows of the breed produce smaller litters than sows of any of the other common breeds. One authority has given the average size of Poland-China litters, based on a large number of observations, as 7.45 pigs; of Berkshires, 8.22 pigs; of Chester Whites, 8.96 pigs; and of Duroc-Jerseys, 9.26 pigs.

A detailed description of an ideal Poland-China, as outlined by the National Association of Expert Judges of Swine, is given in the following.

1. Head and Face.—Head should be broad, even, and smooth between and above the eyes; broad lower jaw. Face slightly dished,

tapering evenly and gradually to near the end of the nose; inclined to shortness, but not short enough to give the appearance of a stubby nose.

Objections: Long or narrow between the eyes; nose uneven and coarse; too large at the muzzle or the head too short; not full or high above the eyes; or too much wrinkled around or above the eyes.

2. Eyes.—Full, clear, prominent, and expressive.

Objections: Dull expression; deep set or obscure; sight impaired by wrinkles, fat, or other cause.

3. Ears.—Attached to the head by a short, firm knuckle, giving free and easy action; standing up slightly at the base to within two-thirds of the tip, where a gentle break or drop should occur; in size neither too large nor too small, but even, fine, thin, and of leaf shape; slightly inclined outwards.

Objections: Large, floppy, straight, upright, or coarse; knuckles long, letting the ear droop too close to the head and face, hindering the hearing.

4. Neck.—Short, wide, even, smooth, well arched and rounding and full from the poll to the shoulder, with due regard to the sex.

Objections: Long, narrow, thin, and dropping from the shoulder to the poll, with unevenness caused by wrinkles or creases.

5. Jowl.—Full, broad, deep, smooth, and firm, carrying fullness back near to the point of the shoulders, and below the line of the lower jaw, so that the lower line will be as low as the breast bone when the head is carried up level.

Objections: Light, flabby, thin, or wedge-shaped; deeply wrinkled; not drooping below the line of the lower jaw, or not carrying fullness back to the shoulder and brisket.

6. Shoulder.—Broad and oval at the top, showing evenness with the back and neck, with good width from the top to the bottom, and even smoothness; extending well forwards.

Objections: Narrow at the top or the bottom; not so deep as the body; uneven width; shields on pigs under 8 months of age, or showing too much shield at any age.

7. Chest.—Large, wide, deep, and full; even bottom line to the shoulders and sides, with no creases; giving plenty of room for heart and other organs; of a large girth, indicating much vitality; brisket smooth, even, and broad; wide between the legs and extending well forwards, showing in front.

Objections: Pinched appearance at the top or the bottom, or tucked in back of the fore legs; showing too narrow between the legs; not depth enough back of the shoulders; brisket uneven, narrow, or not prominent.

8. Back.—Broad, straight, or slightly arched, carrying the same width from the shoulders to the hams; surface even, smooth, and free from lumps, creases, or projections; not too long, but broad on top,

indicating well-sprung ribs; should not be higher at the hip than at the shoulder, and should fill out at the junction with the sides so that a straightedge placed along the top of side will touch all the way from the point of the shoulder to the point of the ham; should be shorter than the belly line.

Objections: Narrow, creased back of the shoulders, swayed, or hollow; dropping below a straight line; humped or wrinkled; too long or sun-fish shaped; loin high, narrow, depressed, or humped up; surface lumpy, creased, ridgy, or uneven; width at the sides not so much as at the shoulders and hams.

9. Sides and Ribs.—Sides full, firm, and deep; free from wrinkles; carrying size down to belly; even from hams to shoulders. Ribs of good length, well sprung at the top and the bottom.

Objections: Flat, thin, flabby, pinched; not so full at the bottom as at the top; drawing in at the shoulder so as to produce a crease or pinched and tucked up and in as it approaches the ham; uneven surface. Ribs flat or too short.

10. Belly and Flank.—Belly broad, straight, and full, indicating capacity and room, being on a level at the flank with the under chest line; bottom line straight, or nearly so, and free from flabby appearance.

Objections: Belly uneven and flabby, or apparent looseness in the make-up. Pinched in the flank or flanked too high.

11. Ham and Rump.—Ham broad, full, deep, and long from the rump to the hock; fully developed above and below, wide at the point of the hip and carrying the width well down to the lower part of the hams; fleshy, plump, and a rounding fullness perceptible everywhere. Rump rounding and gradually sloping from the loin to the root of the tail; broad and well developed all along from the loin and gradually rounding to the buttock; lower front part of the ham should be full and the stifle joint well covered with flesh. Even width of ham and rump with the back, loin, and body; even a greater width in females not objectionable.

Objections: Ham short, narrow, too round, or slim; not filled out above or below, or unshapely for deep meat; not so wide as the body; back or loin too tapering or small. Rump narrow or pointed, not plump or well filled, or too steep from the loin to the tail.

12. Legs and Feet.—Legs of medium length, straight, set well apart, and squarely under the body; tapering, well muscled, and wide above the knees and hock; below the hocks and knees round and tapering; capable of sustaining the weight of the animal in full flesh without breaking down; bone firm and of fine texture; pasterns short and nearly upright. Feet firm, short, tough, and free from defects.

Objections: Legs long, slim, coarse, or crooked; muscles small above the hocks and knees; bone large or coarse; as large at the foot as above the knee; pasterns long, slim, crooked, or weak; the hocks turned in or out from a straight line; legs too close together; hoofs long, slim,

and weak; toes spreading or crooked or unable to bear the weight of the animal without breaking down.

13. Tail.—Tail of medium length and size, smooth, tapering well, and carried in a curl.

Objections: Coarse and long without a curl; or short, crooked, or stubby; or too small, fine, or even, and not tapering.

14. Coat.—Fine, straight, lying close to and covering the body well; not clipped; evenly distributed over the body.

Objections: Bristles; hair coarse, harsh, thin, wavy, or curly; swirls; standing up; ends of hair split and brown; not evenly distributed over all of the body except on the belly.

15. Color.—Black with six white points: at the tip of tail, four white feet, and white in face—on the nose or the point of the lower jaw—all to be perceptible without close examination; splashes of white on the jaw, legs, or flank, or a few spots of white on the body are not objectionable.

Objections: Solid black, white mixed or sandy spots; speckled with white hairs over the body; mottled face of white and black; hair mixed, making a grizzly appearance.

16. Size.—In show condition, or when fat, a 2-year-old boar should weigh not less than 600 pounds, and a sow not less than 500 pounds; a boar 1 year old and over, 400 pounds and a sow 350 pounds; a boar 18 months old, 500 pounds; and a sow, 450 pounds; a boar and sow 6 months old, not less than 160 pounds. All hogs in just fair breeding condition, one-fourth less in size.

Objections: Overgrown; undersized, short, stubby, or inclined to chubby fatness; not a hardy, robust animal.

17. Action and Style.—Action vigorous, easy, and graceful. Style attractive.

Objections: Slow and awkward movements; waddling or twisting walk; a tired or lazy appearance; not standing erect and firm.

18. Condition.—Healthy; skin clear of scurf, scales, and sores; soft and mellow to the touch; flesh fine, evenly laid on, and free from lumps and wrinkles. Hair soft and lying close to the body; good feeding qualities.

Objections: Unhealthy; skin scaly, wrinkled, scabby, or harsh; flabbiness or lumpy flesh; too much fat for breeding. Hair harsh, dry, and standing up from the body; poor feeders; deafness, partial or total.

19. Disposition.—Lively, easily handled, and seemingly kind; responsive to good treatment.

Objections: Cross, sluggish, restless, wild, or vicious.

DUROC-JERSEY SWINE

9. Origin and Development.—The **Duroc-Jersey breed** of swine is an American breed that was originated by crossing the Durocs, a breed of red swine found in New York State, with the Jersey Reds, a breed of red swine found in New Jersey. These original breeds constituting the foundation stock of the Duroc-Jerseys probably sprang from some of the red swine, such as the Guinea hogs, Portuguese hogs, red Spanish hogs, and Berkshires, that were imported into North

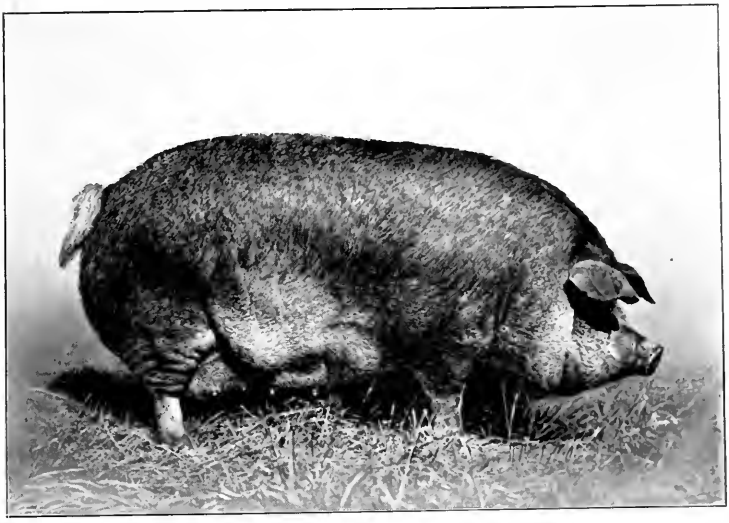

FIG. 6

America at an early date. At first the animals resulting from the Duroc and Jersey Red crosses had many undesirable qualities; in late years, by care in the selection of animals for mating, much improvement has been made, until the Duroc-Jersey has become recognized as one of the leading breeds of the lard type. This breed is especially popular in Iowa, Kansas, and Nebraska.

10. Description.—Fig. 6 shows a typical Duroc-Jersey boar. The Duroc-Jerseys are of a cherry-red color when

purely bred. It often happens, however, especially in mature animals, that they become copper or reddish gray in color, and in some instances the tips of the hairs turn black. These variations from the established cherry-red color are undesirable. Black spots on the belly and legs are also undesirable, but are admissible.

The conformation of Duroc-Jersey swine is similar to that of the Berkshires and Poland-Chinas. The head is small, the face straight or slightly dished, the nose of medium length, the ears are of medium size and point forwards and downwards; the back is broad in comparison to its length, the sides are deep, and the hams and shoulders are heavily fleshed and extend well down on the legs.

In size, the Duroc-Jerseys are somewhat large. Mature boars in good breeding condition should weigh from about 500 to 550 pounds and mature sows in the same condition should weigh from about 400 to 450 pounds. Duroc-Jersey pigs that are fed for market mature quickly and reach a good size.

A point of merit in Duroc-Jersey swine is their prolificacy, and the ability of the sows to save their pigs after farrowing.

The following is a detailed description of an ideal animal of the breed as compiled from the standard of excellence adopted by the Duroc-Jersey Breeders' Association.

1. Head and Face.—Head small in proportion to size of body; wide between the eyes. Face slightly dished (about half way between Poland-China and Berkshire) and tapering well down to the nose; surface smooth and even.

Objections: Head large and coarse; narrow between the eyes. Face straight, or too much dished.

2. Eyes.—Lively, bright, and prominent.

Objections: Dull, weak, or obscure.

3. Ears.—Medium, moderately thin, pointing forwards and downwards and slightly outwards; carrying a slight curve; attached to head neatly.

Objections: Very large; round, or nearly so; too swinging or flabby; not of same size or in different positions, and not under control of animal.

4 Neck.—Short, thick, and very deep; slightly arching.

Objections: Long, shallow, and thin.

5. Jowl.—Broad, full, and neat; carrying fullness back to the point of the shoulder and in line with the breast bone.

Objections: Too large, loose, and flabby, or too small, thin, and wedging.

6. Shoulder.—Moderately broad, very deep and full, and not extending above the line of the back; carrying thickness well down.

Objections: Small, thin, shallow; extending above the line of the back; boars under 1 year old heavily shielded.

7. Chest.—Large; very deep; full behind shoulders, and breast bone extending well forwards, so as to be readily seen.

Objections: Flat, shallow, or not extending well down between the forelegs.

8. Back.—Medium in breadth; straight or slightly arching, carrying even width from the shoulders to the ham; surface even and smooth.

Objections: Narrow; creased behind shoulders; swayed or humped.

9. Sides and Ribs.—Sides very deep and of medium length; level between shoulders and hams, and carrying the fullness down to the line of the belly. Ribs long, strong, and sprung in proportion to the width of the shoulders and hams.

Objections: Flabby; creased; shallow and not carrying proper width from the top to the bottom.

10. Belly and Flank.—Straight and full and carrying fullness well out to the line of the sides.

Objections: Belly narrow; tucked up; sagging and flabby. Flank tucked up or drawn in.

11. Ham and Rump.—Ham broad, full, and extending well down to the hock; buttocks full, and coming nearly down to and filled between hocks. Rump should have a rounding slope from loin to root of tail; same width as back and well filled out around the tail.

Objections: Ham narrow or short; thin or projecting well down to the hock; cut up too high in the crotch. Rump narrow, flat, or peaked at the root of the tail or too steep.

12. Legs and Feet.—Medium in size and length; straight; nicely tapering; wide apart and well set under the body; pastern short and strong. Feet short, firm, and tough.

Objections: Legs extremely long above; set too close together; hocks turned in or out of a straight line. Feet long, slim, and weak; toes spreading and crooked.

13. Tail.—Medium length at the base, nicely tapering, and rather bushy at the point.

Objections: Extremely heavy; too long and ropy.

14. Coat.—Moderately thick and fine; straight; smooth and covering the body well.

Objections: Many bristles; hair coarse, harsh, or rough; wavy or curled; swirls not evenly laid over the body.

15. Color.—Cherry, without admixtures.

Objections: Very dark red, or any shade of brown; very light or pale red; black spots over the body; black flecks on the belly and legs not desired but admissible.

16. SIZE.—Boars 2 years old and over in fair show condition should weigh 600 pounds; sows, same age and condition, 500 pounds; boars 18 months old, 475 pounds, and sows, 400 pounds; boars 12 months old, 350 pounds, and sows, 300 pounds; boars and sows 6 months old, 150 pounds.

Objections: Overgrown or undersized.

17. ACTION AND STYLE.—Action vigorous and animated. Style free and easy.

Objections: Action dull and stupid. Style awkward and wabbling.

18. CONDITION.—Healthy; skin free from any scurf, scales, sores, and mange; flesh evenly laid over the entire body and free from lumps.

Objections: Unhealthy; scurf, sores, or mange; too fat for breeding purposes; hair harsh and standing up; poor feeders, etc.

19. DISPOSITION.—Quiet and gentle; easily handled or driven.

Objections: Wild, vicious, or stubborn.

CHESTER WHITE SWINE

11. Origin and Development.—The **Chester White breed** of swine originated in Chester County, Pennsylvania, as a result of crossing the common white swine of that locality with white hogs brought from Europe. The first animals of this breed were extremely large and coarse, but selection in breeding soon reduced the size and established a finer quality of parts. In 1865, L. B. Silver, of Salem, Ohio, purchased some Chester White swine and began breeding with the purpose of securing a type of this breed of large size and superior quality. As a result of his breeding, a strain known as Ohio Improved Chester White, commonly spoken of as O. I. C., was originated. A separate herd book is maintained by breeders of this strain. Both the old type of Chester Whites and the O. I. C. strain have been developed to the extent that they are to be found in all parts of the United States and Canada where swine are kept.

12. Description.—In Fig. 7 is illustrated a boar of the Chester White breed. The Chester White, as the name implies, is a white breed. Blue specks, known as freckles,

are often found on the skin of these animals and are not objected to by judges, but black, sandy patches in the hair or on the hide are undesirable and will bar an animal from registration in the breed herd books.

In conformation, the Chester Whites are of the typical lard-hog shape. They have short, broad heads, and slightly dished faces. The ears are drooping but do not stand out so far from the head as in the case of animals of the Poland-China breed. In width and depth, Chester Whites are similar to the Poland-Chinas, but, as a rule, they have greater length.

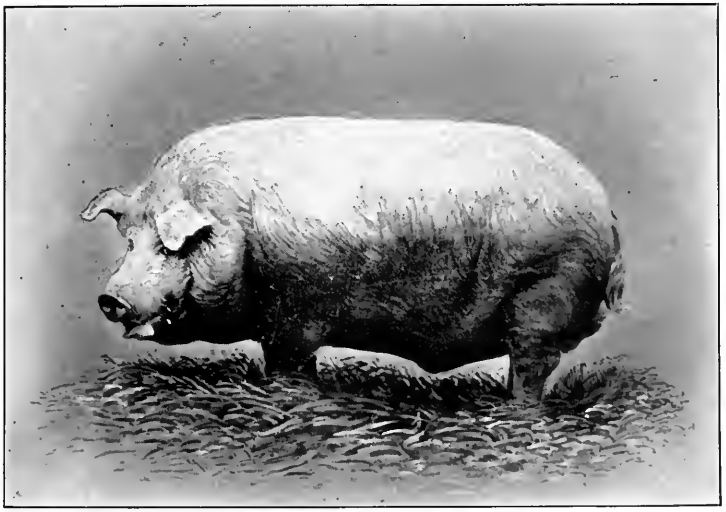

Fig. 7

One weakness, however, that is sometimes found in animals of this breed is that although they have good width at the shoulders, there is often a narrowness toward the rear of the body, thus giving a wedge-shaped form which results in a narrow loin and poorly developed hams. This weakness is guarded against by breeders, and, it is believed, will soon disappear from the breed.

In size, the Chester Whites are large. Mature boars in breeding condition should weigh about 600 pounds and mature sows in the same condition, about 450 pounds. Young

animals that are fattened for market should weigh from about 250 to 275 pounds at 6 months of age.

The breeding and feeding qualities of the Chester Whites are high class. Experiments conducted by various experiment stations have demonstrated that Chester Whites take on fat at a rate that compares favorably with the rate of other breeds of the lard type. The quality of the meat is good, although too much fat is carried in the bacon for the English market.

A detailed description of an ideal animal of this breed, formulated from the standard of excellence in use by the National Chester White Record Association, is given herewith.

1. Head and Face.—Short and broad between the eyes. Face slightly dished, cheeks full.

Objections: Head coarse. Face long and narrow; too much dished; snout coarse and thick, or too long.

2. Eyes.—Bright and full.

Objections: Deeply sunken, or blind.

3. Ears.—Drooping, fine, and silky; pointing forwards and a little outwards; well proportioned to the size of the body.

Objections: Too large and coarse; thick, lopping, and lying too near the face; stiff, erect, or too round.

4. Neck.—Full, deep, short, and slightly arched.

Objections: Long and narrow.

5. Jowl.—Full, firm, neat and carrying fullness well back to the shoulders and brisket.

Objections: Flabby, light, too thick in cheek; tucked up under the throat.

6. Shoulder.—Broad and deep; thick in proportion to the sides and hams, and full and even on top.

Objections: Lacking in depth or width, thick beyond the line of the side and ham, or blade too prominent.

7. Chest.—Full around the heart and back of the shoulders; ribs extending well down; wide and full back of the front legs.

Objections: Less than flank measure, or creased back of the shoulders.

8. Back.—Back broad, straight, or slightly arched, carrying width well back of hams, and of medium length.

Objections: Narrow; creasing back of the shoulders; narrow across the loins; swayed; too long or sunfish shaped.

9. Sides and Ribs.—Sides full and deep, carrying well down and back. Ribs well sprung and long, carrying fullness and depth well back.

Objections: Sides too round or too flat; shallow or thin at the flank. Ribs too flat or the curve too short.

10. Belly and Flank.—Belly wide and straight. Flank well let down and full.

Objections: Belly sagging or narrow. Flank thin, tucked in, or cut up too high.

11. Ham and Rump.—Full, broad, deep; holding width well over back.

Objections: Narrow or short; steep at rump or cut up too high in the crotch.

12. Legs and Feet.—Legs of medium length, strong, and straight; standing well up on toes.

Objections: Too long or slim; coarse; crooked; muscles light; pastern too long, slim, or flat. Foot long or sprawling.

13. Tail.—Well set on, small, smooth, and well tapered.

Objections: Coarse; too large or too prominent at the root.

14. Coat.—Fine and silky and covering the body well.

Objections: Coarse, bristly, harsh, or wiry.

15. Size and Condition.—Not too small for age; hearty and thriving.

Objections: Too small, weakly, or delicate.

16. Style and Symmetry.—A harmonious proportion of the above points.

Objections: Too much development in some points and lacking in others.

17. Disposition.—Quiet and docile.

MULE-FOOT SWINE

13. Origin and Development.—The origin of the **Mule-Foot breed** of swine is unknown. Certain breeders claim a knowledge of its origin, but their claims are discredited by the association fostering the interests of the breed. Doubtless this lack of information is due to the fact that the breed has only recently been brought to public attention. The National Mule-Foot Hog Record Association was organized in 1909, and steps were taken at that time to discover the facts relating to the origin of the breed. The Mule-Foot swine are rapidly gaining in favor in certain parts of Indiana, Ohio, Illinois, and Minnesota, where they are found in considerable numbers.

14. Description.—In Fig. 8 is illustrated a boar of the Mule-Foot breed of hogs. The animal from which the photo-

graph for this illustration was made is Ohio Chief, owned by Samuel Jonns, of Ohio. The Mule-Foot hogs are characterized by a solid hoof, which resembles that of the mule, as the name indicates. This gives them great strength in the feet, a point widely exploited by their admirers. In color, they are black, although white points are admissible. It is claimed for the breed that no animal has ever been known to have hog cholera, but this claim has been proved erroneous. The Mule-Foots are known to possess great vitality and to be good feeders.

FIG. 8

The ideal animal of the breed is described in the following standard of excellence adopted by the National Mule-Foot Hog Record Association.

1. HEAD AND FACE.—Head medium length. Face broad between the eyes, nearly straight, cheeks full; surface even and regular.

Objections: Head large, coarse, crooked, or much dished.

2. EYES.—Bright and lively; free from wrinkles or fat surroundings.

Objections: Small, deep, or obscure, or vision impaired by fat or other causes.

3. EARS.—Medium length, thin tipped, slightly inclined outwards and forwards, knuckles small and well set to the head.

Objections: Large, coarse, thick; large or long knuckles drooping or not under good control of the animal.

4. Neck.—Short, well set to the shoulders; tapering from the shoulder to the head.

Objections: Long, thick, or bulky.

5. Jowl.—Full, neat, and firm; tapering from the neck to the point.

Objections: Thin or flabby.

6. Chest.—Large, deep, and roomy; full girth; extending down even with the line of the belly.

Objections: Narrow at the top or the bottom; small girth; cramped or tucked up.

7. Back and Loin.—Slightly arched; good breadth, with uniform thickness from the shoulders to the hams; full at loin.

Objections: Narrow, creased, or drooped behind the shoulders; surface ridgy or uneven.

8. Sides and Ribs.—Sides full; smooth form; carrying size evenly from the shoulders to the hams. Ribs strong and well sprung at the top and the bottom.

Objections: Sides thin, flat, flabby, or creased. Ribs not well sprung.

9. Belly and Flank.—Straight and full; devoid of coarseness. Flank full and running nearly on a line with the sides.

Objections: Belly sagging or flabby; coarse; flank thin or tucked up.

10. Ham and Rump.—Ham full, long and deep. Rump slightly rounded from the loin to the root of the tail; buttock full, neat, and firm.

Objections: Ham narrow; cut up too high in the crotch. Rump too steep or too narrow; peaked at the root of the tail; buttock flabby.

11. Legs and Feet.—Legs medium length, set well apart and squarely under the body; wide above the knee and hock, rounded and well muscled below; tapering; medium bone; pasterns short and nearly upright. Feet solid, short, smooth, enabling the animal to carry its weight with ease.

Objections: Legs too long or too short, slim, crooked, or coarse; muscles weak or light; joints coarse, not tapering; pasterns too long, crooked, or slender. Feet long, slim, weak, or turned up.

12. Tail.—Medium length, straight, or slightly curled.

Objections: Coarse, long, clumsy; swinging like a pendulum.

13. Coat.—Fine, straight, and smooth.

Objections: Bristles or swirls; too coarse or curly.

14. Color.—Black; white points admissible.

Objections: Too much white; too many and too large white spots on body.

15. Size.—Large for condition; boar 2 years old and over should weigh 500 pounds, and sow at the same age 450 pounds; boar 18 months

old should weigh 375 pounds, and sow at same age 350 pounds; boar or sow 12 months old should weigh 300 pounds; boar or sow 6 months old should weigh 175 pounds.

16. Action and Style.—Active, vigorous, and graceful. Style attractive.

Objections: Dull, sluggish, or clumsy.

17. Condition.—Healthy; skin free from defect; flesh smooth, firm, and evenly laid on.

Objections: Unhealthy; skin scurfy, scaly or mangy; hair harsh, not of good growth.

18. Disposition.—Docile, quiet, and easily handled.

Objections: Cross, restless, nervous, sluggish, or without ambition.

CHESHIRE SWINE

15. Origin and Development.—The **Cheshire breed** of swine originated in Jefferson County, New York. Evidence indicates that the breed is the result of crossing Large Yorkshire and White Suffolk swine with the native white swine of Jefferson County. The reason for the use of the name Cheshire in connection with the breed is unknown. Although the Cheshires have been bred since 1870, there are few animals of the breed outside of New York State.

16. Description.—Cheshires are white in color. Black spots sometimes occur on the skins of pure-breds and although objectionable do not disqualify them. The animals are smooth, compact, and of symmetrical proportions. As a rule, they mature early. They are of medium size, as a breed, but frequently specimens are found that are as large as the largest individuals of the lard-type breeds. The sows are good mothers and are very prolific. The feeding qualities of the animals of the breed have not been thoroughly investigated.

A detailed description of an ideal Cheshire, formulated from the standard of excellence for the breed as adopted by the Cheshire Swine Breeders' Association, is given in the following.

1. Head and Face.—Head short to medium in length, short in proportion to length of body. Face somewhat dished; wide between the eyes.

2. Ears.—Small, erect, in old animals often slightly pointed forwards.
3. Neck.—Short.
4. Shoulders.—Broad and full.
5. Hips.—Broad.
6. Body.—Long and deep.
7. Ham.—Broad, nearly straight with the back and running well down toward the hock.
8. Legs and Feet.—Long, slim; set well apart and supporting the body on the toes.
9. Tail.—Small and slim.
10. Hair.—Fine, medium in thickness and quantity; color, white.
11. Size.—When mature and well fattened should dress from 400 to 600 pounds.

SMALL YORKSHIRE SWINE

17. Origin and Development.—The **Small Yorkshire breed** of swine originated in England. Little is known of the foundation stock, but it is believed they were Chinese swine.

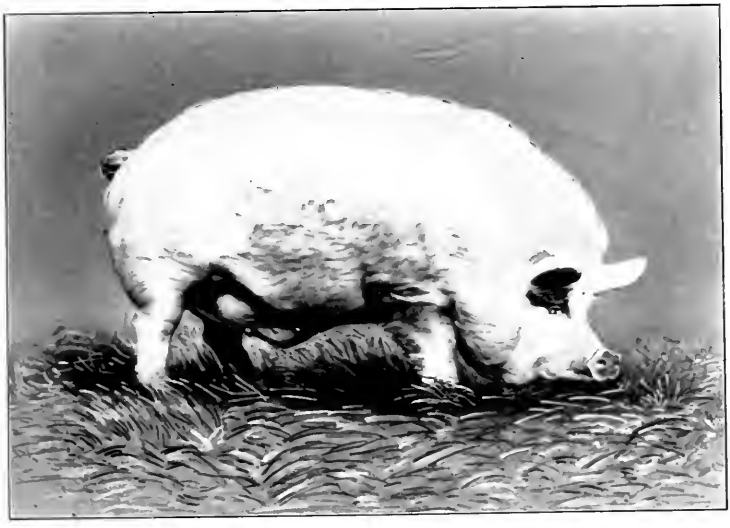

Fig. 9

Animals of the Small Yorkshire breed, and strains developed from it, were popular with the early Shorthorn cattle breeders of England. The introduction of the breed into

America took place early in the history of the country. The best known herds in America are descendants of animals imported during the years from 1872 to 1878.

18. Description.—In Fig. 9 is illustrated a Small Yorkshire boar; the photograph for this illustration was furnished by Prof. C. S. Plumb, of the Ohio State University. Small Yorkshires are white, with occasional black spots on the skin. They are very small and compact. Animals of this breed are noted for quick-maturing qualities, and are well adapted for producing early market pork. Their meat is fine grained and tender, but inclined to be rather fat.

The following is a detailed description of an ideal animal of the breed as compiled from the standard of excellence adopted by the American Yorkshire Club.

1. General Outline.—Wide and deep in proportion to the length, and straight above and below; short in head, neck, body, and limbs.

2. Outline of Head.—Short, abrupt, inclining to fine; possessed of much dish, and downward springing under the jaws.

3. Forehead and Poll.—Wide.

4. Eyes.—Medium size, clear, and bright.

5. Jowl.—Large, smooth, and carried well back toward the neck.

6. Snout.—Short, turning upwards somewhat, with a deep indenture or curve immediately above it.

7. Ears.—Small, thin, erect, and inclining slightly forwards rather than backwards at the tips.

8. Neck.—Short, wide, and deep, the width slightly increasing toward the shoulders.

9. Outline of Body.—Short, broad, deep, and straight above, below, and on the sides.

10. Back.—Very broad, of even width, and straight from the withers to the tail head.

11. Shoulder.—Large, smoothly and evenly developed, and blending perfectly with the neck and crops.

12. Arm and Thigh.—Moderately wide, tapering nicely down, and inclining to be short.

13. Brisket.—Wide and on level with the under line.

14. Side.—Deep, thick in every part; straight and even from the shoulder to the hip.

15. Ribs.—Widely and deeply sprung

16. Heart and Flank Girth.—Excellent in proportion to the length of body and about equal.

17. Hind Quarters.—Relatively long; broad in every part and deep, with but little lowering toward the tail head.

18. Ham.—Large, well let down at the thigh and twist, and inclined to be straight behind.

19. Twist.—Well down and full.

20. Tail.—Fine, short, and inclined to curl.

21. Legs.—Short, fine rather than coarse; strong, straight, and placed well apart

22. Hair.—Abundant, fine, and even in quality.

23. Skin.—Smooth, white, and free from creases and scales.

24. Color.—White on every part.

25. Movement.—Gentle and easy but not sluggish.

VICTORIA SWINE

19. Origin and Development.—The **Victoria breed** of swine originated in Lake County, Indiana, as a result of crossing Poland-Chinas, Berkshires, Chester Whites, and a breed of white hogs from England. A strain of Victorias known as the Curtis Victoria originated in Saratoga County, New York, but so far as is known there are now no pure-bred Curtis Victorias in existence. Although the breed originated about 1870, it is not well known, there being but few breeders in the United States.

20. Description.—In color, Victoria swine are white, with occasional dark spots in the skin. The ears are erect or slightly drooping, and the animals have a good coat of fine, soft hair; the head is small and the face is medium dished; the bones are fine, and the back is straight, broad, and level. The Victorias are said to be prolific hogs, easy to keep in condition, and readily fattened at any age. They are of medium size; mature sows should weigh about 450 pounds and mature boars about 600 pounds.

ESSEX SWINE

21. Origin and Development.—The **Essex breed** of swine originated in the county of Essex, England, as a result of crossing Neapolitan swine with the native hogs of Essex.

It is thought also that Berkshire and Suffolk blood was used in the crossing. At first the Essex swine were black and white in color, but later the black color was established. These early Essex hogs became of weak constitutions, as a result of inbreeding, and the breed lost in favor. The Improved Essex strain was developed by a tenant of the originator of the Essex breed. Animals of this strain were larger in size and possessed more vigor than those of the original type. The Essex breed is known in England as the Small Black breed, or Black Suffolk. The breed was introduced into America at an early date, but has never become generally popular.

22. Description.—Essex swine are black; animals with white on them are not admitted to registry by the record association. They are small, compact animals, set on short legs. The face is dished, the snout short, and the shoulders and hams well developed. The animals are quick maturing, and easily fattened; the meat is fine grained, but carries an excessive quantity of fat. The breed does not stand very high in prolificacy.

BREEDS OF THE BACON TYPE

LARGE YORKSHIRE SWINE

23. Origin and Development.—The **Large Yorkshire breed** of swine originated in England. For many years large, awkward, white swine have existed in certain parts of that country, particularly in Yorkshire, Lincolnshire, and Norfolk, and it is from these animals that the Large Yorkshires were developed. The first improvement in these swine was brought about by crossing them with a breed known as Leicester. This cross was further improved by breeding the best sows to Small Yorkshires. In later years, breeding has been for the purpose of developing the sides of the animals and consequently the bacon-producing qualities. The first Large Yorkshires were imported into the United States in 1892, and

were taken to Minnesota. The breed has since spread to many parts of the United States and Canada. It is better known at the present time in the eastern provinces of Canada and in Minnesota than elsewhere in America.

The American Yorkshire Club has charge of the registration of both Large Yorkshires and Small Yorkshires in the United States and Canada.

24. Description.—In Fig. 10 is shown a boar of the Large Yorkshire breed. The hogs of this breed are white in color,

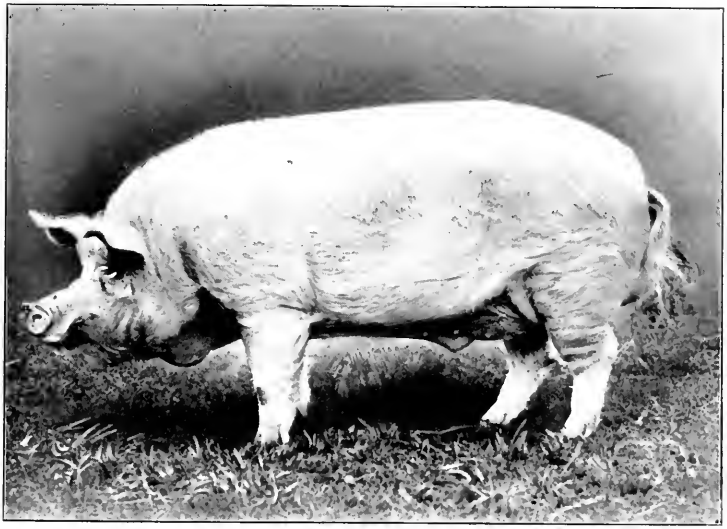

FIG. 10

with occasional blue spots on the skin. They are large in size, rangy, inclined to be long in the leg and coarse in bone, and are somewhat slow in coming to maturity. They have extreme length and depth of body, and their meat is well streaked with fat and lean, being especially desirable for bacon purposes. In fact, Yorkshire bacon is considered to be the best obtainable.

The ideal Large Yorkshire is described in the following detailed standard of excellence compiled from that adopted by the American Yorkshire Club.

1. Forehead and Poll.—White.
2. Eyes.—Medium size, clear, and bright.
3. Jowl.—Medium, not carried too far back toward the neck, and not flabby.
4. Snout.—Turning upwards with a short curve, increasing with age.
5. Ears.—Medium in size, standing well out from the head; of medium erection and inclining slightly forwards.
6. Neck.—Of medium length, fair width and depth, rising gradually from the poll to the withers; muscular, but not gross; evenly connecting the head with the body.
7. Outline of Body.—Long, deep, and of medium breadth; equally wide at the shoulders, sides, and hams; top line slightly arched, bottom line straight.
8. Back.—Moderately broad, even in width from end to end; strong in loin; short ribs of good length.
9. Shoulders.—Large, but not massive; not open above.
10. Arms and Thighs.—Broad and of medium length and development.
11. Brisket.—Wide and on a level with the bottom line.
12. Sides.—Long, deep, straight, and even from the shoulder to the hip.
13. Ribs.—Well arched and deep.
14. Heart Girth and Flank Girth.—Good and about equal.
15. Hind Quarters.—Long, to correspond with the shoulders and sides; deep, with moderate and gradual droop to the tail.
16. Hams.—Large, well let down on the thigh and twist, and rear outline somewhat rounded.
17. Twist.—Well down and meaty.
18. Tail.—Medium; not much inclined to curl.
19. Legs.—Medium in length; strong; not coarse, but standing straight and firm.
20. Hair.—Abundant, long, of medium fineness, and without any bristles.
21. Skin.—Smooth and white; without scurf; dark spots in skin do not disqualify.
22. Color.—White on every part.
23. Movement.—Active but not restless.

TAMWORTH SWINE

25. Origin and Development.—The **Tamworth breed** of swine originated in central England, notably in the county of Stafford. The breed is one of the oldest in existence and the ancestry is obscure. The early animals of the Tamworth

breed were long and narrow, and exceedingly active, but those of the present day are more compact and less active. Improvement was made by selection rather than by crossing. Not many animals of the breed are found in the United States, but they are found in every province of Canada, being especially numerous in Ontario.

26 **Description.**—A typical Tamworth boar is illustrated in Fig. 11. The color of the Tamworths is somewhat variable, a golden-red hair on flesh-colored skin that is free from black being preferred. The snout, as may be seen in the illus-

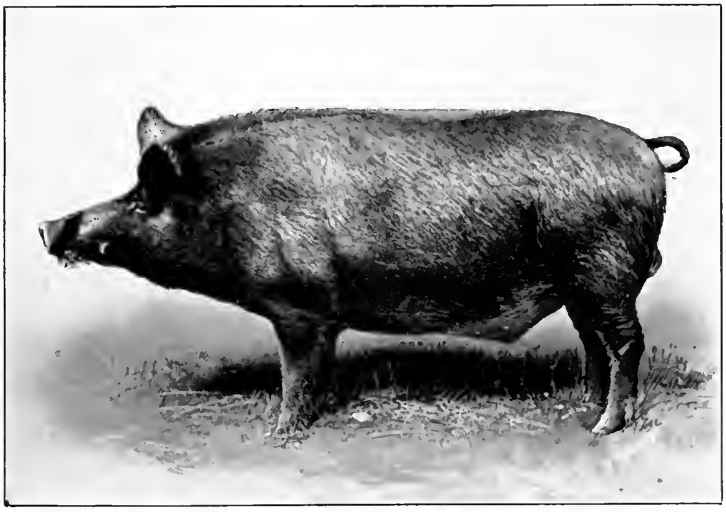

FIG. 11

tration, is very long and straight, the ears are large and pointed, and the legs are long. The animals have long, deep bodies and the meat from their carcasses is well fitted for bacon purposes. As compared with Poland-Chinas, Berkshires, and other animals of the lard type, they seem long and narrow. In constitution, they take high rank, being especially strong and vigorous.

The standard of excellence for Tamworths, as adopted by the National Pig Breeders' Association of Great Britain and used by the Tamworth Association of America, is as follows:

1. Color.—Golden-red hair on a flesh-colored skin; free from black.
2. Head.—Fairly long; snout moderately long and quite straight; face slightly dished; wide between the ears.
3. Ears.—Rather large, with fine fringe; carried rigid and inclining slightly forwards.
4. Neck.—Fairly long and muscular, especially in the boar.
5. Chest.—Wide and deep.
6. Shoulders.—Fine, slanting, and well set.
7. Legs.—Strong and shapely, with plenty of bone, and set well toward the outside of the body.
8. Pasterns.—Strong and sloping.
9. Feet.—Strong and of fair size.
10. Back.—Long and straight.
11. Loins.—Strong and broad.
12. Tail.—Set high and well tasseled.
13. Sides.—Long and deep.
14. Ribs.—Well sprung and extending well up to the flank.
15. Belly.—Deep, with straight bottom line.
16. Flanks.—Full and well let down.
17. Quarters.—Long, wide, and straight from the hip to the tail.
18. Hams.—Broad and full; well let down to the hocks.
19. Coat.—Abundant, long, straight, and fine.
20. Action.—Firm and free.

Objections: Black hair; very light or ginger hair; curly coat; coarse mane; black spots on skin; slouching or drooping ears; short or turned-up snout; heavy shoulders; wrinkled skin; inbent knees; hollowness back of the shoulders.

HAMPSHIRE SWINE

27. Origin and Development.—The **Hampshire breed** of swine, formerly known as the **Thin Rind breed,** is indigenous to England. Like all other breeds of swine, the Hampshire has been developed from coarse, ungainly animals, by careful selection in breeding. Importations into the United States have been made since about 1830. Most of the animals of the breed found in this country are in Indiana, Illinois, Kentucky, and Missouri.

28. Description.—The Hampshire is a black animal with a broad white belt encircling the body and with white fore legs. In Fig. 12 is shown a typical boar of the breed. The

ears of the Hampshire are erect, which, together with the peculiar marking of white, makes them easy to distinguish from animals of other breeds. They have a rather long snout and narrow face, and incline somewhat to smallness of bone.

The Hampshires can be fed to produce a good selling weight of hog at an early age, and by feeding to maturity they make

Fig. 12

good heavyweight hogs. As breeders, they are prolific and are said to possess good constitutions.

The following is a detailed description of an ideal animal of the breed, formulated from the standard of excellence adopted by the Hampshire Swine Record Association.

1. Head and Face.—Head medium length, rather narrow; cheeks not full. Face nearly straight and of medium width between the eyes; surface even and regular.

Objections: Head large, coarse, and ridgy; nose crooked or much dished.

2. Eyes.—Bright and lively; free from wrinkles or fat surroundings.

Objections: Small, deep, obscure, or vision impaired by fat or other cause.

3. Ears.—Medium length; thin and slightly inclined outwards and forwards.

Objections: Large, coarse, thick; large or long knuckles; drooping or not under good control of the animal.

4. Neck.—Short, well set to the shoulders, and tapering from the shoulder to the head.

Objections: Long, thick, or bulky.

5. Jowl.—Light and tapering from neck to point; neat and firm.

Objections: Large, broad, deep, or flabby.

6. Shoulder.—Deep, of medium width and fullness, and well in line with the back.

Objections: Narrow on the top or the bottom; thick beyond the line of the side and ham.

7. Chest.—Large, deep, and roomy; full girth; extending down even with the line of the belly.

Objections: Narrow at the top or the bottom; small girth; cramped or tucked up.

8. Back and Loin.—Back straight or slightly arched; medium breadth, with nearly uniform thickness from shoulders to hams and full at loins; sometimes higher at hips than at shoulders.

Objections: Narrow, creased, or drooped behind shoulders; surface ridgy or uneven.

9. Sides and Ribs.—Sides full, smooth, firm, and carry size evenly from shoulders to hams. Ribs strong, well sprung at the top and the bottom.

Objections: Sides thin, flat, flabby, or creased. Ribs not well sprung.

10. Belly and Flank.—Belly straight and full, without grossness. Flank full and running nearly on a line with the sides.

Objections: Belly sagging or flabby. Flank thin or tucked.

11. Ham and Rump.—Ham of medium width, lank, and deep. Rump slightly rounded from the loin to the root of the tail: buttock full, neat, and firm; devoid of flabbiness or excessive fat.

Objections: Ham narrow; cut up too high in the crotch; buttock flabby. Rump too fat, narrow, steep, or peaked at root of the tail.

12. Legs and Feet.—Legs of medium length, set well apart and squarely under the body; wide above knees and hocks, and rounded and well muscled below; tapering; bone medium; pasterns short and nearly upright. Toes short and firm, enabling the animal to carry its weight with ease.

Objections: Legs too long, slim, crooked, coarse, or short; weak; muscles above hock and knee bones large and coarse and legs without taper; pasterns too long to correspond with the length of leg; too crooked or too slender. Feet long, slim, and weak; toes spreading, too long, crooked, or turned up.

13. Tail.—Medium length and slightly curled.

Objections: Coarse, long, clumsy, or swinging like a pendulum.

14. Coat.—Fine, straight, and smooth.

Objections: Bristles or swirls; coarse or curly.

15. Color.—Black, with the exception of a white belt encircling the body, including the fore legs.

Objections: White running high on the hind legs or extending more than one-fourth of the length of the body; solid black.

16. Size.—Large for condition; boar 2 years old and over should weigh 450 pounds, and sow at the same age 400 pounds; boar at 18 months 350 pounds and sow 325 pounds; boar or sow at 12 months 300 pounds; and at 6 months, 140 pounds.

17. Action and Style.—Action active, vigorous, and quick. Style attractive and graceful.

Objections: Dull, sluggish, and clumsy.

18. Condition.—Healthy; skin free from all defects; flesh evenly laid on and smooth and firm; not patchy or gross.

Objections: Skin scurfy, scaly, mangy, or otherwise unhealthy; hair harsh or unhealthy.

19. Disposition.—Docile, quiet, and easily handled.

Objections: Cross, restless, vicious, or listless.

SWINE FEEDING AND JUDGING

SWINE FEEDING

FEEDING IN GENERAL

1. The feeding of swine should receive much consideration from hog raisers. The hog can be raised on any kind of farm, and, if properly fed, will bring the owner a profit. Too often, however, the feeding of swine is neglected. It is thought by some that the hog is an animal to which unwholesome or spoiled feed can be fed, and that this feed will be digested and assimilated. Although the hog is an omnivorous creature, nevertheless its feed should be chosen with care and should be good and palatable. This does not mean that kitchen wastes should not be utilized as swine feed, but whenever they are used for this purpose, they should be in a wholesome, unspoiled condition.

2. Moldy grain should not be fed to swine, as it is liable to make the animals sick. Soft corn, that is, corn that is immature when cribbed, is also an undesirable swine feed. Corn of this kind that has become frozen before it is ripe is liable to poison hogs to which it is fed. In fact, many hog raisers imagine that their hogs die of hog cholera when death is due to the use of immature frosted corn. Soft corn that has not been frozen can sometimes be utilized as swine feed, but it is much inferior to mature hard corn for making gains in fattening animals.

In connection with the use of spoiled grain as swine feed, a word should be said about the use of what is termed

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blackened grain. Wheat, oats, barley, or rye, if not properly cared for while going through the sweat, will often be slightly blackened as a result of the heating that occurs. Grain of this kind, especially if only slightly charred, is not injurious to swine, and very frequently the farmer can purchase a large quantity at a price that will warrant its use.

3. Sanitary conditions about the places where hogs are fed should not be disregarded. Too often, unused portions of feed will be left in the trough to become moldy, and thereby injurious to the health of the animals. It will be found that hogs will make better gains in weight and will be more thrifty generally if careful sanitary conditions about the feeding lot are observed.

4. The number of times that a hog should be fed during a day and the time that feeding should be done are matters of concern to hog raisers. Persons of experience along this line claim that swine should be fed only twice a day. They state that the hog's health will be better and that larger profits will be made if thus fed than if fed oftener. The first feeding should be done in the morning—in the summer at about 8 or 9 o'clock, and in the winter, say, about ½ hour later. The hog is naturally a late riser, and for this reason late feeding in the morning is preferable to early feeding. In winter, too, a hog seems to prefer the warm nest of his sleeping quarters to the chill morning air of the feeding lot. The time of day at which the second portion of feed should be given, will depend on the season. In winter, it should be as early as 4 o'clock in the afternoon. The animal will then have a chance to eat before going to its nest for the night. If fed much later than this, the animal will be routed out of its nest. In summer, the feed may be given about an hour later, for the reason that the hog does not seek its nest so early. Hogs should not be fed during the heat of the day, especially in the summer time, because they are liable to become overheated.

SWINE FEEDS

5. Grains.—Some kind of grain is nearly always included in a ration for swine. The grain commonly used for this purpose is **corn,** largely because of its fattening tendency and because hogs nearly always thrive when this grain is part of a ration. Corn, however, must be used judiciously, or bad effects will result. Only a part of the ration should be corn. An experiment to determine whether or not corn alone is satisfactory as feed for swine was made a few years ago at the Illinois Experiment Station. A lot of pigs 3 months old that weighed about 50 pounds each were fed for a period of 6 months on corn only. At the end of this period, it was found that each pig had gained only 20 pounds in weight, and that 21 pounds of corn was required to make 1 pound of gain. At the same time, a similar lot of pigs were fed on a properly balanced ration that included corn as the grain part. Each of these pigs gained 250 pounds in the same time that each of the first lot gained 20 pounds, and the number of pounds of feed required to make a pound of gain in the second lot was only 4.6 as compared with 21 pounds for the first lot. The experiment proved that corn is valuable as the grain part of a ration for hogs, and that it is not advisable to use it as the sole feed of the animals.

6. Oats, barley, wheat, and **rye** are also valuable grains for hog feed. None of them, however, is so fattening as corn. If fed as the principal grain of a ration, they are better adapted for the production of the bacon type of hog than the lard type. Most of these grains are used more extensively for other purposes than as swine feed, but whenever they can be purchased at a suitable price they can be profitably used for the feeding of swine. As has already been mentioned, it is sometimes possible to procure oats, barley, wheat, and rye that have been blackened by heating. Whenever these grains can be purchased at a reasonable price, they may well be made a part of the swine ration, for blackened grains are as useful so far as food value is concerned, as grains not blackened.

7. Buckwheat is sometimes fed to swine. Especially is this true in regions where it is grown extensively. Like wheat, buckwheat is sometimes injured so that it cannot be made into flour, and it may then be profitably used as swine feed.

8. Grain By-Products.—Besides the grains themselves, the **grain by-products** are very often used as swine feed. The by-products obtained in the milling of wheat are especially valuable, as all of them are rich in protein. They include *bran*, *shorts*, *middlings*, and *screenings*. The by-products of oats are *oat hulls* and *oat feed*. The former of these is of little value because it consists largely of crude fiber, but the latter can often be used to advantage, as it contains about 15 or 16 per cent. of protein. The by-products obtained in the milling of rye are rye bran, which contains 15 per cent. of protein, and rye shorts, which contains 18 per cent. Both of these are sometimes used as swine feed.

Other small grain by-products are *rice bran*, *rice hulls*, *rice polish*, *buckwheat hulls*, *buckwheat bran*, and *buckwheat middlings*. Of these, rice hulls and buckwheat hulls are the poorest for hog feed, because they are made up largely of crude fiber. Rice bran, rice polish, and buckwheat bran contain about 12 per cent. of protein, while buckwheat middlings contain as high as 28 per cent. of protein.

Brewers' grains and *malt sprouts* are grain by-products obtained from breweries. The grains when dried contain about 20 per cent. of protein, and the sprouts about 27 per cent. These by-products are extensively used for feeding swine.

Gluten meal and *gluten feed*, which are corn by-products, are often used as swine feeds. The meal contains on an average about 33 per cent. of protein and the feed about 24 per cent.

Of the grain by-products mentioned above, the ones best adapted for swine feeding are gluten meal, gluten feed, buckwheat middlings, brewers' grains, malt sprouts, and wheat middlings.

9. Cottonseed and Linseed Meals.—The meals obtained from cottonseed and flaxseed, known respectively as **cottonseed meal** and **linseed meal** are similar in some respects to the grain by-products just mentioned. These meals are especially rich in protein, cottonseed meal averaging about 45 per cent. and linseed meal about 35 per cent. Although cottonseed meal is one of the most valuable of the protein feeds, it is not particularly well adapted for the feeding of swine. In the meal, there are always small quantities of cotton fiber, and when it is fed to hogs these fibers are likely to form into a mass in the intestines or stomach, sometimes causing the death of the hog. If used at all for hog feeding, linseed meal must be given in small quantities, as an excessive quantity is injurious to the health of the animals.

10. Beans and Peas.—The leguminous feeds, **beans** and **peas,** either whole or ground into meal, are useful as swine food. They are rich in protein and are therefore especially suitable for mixing with corn to produce a ration that is less fattening than if corn alone is used. For the feeding of bacon hogs, these leguminous feeds are well adapted. They include soybeans, cowpeas, garden peas, and the meals made from them.

11. Succulent Feeds.—Swine need a certain quantity of **succulent feed.** Vegetables of any kind are often included in the ration to supply a part or all of the succulent feed required. Sugar beets, mangel wurzels, and turnips are frequently used for this purpose, and small or otherwise unmarketable potatoes can often be disposed of to advantage by feeding them to swine. Sweet potatoes, especially in places where they are abundantly grown, are often used as swine feed. Pumpkins also make a good feed for swine. They should be broken into small pieces and thrown into the hog lots or pastures. They are greatly relished by the hogs and are said to act beneficailly on the kidneys of these animals.

In the summer, succulent feed for hogs can be provided in the form of a pasture. Alfalfa is one of the best pastures for swine. Red clover in the North and Crimson clover in

the South are valuable plants for a swine pasture. A blue-grass pasture in which there is a mixture of White clover is a desirable one for swine during spring, early summer, and fall, but in late summer these pastures generally dry out so much that some other form of green feed must be supplied for a time. Timothy while young and before it forms the stem is a good plant for hog pastures; so also is either oats or rye. Winter vetch and oats and peas mixed are also frequently used for pasturing hogs.

12. Other succulent green feeds used for feeding swine are green sweet corn, green field corn, and green sorghum. Sweet corn can be planted at such a time that it will be ready for use when pastures are dry. It is fed at about the roasting-ear stage, the whole stalk with ear attached being thrown into the feeding lot. Green field corn is used in the same manner. As a rule, the field corn comes into the roasting-ear stage a little later than the sweet corn. The lower part of the stalks of field corn, if exceedingly woody, should be discarded. Sorghum cane that is to be used as swine feed should be cut just as it is ripe and either stored in a barn or shed or made up into large shocks. The cane will make a valuable succulent feed, especially if it has not been frozen. After freezing, sorghum cane becomes sour and lacks sugar and juice.

13. Hay.—In order to add bulk to a swine ration **hay** is sometimes used. Well-cured alfalfa and clover hays are superior to other hays for swine feeding. A good way to prepare hay for use is to chop it into short lengths in a cutting box, mix it with the quantity of grain to be used for a mess or two, and then run the mixture through a steel-burr grinder. The chopped hay will not run through the grinder unless it is mixed with the grain.

14. Animal By-Products.—From meat-packing establishments are obtained several **animal by-products** that may be used as swine feed. They include tankage, meat meal, cracklings, and bone meal. The tankage and meat meal are especially rich in protein and are therefore valuable for mixing

with corn. Tankage and meat meal often contains as high as 60 per cent. of protein, but as the quantity varies in different lots, the hog raiser should always purchase and feed these materials according to the analysis that is printed on the outside of the bag in which they are sold. Cracklings, which is the residue left after lard has been removed from hog fat, is compressed into cakes at the factory. Before being fed to hogs, it should be broken into pieces and ground into a meal. Cracklings is relished by pigs of any age, and is especially useful in a ration, as it has a tendency to act as a laxative for the animals and to make their hair glossy and smooth. Bone meal in a swine ration acts as bone-making material for the hogs. It is fed in small quantities; a tablespoonful for each pig at weaning age is the average quantity used.

15. Dairy Products.—Whenever procurable, milk or some of its products should be included in a swine ration. The skim milk, buttermilk, or whey returned from creameries or cheese factories is a valuable feed for swine. Such products are nearly always mixed with corn meal, pea meal, etc. when fed to the animals. Whole milk is sometimes used for swine feeding, but, as a rule, it is so valuable for other purposes that the by-products are more often used.

16. Mineral Matter.—It is necessary that hogs have **mineral matter** in their feed. A mixture of wood ashes, salt, iron sulphate, and air-slaked lime is used with success by many swine raisers. The proportions of such a mixture should be about as follows: 1 part each of iron sulphate and salt, 2 parts of lime, and 4 parts of ashes. Some of the mixture should be placed in a box or some other receptacle in the feeding lot where it will be accessible to the hogs at all times.

17. Charcoal.—Hogs should be fed some **charcoal** at least once a week, as this substance will correct any acidity in their stomachs. A bushel of charcoal for every 8 or 10 hogs is about the quantity that should be fed at one time. Char-

coal can be easily prepared on the farm. In the first place, it will be necessary to dig a pit in which to burn the charcoal. A pit that is 5 feet in depth and 6 feet in diameter at the surface and 3 or 4 feet in diameter at the bottom, so that the sides will slope from top to bottom, will be large enough. The pit should be walled up with brick or stone if it is dug in soil that is liable to cave in at the sides. It will be necessary also to have a sheet-iron cover that will fit over the top of the pit. This cover should be made so that it can be easily removed. Dry corn cobs are used in making charcoal, one wagon box being sufficient to make one pitful of charcoal. A shovelful of cobs is set on fire in the pit and then dry cobs are added, a shovelful at a time, fast enough to keep the whole mass at a glow. Care must be taken, however, that the cobs do not burn to ashes. When the pit is full of glowing cobs, a barrelful of salt water, that is, water containing sufficient salt to form a strong brine, is poured into the pit. This water will check any blaze there may be in the pit, but it will not put the fire out entirely, and the salt it contains will have a tendency to make the charcoal palatable. The cover is then placed over the pit and earth is banked above it so as to prevent air from entering. If air is allowed to enter, the cobs will burn to ashes, but if the air is excluded, they will soon char. After a day or so the pit is opened, when it will contain a quantity of charcoal that will be relished by the hogs.

18. Water.—Swine, of course, require **water.** It should be borne in mind, however, that pure water, and only pure water, should be given to them. If there is no water supply in a hog lot or pasture, it will be necessary to carry the water there, for animals should be given all the water they desire to drink. It has been observed, however, that when considerable water is used in the grain rations fed to hogs, they will want very little to drink.

FEEDING OF SWINE FOR PORK PRODUCTION

GENERAL CONSIDERATIONS

19. Indications of Good-Feeding Type of Swine.—The person who feeds swine for the purpose of producing pork should know the indications of an animal that will gain weight rapidly and thereby pay a profit to his owner. If the hog raiser is feeding the lard type of hog, he should seek as animals for fattening those which possess the form and characteristics of the fat-hog type. The indications of an animal that will put on fat rapidly are as follows: Face, rather short and broad; head, wide; ears, well apart; jowl, full; legs, short; body, wide and deep, with a good, full spring of rib. To the touch the hog should be mellow, rather than hard and rigid. A hog possessing these qualities will be found an easy one to fatten. The indications of a hog of the fat-hog type that is not easy to fatten are as follows: Nose, long; face, narrow; space between eyes, narrow; ears, near together; head, narrow; legs, long; body, narrow, with a poor spring of rib.

If a hog raiser is feeding bacon hogs, he should look for a little less width about the head and face than is found in the lard type, but at the same time he should avoid selecting a hog that possesses coarseness. He should look for good length and depth of body, and for an animal that seems thrifty and has a good appetite.

20. Feeding for Lard or for Bacon.—Whether a hog raiser should feed hogs for lard or for bacon will depend largely on the location of his farm. Whenever possible he should make use of home-grown feedstuffs, because the feeding of hogs on purchased feed entirely is not often conducive to profit. If the hog raiser lives in the corn belt of the United States and grows large quantities of corn and clover, he will generally find it profitable to raise lard-type breeds. Corn, on account of its fattening tendency, is an excellent grain for lard pro-

duction. Farmers in the corn belt can produce a fairly good bacon hog by feeding a narrow ration to their swine, but corn should not form more than one-third of the grain part of the ration.

Swine raisers outside of the corn belt who can grow barley, peas, oats, etc.—feeds having a narrower nutritive value than corn—can often raise bacon hogs to advantage, because their home-grown grains form a narrow ration that is well adapted for the production of bacon.

21. Age to Market Hogs.—Formerly, the markets demanded heavy-weight hogs; that is, hogs weighing 400 or 500 pounds. To raise hogs of this weight, it is necessary to feed them to an age of 1½ to 2 years. The demands of the markets during late years, however, have changed considerably. Young hogs weighing from 150 to 200 pounds now bring the best market prices. Hogs larger than these will find a ready sale, but they generally bring a little less per pound. The present demand of the market is advantageous to hog raisers, because more money can be made in selling young hogs than in selling old ones. The reason for this is that a hog during the first months of its life will make greater gains in weight for a given quantity of feed consumed than will an older hog. Experience proves that two lots of pigs can be fed to an age of from 6 to 8 months and be brought to a weight of about 200 pounds each for less money than one lot can be fed to an age of 1 or 1½ years and be brought to a weight of about 400 pounds each.

22. Time of Year for Fattening Hogs.—The time of the year during which hogs are fattened has much to do with the profits. Except in warm climates, winter is a poor time for fattening hogs. Much of the feed that would tend to make fat is needed to keep the animals warm, and for this reason it requires more grain to make a pound of gain during cold weather than during warm weather. When raising hogs commercially, therefore, it is a good plan to breed them so that the litters will be farrowed in the spring. The pigs can

then be fattened during the summer and sold before the occurrence of winter weather

23. Places for the Fattening of Hogs.—When pigs are to be fattened during the warm season of the year, the best place for them is a good pasture. Shelter, of course, should be provided. Houses or sheds, as described in a previous Section, should be erected in the pasture or lot. In addition, there should be some kind of shade to protect the pigs from the heat of the sun; if there are no trees to provide natural shade, an artificial shelter should be erected. Such a shelter can be made by covering a framework of posts with tree branches. These branches should not be placed so close together that rain cannot penetrate to the ground below, because an occasional wetting is necessary to lay the dust in the shelter. In fact, if rains are not frequent enough to keep the dust settled, a few pails of water should occasionally be thrown on the floor of the shelter place. Dust will cause hogs to cough.

Hogs cannot be fattened so economically in small yards as in pastures. Pen feeding, therefore, should not be adopted except by persons who have small farms and cannot spare space for a pasture lot or by villagers who wish to keep a few swine in their back yards. When feeding hogs in pens, it is a good plan to give them some green stuff occasionally so as to make up for what they would get were they on pasture.

If it happens that hogs must be fed for fattening during part or all of the winter, they should be placed in a fairly good-sized feeding lot that is provided with a house or shed in which they can stay when not being fed. Plenty of straw should be placed in such an enclosure, so that the animals can burrow into straw and thus keep warm.

24. Gain in Weight Made in Fattening Swine.—The gain that hogs should make while being fattened for market depends on conditions. If they are of the kind that fatten readily and are properly housed and kept free from vermin

and disease, they will naturally make greater gains than if the reverse is true. Under average conditions, a swine raiser may expect a daily gain of at least 1 pound for each hog from the date of its birth to the age of 1 year. After a hog is 1 year old, it will gain less per day than before. Under exceptional conditions, a gain as high as $2\frac{1}{2}$ pounds a day may be made, but as a rule a feeder should not expect a greater gain than 1 pound a day.

RATIONS FOR FAT HOGS

25. Ration for Unweaned Pigs.—During the time pigs are running with their mothers they should be fed a rather narrow grain ration. The reason for feeding a narrow ration at this period of their lives is that they need feed rich in protein. Protein furnishes the material to grow bone, muscle, hair, etc., the parts that are being developed during the first month or two of the life of the pig. The following materials mixed in the proportion given have been found by experience to be well suited for suckling pigs:

	Parts
Corn meal	2
Wheat middlings	7
Tankage	1
Skim milk	30

These materials are mixed together to form a medium thick slop, and are fed soon after being mixed. If allowed to stand very long, the mixture will become sour, and thus unfit for use. Of this mixture the pigs are fed just what they will clean up with a relish. No feed should be left in the troughs to become sour. If skim milk cannot be procured, pure, fresh water may be substituted.

26. Ration for Pigs After Weaning.—After weaning the pigs, the rations given in the preceding article may be continued until they reach an age of about 4 months. From the fourth to the sixth month, the following proportions may be used:

	Parts
Corn meal	5
Wheat middlings	4
Tankage	1
Skim milk	30

From 6 months up to the time the pigs are marketed, the following proportions are used:

	Parts
Corn meal	4
Tankage	1

This mixture is either fed dry or made into a thick mush by the addition of skim milk, whey, or water. If fed dry, an abundance of pure, fresh water should be placed where the pigs can get it at will.

27. Other mixtures that will give about the same proportion of nutrients may be substituted for the preceding rations. When fattening pigs for market, the hog raiser should bear in mind that it is always advisable to have the ration made up largely of home-grown feed.

Whatever ration is used, it is a good plan to change the ingredients occasionally by substituting other feeds that will give about the same quantity of nutrients. Hogs welcome a variety in feed as well as do other animals. If the preceding mixture is being used, the hog raiser can substitute ground barley or ground rye for the corn meal for a few days, or he can leave out the middlings and add ground oats. Care, however, should be taken in feeding oats. Unless the hulls are separated from the grain part, oats should not be fed to pigs until they have reached the age of 5 or 6 months. The hulls of oats tend to irritate the intestines of young pigs.

28. Succulent Feed for Fattening Hogs.—In addition to rations given in the preceding paragraphs, young pigs need some kind of succulent feed. In summer, which is the ideal time to fatten pigs, this succulent feed can best be derived from pasture. Animals running on pasture require less attention from their caretakers than do animals that are

being fed in a lot, for the reason that they gather a large part of their feed themselves. The exercise that the pigs get in searching for feed in a pasture tends to give them a good appetite and to keep them healthy.

29. In the corn belt of the United States, a satisfactory system of pasture feeding is followed for pigs that are farrowed sometime in April and are ready to be turned out to pasture in May. In the previous fall, a field is sown to either rye or winter vetch, so that there will be a good crop ready for the pigs when they are turned out in the spring. Either of these crops makes a good pasture for pigs at this early date, and, 1 acre of pasture will supply 100 pigs and their mothers with green feed for a month. While the pigs are on this pasture, a ration of corn meal, wheat middlings, tankage, and skim milk, as described in Art. **25,** is fed to them.

About the first of June, and in some cases sooner, the pigs are separated from their mothers and placed in a clover or an alfalfa pasture. If in good growing condition, an acre of this kind of pasture will supply green feed for the pigs for the next 5 or 6 weeks. A ration of corn meal, wheat middlings, or some similar feed is also fed to the pigs while on this pasture.

On or about the fifteenth of July, when clover and alfalfa pastures begin to dry up, the pigs are turned into a pasture of field peas and oats. The planting of the peas and oats is so timed that the plants will be far enough grown by about the middle of July to supply a part of the grain ration for the pigs. Thus, this pasture makes it possible to decrease the quantity of corn meal, etc. that must be fed to the animals. The acreage of peas and oats, however, is of course a little larger than that of rye or vetch, because the pigs by this time are larger and because the pasture supplies a part of their grain feed.

Green sweet corn is fed to the pigs while they are on the pasture of peas and oats, and in order to supply it, a piece of land is planted to sweet corn at the regular corn-planting time. The green corn is not given to the animals until it reaches

the roasting-ear stage, when the stalks with ears attached are cut up and thrown into the pasture. Green sweet corn is fed sparingly at first, the quantity being increased gradually. Too much corn at first is liable to make the pigs sick. The corn-meal ration is made very small while green corn is being fed to the pigs, and in some cases it is done away with entirely. Shortly after the sweet-corn crop, the field corn is ready for swine feeding. It, too, is fed while in the roasting-ear stage. However, if the bottom portion of the stalks of field corn have become woody by the time the ears reach the roasting-ear stage, only the top portion is fed to the hogs. The pigs are kept on pasture, and corn, which in the meantime becomes more mature, is fed to them until fall or early winter, when they are ready for market.

RATIONS FOR BACON HOGS

30. Rations for producing bacon hogs should be somewhat narrower than those required for fat hogs. In the corn belt, bacon hogs for the first month or two after birth should be fed about the same ration as that given in Art. **25.** The finishing ration, however, should be different from that for fat hogs. A mixture of corn, other grains, mill feed, tankage, skim milk, and pasture crops make a satisfactory ration for bacon pigs. Corn should not, however, form more than one-third of the concentrated part of the ration. Outside of the corn belt where barley, peas and oats, are grown, these grains mixed with shorts, middlings, tankage, and skim milk give good results. For summer, alfalfa, clover, or some other pasture for the production of green forage is desirable. If the hogs are kept and fed during winter, mangel wurzels, sugar beets, or turnips may form the succulent part of the ration. Winter feeding, however, is so expensive that it is not often practiced.

RANGE FEEDING OF HOGS

31. In the western part of the United States and in some parts of Canada, hogs are sometimes kept in large droves and fed for market. Such a method of feeding is known as **range feeding.** In the spring a drove of sows with their litters is placed in the best pasture obtainable, which in these regions is generally one of alfalfa or field peas, or in some cases both. The sows and the young pigs are left on this pasture until they become marketable, no feed other than the alfalfa or peas being given to them. In the fall, stock for breeding purposes is removed from the drove and the rest of the animals are taken to market. Hogs raised and fed in this manner make a satisfactory product at a small cost. The labor required in caring for a large number of hogs on a range is much less than that required where more intensive methods are followed. One or two men can care for about 1,000 range-fed hogs during a season. Shade of some kind should be present in the pasture; if there are no trees, cheap sheds should be built. Pure water should, of course, be available at all times.

FEEDING OF BREEDING SWINE

32. Feeding of Herd Boars.—The boar or boars of a breeding herd of swine should be placed in pastures or lots by themselves. The feed for aged animals should consist of a slop composed of a mixture of different ground grains and mill feeds, enough only being fed to the animals to keep them in fair flesh. A ration that has been found satisfactory consists of the following:

	Parts
Ground oats	2
Corn meal	1
Wheat middlings	1

For each mess, a small quantity of salt and a handful of linseed meal may be added to this ration, and these should be mixed together with sweet skim milk to form a slop.

Only as much of this mixture as the boar will eat with a relish should be given at one time.

Young boars during their first half year should be given enough of a ration consisting of mixed mill feed and grain to keep them in rapid growth. This means that the quantity given at a meal should be all that they will eat with a relish.

33. Feeding of Brood Sows.—In order to produce a strong litter of pigs, a brood sow should be properly fed during the entire period of gestation. The feed used should be similar to that recommended for young pigs. The following combination for the concentrated part of the ration has been found to be satisfactory:

	Parts
Corn meal	5
Middlings or ground oats	5
Tankage	1

This ration may be fed either dry or mixed with water. If the sows are being fed during the winter, some bulky feed should be added to the above list. Well-cured alfalfa or clover hay will prove to be a good feed. If such hay cannot be procured, sugar beets or mangel wurzels may be used. In the absence of all these, sorghum cane that has been cut when ripe and placed where it is protected from frost will answer.

34. A brood sow carrying a litter during the summer should be placed on good alfalfa or clover pasture. She will then require no other bulky feeds than those which she can gather. The mixed ration mentioned in the preceding article may be fed to the sow if it is easily procurable, but, if the pasture is an exceedingly good one, ear corn alone may be made to answer as the grain part of the ration.

35. After a sow has farrowed, she should not be fed anything for the first 24 hours. A drink of pure water should, however, be given several times during the day. If feed is fed to the sow the first day after farrowing, it is likely to cause such a flow of milk that a fever will be started in the udder.

Such a condition results in tenderness of the udder, and when such is the case, the sow will not allow the pigs to get milk. A condition like this will often result in the loss of the pigs and in the ruination of the sow. On the second day the sow should be fed a small quantity of slop consisting of the mixture just mentioned and water. The quantity of slop fed to the sow should then be increased a little each day up to about a week after the pigs are born. At the end of the week, if the pigs and the sow are healthy, she may be given a full feed of the slop. A full feed in this case will mean about the quantity she will eat with a relish. As the pigs increase in size, the slop given the sow should be mixed with skim milk instead of water, as the skim milk will have a tendency to increase the milk flow of the sow.

SWINE JUDGING

36. Classification of Exhibition Swine.—At county and state fairs and at livestock exhibitions, animals are generally brought together in competition. In the swine family, there will naturally be three general classes, or divisions, into which animals can be placed. These classes are **lard, or fat, swine; bacon swine;** and **breeding stock.** Pure-bred animals can, of course, be placed in two of the classes. For example, pure-bred Berkshires can be placed in the fat-hog class as well as in the breeding-stock class; and Tamworths can be placed in the bacon-hog class and in the breeding-stock class. Animals that are not pure bred can be placed only in the fat-hog or in the bacon-hog class.

37. Qualifications of a Swine Judge.—When animals are brought together in competition, it is necessary that some person decide which ones possess merits over others. This work at the fairs and expositions is generally done by competent judges. No person is capable of judging swine unless he has in mind the ideal standard of the type on which he is asked to pass judgment. In addition, he must be able to see the points of excellence as well as the points of weakness

in all animals, and to weigh these as to importance. Besides these qualifications, he should be a person that is not easily confused. After decisions have been made by a judge, he should be able and willing to show why he considers a certain animal or certain animals better than others. It often happens that he can do this to advantage by placing the animals about which exhibitors may be disputing side by side in the judging ring and then pointing out the weaknesses of the one animal and the excellent points of the other. For example, suppose two hogs are similarly well formed in every respect, except that one has a good, full, strong back while the other has a back that sags about 2 inches below the level. Were these two animals placed side by side, the exhibitors would quickly see why one is judged to be better than the other.

38. Use of Score Card in Swine Judging.—When learning to judge animals, persons often make use of a **score card,** which is a card containing a list of qualifications that should be looked for in an animal of the type or breed that is to be judged. At the right of the list is a series of numbers that when added will amount to 100. These numbers indicate the relative weights of the qualifications.

In scoring animals, a cut, or deduction, is subtracted from the number opposite each qualification, and the remainder is placed as the relative worth of the animal for that qualification. These numbers are added after the work of scoring has been finished, and the sum is said to be the *score of the animal.* An ideal animal, that is, one that is perfect in all qualifications, would score 100.

39. Three score cards are given here. The first is for a barrow of the fat-hog type, and the second is for a barrow of the bacon-hog type. In comparing the weights given for certain qualifications on these two score cards, it will be seen that in the fat-hog type great weight is given to the back, loin, and hams, while in the bacon-hog type great weight is given to the sides and belly. The reason for giving these relative weights is obvious when it is remembered that the

SCORE CARD FOR FAT BARROW

	General Appearance	Perfect Score	Judge's Score
1.	Weight: score according to age (pigs of a given age should show a certain weight)..	6	____
2.	Form: deep, broad, low, long, symmetrical, compact, standing squarely on legs.....	10	____
3.	Quality: hair, silky; skin, fine; bone, fine; mellow covering of flesh, free from lumps and wrinkles.....	10	____
4.	Condition: deep, even covering of flesh and fat over all parts of the body.....	10	____
	Head and Neck		
5.	Snout: medium length, not coarse.....	1	____
6.	Eyes: full, mild, bright.....	1	____
7.	Face: short, cheeks full.....	1	____
8.	Ears: fine, medium size, soft.....	1	____
9.	Jowl: strong, neat, broad.....	1	____
10.	Neck: thick, medium length.....	1	____
	Forequarters		
11.	Shoulder; broad, deep, full, compact on top	6	____
12.	Legs: straight, short, strong; bone, clean; pasterns, upright; feet, medium size.....	2	____
	Body		
13.	Chest: deep, broad; large girth.....	4	____
14.	Sides: deep, lengthy, full; ribs, close and well sprung.....	6	____
15.	Back: broad, straight, thickly and evenly fleshed.....	10	____
16.	Loin: wide, thick, straight.....	8	____
17.	Belly: straight, even.....	4	____
	Hindquarters		
18.	Hips: wide apart, smooth.....	2	____
19.	Rump: long, wide, evenly fleshed, straight..	2	____
20.	Ham: heavily fleshed, plump, full, deep, wide	10	____
21.	Thighs: fleshed close to hocks.....	2	____
22.	Legs: straight, short, strong; bone, clean; pasterns, upright; feet, medium size.....	2	____
	Total.....	100	____

SCORE CARD FOR BACON-TYPE BARROW

	General Appearance	Perfect Score	Judge's Score
1.	Weight: 170 to 200 pounds, the result of thick cover of firm flesh	6	
2.	Form: long, level, smooth, deep	10	
3.	Quality: hair, fine; skin, thin; bone, fine; firm covering of flesh without any soft bunches of fat or wrinkles	10	
4.	Condition: deep, uniform covering of flesh, especially in region of high-priced cuts	10	
	Head and Neck		
5.	Snout: fine	1	
6.	Eyes: full, mild, bright	1	
7.	Face: slim	1	
8.	Ears: trim, medium size	1	
9.	Jowl: light, trim	1	
10.	Neck: medium length, light	1	
	Forequarters		
11.	Shoulders: free from roughness, smooth, compact and same width as back and hindquarters	6	
12.	Breast: moderately wide, full	2	
13.	Legs: straight, short, strong; bone, clean; pasterns, upright; feet, medium size	2	
	Body		
14.	Chest: deep, full girth	4	
15.	Back: medium and uniform in width, smooth	8	
16.	Sides: long, smooth, level from beginning of shoulders to end of hindquarters. The side at all points should touch a straight edge running from fore to hindquarter	10	
17.	Ribs: deep, uniformly sprung	2	
18.	Belly: trim, firm, thick without any flabbiness or shrinkage at flank	10	
	Hindquarters		
19.	Hips: smooth, wide; proportionate to rest of body	2	
20.	Rump: long, even, straight, rounded toward tail	2	
21.	Gammon: firm, rounded, tapering, fleshed deep and low toward hocks	8	
22.	Legs: straight, short, strong; feet, medium size; bone, clean; pasterns, upright	2	
	Total	100	

SCORE CARD FOR BERKSHIRE SWINE

STANDARD OF EXCELLENCE ADOPTED BY THE AMERICAN BERKSHIRE ASSOCIATION

	Perfect Score	Judge's Score
COLOR—Black, white feet, face, and tip of tail, but skin and hair occasionally showing tinge of bronze or copper color. An occasional splash of white not objectionable; lack of either of white points admissible	3	
FACE AND SNOUT—Face well dished and broad between eyes. Snout short and broad	7	
EYES—Prominent, clean, clear, large, dark hazel or grey	2	
EARS—Medium size, setting well apart, carried fairly erect, inclining forward, especially with age	3	
JOWL—Full, firm, not flabby or hanging too low, running back well on neck	3	
NECK—Full, short and slightly arched; broad on top; well connected with shoulder	3	
HAIR—Fine, straight, smooth, lying close to and covering the body well. Free from bristles	3	
SKIN—Smooth and mellow	3	
CHEST—Deep, full and wide, with good heart girth	6	
SHOULDER—Smooth and even on top and in line with side	6	
SIDE—Deep, smooth, well let down; straight side and bottom lines	6	
BACK—Broad, full, strong, level or slightly arched; ribs well sprung	10	
FLANK—Well back and low down on leg, making nearly a straight line with lower part of side	5	
LOIN—Full, wide and well covered with flesh	6	
HAM—Deep, wide, thick and firm, extending well upon back and holding thickness well down to hock	10	
TAIL—Well upon line with back; neither too fine, short nor tapering	2	
LEGS AND FEET—Straight and strong, set wide apart, short in pastern, with hoofs nearly erect, capable of carrying great weight	10	
SIZE—Size all that is possible without loss of quality or symmetry, with good length. Weight in good condition, boars at 12 months, 350 to 450 pounds; at 24 months, 500 to 700 pounds; sows at 12 months, 350 to 400 pounds; at 24 months, 500 to 700 pounds	6	
APPEARANCE AND CHARACTER—Vigorous, attractive, of good disposition, firm and easy movement	6	
Total	100	

fat-hog type is raised for the production of lard and hams, and the bacon-hog type for the production of bacon. The third score card is for use in scoring breeding hogs of the Berkshire breed. It will be seen that attention is paid to breed characteristics, such as dish of face, shape of ear, color, etc. There are score cards for every breed of hog, but they differ from the one here given only in breed characteristics.

40. General Procedure in Swine Judging.—After a judge has had experience in judging swine, he does not resort to the score card, but places the animals in their respective positions of first, second, third, etc. merely by weighing their several qualifications in his mind. In judging any class of hogs, it is necessary to go about the work in a systematic manner. The exact procedure will vary with different judges; nevertheless, each man should have a definite plan in mind and follow it.

A plan that works well is first to approach the animal from the front and observe from this position the width of the back, the width and smoothness of the shoulders on top, the manner in which the neck joins the shoulders, the width and length of the head, the shape and set of the ears, the presence or absence of wrinkles in the face, and, if the class is one of the breeding swine, the color of the eyes.

The judge should next step to one side of the hog and observe the dish of the face, the trimness or fulness of the jowl, and the manner in which the neck is connected with the shoulder. The width and depth of the shoulder, the depth of the chest and the body, and the shape of both top and bottom lines should also be observed, and from this position the judge can see the length of the rump, the depth and width of the ham, the straightness of the legs, the length of the pasterns, and the way in which the hog stands on its toes. The breaking over of the pasterns, which allows the hog to be let down too far on his toes, is a common fault that should be carefully observed by judges.

The judge next takes his position back of the animal. Here, he observes the width of the hindquarters, and the manner in which the hog is filled out in the hind legs.

The opposite side is then viewed the same as was the other, after which the judge has made a complete observation of the animal from all sides.

This method, or one similar, the judge follows with each hog to be judged. Experience will soon enable him to observe a hog very quickly, and after having observed all, he will reject the inferior ones and give his attention to the better ones. He will then look over the better hogs carefully and decide which one is the best. The second, third, fourth, etc. are then selected, and the result announced.

SWINE BREEDING

GENERAL REMARKS

1. Origin and Development of Swine.—Naturalists are practically agreed that domestic swine are descendants of two species of wild animals: the wild hog of Europe, Africa, and Western Asia, shown in Fig. 1, and the Chinese hog of Japan and Eastern Asia, shown in Fig. 2.

Of the early domestication of swine little is known, save that in ancient times they were herded in large droves in the forests. Early accounts show that little effort was made toward the improvement of swine by breeding until after the latter part of the 18th century. In 1778 a breed known as the Old Irish, a specimen of which is shown in Fig. 3, was in existence in Ireland. The hogs of this breed had long heads, drooping ears, large bones, and coarse bristles. A little later a breed known as the Old English, a typical animal of which is shown in Fig. 4, was developed in England. As may be seen by comparing the specimens illustrated in Figs. 3 and 4, the English hog was an improvement over the Irish hog, as it was shorter in the legs and had more of the body conformation characteristic of the modern breeds of swine. It was, however, uncouth and coarse, and in many ways lacked the quality and fineness possessed by swine of the present day.

From the time of the Old English hog down to the present, there has been much progress in swine breeding. To comprehend this fact, all that is necessary is to compare the illustration of the Old English hog shown in Fig. 4 with that of the two smooth, well-formed Yorkshires shown in Fig. 5.

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The hog of today is a smooth, evenly fleshed animal, and is much better fitted for the production of hams, shoulders, bacon,

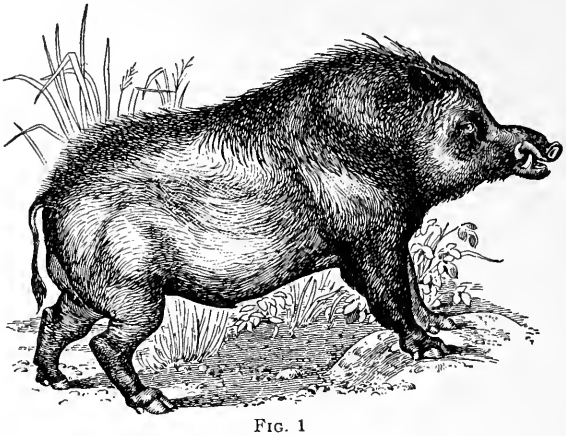


FIG. 1

and lard of excellent quality than were the old types of hogs.

2. Production of Pure-Bred Swine.—It should be the aim of every breeder of swine to improve his stock. A breeder, to

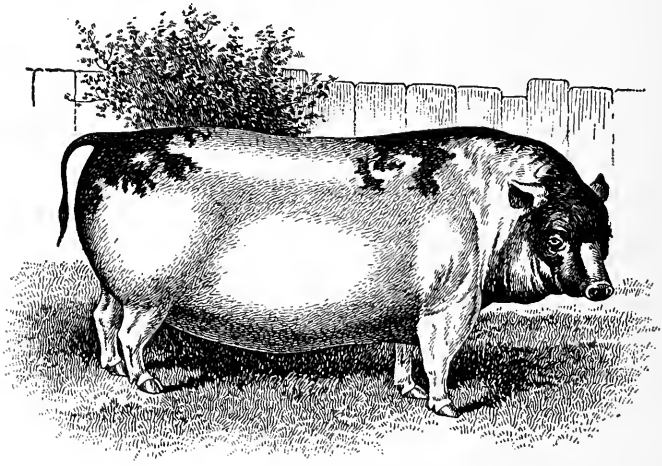


FIG. 2

be able to do this, should study and observe the animals he desires to improve and thus learn wherein improvements can

be made. He should have in mind a definite idea of the type of animal he wishes to produce, for the breeder with a definite type in mind is the only one that succeeds.

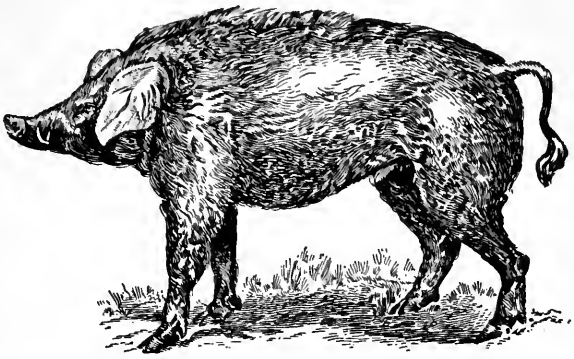


FIG. 3

A person starting in the business of breeding pure-bred animals should purchase his foundation stock from a reliable breeder who sells only animals that possess merit. Before starting in the business, however, he should give it much study and should visit the farms of successful breeders and learn the characteristics of the breed of animals he expects to raise.

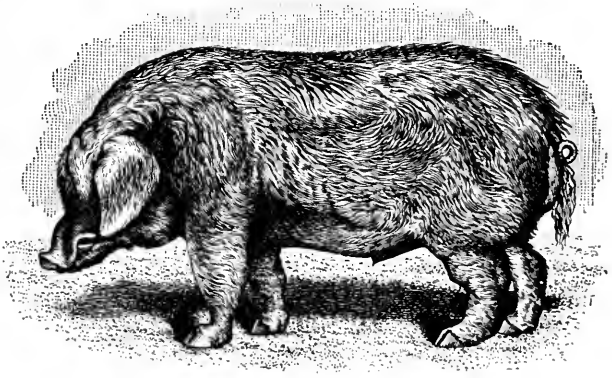


FIG. 4

A man in the breeding business must be truthful in the registering of his stock with the record associations. It is

possible to conceal fraud in pedigree for a time, but the imposition is sure to be discovered and the breeder will find that his breeding stock is not in demand on the market.

Breeders will always find it to their advantage to exhibit their choicest animals at fairs and livestock shows. When just starting in business, small fairs and shows should be the ones attended, and as the breeder becomes better established he should exhibit his animals at the large shows. The exhibiting of animals in this way is the best kind of advertising a breeder can get.

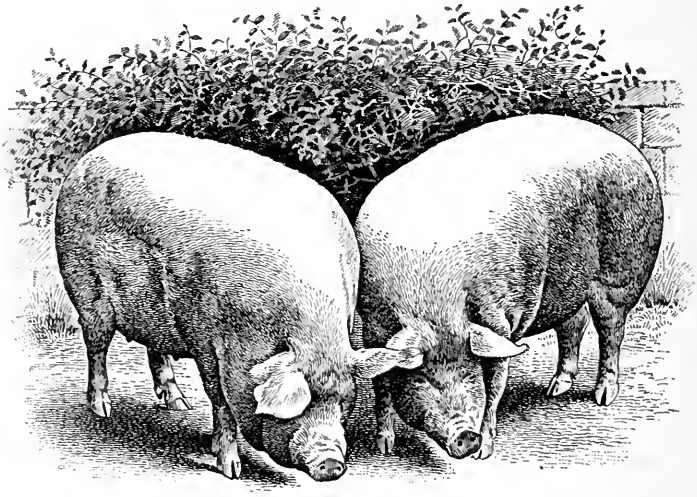


FIG. 5

3. When it is desired to start in the business of breeding pure-bred swine and capital is lacking, a good method of procedure is to grade up a herd. Grading up is accomplished by breeding either native or grade animals with pure-breds, and then breeding the offspring with other pure-breds; this is continued until a cross is reached that is practically a pure-bred animal. The most practical way to accomplish grading up on farms is for a farmer to begin with either native or grade sows and breed them to a pure-bred boar, rather than to begin with pure-bred sows and a grade boar. The offspring will be at least half-breeds, or, as they are

sometimes termed, half-bloods. A pure-bred boar is selected instead of pure-bred sows for the reason that it is more economical to purchase one pure-bred male than it is to purchase a number of pure-bred breeding sows.

At the end of the first breeding season the farmer should dispose of the native or grade sows, the young male pigs of the year's production, and the pure-bred boar, saving only the young half-breed sows for breeding purposes for the next season. The pure-bred sire is disposed of for the reason that were he kept he would be bred to his own offspring; and this inbreeding, except for the accomplishment of certain definite objects, is not considered advisable. The next season a pure-bred boar should be purchased and bred to the young half-breed sows. The resulting offspring will be three-quarters pure blood. Of these, the sows should be saved and bred the next year to another pure-bred boar. The cross that year will be seven-eighths pure bred. If the same process were carried on the next year the pigs would be fifteen-sixteenths pure blood, and the next year the offspring would be thirty-one thirty-seconds pure. This process can be carried on indefinitely, the herd becoming purer each successive generation. Thus, it can be seen that by grading up a herd, a farmer can eventually become a breeder of practically pure-bred hogs.

It often happens that when such a process of grading up is carried on that there will be animals among the offspring that revert to forms similar to the native or grade sows with which the breeding was started. Any such animals should, of course, be rejected. Only the best—that is, those that most nearly approach the pure-bred type—should be kept for breeding.

4. Selection of a Pure-Bred Herd Boar.—A boar selected for use in a herd should be pure-bred and have the desirable characteristics of his breed. He should show marked masculinity. In a good boar this character shows strongly about the head and forequarters. The head may be slightly coarse, the neck should be full and slightly arched, and the

shoulder somewhat heavy. The forequarters are usually a little heavier than the hindquarters, and this difference becomes more pronounced as age increases, as the shields—the thickened skin over the shoulders—develop with age. Masculinity in a boar denotes vigor, stamina, strength, and ability to stamp his get with his own characters.

Generally speaking, the coat of hair on a boar is a little coarser than that on a sow; nevertheless, a boar should not have exceedingly coarse hair over his neck and crest. He should be particularly strong in feet and legs, and should show good development in back, loin, sides, and hams. In addition, he should be active but at the same time docile.

5. Selection of a Pure-Bred Brood Sow.—In selecting a pure-bred brood sow for use in a herd, the breeder should have in mind the type of animal described in the standard of excellence for the breed to which the animal belongs, and should be sure that the points described there are present in the animal. He should see that the color and markings accord with the standard set for the breed, that the shape of face, set and shape of ears, color of eyes, etc. are as they should be. These may seem like fancy points, but they are of value when it comes to showing an animal at a livestock show or when trying to sell it for an animal true to the breed. If a grade sow for breeding were being selected, no attention would be paid to the so-called fancy points.

Besides the fancy points, there are other qualities to be considered. The sow should have the indications of a good feeder and be of a rather large, roomy type, showing plenty of size for her age, with a good length and depth of body, well-sprung ribs, broad back and loin, and deep, well-filled hams. In addition, she should have straight legs set well apart and strong feet on short pasterns. A sow with broken-down feet is very objectionable. Her top line should be straight or preferably show a slight arch upwards. A sagging back should not be tolerated in a brood sow, for if there is even a slight sag in her back before she is bred, she is liable to become saddlebacked when she is carrying her litter, and

besides this, there would be a tendency for the weakness to appear in her offspring. A good brood sow should have at least from 12 to 14 teats, for a large number of teats generally denotes a prolific breeder and one that can suckle a good-sized litter of pigs.

CARE AND MANAGEMENT OF BREEDING STOCK

BOARS

6. Boars that are to be used as sires in a herd of breeding swine need proper care and management. First of all, a breeding boar should have the proper kind and quantity of feed. A mixture of ground oats, corn meal, and wheat middlings, to which is added small quantities of salt and linseed meal and the whole mixed with sweet skim milk to form a slop, makes a satisfactory feed. The quantity that is given will depend, of course, on the size of the animal and his appetite. A good rule to follow in regard to quantity is to feed him enough to keep him in a fair condition, but not enough to keep him fat. In addition to the above ration, a quantity of charcoal, lime, wood ashes, and iron sulphate should always be kept in the feed lot in such a place where they will be available for the boar.

Exercise is necessary for a boar, and for this reason he should be given the run of a small pasture. Boars kept in small pens where they cannot get exercise are not likely to be in strong, vigorous breeding condition.

A boar, to be kept in good condition for breeding, should not be used for service too frequently. Until he becomes fully matured, one service a day is all he should be allowed to give; after he is matured, two services a day may be allowed. Under exceptional conditions three services a day may be allowed, although, as a rule, such practice is not best, for it may result in lessening the vitality of the boar and in the production of litters of weak pigs. A breeder will be much surer of keeping his boar in good breeding condition

and of having vigorous litters of pigs if he is careful about the frequency with which he uses the breeding boars for service.

When a boar is placed with a sow for copulating, he should be removed as soon as the service is finished. If left there longer he may serve the sow again, which, besides being unnecessary, is weakening to the boar. Some breeders make the mistake of using very young boars for breeding. This is not a good practice, for it will not only result in a weakened boar, but the resulting litters are very likely to be small and the pigs weak and puny. A boar near maturity is preferable to a very young one.

SOWS

7. Appearance of Heat in Sows.—Sows that have been properly fed from weaning time first come into the period of heat at about 7 or 8 months of age, although if they have been forced in their early growth the period may occur somewhat earlier. After the first occurrence the sow comes in heat about every 21 days, unless, of course, she has been bred. The period of heat in a sow usually lasts about 3 days. A sow in heat is restless and when in sight of a male hog will give a sort of bark or call. The swelling of the vulva is another indication of heat.

8. Period of Breeding for Sows.—Sows should not be bred until they are at least a year old, and it will generally be found that better results are obtained if they are not bred until they are from 14 to 16 months old. Farmers too often breed their sows when they are not more than 7 or 8 months old. Such early breeding is a mistake, and those who continue the practice will find that each year the litters become smaller and the pigs lower in vitality and hence more susceptible to disease.

A sow will farrow stronger pigs and more of them in a litter when she is from 2 to 6 years old than at any other time in her life. However, on many swine-breeding farms it is a custom to keep for breeding purposes, as long as she lives, any sow that has proved to be a regular producer and a good mother.

9. Care of Sow After Service.—A sow, after being served by a boar, should be placed in a pen or yard by herself and left there until she passes out of the period of heat. This will prevent her from being annoyed by other sows.

10. Sterility in Sows.—If a sow is kept in only fair growing condition there will seldom be trouble of failure to breed, although animals that are being fitted for show purposes sometimes give evidence of sterility. To correct a sterile condition in sows, some successful swine raisers recommend drenching the sows with a dose of 2 ounces of Epsom salts dissolved in ½ pint of cold water, following this with 10 grains of iodide of potassium in her feed twice daily for 2 weeks. Sows sometimes fail to breed on account of being thin, weak, and in a run-down condition. To improve this condition it is advisable to give the sow all the good feed she will eat, to which is added twice daily from 20 to 40 drops of tincture of iron chloride, the number of drops being regulated by the size of the animal.

11. Selection of Sows for Breeding.—A breeder, when selecting a number of sows for breeding, should be sure that the animals are as nearly alike in form and type as it is possible to get them. Uniformity is desired because the resulting offspring are all likely to be uniform, which is an important factor in marketing swine. A lot of hogs uniform in color, size, markings, etc. will sell for a better price than a lot of the same age and weight that are lacking in uniformity. In the mating of sows, the boar used should be of a type similar to the sows, or otherwise there may be a lack of uniformity in the offspring.

12. Period of Gestation in Sows.—The period of gestation in sows is from 112 to 116 days. It sometimes happens that the time runs a day or two longer than 116, but unless there is a premature birth it seldom is less than 112 days. Table I shows the date after breeding at which a sow is due to farrow. This gestation table will be found helpful in ascertaining the date when litters of pigs may be expected.

TABLE I

GESTATION TABLE FOR SWINE

Date Bred	Due to Farrow	Date Bred	Due to Farrow	Date Bred	Due to Farrow
Jan. 1	Apr. 22	Feb. 1	May 23	Mar. 1	June 20
2	23	2	24	2	21
3	24	3	25	3	22
4	25	4	26	4	23
5	26	5	27	5	24
6	27	6	28	6	25
7	28	7	29	7	26
8	29	8	30	8	27
9	30	9	31	9	28
10	May 1	10	June 1	10	29
11	2	11	2	11	30
12	3	12	3	12	July 1
13	4	13	4	13	2
14	5	14	5	14	3
15	6	15	6	15	4
16	7	16	7	16	5
17	8	17	8	17	6
18	9	18	9	18	7
19	10	19	10	19	8
20	11	20	11	20	9
21	12	21	12	21	10
22	13	22	13	22	11
23	14	23	14	23	12
24	15	24	15	24	13
25	16	25	16	25	14
26	17	26	17	26	15
27	18	27	18	27	16
28	19	28	19	28	17
29	20			29	18
30	21			30	19
31	22			31	20

TABLE I—(*Continued*)

Date Bred	Due to Farrow	Date Bred	Due to Farrow	Date Bred	Due to Farrow
Apr. 1	July 21	May 1	Aug. 20	June 1	Sept. 20
2	22	2	21	2	21
3	23	3	22	3	22
4	24	4	23	4	23
5	25	5	24	5	24
6	26	6	25	6	25
7	27	7	26	7	26
8	28	8	27	8	27
9	29	9	28	9	28
10	30	10	29	10	29
11	31	11	30	11	30
12	Aug. 1	12	31	12	Oct. 1
13	2	13	Sept. 1	13	2
14	3	14	2	14	3
15	4	15	3	15	4
16	5	16	4	16	5
17	6	17	5	17	6
18	7	18	6	18	7
19	8	19	7	19	8
20	9	20	8	20	9
21	10	21	9	21	10
22	11	22	10	22	11
23	12	23	11	23	12
24	13	24	12	24	13
25	14	25	13	25	14
26	15	26	14	26	15
27	16	27	15	27	16
28	17	28	16	28	17
29	18	29	17	29	18
30	19	30	18	30	19
		31	19		

TABLE I—(*Continued*)

Date Bred	Due to Farrow	Date Bred	Due to Farrow	Date Bred	Due to Farrow
July 1	Oct. 20	Aug. 1	Nov. 20	Sept. 1	Dec. 21
2	21	2	21	2	22
3	22	3	22	3	23
4	23	4	23	4	24
5	24	5	24	5	25
6	25	6	25	6	26
7	26	7	26	7	27
8	27	8	27	8	28
9	28	9	28	9	29
10	29	10	29	10	30
11	30	11	30	11	31
12	31	12	Dec. 1	12	Jan. 1
13	Nov. 1	13	2	13	2
14	2	14	3	14	3
15	3	15	4	15	4
16	4	16	5	16	5
17	5	17	6	17	6
18	6	18	7	18	7
19	7	19	8	19	8
20	8	20	9	20	9
21	9	21	10	21	10
22	10	22	11	22	11
23	11	23	12	23	12
24	12	24	13	24	13
25	13	25	14	25	14
26	14	26	15	26	15
27	15	27	16	27	16
28	16	28	17	28	17
29	17	29	18	29	18
30	18	30	19	30	19
31	19	31	20		

TABLE I—(*Continued*)

Date Bred	Due to Farrow	Date Bred	Due to Farrow	Date Bred	Due to Farrow
Oct. 1	Jan. 20	Nov. 1	Feb. 20	Dec. 1	Mar. 22
2	21	2	21	2	23
3	22	3	22	3	24
4	23	4	23	4	25
5	24	5	24	5	26
6	25	6	25	6	27
7	26	7	26	7	28
8	27	8	27	8	29
9	28	9	28	9	30
10	29	10	Mar. 1	10	31
11	30	11	2	11	Apr. 1
12	31	12	3	12	2
13	Feb. 1	13	4	13	3
14	2	14	5	14	4
15	3	15	6	15	5
16	4	16	7	16	6
17	5	17	8	17	7
18	6	18	9	18	8
19	7	19	10	19	9
20	8	20	11	20	10
21	9	21	12	21	11
22	10	22	13	22	12
23	11	23	14	23	13
24	12	24	15	24	14
25	13	25	16	25	15
26	14	26	17	26	16
27	15	27	18	27	17
28	16	28	19	28	18
29	17	29	20	29	19
30	18	30	21	30	20
31	19			31	21

13. Signs of Pregnancy in Sows.—If a sow has been bred successfully there will be an absence of the period of heat. Signs of heat should be looked for about 21 days after the sow was bred, or at the time when heat would be due. If no signs are noticed it can generally be concluded that the sow is pregnant. There is no external evidence, however, until a fulness is seen along the sides and belly of the sow.

14. Exercise for Sows During Pregnancy.—A sow during pregnancy needs much exercise to induce appetite, strengthen muscles, and keep her in vigor and health. Lack of exercise will often result in the loss of a litter. A fair-sized pasture lot in which the sows can walk about in search of feed is a good provision, as they will then get the needed exercise.

15. Bedding for Farrowing Nest.—Bright, dry rye straw cut into lengths of 1 or 2 inches makes the best kind of bedding for the nest where sows are to farrow. The cutting can be done by running the straw through a fodder cutter. Straw cut into short lengths makes a much better bed than long straw, as the pigs do not become tangled in it so easily.

The next best bedding is shredded corn fodder. This makes satisfactory bedding, and, in fact, is preferred by some persons to rye straw. Wheat straw is also good material for bedding. Unless it has been much broken by the thrashing machine it, like rye straw, should be cut into short lengths. Oat straw is not a satisfactory material for use in farrowing nests; it is so easily broken that it soon becomes fine and chaffy when used as bedding. In addition, it has more of a tendency to heat than other straws. The effects of heating in farrowing nests are described in the next paragraph.

The bedding in a farrowing nest, especially after the litter has been farrowed, should be changed at least twice a week. If this is neglected the nest will become damp, which condition will cause it to heat and steam, and as a result the pigs are likely to suffer from injury to the skin, which may extend to the tails and result in their loss.

16. Best Months for Farrowing.—The best months to have litters farrowed will depend on the location of the farm

and on the care that can be given the litter. In the northern part of the United States and in the provinces of Canada, unless special care can be given the pigs, the sows should be bred so that the litters will not be farrowed until between the middle of March and the first of May. In southern sections they may come earlier. In northern sections, if the pigs were farrowed earlier than the time given, they would, on account of the cold, be sure to lie in their nests day after day without taking much exercise. Lack of exercise would eventually result in the loss of the pigs. A young pig that does not take enough exercise is likely to succumb to a disease known as **thumps.** Pigs that have this disease become broad across the shoulders and through the chest. Their hearts beat weakly, and if they try to walk their sides jerk and thump with each heart beat. If pigs are farrowed during the time given, the weather will probably be warm and there will be sunshine to tempt them to leave their nests and follow the sows about the pasture; as a result, they get the needed exercise and are not so likely to be troubled with the thumps.

17. It sometimes happens in the breeding business that litters of pigs are desired early in the season. When such is the case, proper precaution for saving the pigs should be taken. The sow about to farrow should be placed in a warm, dry, clean place and an attendant should be on hand when the litter is farrowed. A small box that will just about hold the average litter of pigs should be in readiness and cut straw or chaff should be placed in the box for a nest; warmth should be provided by placing hot stones or bricks in the straw or chaff. As each pig is born the attendant should place it in the warm box. After all are born and they have become warm and dry they should be returned to the sow for a feed. Each day from the time the pigs are born until warm weather, an attendant should exercise the pigs by driving them about the lot. In ordinary farm breeding establishments the extra trouble caused by early farrowed pigs will not pay; hence the reason for the general practice of breeding for late farrowing.

In the southern part of the Central States and in the most northern of the Southern States pigs may be farrowed as early as February, for in these regions the weather will be warm enough at this time of the year for the pigs to take exercise. In the southern part of the Southern States pigs may be farrowed at any time of the year, as the temperature will never be low enough to prevent them from exercising.

As a rule, the fall litters of pigs in the Northern States should be farrowed during the last part of August or the first part of September. When farrowed at this time they can be weaned before winter. Late-farrowed fall pigs that have to be weaned about December are likely to be stunted in growth. Late-farrowed pigs can be raised, however, if they are kept in a warm place and compelled to take daily exercise.

In the northern sections it is a poor plan to have pigs farrowed during July or the first part of August, on account of the prevalence of flies at this season. Flies are the cause of much worry to a litter of young pigs, and as a result the pigs may become so weak and stunted that no amount of later care and attention will make up for the setback they received during the early part of their lives.

18. Pig Eating Among Sows.—Sows that have not been properly cared for previous to the farrowing of their litters have been known to kill the pigs of their own litters and eat them. A sow fed on a ration that contains sufficient protein and placed where she can get exercise is not likely to eat her pigs. On the contrary, a sow fed on a very fattening ration, such as one of corn or corn meal alone, and kept in a small pen where she cannot take exercise, is likely to crave protein to the extent that she will kill and eat her litter. Sometimes a sow will destroy the whole litter at once; other sows will devour the pigs at intervals of about a day apart. The remedy, as explained, is a proper ration, as described in *Swine Feeding and Judging*.

19. Breeding of Sows After Farrowing.—A sow should not be bred until after her litter has been weaned. As a rule, pigs will be weaned about 12 weeks after they are born,

although, if plenty of sweet, whole milk is available, they can be weaned in from 8 to 10 weeks. A sow will come into heat about the third day after farrowing a litter, and there are farmers who are foolish enough to breed her at that time. Such a practice is wrong, as a sow should not be required to nurse one litter while carrying another; she cannot do justice to either under such a condition.

A farmer can have his sows produce two litters a year, but to do so it will be necessary for the first litter to be weaned about June 1, and when pigs are weaned at this early date they should have been farrowed sometime the last of March and be weaned at about 8 or 10 weeks of age. Such a practice means work for an attendant, both in caring for an early litter of pigs and in providing good, nourishing feed for the litter, so that they can be weaned at an early age.

If pigs are weaned by June 1, the sow can be bred soon after and will farrow sometime in September, which will make it possible to wean the second litter before the cold weather of winter sets in.

20. Management of Sows After Pigs Are Weaned.—In the summer, after spring litters are weaned, sows should be placed in a good pasture, preferably one containing a grove of trees. If a second litter is desired they should, of course, be bred as early as possible so that the litter can be weaned before winter. If the sows are not excessively thin they will require no feed other than pasture. However, sows that have become thin from nursing their litters should be given a little grain in addition to the pasture. Sows that forage on pasture during the summer will generally farrow larger litters of pigs in the fall than in the spring, largely on account of the increased exercise they take during the summer over what they take during the winter.

Sows that farrow in the fall should, during the winter, have a warm, dry place where they can sleep and should be given the run of any fields that may be available. A corn field from which the ears of corn have been gathered but in which the stalks still stand, or a pasture of some kind that is

not entirely covered with snow, are good places for them to range over in search of feed. As but little forage is available in the fields, the sows must be fed a grain ration. In the early spring those that are to farrow should be taken to the farrowing houses and be kept warm until after the litters are farrowed.

MISCELLANEOUS INFORMATION

21. Removal of the Tusks of Young Pigs.—Young pigs that are nursing will often fight one another for the possession of a teat, and even at this early age will make use of their tusks. This results in many lacerated mouths. In addition, the teats of the sows sometimes become sore from this same cause. The best way to prevent these troubles is to remove the tusks, which can easily be done by taking a pig under the left arm, opening his mouth and with a pair of pinchers breaking off near the gums the tusks on both sides of the mouth. Any sores that may have been caused before the tusks are removed should be treated with vaseline or some healing ointment.

22. Marking of Litters.—The pigs of each litter should be marked in some way so that the different litters can be distinguished. There are on the market several kinds of labels that can be attached to the ears of the pigs, but most hog raisers do not use them because of the ease with which they are lost from the ears. A method of marking that has been found to give good satisfaction is an arrangement of notches that are punched in the edges of the ears of the pigs. A good instrument for making the notches is a hand punch such as is used by harness makers for making holes in leather.

An arrangement of notches that has been found satisfactory for the marking of pigs, or even older hogs, is shown in Fig. 6. As the litters are farrowed they are marked as litter No. 1, No. 2, No. 3, etc., each pig of a particular litter receiving the same mark. A notch in the lower edge of the right ear, as shown in *1*, means litter No. 1; two notches in

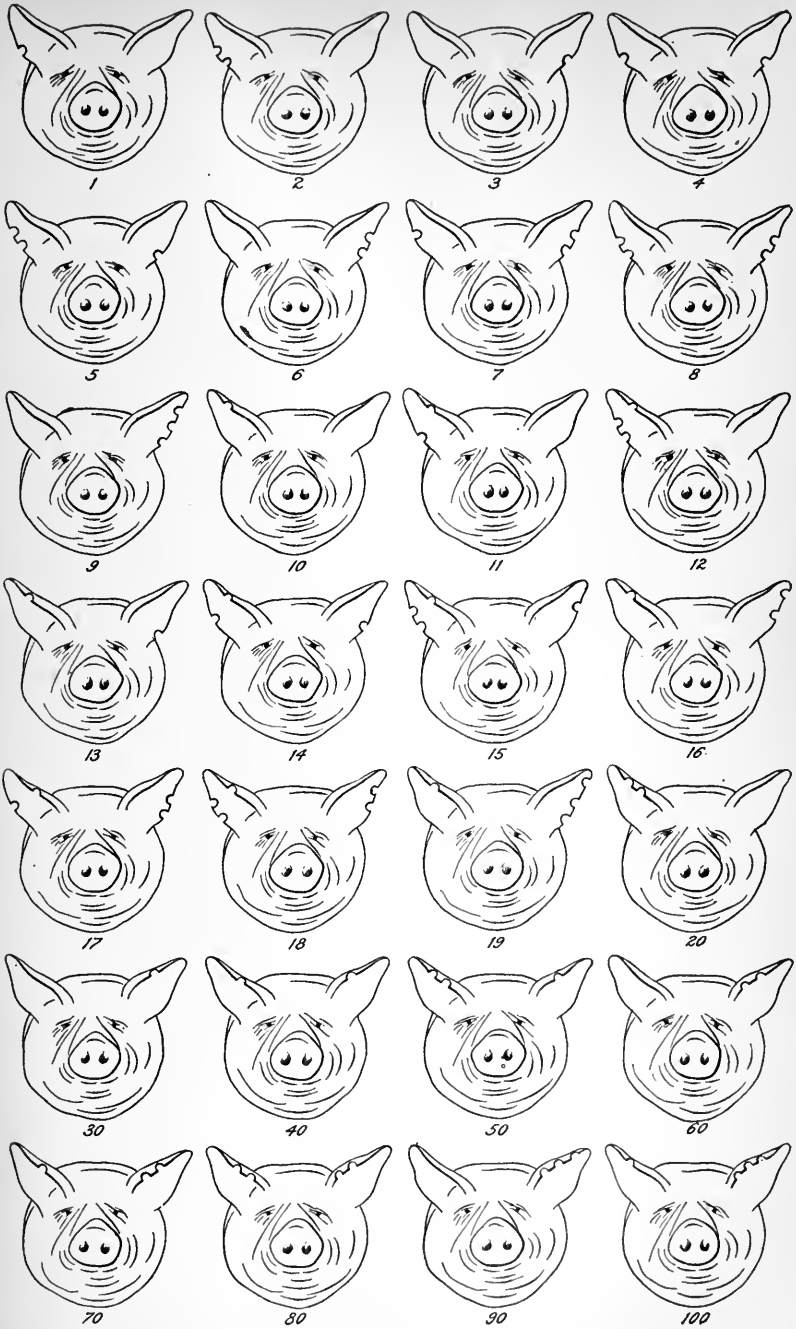


FIG. 6

the same ear, as shown in *2*, means litter No. 2; a notch in the lower edge of the left ear, as shown in *3*, means litter No. 3; a combination of the notches of *3* and *1*, as shown in *4*, means litter No. 4; a combination of the notches of *3* and *2*, as shown in *5*, means litter No. 5; two notches in the left ear, as shown in *6*, indicates litter No. 6; a combination of the notches of *6* and *1*, as shown in *7*, means litter No. 7; a combination of the notches of *6* and *2*, as shown in *8*, means litter No. 8; three notches in the lower edge of the left ear, as shown in *9*, means litter No. 9; a notch in the upper edge of the right ear, as shown in *10*, means litter No. 10. Litter No. 11 is indicated by a combination of the notches of *10* and *1*; litter No. 12, by a combination of the notches of *10* and *2*; litter No. 13, by a combination of the notches of *10* and *3*; litter No. 14, by a combination of the notches of *10* and *4*, or of *10*, *3*, and *1*; litter No. 15, by a combination of the notches of *10* and *5*; litter No. 16, by a combination of the notches of *10* and *6*; litter No. 17, by a combination of the notches of *10* and *7*; litter No. 18, by a combination of the notches of *10* and *8*; and litter No. 19, by a combination of the notches of *10* and *9*, as shown, respectively, in *11*, *12*, *13*, *14*, *15*, *16*, *17*, *18*, and *19*. Litter No. 20 is indicated by two notches in the upper edge of the right ear, as shown in *20*, and the numbers from 21 to 29, inclusive, are indicated by a combination of the notches of *20* and *1*, *2*, *3*, etc. Litter No. 30 is indicated by a notch in the upper edge of the left ear; litter No. 40, by a notch in the upper edge of each ear, or a combination of *30* and *10*; litter No. 50, by a combination of the notches of *20* and *30*; litter No. 60, by two notches in the upper edge of the left ear; litter No. 70, by a combination of the notches of *60* and *10*; litter No. 80, by a combination of the notches of *60* and *20*; litter No. 90, by three notches in the upper edge of the left ear; litter No. 100, by a combination of the notches of *90* and *10*, as shown, respectively, in *40*, *50*, *60*, *70*, *80*, *90*, and *100*. The intervening numbers are indicated by combinations of these numbers with *1*, *2*, *3*, etc., as already explained for numbers between 20 and 30.

23. Care of Show Swine.—Swine that are being fitted for show purposes require more and better care than is usually given to those that are to be sold for pork. This extra care should begin even before the pigs are farrowed by paying particular attention to the feeding of the sows during the period of gestation. The ration of the sow should contain abundant bone-building material. This can be provided for by adding a tablespoonful of steamed bone meal to her daily ration.

After the show pigs are farrowed they should be fed a good ration such as described in *Swine Feeding and Judging*. To insure a good appetite, it is advisable to vary the ration from time to time by substituting different grains or mill feeds. The ration, too, must at all times be palatable and relished by the pigs. Condimental foods, of which there are many on the market, can often be added in small quantities to rations for the purpose of making them more palatable. Animals being fitted for show purposes should be given all the feed they can assimilate. In addition, they should be brushed daily, and occasionally washed with soap and water to which a little disinfectant has been added. The skin and hair must be kept free from dirt and other foreign substances.

An animal that is in the right condition for the show ring is said to be in **bloom,** that is, in a condition of full flesh at every point yet not so overloaded with flesh as to appear clumsy; in addition, the coat is bright and glossy, and the animal presents a general appearance of perfect health.

The animals should be handled enough to make them tame and easily driven from place to place. Exercise is necessary for show animals, as it helps to keep them in good health, and in addition makes them able to walk into the show ring with a sprightly step. This is an advantage when they are to be judged.

The claws sometimes become so long as to present an unsightly appearance and to interfere with walking. In such cases they may be shortened or trimmed with a pair of pruning shears or other suitable instrument. Care should be taken not to cut into the quick—that is, the fleshy part of

the toe. Trimming can be most conveniently done when the animal is lying down. It is not difficult to induce hogs to lie down whenever desired by scratching the side and upper part of the belly with the ends of the fingers.

An animal older than a spring pig, when fitted for show, should have shed its old coat and regained a new one. The frequent washing and brushing will tend to get the old coat off quickly. To be sure that pigs will have new coats by fall, extra care should begin in May. The old coats will then be off about the first of August and new ones ready by early fall.

When ready for the show ring, the coats of the animals should be treated with a dressing of equal parts of olive oil and alcohol. This mixture should be well shaken and rubbed into the coats with a sponge or a brush. It will be found that the hair of hogs so treated will have a gloss or finish that will do much toward improving their general appearance. Some breeders use as a dressing a mixture of fish oil and lampblack, but experience proves that this preparation does not give as desirable a gloss to the coat of the animal as does the olive oil and alcohol preparation. Besides, it is unpleasant for a judge, while looking over the pigs, to smear himself with the oil and lampblack.

Just before an animal goes into the show ring, the long hair on the edge and inside of the ears and on the tail, except the switch, should be clipped. An animal with this hair removed presents a better appearance than one that has not been clipped.

24. Transportation of Swine.—Swine breeders often sell individual hogs that must be shipped in crates to the purchasers. When shipping swine in crates there are certain precautions that must be taken. A hog that is expected to arrive at its destination in 48 hours or less should not be fed the day shipment is made. Experience proves that an animal shipped such a distance without feed will arrive in better condition than if it were fed. When shipments are made that take more than 48 hours, a few pounds of dry feed should be placed in a bag and tied to the crate. Instructions on the

shipping card should state that a small quantity of feed is to be given to the hog each day. Before the animal is placed in the crate it should be brushed thoroughly with a dry brush. Following the dry brushing, a small quantity of liquid disinfectant should be brushed into the coat. Dry bedding is then placed in the bottom of the crate and the hog is driven in at one end, slats being nailed across to prevent the animal from getting out. The instructions on the shipping tag, besides giving directions for feeding the animal, should, when the shipment is made in hot weather, state that the crate is to be placed near the door of the express car, and that, in case the hog becomes overheated, a small quantity of water is to be sprinkled on its nose and in the bottom of the crate, but that none is to be thrown on its back.

A hog that has been shipped must upon arrival be expected to come out of the crate looking rather gaunt, dirty, and tired, and it will require special care for a few days. As soon as the animal is out of the crate its coat should be brushed with a dry brush, after which a drink of water and a light feed of mixed grains made into a slop should be given. This first feeding should be about half the quantity generally fed to an animal. The hog should then be placed in a lot by itself for a few days and be brought gradually to full feed. It is a good plan, when purchasing swine, to ascertain what rations have been fed and continue with the same feed for at least a week or so. Changes in the rations should be made gradually.

25. Inadvisability of Placing Strange Hogs Together.—A swine raiser should avoid as much as possible the placing of strange hogs in yards or pens with others; no animal is quicker than a hog to fight strangers. However, when it is necessary to place strange hogs together, they should be plunged, one at a time, into liquid disinfectant in a dipping tank. The sensation of the plunge will take the attention of the hogs from their neighbors, and the smell of the disinfectant will make it difficult for the animals to recognize strangers.

26. **Castration of Boars.**—When pigs are to be fed for the general market or for home use, the males should be castrated at an early age. The **castration** of hogs consists of the removal of the testicles, and if the work is done when the animals are young the operation is not difficult. Two persons are needed to castrate a pig, one to hold the animal and the other to remove the testicles. There are several methods of holding a pig for castration. One that has given good satisfaction is to lay the pig on its right side, hold the head flat on the ground with the knee, hold the right, or lower, leg with one hand, and with the other raise the left, or upper, leg and pull it toward the belly of the animal. By following this plan the pig can be held so that it cannot move, and the part on which the operation is to be made will be in the correct position for the person doing the operating. The two testicles are side by side in a sack known as the *scrotum*. They are attached by a string of tissue known as the *cord*. There are three layers of tissue surrounding the testicles: the skin of the scrotum, a white fibrous layer, and a thin transparent layer immediately around the testicles.

The details of the operation are as follows: The operator grasps the scrotum with his left hand in such a way as to draw the skin tightly over the testicles and cause the latter to stand out prominently. The testicles appear as two objects of oval shape under the skin of the scrotum. An incision is then made through the three walls of the sack over each testicle. The incision should be lengthwise of the latter and not deep enough to cut into it. The length of the openings so made should be sufficient to enable the operator to squeeze the testicles out easily. It is usually considered well to make the incision in such a way that pus and blood will drain away freely, leaving no pocket in the lowest portion of the scrotum.

Each testicle, as it comes out of the sack, is grasped in the hand and pulled gently as long as the cord, by which it is fastened, emerges. It is then detached from the cord by scraping the cord with the blade of the knife. This scraping with the knife blade is to be preferred to a sharp cut, on

account of the presence of an artery in the cord. Scraping the cord breaks the walls of the artery and thus prevents excessive bleeding; if a clean cut were made, blood would flow freely from the artery and might possibly cause the death of the animal. The cord should be detached so that but a short length is left in the scrotum. If too great a length is left attached, the cord sometimes becomes fastened to the walls of the scrotum and, as a result, a tumor known as Shirirron's cord is formed. A tumor of this kind must be removed surgically in the same manner as are the testicles in castration. If blood clots or pus form in the scrotum after castration, the part should be syringed first with warm boiled water, followed by a 3-per-cent. solution of carbolic acid in water.

27. Spaying of Sows.—The spaying of sows, or the removal of their ovaries, is less often done than is castrating of boars, largely on account of the difficulty of the operation. Where a large number of young females are being fattened for market, the spaying of the lot might be a financial advantage; but where only a small number are being fed, spaying will not pay. The reason for spaying is that spayed animals make more pounds of gain in weight in the same length of time for the same quantity of feed than unspayed animals. The operation of spaying sows is such a difficult one that it is generally necessary to employ a qualified veterinary surgeon for the work. In spaying sows, it is necessary to make an opening into the abdominal cavity and remove the ovaries. An incision is made in the left side of the animal just forwards of the hip bone. The fingers are inserted in this opening and the ovaries found and removed. The cord by which they are attached is severed in the same manner as described for castration. The incision is then disinfected with some liquid solution and the wound sewed up, after which, if the work has been properly done, it usually soon heals.

28. Treatment of Overheated Hogs.—As hogs are easily overheated, crowding them too close together in pens or driving them about during the heat of the day should be

avoided. The symptoms of overheating are fast breathing and the protruding of the tongue from the mouth. Unless properly cared for, overheated hogs are likely to die. The proper treatment is first to sprinkle water on an animal's nose, gradually allowing it to wet all of the face, and then to wet the ground near by. It will be found that the hog will lie down; when this occurs more water should be sprinkled on the face, and the ground near by should be kept wet until the animal has cooled off. Under no condition should large quantities of cold water be thrown on the body of an overheated hog, for the sudden chill that would result is likely to cause its death.

RECORDING AND REGISTERING OF SWINE

29. Recording of Produce.—A thorough and complete system for recording the birth, pedigree, description, markings, disposal, and other data relating to offspring, or, as it is commonly termed, *produce*, will be found necessary by the swine breeder if he is to keep his work on a business basis. Such a system should be simple and convenient as well as complete. A desirable system of keeping these records is by means of the card illustrated in Fig. 7, which shows the opposite sides; it is perforated for filing in a card-index case. On the side shown in (*a*) is recorded the names of the sire and the dam of the litter, and the date of birth, sex, name, registry number, purchaser, and selling price of each pig. The head of a hog printed on this side of the card is used for recording the ear marks given to the pigs of a litter, as previously explained; this recording is done by simply marking the margin of the ear with a pen or pencil, as is shown by the two marks on the right ear and the one on the left. On the side of the card shown in (*b*) is recorded the description, date of birth, and pedigree of the dam of the litter. The head of a hog stamped on this side of the card is for showing the ear marks of the dam.

Blank cards similar to these, bearing such printing as the breeder desires, and a small filing case for containing the cards, can be purchased cheaply from printing houses. Some

INDEX NO. (4)

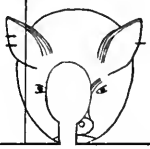
A. J. LOVEJOY & SON.

BOARS (4) SOWS (5)

Pigs FARROWED May 1st, 1909

SIRE Masterpiece 77000 DAM Lee Duchess V 84975

SEX	NAME	NUMBER	SOLD TO	PRICE
B	Challenger	90985	Bill Jones, Lostant, Ill	40.00
S	Miss Lee Duchess	100568	Sam Small, Brookfield, Wis	35.00
S	" " " 2nd	100569	ditto	35.00
S	" " " 3rd	100570	"	35.00
S	" " " 4th	100571	"	35.00
S	" " " 5th	100572	"	35.00
B	Master Duke	101600	L Wilcox, Dallas, Texas	50.00
	(balance of litter	sold for	pork	26.00
			Total	291.00



(a)

DESCRIPTION

Neat head, large white face, mark left ear, few white hairs, black switch.

FARROWED April 1st, 1908.

Lee Duchess V 84975

- Baron Lee of Riverside 70400
  - Baron Lee 8th 48160
  - Victor's Duchess 58861
- Combination Duchess 5th 63371
  - Combination 56028
  - Victor's Duchess 2nd 60776

(b)

FIG. 7

BREEDING RECORD.

of Berkshire Sow

NAME AND NO.

Columbus Princess 4th 76622

Service Boar Masterpiece 77000 *

Date of Service.			Date when Due.		
MONTH.	DAY.	YEAR.	MONTH.	DAY.	YEAR.
Jan	1	1906	April	23	1906

THE ABOVE SOW WAS

Farrowed April 19-1903

Sire Rockland's Joy 51696

Dam Columbus Princess 65182

Breeder K. B. Clough

P. O. N. Amherst, Ohio

*The second line is for name of Boar in case the Sow is served a second time by another Boar, and the five spaces for date of service and date when due, are also for use in case the Sow is bred several times.

MEMORANDUM OF PRODUCE.

(For preceding litter, see page.....)

Date of farrow April 23 1906 No. of Boars in the Litter 3 . No. of Sows in the Litter 5

Give in the above line the actual date of farrow and the actual number of pigs of each sex in the litter. The column to the left below is for total number of the surviving pigs at weaning time, or when they are named or sold.

No.	Sex.	Name and Number, if Recorded.	EAR MARK. See p. 4.	REMARKS—Showing whether retained in the herd, or when and to whom sold.
1	B	Master's Prince 95556	45	Sold to C. H. & E. Stanton, Edwardsville, Nov 3-'06
2	S	Matchless Princess 4th 96674	45	" " R. R. Ward, Benton, Ill., Dec 11-'06
3	S	" 2d 97469	45	" " D. S. Council, Vandalia, Ill., Nov. 5-'06
4	S	" 3d 97470	45	do do
5	S	" 100014	45	Retained in herd - see page 150
6	S	" 5th 103001	45	Sold to Earles + Stanton, Oakwood, Wis., Aug 23-07
7	B	Died	45	
8	B	Died	45	
9				
10				
11				
12				
13				
14				
15				

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(For next litter, see page....)

FIG. 8

breeders have found it convenient to have a rubber stamp made for stamping the head of a hog on cards or other records.

Another convenient system of recording produce is that illustrated in Fig. 8, which shows a leaf from a record book after the blanks have been filled in with data. The leaf is divided into two sections: a breeding record and a memorandum of produce. The breeding record contains the breed, name, age, dam, and breeder of the sow, the name of the service boar, the date of service, and the time of farrowing. The memorandum of produce contains columns in which are recorded the litter number, sex, name, registry number, and ear marks of the pigs of the litter, together with a column for remarks concerning the disposal of each animal.

30. Registration of Swine.—The interests of the various breeds of swine are fostered by record associations, which maintain herd books for the registration of such animals as conform to the standards of pedigree required by these associations. If a breeder has an animal that he desires to have registered, the first step necessary toward this end is to file, with the secretary of the association of the breed his animal represents, an application filled out on one of the standard entry blanks provided by the secretary for this purpose. In Fig. 9 is shown an application for the registration of an animal in the American Berkshire Association. Associations representing other breeds use somewhat similar blanks. In these applications the name, date of birth, artificial and natural marks of the animal, the name and registry number of the sire and dam, the name of the breeder and owner, and various other points of information must be recorded. In case the sire of the animal is owned by another breeder at the time of service, a certificate of service signed by the owner of the service boar must accompany the application for registration. A form of certificate used by the American Berkshire Association is shown in Fig. 10, the blank being filled in for illustration. This is merely a signed statement that a certain sow has been served by a certain boar owned by the breeder signing the certificate.

(20C) **ENTRY BLANK AMERICAN BERKSHIRE ASSOCIATION, Springfield, Ill.**

SECRETARY—
Please record the following described animal: *Postoffice* Roscoe, Ill. *Date* Jan. 18 *1911*

NAME OF ANIMAL to be recorded, Louisiana Baroness Date of Farrow May 9 1910 Sex Sow

Artificial Marks 1 l. l., 2 u. s. r., 1 l. s. r.

Distinguishing Natural Marks Six white points, white on jowl, white right fore foot to knee.

If Imported: When? ; By Whom? ; P. O.

No. of Pigs in Litter 10 : Raised 8 : Boars 3 : Sows 5 : Bred by A. J. Lovejoy & Son, P. O. Roscoe, Ill.

Owned by same, P. O. same

NAME and Record No. of Sire Majestic Baron 106000 NAME and Record No. of Dam Baroness Girl 5th 97868

The above is correct to the best of my knowledge and belief,

A. J. Lovejoy & Son *Owner.*
and *Breeder.*

(Over)

FIG. 9

CERTIFICATE OF SERVICE.

For use when the boar is not owned by the breeder of the animal to be recorded.

Post Office. Roscoe Ill. Dec 4 1910

I HEREBY CERTIFY that the Sow Matchless Belle 10th 112972 *owned by* B. B. Perry

P. O. Leslie, Mich. *was served on the* 20th *day*

of August *1908., by the boar* Masterpiece Climax *No.* 100001

Rule 3. A certificate of service, signed by the owner of the service boar, must accompany each application for entry, except where said boar is shown on the Record to have been owned at the time of service by the breeder of the animal to be recorded.

Sign here A. J. Lovejoy & Son

Owner of Service Boar.

FIG. 10

CERTIFICATE OF REGISTRY.

OFFICE

American Berkshire Association

ORGANIZED FEBRUARY 25, 1875.

SPRINGFIELD, ILLINOIS, U. S. A.

February 25th, 1911.

This is to Certify That upon the application of

A. J. Lovejoy & Son, Roscoe, ILL.

there has been admitted to registry in Volume 36 of the

AMERICAN BERKSHIRE RECORD

A Berkshire	Sow
known as	Louisiana Baroness 142727
Farrowed	May 9th, 1910.
Sire	Majestic Baron 106000
Dam	Baroness Girl 5th 97868
Bred by	A. J. Lovejoy & Son, Roscoe, ILL.
was sold on the	18th, *day of* January 1911.
to	Jos. H. Jasseau, Alexandria, La.
by	A. J. Lovejoy & Son, Roscoe, ILL.

Frank S. Springer.

Secretary

Please examine this Certificate and notify the Secretary at once of any errors therein.

FIG. 11


CERTIFICATE OF REGISTRY
NATIONAL POLAND-CHINA RECORD CO.
The American Tamworth Swine Record Association
CERTIFICATE OF REGISTRY
American Hampshire Swine Record Association
SECRETARY'S OFFICE.
ORIGINAL CERTIFICATE FILED FOR RECORD IN VOLUME
AMERICAN HAMPSHIRE SWINE RECORD
SEAL
CERTIFIED PEDIGREE
STANDARD POLAND-CHINA RECORD ASSOCIATION
FIRST SIRE
NATIONAL DUROC-JERSEY RECORD ASSOCIATION

Fig. 12

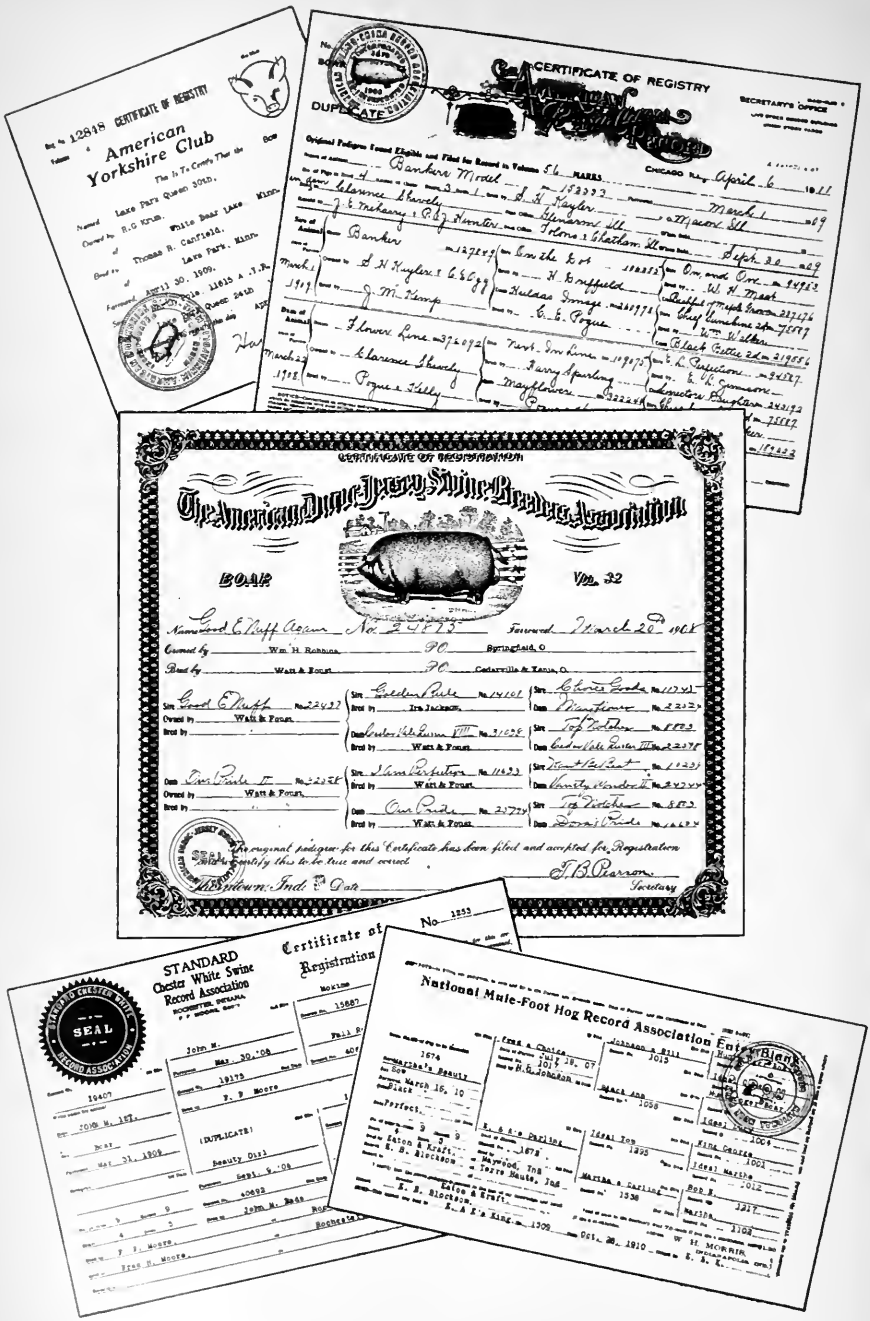
American Yorkshire Club
CERTIFICATE OF REGISTRY
DUPLICATE
The American Duroc Jersey Swine Breeders' Association
BOAR
Vol. 32
STANDARD
Chester White Swine
Record Association
SEAL
National Mule-Foot Hog Record Association

FIG. 13

Name and No. Animal Sold.

Matchless Belle 4th

No. 100005 Sex Sow

Marks 2 2

Sire Masterpiece 77000

Dam Lustre's Lady 2d. 66416

Sold to W. S. Corsa

White Hall

Of Illinois

Date shipm't Aug. 23 1907

Shipped by W. S. Express

Served June 3 1907

Served by 84966

Remarks Sold for $525.00

FORM C.—AMERICAN BERKSHIRE ASSOCIATION TABULA
Bound in sets of 100, with stub for memoranda.

Post Office Roscoe

Pedigree of Matchless Belle 4

Bred by A. J. Lovejoy & Son

of White Hall State of Ill

on the 23 day of August

SIRE OF ANIMAL.

Sire Black G

Masterpiece 77000

Bred by G. W. Berry

Dam Duches

NAME OF ANIMAL. Matchless Belle 4th

DAM OF ANIMAL,

Sire Lustre's

Lustre's Lady 2d 66416

Bred by D. N. Barker & Son

Dam Columbu

(If a female and bred before being sold, fill the blanks on line

Served on 3 day of June

by Lustre's Combination No.

(Sign here) A. J. Lovejoy & Son

PEDIGREE BLANK.
lled on receipt of $1.00. Address American Berkshire Association, Springfield, Ill.

State Illinois Date November 16 1910

h No. 100005 Sex Sow Date of Birth March 5 1906

O. Roscoe, Ill. Sold to W. S. Corsa

1907

Sire Imperial Duke 43929 — Sire Longfellow's Model 27058 — Dam Silver Tips 29th 42685

inhood 66086 Dam Black Girl 40th 33681 — Sire Ruby 10th's Robinhood 28663 — Dam Black Girl 29th 28674

Sire Lord Premier 50001 — Sire Baron Lee 4th 33446 — Dam Margery 37491

21st 56257 Dam Duchess 192d 50028 — Sire Baron Lee 4th 33446 — Dam Duchess 168th 44832

100005

Sire Highclere Bachelor 52258 — Sire Halle 33100 — Dam Frivolous 41278

chelor 52262 Dam Lustre 51625 — Sire Wicked Duke 97526 — Dam Rubical 51709

Sire King Columbus 42311 — Sire Columbus 28701 — Dam Lady Hendricks 28262

inl 2d 47068 Dam Columbus Girl 40769 — Sire Columbus 28701 — Dam Maid of Wolf Creek 2d 24159

w.)

.....1907

9.66.

ervice Sire.

The above pedigree is correct to the best of my knowledge and belief

(Sign Here) J. Lovejoy & Son

31. If the secretary finds that the animal is eligible for registration, its name is entered in the herd book and a certificate of registry, one of which is shown in Fig. 11, is furnished to the breeder. The form shown in the illustration is the one used by the American Berkshire Association. In Fig. 12 is shown the forms of certificates of registration used by the National Poland-China Record Co., the American Tamworth Swine Record Association, the American Hampshire Swine Record Association, the Standard Poland-China Record Association, and the National Duroc-Jersey Record Association. Fig. 13 shows the forms of certificates of registration used by the American Yorkshire Club, the American Poland-China Record, the American Duroc-Jersey Swine Breeders' Association, the Standard Chester White Record Association, and the National Mule-Foot Hog Record Association. Such certificates contain certain information relating to the animal and establish the fact that the animal has been admitted to registry.

32. Recording of Pedigrees.—After an animal has been registered, or possibly before, in case it has been sold before being admitted to registry, the breeder should record its pedigree on some form of blank made for this purpose. The tabulated pedigree blank of the American Berkshire Association, filled in with a complete pedigree, is shown in Fig. 14. Other associations, of course, have similar blanks. The form of blank shown in the figure has a stub for memoranda, and space for tracing the pedigree to the fourth generation. It has, also, blank spaces for the signatures of both the breeder and the owner of the service sire. When a pure-bred animal is sold, such a pedigree should always be furnished to the purchaser.

33. Recording of Lease of Boar for Service.—If a registered boar is leased for service to another breeder, some form of notification must be filed with the secretary of the record association. A standard form of lease of service used by the American Berkshire Association is shown in Fig. 15. This is merely a certification by the owner of the

LEASE OF SERVICE.

For use when the boar has been leased for service.

Post Office Roscoe, Ill., Dec. 10 1903

I HEREBY CERTIFY that the Boar Baron Lee of Riverside 70400 *owned by* A. J. Lovejoy & Son

P. O. Roscoe Ill. *has been leased for service to* S. E. Kelly

P. O. Mineral Point, Wis. *to date from* October 1 *190* 3 *to* December 8 *1903*

Sign here A. J. Lovejoy & Son
Owner of Boar.

FIG. 15

For Sows in farrow at time of sale, certificate of service must be completed (or the words "not served" inserted), and signed by the owner of Service Boar.

P. O., Roscoe Ill. *, Date,* March 2 *1906*

SECRETARY AMERICAN BERKSHIRE ASSOCIATION, Springfield, Illinois:

Transfer the ownership of the animal known as Masterpiece 77000 *from former owner* A. J. Lovejoy + Son *to present owner* W. S. Corsa

P. O. White Hall, Ill.; *said transfer of ownership to bear date* 22 *day of* March *1906*

The animal above named was farrowed May 29 *1902; bred by* G. W. Berry

sired by Black Robinhood 66086, *and out of* Duchess 22 1st 56257

Served on ..... *day of* ..... *19*..., *by* .....

Sign here ..... *Sign here* A. J. Lovejoy + Son

Owner of Service Boar. Seller of Animal above transferred.

N. B.—Be sure to give the Record Number of the Animal to be transferred, immediately after its name. Insert date of sale.

Rule 2. In case the animal offered for entry is owned by other than the owner of the dam at the time of birth, a transfer is required to the present owner from the previous owner; and if the animal has passed through one or more intermediate hands, transfers must be given in their regular order.

FIG. 16

ABSTRACT OF OWNERSHIP.

OFFICE

American Berkshire Association

ORGANIZED FEBRUARY 25, 1875.

SPRINGFIELD, ILLINOIS, U. S. A.

February 25th, 1911.

This is to Certify That upon the application of

A. J. Lovejoy & Son, Roscoe, ILL.

the change in ownership noted below has been filed for publication in the forthcoming volume of the

AMERICAN BERKSHIRE RECORD

A Berkshire Boar

known as Masterpiece 77000

and recorded in Volume 23 *as bred by*

G. W Berry, Berryton, Kansas.

was sold on the 2d, *day of* March 1906.

to

W. S. Corsa, White Hall, ILL.

by

A. J. Lovejoy & Son, Roscoe, ILL.

Frank S. Springer.

Secretary

Please examine this Abstract of Ownership and notify the Secretary at once of any errors therein.

FIG. 17

boar that the latter has been leased to a certain breeder for a specified period of time. Blanks for lease of service can be obtained from the secretaries of the various record associations.

34. Recording of Transfer of Ownership.—When a registered animal is sold, it is necessary to have the change in ownership recorded by the secretary of the record association. To have this done, the former owner must file with the secretary a standard blank provided for this purpose, completely filled out as required. A standard form of request for transfer of ownership that is used by the American Berkshire Association is shown in Fig. 16. This simply gives the names and addresses of the former and the present owner, the date of transfer, and the data concerning the animal.

Upon receipt of this request for transfer of ownership, the secretary will issue to the present owner an *abstract of ownership*, one of which, with blanks filled in for illustration, is shown in Fig. 17. This abstract merely contains notice that the change in ownership has been recorded as requested, with such data concerning the animal as was contained in the request.

TYPES AND BREEDS OF SHEEP

TYPES OF SHEEP

INTRODUCTION

1. From the earliest recorded time sheep have been raised for the production of food and clothing for man. The Scriptures contain numerous references to sheep and to sheep husbandry, and other early writings indicate that the raising of sheep was one of the most important industries of the ancients. As might be expected, the sheep of early times were quite different from those of the present time, and the early methods of sheep husbandry were dissimilar to those now in vogue in all sheep-raising countries, save in isolated sections of Asia, where a few tribes of people still practice the primitive methods.

2. Modern types and breeds of sheep differ from the earlier forms described in the Scriptures and elsewhere, principally in the degree of development of certain characters. The modifications have been brought about by changes in the methods of care and management, in geographical environment, and in the purposes for which the sheep were raised. From the sheep that centuries ago were raised in the southern part of Europe, especially in the hills of Spain, and fostered by the early Romans, there has been developed a type of sheep known as the **wool type.** The animals of this type are noted for the production of a large quantity and a fine quality of wool, from which the finest woolen cloth is made.

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In the British Isles, sheep raising has been carried on for several centuries, but in this region the chief aim of the breeder has been the production of a fine quality of mutton, wool production being a secondary consideration. The type of sheep that has been developed under these conditions is known as the **mutton type.** Sheep of this type do not possess the fine, dense fleeces characteristic of sheep of the wool type, but they excel the latter in the quantity and quality of the mutton they produce.

3. Sheep of the wool type have been the pioneer sheep of all countries, other than European countries, in which sheep raising has become an important industry in modern times; namely, North America, Australia, New Zealand, South

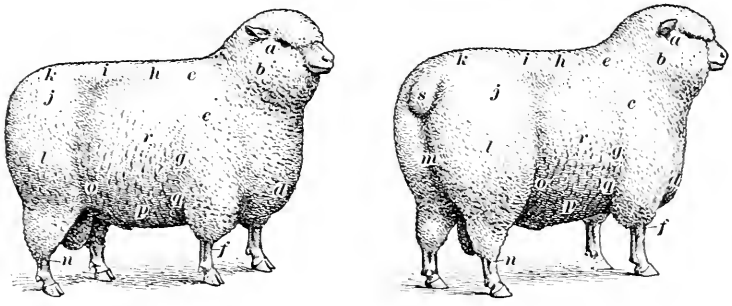

FIG. 1

Africa, and South America. Wool-type sheep were extensively used in developing the sheep industry in these countries for the reasons that sheep of this type are very active, have a tendency to remain in flocks when in open country, are able to subsist on scant herbage, and have the ability to make long journeys on a small supply of water. Furthermore, the product, wool, is always in demand, and, as it is not perishable, can be shipped long distances. On the other hand, mutton, the chief product of the mutton type of sheep, is not in such steady demand, and, being perishable, is less easily shipped. However, with the advent of refrigerator cars and ships, and improved transportation facilities, the mutton type is increasing in popularity in the countries mentioned.

4. In order that the description of the types and breeds of sheep may be more intelligible, the position of the different parts of a sheep is indicated on the animals shown in Fig. 1. The names of the different parts are as follows: *a*, head; *b*, neck; *c*, shoulder; *d*, brisket; *e*, top of shoulder, or withers; *f*, fore leg; *g*, chest; *h*, back; *i*, loin; *j*, hip; *k*, rump; *l*, leg of mutton; *m*, twist; *n*, hind leg; *o*, flank; *p*, belly; *q*, fore flank; *r*, ribs, or sides; and *s*, tail, or dock.

WOOL TYPE

5. Perhaps the most striking feature of the general appearance of a sheep of the wool type is that of narrowness. This characteristic is illustrated in Fig. 2, which shows views of two sheep of the wool type. A typical wool-type animal is angular in shape; the skin lies in folds over the body, especially about the neck; and the head presents a strong and rather coarse appearance, particularly in the case of a ram

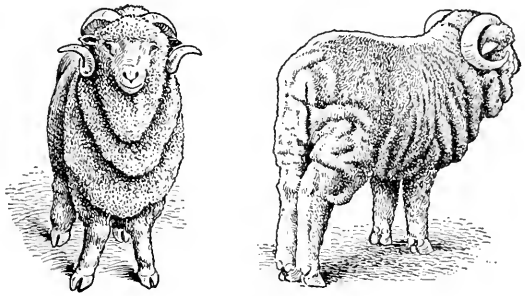

FIG. 2

that shows great vitality. The neck is long, rather thin, and often droops where it joins the body; the shoulders are close together, sharp, and prominent on top; the brisket is narrow; the fore legs are close together, with the fore feet often wider apart than the knees; and the fore flanks are low but thin. The ribs slope downwards sharply from the backbone, which appears to be too long for the length of the sheep; the back is narrow; the loin is thin and narrow; the rump is short and

inclined to droop abruptly from the hips, which are also narrow; the thighs are thin and separated well up toward the tail, or dock; the flanks are thin; the bottom line is generally level; and the legs have a tendency to be long.

Some breeds of the wool type of sheep have been developed by feeding, selection, and breeding until they produce a fair quantity and quality of mutton as well as excellent fleeces of wool.

MUTTON TYPE

6. The mutton type of sheep, three animals of which are illustrated in Fig. 3, shows a marked contrast to the angular,

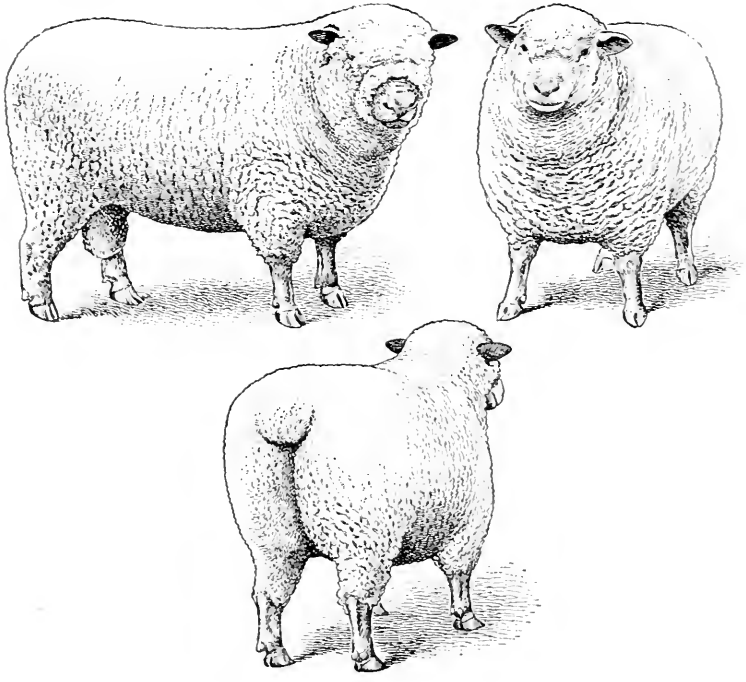

FIG. 3

narrow form and folded skin of the wool type. In form, a sheep of the mutton type is smooth, round, compact, symmetrical, and free from angularities, and the flesh is evenly

distributed over the carcass. The head is broad between the eyes, which are large and prominent; the neck is short and thick; the brisket is broad and full; the fore legs are short, straight, and set squarely under the body; the fore flanks are well filled so that there is but a slight depression just back of the shoulders, which are evenly and deeply covered with flesh and are smooth and round on top. The ribs are well covered with flesh and spring boldly out from the backbone, making the back broad and level and the body cylindrical. The loin is broad and thickly covered with flesh; the flanks are let well down but are thick, giving a straight bottom line that is parallel with the top line. The hindquarters are broad; the rump is long and level; and the twist extends well down to the hocks. The legs stand well apart; and the thighs, both on the outside and between the legs, are well covered with flesh, thus making a good leg of mutton.

In general, the body of the mutton type of sheep is longer than that of the wool type of sheep; this condition is due more to the long, level rump than to the length of the back. Sheep of the mutton type take on flesh quickly, mature early, are of a quiet disposition, and are shorter lived than those of the wool type. They thrive best on well-cultivated farms where feed and water are provided for them.

Sheep of breeds of the mutton type produce heavy fleeces, but these are not of as fine a quality as those produced by sheep of the wool type.

BREEDS OF SHEEP

7. Although more than sixty distinct breeds of sheep are known to exist, less than one-fourth of these are of importance in America, and in the following discussion of the breeds of sheep, only such breeds as are important in this country will be described. Three of the important breeds are of the wool type, and these, with respect to wool production, are known as *fine-wool breeds;* the others are of the mutton type, which, with respect to wool production, are known as *medium-wool breeds* and *coarse-wool breeds.*

The fine-wool breeds are the American Merino, the Delaine Merino, and the Rambouillet. The medium-wool breeds are the Southdown, the Shropshire, the Oxford Down, the Hampshire, the Dorset, the Cheviot, and the Suffolk. The coarse-wool breeds are the Lincoln, the Leicester, and the Cotswold.

FINE-WOOL BREEDS

AMERICAN MERINO

8. General Description.—In general appearance, a typical animal of the **American Merino breed** of sheep more nearly represents the ideal wool type than does an individual of any other breed in America. The American Merino is narrow and angular in conformation; has a rather long neck and long legs; and has many distinct folds in its skin, except on the back.

The head of the American Merino is small as compared with the heads of animals of other breeds, and usually the lips, nostrils, legs, and part of the face are covered with fine, white, silky hair. The ears are small, and, as a rule, are covered, like the parts just mentioned, with fine, white hair, although occasionally tan-colored spots of hair are found on one or

FIG. 4

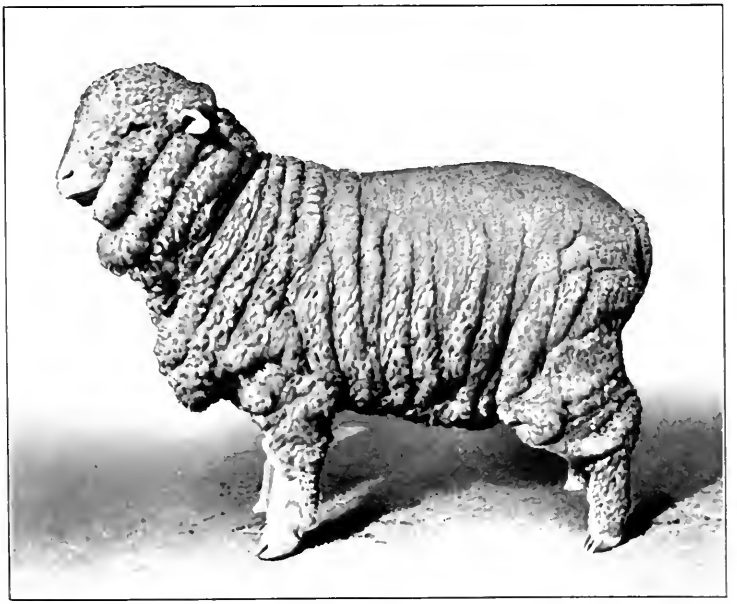

FIG. 5

more of such parts. The head of the ewe is hornless, but the rams carry heavy, spiral horns, which are marked with transverse wrinkles. The neck is heavily covered with wrinkles, the shoulders are sloping, and the chest is narrow but deep. The back and loins are narrow and scantily covered with flesh, and the rump is inclined to be short and steep. The hind legs are thin and make a poor leg of mutton.

A ram of the American Merino breed is shown in Fig. 4 and a ewe in Fig. 5.*

In size, American Merinos vary greatly, the variation being largely due to the fact that different breeders have developed strains of the breed according to their individual ideas of the most desirable size. It is generally accepted, however, that mature ewes should weigh about 100 pounds and mature rams about 150 pounds.

9. Qualities.—*Adaptability.*—No other breed of sheep in America is as able to adapt itself to such a wide range of conditions as the American Merino. Sheep of this breed readily become adapted to almost any kind of feed, and are better suited than those of any other breed to rough conditions, scarce feed, and poor treatment. They have a natural tendency to stay in large flocks, and do better than any other breed when large numbers are kept together; consequently, they are well suited for range conditions, under which it is necessary to keep the sheep in large flocks.

Maturity.—American Merino sheep do not reach maturity as early as sheep of the mutton breeds, and for this reason they are said to be inferior in maturing qualities.

Breeding Qualities.—American Merino sheep are somewhat inferior to those of other breeds in breeding qualities, as the ewes are not very prolific, and are not good dams; however, they breed to an advanced age. Animals of this breed are desirable for crossing with grade sheep if an increase in weight and fineness of wool over that of the grade sheep is desired. When American Merinos are crossed with sheep

*The photographs from which Figs. 5, 6, 7, 23, and 28 were made were furnished by The American Sheep Breeder.

of the mutton type, it is customary to use a ram of the mutton type on American Merino ewes. The lambs from this crossing produce a good grade of mutton and of wool. If an American Merino ram is crossed on ewes of the mutton type, the lambs usually produce a larger quantity and a better quality of wool, but are smaller than the offspring of the first-mentioned cross and make inferior mutton.

Mutton Production.—The American Merino is an inferior animal for mutton production, because it does not make a rapid growth, lay on flesh rapidly, or produce a first-class carcass. The meat is lacking in quality, and there is always much waste in dressing, due to the extensive folds of the skin, the long legs, and the large proportion of bone to flesh.

Wool Production.—In wool production, sheep of the American Merino breed surpass those of all other breeds in America. Sheep of no other breed produce as fine or as heavy fleeces. For the reason that fleeces of the American Merino sheep vary greatly in weight, according to the density and fineness of the wool and the quantity of yolk—that is, the oil or grease on the wool—it is difficult to give an average weight for a fleece. However, rams should produce from about 15 to 20 pounds of unwashed wool, and ewes should produce from about 12 to 15 pounds. These weights are frequently exceeded, and in a few cases more than doubled. There are numerous records of rams whose fleeces weighed from 25 to 35 pounds, and of ewes whose fleeces weighed from 15 to 25 pounds. The fleece of a 2-year-old American Merino ram, bred in Vermont, weighed 44 pounds and 3 ounces, the greatest yield on record for a 2-year-old. The fleece of a ewe, also bred in Vermont, weighed 32 pounds and 8 ounces. The heaviest fleece ever recorded was that shorn at the state shearing in Michigan in 1884, from a ram named Buckeye; this fleece weighed 44 pounds and 8 ounces.

DELAINE MERINO

10. General Description.—Sheep of the **Delaine Merino breed** differ from American Merino sheep in having a larger and better mutton carcass, fewer wrinkles and folds on the body, and longer wool that contains less yolk. The minimum weight for ewes of the various families of Delaine Merinos varies from 100 to 130 pounds, and the minimum weight for the rams, from 150 to 180 pounds. A ram of this breed is shown in Fig. 6 and a ewe in Fig. 7.

11. Development.—The Delaine Merino breed is really a branch of the American Merino breed, and has been developed principally in the section including the western part of Pennsylvania, the Panhandle district of West Virginia, and a few counties in the eastern part of Ohio. During the early part of the last century the demand for mutton increased, and this encouraged a few breeders of the American Merino to attempt the development of a breed of sheep that would produce fair mutton carcasses as well as fine fleeces of wool. To accomplish this they selected as their breeding stock animals of the American Merino breed that were of large size, had few wrinkles, were broad and deep of chest, and possessed plenty of digestive capacity. These breeders found that with the increase in size and mutton qualities of their sheep they also secured longer wool that had less yolk but still retained much of the fineness of that of the old type of the wrinkly American Merino. The breed thus developed is known as the Delaine Merino.

12. Qualities.—*Adaptability.*—The Delaine Merino, like the American Merino, can adapt itself to a wide range of conditions. The breed is not, however, so well adapted to rough pasture or to adverse conditions as the American Merino.

Maturity.—Although the Delaine Merino breed ranks first among the fine-wool breeds in the length of time required for maturity, it is, nevertheless, comparatively poor in this respect, as compared with the medium-wool and coarse-wool breeds.

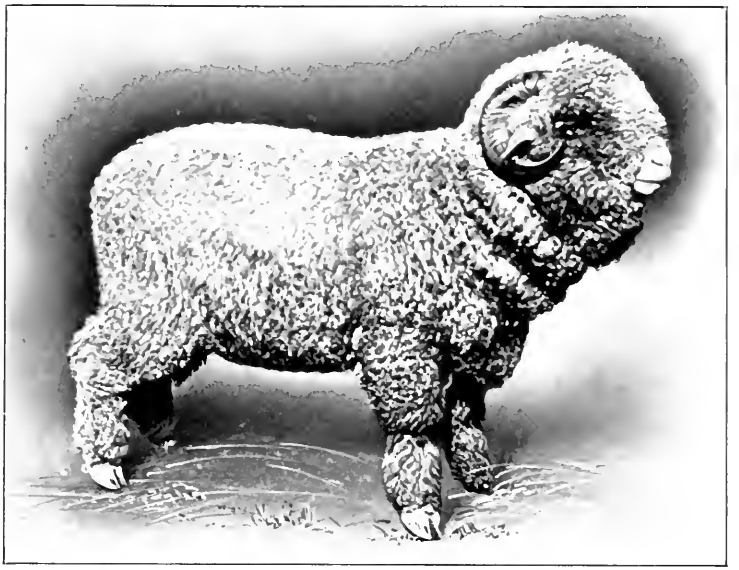

FIG. 6

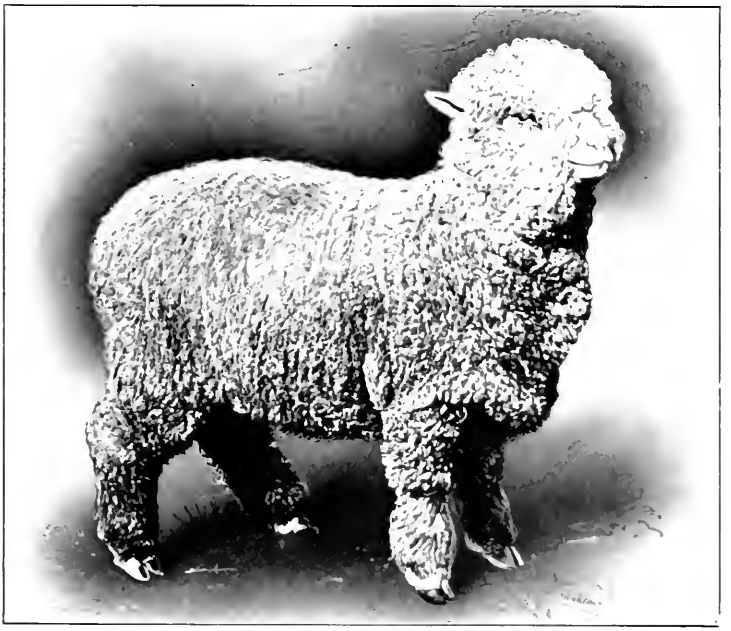

FIG. 7

Breeding Qualities.—The Delaine Merino is distinctly better in breeding qualities than the American Merino, because Delaine Merino breeders have paid particular attention to the breeding qualities of their sheep. The ewes are regular and prolific breeders, are good dams, and produce an abundant supply of milk.

Delaine Merino rams are extensively used for cross-breeding with American Merinos when it is desired to produce a large animal with longer wool than the American Merino, and with grade ewes when it is desired to increase the density, fineness, and length of the wool.

Mutton Production.—The Delaine Merino is superior to the American Merino for mutton production, on account of the fact that the breeders of Delaine Merinos have, from the time of the foundation of the breed, emphasized the importance of mutton production. Yearlings often weigh from 80 to 90 pounds and dress with less offal than do the American Merinos.

Wool Production.—The Delaine Merino is not, as a rule, equal to the American Merino in wool production. It does not have as heavy or as fine a fleece as the American Merino, but the fiber is longer, which makes the wool especially desirable in the market.

RAMBOUILLET

13. General Description.—In general appearance, a typical animal of the **Rambouillet breed** of sheep bears some resemblance to the American Merino, but the Rambouillet is larger and has more of a mutton carcass. The outline of the body is rounder and more plump; the back is broader; the ribs are better arched; and there is a better development of loin, hindquarters, and leg of mutton, and a deeper fleshing all over the body than in the American Merino. The body is generally smooth and free from wrinkles, although wrinkles are found in the flanks, on the neck, and around the tail. The head is rather large, broad between the eyes, and the face, nose, and ears are covered with fine, white, silky hair.

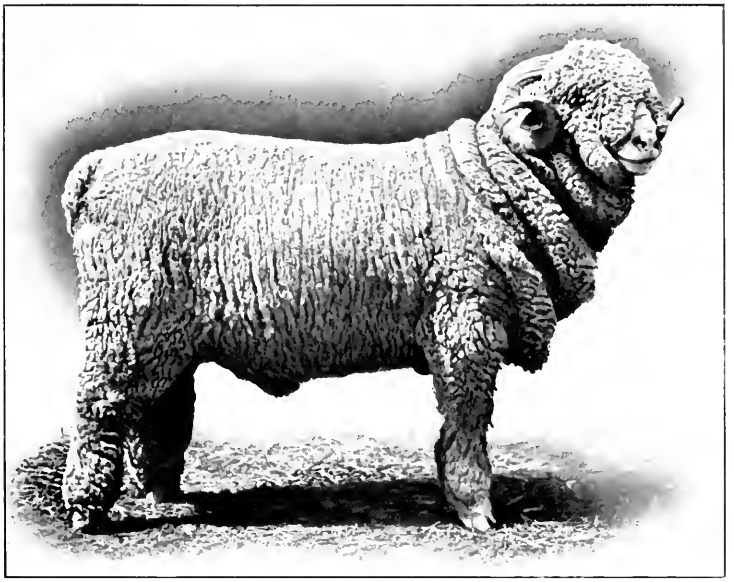

Fig. 8

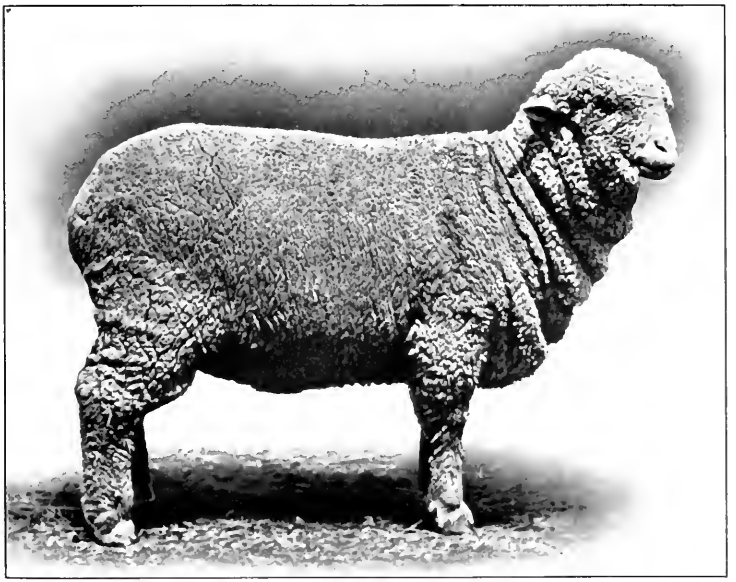

Fig. 9

The females are hornless, but the rams usually bear large, spirally curved horns; occasionally, polled rams are found. The skin should be bright pink in color.

A Rambouillet ram is illustrated in Fig. 8 and a ewe in Fig. 9.

In size, the Rambouillet is considerably larger than the American Merino. Mature rams usually weigh from 175 to 250 pounds, and occasionally one will weigh 300 pounds. Mature ewes weigh from about 110 to 150 pounds, and mature wethers from about 150 to 200 pounds.

14. Qualities.—*Adaptability.*—The Rambouillet, like the American Merino, is adapted to a wide range of conditions. It is hardy, able to withstand extremes of weather, and well adapted to range conditions, but, on account of its large size, it is not so well adapted as the American Merino to scant pastures. Animals of the Rambouillet breed are good grazers and are better adapted than those of any other breed, except the American Merino, to obtain a living from grass and coarse forage.

Maturity.—The Rambouillet, like the animals of the other fine-wool breeds, does not mature as early as animals of the mutton breeds. It is better in this respect, however, than the American Merino but not so good as the Delaine Merino.

Breeding Qualities.—The Rambouillet is a regular breeder and breeds to an old age, often producing twins. The ewes are good dams and supply an abundance of milk.

On account of their strong constitutions, good mutton qualities, and heavy fleeces, Rambouillet sheep are well adapted for cross-breeding with the common sheep of the range, and there is a strong demand for the rams for this purpose.

Mutton Production.—The Rambouillet is not one of the best breeds of sheep for mutton production, but it is better in this respect than the American Merino, although not so good as the Delaine Merino. The quality of the meat is fairly good, but is not equal to that of the mutton breeds on account of being somewhat coarser and not containing so

good a mixture of fat and lean, and there is not so deep a covering of flesh over the body as in the mutton breeds. There is always a comparatively large waste in dressing a Rambouillet sheep, due to the long neck and legs and the heavy pelt.

Wool Production.—The Rambouillet is one of the best breeds for wool production. The wool covers the body evenly, is of good length on the belly, and grows well down

Fig. 10

on the nose and legs. A striking example of how completely the head of a Rambouillet is covered with wool is shown in Fig. 10. As a rule, from 12 to 24 pounds of wool are shorn annually from rams and from 6 to 10 pounds from ewes; these weights are frequently exceeded.

The fiber of a Rambouillet fleece is fine, has a fine crimp, is from 3 to 5 and sometimes 6½ inches in length, and is usually white, but sometimes of a buff color. The fleece is fairly dense and compact, and does not contain

so much yolk as that of the American Merino; there is never enough to form a crust on the surface, as is the case with some strains of the Delaine Merino breed.

MEDIUM-WOOL BREEDS

SOUTHDOWN

15. General Description.—The **Southdown breed** of sheep probably more nearly represents the ideal mutton type than does any other breed. In general appearance, the typical Southdown presents a compact, broad, deep, and smooth body evenly covered with flesh. The head is small and hornless in the case of both rams and ewes, the eyes are full and bright, the ears and the space on the head between the ears are well covered with wool, and the color of the face and ears is a uniform tint of brown or gray. The neck is straight, and is thin toward the head but broadens out toward the body so as to join smoothly with the broad, thick, deep, evenly covered shoulders. The breast is wide and deep, projecting forwards between the fore legs, making a large, full brisket and indicating a strong constitution and a thrifty condition. The fore legs are straight from breast to feet and are set squarely under the body. The ribs are heavily covered with flesh and spring out horizontally from the backbone, making a broad, flat back, and a body that is almost round. The back is nearly level, and is straight from the shoulders to the tail; the loin is broad, thick, and flat. The rump is long and broad and has the same width as the rest of the body. The thighs are full on both the inside and outside of the legs, and the twist is low and full. The lower line of the body is as straight as the top line and parallel with it. The belly is well covered with wool, as are also the legs as far down as the knees and hocks. The legs, below the knees and hocks, should be of the same color as the face and ears.

A Southdown ram is shown in Fig. 11 and a ewe in Fig. 12.

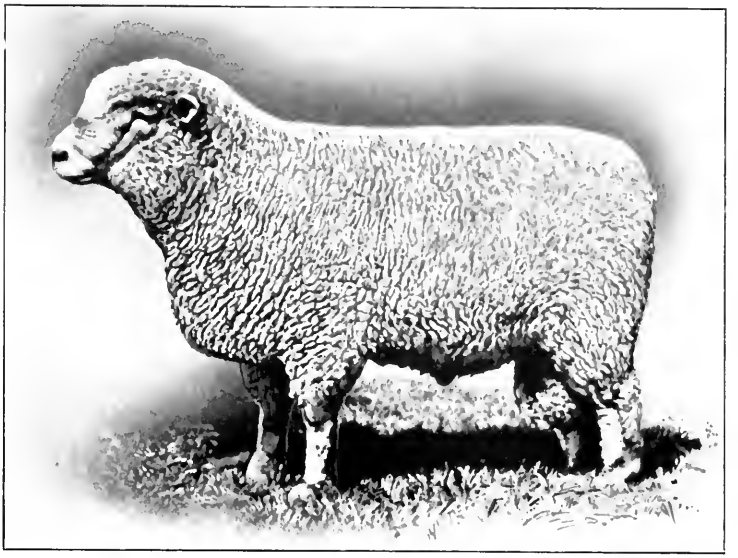

FIG. 11

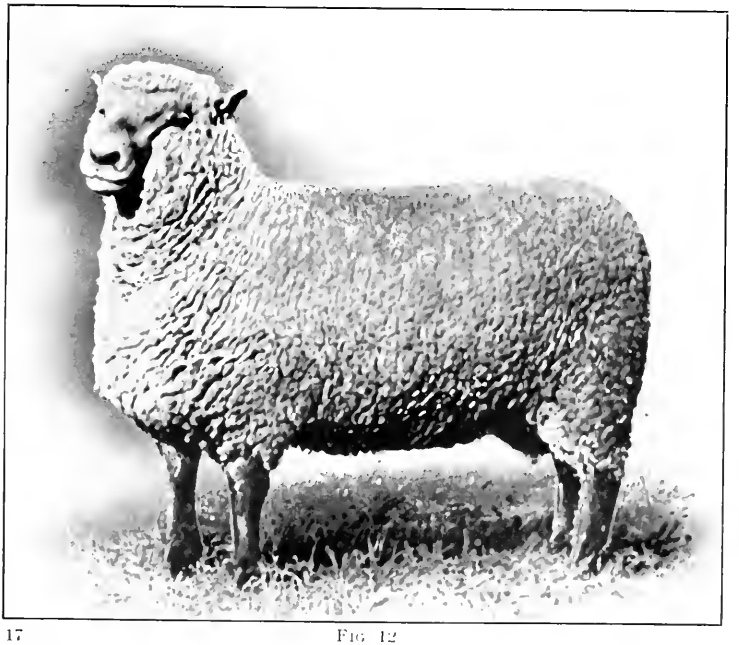

FIG. 12

243—12

The Southdown is the smallest of the medium-wool breeds, and is often criticised on account of its lack of size. However, the carcass of a Southdown is so compact that mature rams of the breed will weigh, on an average, about 175 pounds and mature ewes about 135 pounds.

16. Qualities.—*Adaptability.*—The Southdown breed is best adapted to the conditions that exist on its native downs in England, where the country is hilly, the climate dry, and the pasturage short, fine, and nutritious. It thrives on the rolling, well-drained farm lands of the middle portion of the United States and in Canada, and has also proved to be one of the best breeds to raise in the South.

Maturity.—The Southdown matures early and makes rapid gains for the quantity of feed consumed. After attaining a marketable size, a sheep of this breed remains in prime condition and may be marketed at any suitable time thereafter.

Breeding Qualities.—The breeding qualities of Southdown sheep are only medium, although the ewes are good dams and have a fair flow of milk. Sheep of the Southdown breed have been used for the improvement of several breeds of sheep, especially the Shropshire, Oxford Down, and Hampshire. They improve the feeding and maturing qualities of any breed with which they are crossed.

Mutton Production.—For the production of mutton, the Southdown breed is one of the best. Animals of this breed are good feeders, make good gains for the feed consumed, mature quickly, and can be made ready for the market at almost any age. The meat is of the finest quality and the animals dress with a small percentage of bone and offal.

Wool Production.—In wool production, the Southdown does not rank high, although the wool is finer in quality than that of sheep of any other breed of the mutton type. The fleece is dense and compact but the staple is too short and contains too little yolk for the yields to be heavy. Southdown breeders, however, are endeavoring to develop sheep that will produce heavier fleeces with longer staple. The weight of a Southdown fleece varies from about 4 to 8 pounds.

SHROPSHIRE

17. General Description.—The **Shropshire breed** of sheep is a medium-wool breed that is popular with sheep raisers. The sheep of this breed are larger and heavier than those of the Southdown breed, which they resemble in general conformation, although they are not so compact as the Southdowns. Both the ram and the ewe are hornless, and in the case of the best specimens of the breed, the head, with the exception of a small part of the nose, is covered with a dense cap of wool. The nose of the ram is slightly Roman, and the nostrils are strong and large; the head of the ewe is finer than that of the ram and the nose is straight. The ears of a Shropshire sheep are small, short, pointed, moderately thick, wide apart, and covered with short, fine wool. The head joins neatly to the well-muscled neck, and the neck blends smoothly with the broad, smooth, well-laid shoulders, which are heavily covered with flesh. The chest is deep, wide, and low, and the brisket is full, prominent, and carried well forwards between the fore legs. The body is broad, deep, and round, and the ribs are long, well arched, and thickly covered with flesh. The back and loins are strong, level, broad, and evenly covered with thick, firm flesh. The width of the body is the same from the shoulders to the end of the rump. The rump is long, wide, broad, and level on top, although it is inclined to droop from the hips. The thighs, however, are unusually thick, and the twist is low down, thus forming an excellent leg of mutton. The flanks are low down and thick; when compared with the deep body, the legs are short and are covered with wool down to the hoofs. The legs, below the knees and hocks, and that part of the face not covered with wool are of a dark brown color.

The general appearance of a Shropshire ram is shown in Fig. 13 and that of a ewe in Fig. 14.

In size, the Shropshire is about an average of the sheep of the medium-wool breeds. Mature rams should weigh about 225 pounds and mature ewes from 150 to 160 pounds.

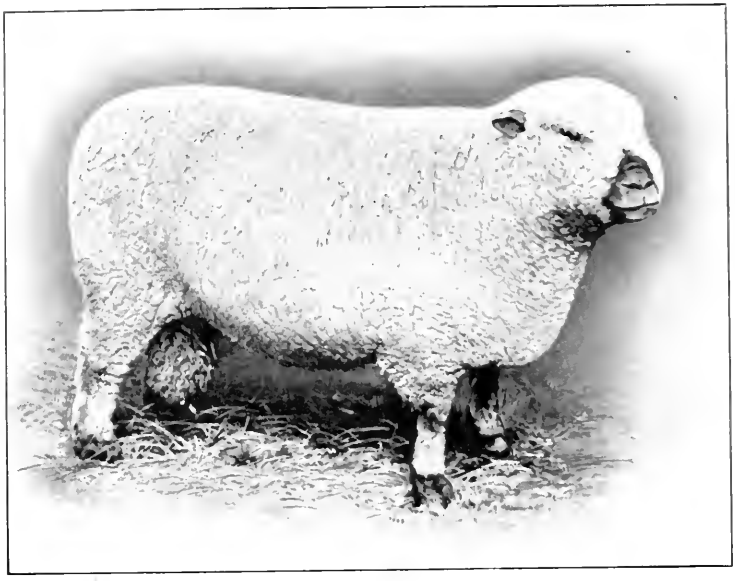

Fig. 13

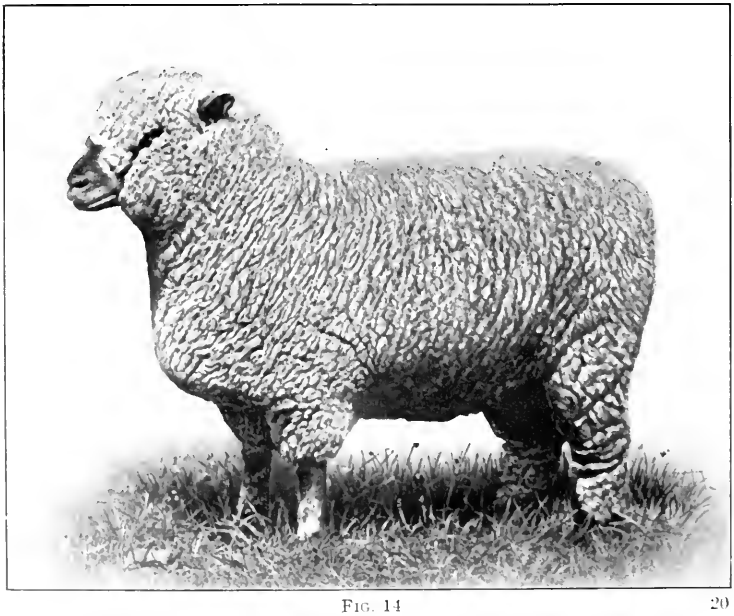

Fig. 14

18. Qualities.—*Adaptability.*—The Shropshire breed is especially adapted to gently rolling land where pastures are good and the climate is dry and cool. The breed is decidedly suited to the corn-belt region of America, where it is exceedingly popular, although it is not so well adapted to the range as are the fine-wool breeds.

Maturity.—The Shropshire breed ranks high for early maturity, as the lambs can be made to weigh 40 pounds in 4 months and 100 pounds in 12 months. This quick-maturing quality has made Shropshire sheep popular with feeders.

Breeding Qualities.—Shropshire sheep are noted for their breeding qualities, due to the fact that the ewes are good dams and are regular breeders, often giving birth to and raising twins or triplets. About 150 lambs, on an average, are dropped for every 100 ewes bred.

The crosses from Shropshire rams and native, or Merino, ewes are among the most common and acceptable mutton sheep found in American livestock markets. The offspring of a Shropshire ram and a ewe of a fine-wool breed is much better in mutton quality than the dam, and the offspring of a Shropshire ram and a long-wool grade ewe is better in both mutton and wool qualities than the dam.

Mutton Production.—The Shropshire breed ranks next to the Southdown in the quality of mutton produced; in fact, the quality of Shropshire mutton is claimed by some to be equal to that of the Southdown. Shropshires fatten readily and there is comparatively little offal in dressing.

Wool Production.—The wool of Shropshire sheep is of superior fineness and crimp for a medium-wool breed, is usually about 3½ inches in length, and often contains a considerable quantity of yolk. The fleeces from a flock of Shropshire sheep should average about 7 or 8 pounds in weight.

OXFORD DOWN

19. General Description.—Sheep of the **Oxford Down breed** are the largest of the animals of the medium-wool breeds. They resemble the Southdowns and Shropshires in

general conformation, which is that of the mutton type. The head is hornless, the poll, or top of the head, is well covered with a tuft or a topknot of wool, and the cheeks are covered with wool, although the rest of the face is usually covered with dark hair. The ears are rather long, thin, set low and well back, and are free from wool. The face and legs are of a dark-brown color. The body is practically the same as that of the Shropshire. The rump is broad, level, and well covered with flesh.

The general appearance of an Oxford Down ram is shown in Fig. 15 and that of a ewe in Fig. 16.

When mature, Oxford Down rams should weigh not less than 275 pounds, and some rams of the breed have attained a weight of 400 pounds. Mature ewes should weigh about 200 pounds. Lambs dropped in April should weigh from 100 to 120 pounds in the following September.

20. Qualities.—*Adaptability.*—Oxford Down sheep, like those of all the other breeds of large sheep, thrive best in sections of well-cultivated land where there are luxuriant pastures and abundant feed can be supplied to them. They can withstand confinement well and in England they are pastured largely on small areas enclosed by movable fences. Oxford Down sheep are widely distributed throughout the fertile farming sections of the United States and Canada, and the breed, wherever introduced, has become popular.

Maturity.—The Oxford Downs rank high for maturity on account of the rapid gains made by the lambs. In feeding experiments, Oxford Down lambs made a daily gain of more than ½ pound each for a period of 90 days.

Breeding Qualities.—Oxford Down sheep are noted as being prolific breeders, ranking in this respect next to the Shropshires. The ewes frequently give birth to twins, are good dams, and furnish an ample supply of milk for the lambs.

On account of the increased demand for mutton and the large size of the Oxford Down rams, the latter have been extensively used all over the United States, especially on the western ranges, for improving the mutton quality of the grade

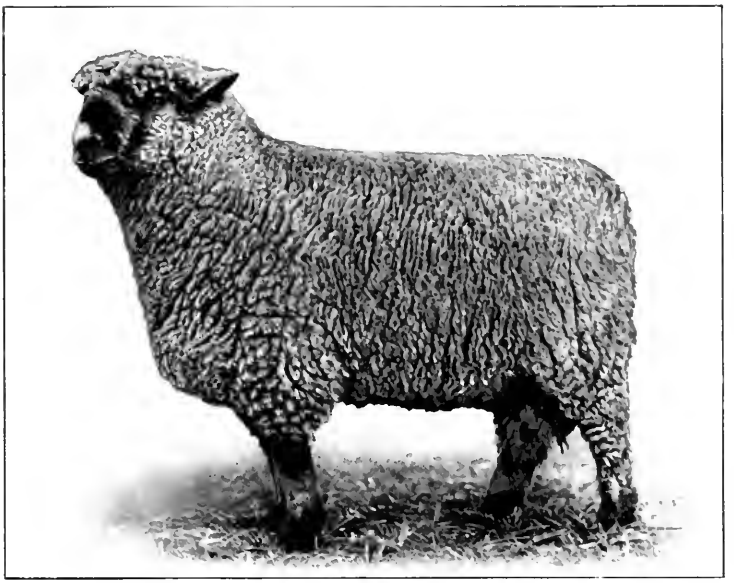

Fig. 15

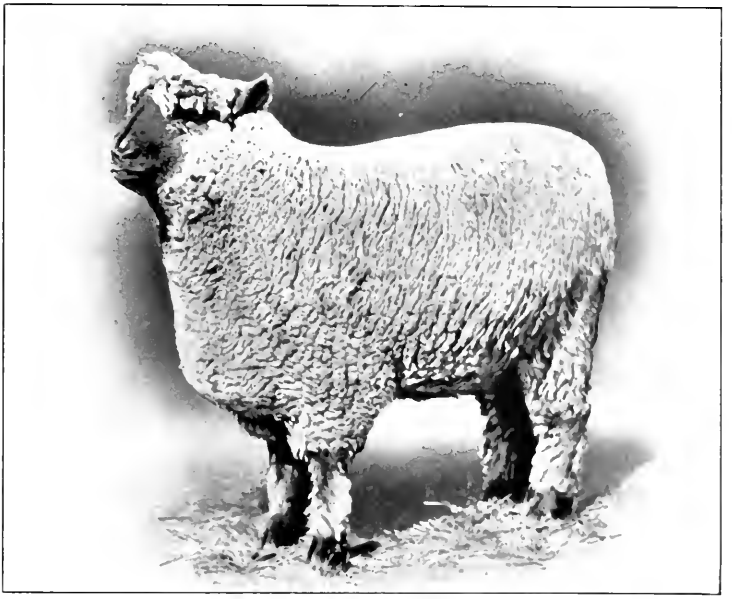

Fig. 16

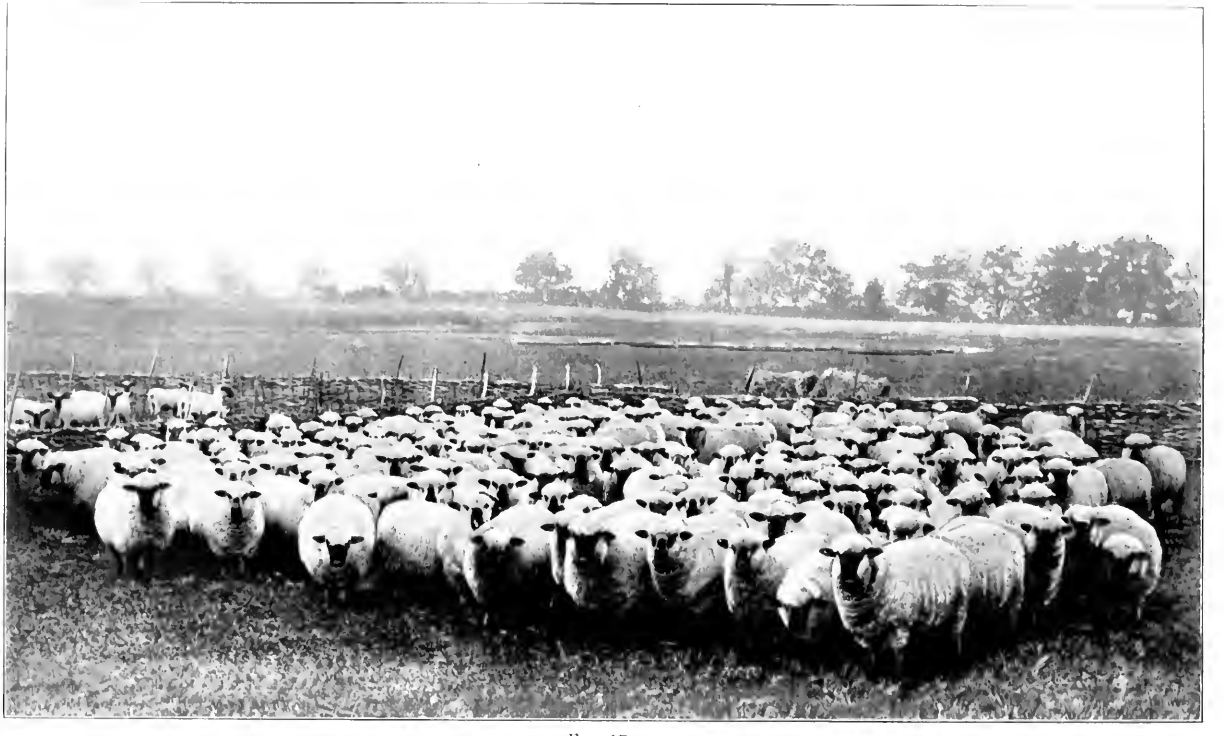

Fig. 17

sheep of the fine-wool breeds. When an Oxford Down ram is used on common grade ewes the offspring are an improvement over the dam in both mutton and wool qualities.

Mutton Production.—In the ability to produce mutton, Oxford Down sheep rank high on account of their large carcasses, the small proportion of waste in dressing, and the fine quality of the mutton. The lambs grow rapidly and attain a desirable killing size at 12 months of age, and when kept until older they continue to make good gains.

Wool Production.—As wool producers, the Oxford Downs are much in favor on account of their heavy fleeces. The wool is of a quality known as combing wool, which is longer and coarser than that from sheep of any of the other medium-wool breeds. The fleeces from a flock of good Oxford Down sheep should average from 10 to 12 pounds.

HAMPSHIRE

21. General Description.—A general idea of the appearance of sheep of the **Hampshire breed** may be obtained from Fig. 17, which shows a flock of Hampshire lambs. The ears, nose, and legs of Hampshire sheep are of a uniformly dark-brown color that often shades to almost black. The nose of a mature ram of the breed is thick, bold, and of an intensely dark-brown color; the nose of a mature ewe is more delicate and feminine in appearance than that of the ram. The lips and nostrils of the Hampshire are black, the eyes are large, full, and of a rich, yellow-brown color. The ears, the back of which may be of a dark mouse color, are rather long and in the best specimens of the breed are inclined to fall slightly outwards. When the attention of a Hampshire is attracted, the ears are pricked forwards, which gives it an intelligent appearance. The head is well covered with wool between the ears and on the cheeks; the neck is rather long, thick, and well muscled, and the body is very much like that of an animal of the Oxford Down breed.

A Hampshire ram is shown in Fig. 18 and a ewe in Fig. 19.

FIG. 18

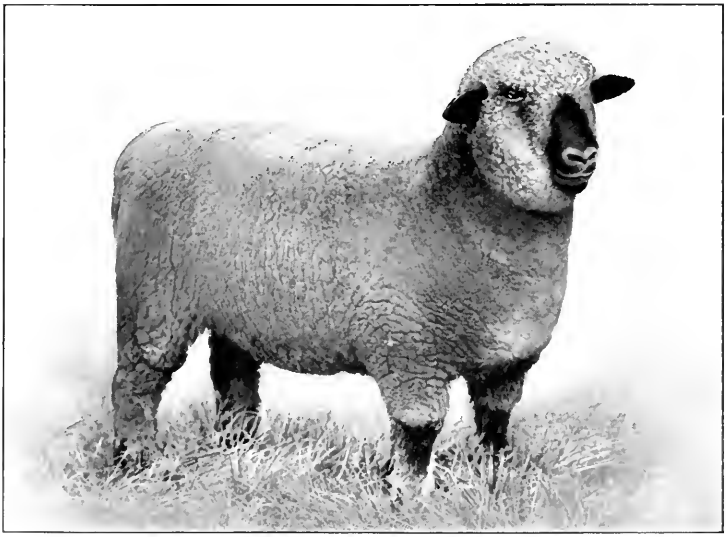

FIG. 19

The Hampshires raised in America are lighter in weight than the Oxford Downs, but in England the Hampshires are often regarded as the heaviest sheep of the medium-wool breeds. Mature rams should weigh about 250 pounds and mature ewes about 190 pounds. Occasionally, by careful breeding and good care, rams weighing 300 pounds are produced.

22. Qualities.—*Adaptability.*—Hampshire sheep, like the Oxford Downs, thrive best when they are supplied with an abundance of feed and are allowed to graze over luxuriant pastures. In their native home, Hampshire, England, they are pastured on small areas enclosed by hurdles, and in this way a large number of sheep are maintained on a small area. In the United States, small flocks are found in parts of New York, Pennsylvania, Ohio, and Indiana; in Canada, they are found in Ontario and Quebec.

Maturity.—Hampshire lambs fatten readily, mature quickly, and are much sought after in the early spring-lamb market.

Breeding Qualities.—The Hampshires are good breeders; about 115 lambs are raised from every 100 ewes that are successfully bred. The crossing of Hampshires with sheep of the larger breeds is extensively practiced and produces desirable, quick-maturing, mutton sheep. Where early lambs —that is, lambs for the early spring-lamb market—are desired, the Hampshire ram is an excellent sire to use. Hampshire rams are prepotent, stamping the black faces and the rapid-fattening and early maturing qualities on their offspring.

Mutton Production.—For the production of mutton, Hampshire sheep have long ranked high in England, and during the past few decades have met with favor in American markets. The sheep of this breed consume large quantities of feed and make gains accordingly. The early lambs of both pure-bred and grade Hampshires are highly esteemed by mutton buyers.

Wool Production.—The wool of Hampshire sheep is of medium length and is not as fine as that of the Southdowns. The fleeces of a flock of Hampshire sheep should average about 7 pounds each in weight.

DORSET

23. General Description.—The **Dorset breed** of sheep, also known as the *Dorset Horn breed*, is a breed that is distinctly marked. Both the rams and the ewes have horns. The horns of the ram are spirally curved rather close to the head; those of the ewe are shorter, smaller, not so close to the head, and are curved less than those of the ram. The sheep of the Dorset breed have white faces and legs. The face, muzzle, ears, and that part of the legs below the knees and hocks are covered with short, white hair. The nostrils are large and white. The body of the Dorset, although smooth and well covered with flesh, is longer in proportion to its depth and width than the body of a sheep of the other breeds of the mutton type.

The distinctive markings of the Dorset may be seen in Fig. 20, which shows a Dorset ram, and in Fig. 21, which shows three Dorset ewes.

In size, sheep of the Dorset breed rank somewhat above the average of those of the medium-wool breeds. Mature rams should weigh about 225 pounds and mature ewes about 165 pounds; an extra good 2-year-old ram has been known to weigh 317 pounds; a yearling ram, 287 pounds; a 5-month-old ram lamb, 184 pounds; and yearling ewes, 250 pounds.

24. Qualities.—*Adaptability.*—Sheep of the Dorset breed are fairly hardy, the animals being able to adapt themselves to a rather wide range of conditions. Although Dorsets instinctively choose a hilly region for grazing, they do equally well on level, well-drained, fertile farm land. They are good grazers, are strong limbed, well able to travel, and will exist on a coarser herbage than the sheep of many other breeds, although they do not prefer the coarser herbage.

Maturity.—The sheep of this breed are noted for their ability to produce early lambs and are unsurpassed in the rapid-maturing quality of the lambs. For this reason sheep of the Dorset breed are considered to be the best for pro-

Fig. 20

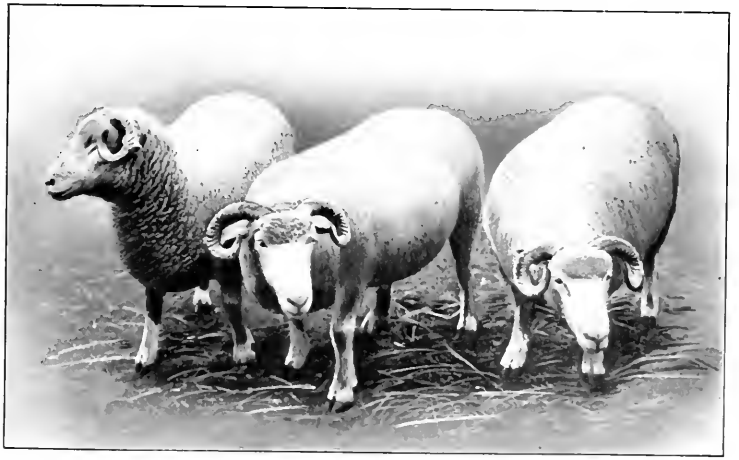

Fig. 21

ducing lambs that are to be placed on the market from Christmas to about the first of May as hothouse lambs.

Breeding Qualities.—Dorset sheep stand without equals as breeders. The ewes not only breed regularly, but often produce twins, sometimes triplets, and occasionally quadruplets. The ewes can often be made to breed twice a year, and will breed at almost any time of the year. They are good dams and produce a good supply of milk. Dorset ewes are excellent sheep to cross with a Hampshire, Shropshire, Oxford Down, or Southdown ram when it is desired to produce early lambs with the natural markings of the ram used.

Mutton Production.—In the production of mutton, sheep of the Dorset breed rank only fair among those of the medium-wool breeds. Sheep of this breed dress with a larger percentage of waste than those of some other breeds, although the quality of the meat is fair. The principal value of Dorset sheep is in the production of early, or hothouse lambs, for which they have long been highly valued. It is the custom to have the ewes lamb in September or October, so that the lambs will be ready for market by Christmas.

Wool Production.—The Dorset does not rank high in production of wool. The fiber is rather short and of medium quality, and the fleece does not cover the body well on the under parts. Ewes will produce about 6 pounds of unwashed wool and rams from 9 to 10 pounds.

CHEVIOT

25. General Description.—Sheep of the **Cheviot breed** are white in color and have a graceful carriage. The head is usually hornless in the case of both the male and the female, although occasionally horns occur on the ram; according to an enactment of the American Cheviot Sheep Society, all male lambs dropped after January 1, 1905, are ineligible to registry unless they have a true polled head. The head, back to a line just back of the ears and around under the middle of the lower jaw, and the legs from the knees and hocks down, are usually covered with fine, white hair; some-

times small black spots, which are not considered objectionable, appear on the head and ears. Reddish or sandy hairs that occasionally occur on the face and legs are objectionable. The nose frequently has a slight Roman curve; the lips and nostrils are generally black, but occasionally flesh colored. The ears are long and slender and stand upright. Cheviot sheep are lighter in the forequarters than sheep that have been raised on the plains; this character is supposed to have been inherited from the ancestors of the Cheviots, which were highly adapted to mountain climbing. The legs of

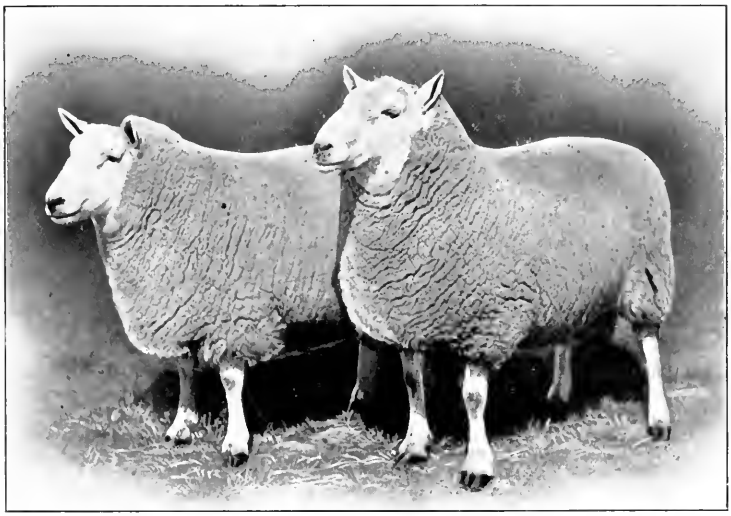

Fig. 22

Cheviots are squarely set, and the hoofs are black. The bodies lack the breadth of those of Southdowns or Shropshires, but they are well covered with flesh. The bodies are covered all over, except on the head and legs, with fleeces of medium wool.

A Cheviot ram is shown at the right and a Cheviot ewe at the left in Fig. 22.

A mature Cheviot ram should weigh from 200 to 225 pounds and a mature ewe from 150 to 160 pounds.

26. **Qualities.**—*Adaptability.*—From the long period of mountain existence of the breed, Cheviot sheep are well adapted to mountain conditions. The animals are good climbers and are able to graze over rugged land, although they do well also on more level lands. The extreme hardiness of Cheviot sheep is a point in favor of the breed.

Breeding Qualities.—The breeding qualities of Cheviot sheep are somewhat above the average. The ewes breed regularly, require but little attention at lambing time, and produce a good supply of milk. They are not as prolific, however, as those of the Shropshire or Dorset breeds. Cheviot sheep, especially the ewes, are extensively used for crossing with Lincoln or Leicester rams. Such a cross produces lambs that are more hardy and yield carcasses with less fat than those of either the Lincoln or the Leicester sheep.

Mutton Production.—The quality of the meat of the Cheviot is good, although not so delicate as that of the Southdown, and there is comparatively little offal in dressing.

Wool Production.—Cheviot sheep produce fleeces of a medium quality known in the market as *half combing wool.* The wool is coarse in texture, although longer than that of the best Shropshire, but is superior to that of the Oxford. The average weight of fleeces of Cheviot sheep has been greatly increased by careful breeding and management, but it is still somewhat light. Fleeces from rams should weigh from about 7 to 11 pounds and those from ewes should weigh from about 5 to 9 pounds.

SUFFOLK

27. **General Description.**—Sheep of the **Suffolk breed** have a characteristic inky-black color in the region of the head, ears, and legs. The head, in the case of both the male and the female, is hornless. The face is long and narrow, and the ears long and rather large. The face and the ears are covered with jet-black hair; there is rarely any wool on any part of the head, although a small quantity of clean, white wool on the forehead is not regarded as objectionable. The neck and legs are inclined to be a little long and the body some-

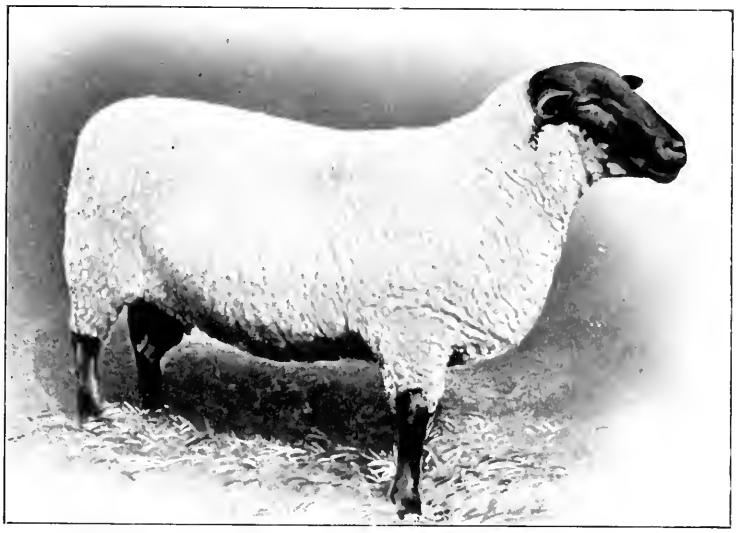

FIG. 23

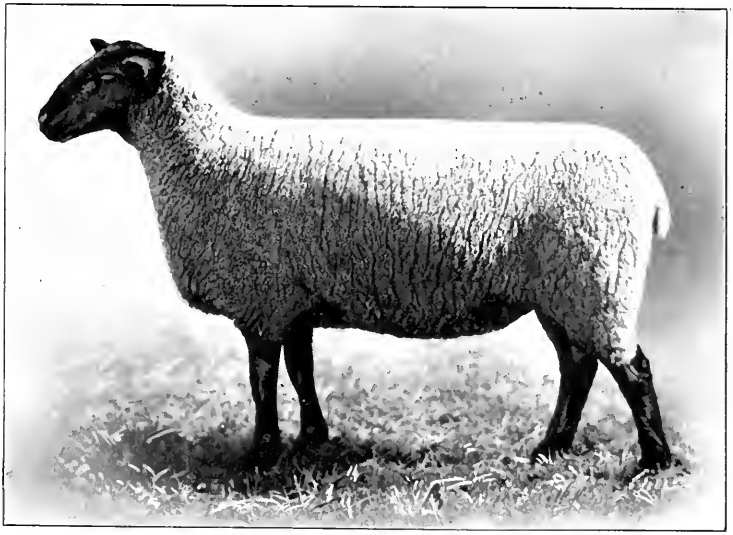

FIG. 24

what rangy, although it has a good spring of rib. The fleece is moderately long and fine, covering the body to the head and the legs nearly to the knees and hocks.

A Suffolk ram is shown in Fig. 23 and a ewe of the same breed in Fig. 24.

In size, the Suffolk sheep rank somewhat above the average of those of the medium-wool breeds. Mature rams should weigh from about 225 to 240 pounds, and mature ewes about 175 pounds.

28. Qualities.—*Adaptability.*—Suffolk sheep are hardy, and it is claimed that they will obtain a living on pastures where sheep of other breeds will starve. They are best adapted for the production of high-class mutton, wool being a secondary consideration. They thrive best on rather level or only slightly rolling, fertile grazing land. There are but few Suffolk sheep in North America, and these are found largely in New York, Iowa, Illinois, Michigan, and Missouri, in the United States, and in Ontario, Canada.

Breeding Qualities.—The Suffolks are among the most prolific of sheep. The ewes give an abundance of milk and are good dams. They frequently produce twins, and triplets are not uncommon.

Mutton Production.—Sheep of this breed rank high for the quality and quantity of the mutton that they produce. The meat is fine-grained, of good flavor, and has a good proportion of lean to fat, both of which are properly distributed. Suffolk sheep make fair gains for the quantity of feed consumed, and mature rapidly.

Wool Production.—As wool producers Suffolk sheep do not rank high. They are inclined to be bare of wool on the under part of the body, and the fleeces are somewhat light.

The fleeces from a flock of Suffolk sheep vary in weight from about 7 to 9 pounds each.

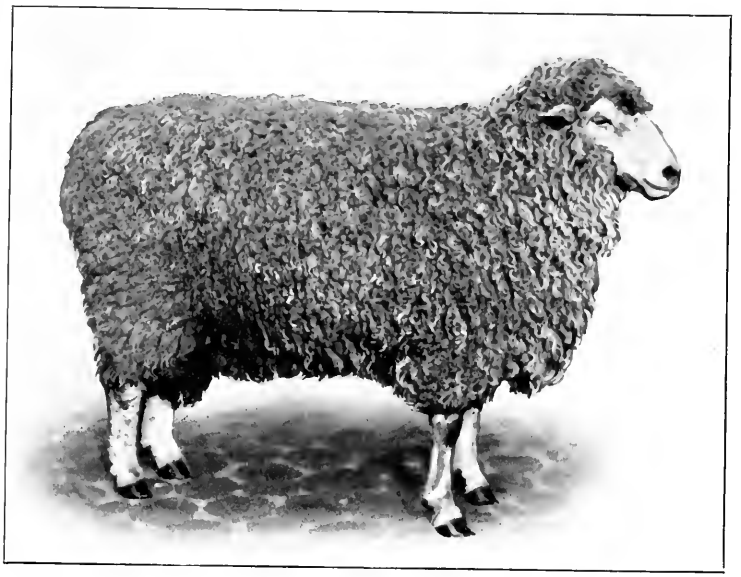

Fig. 25

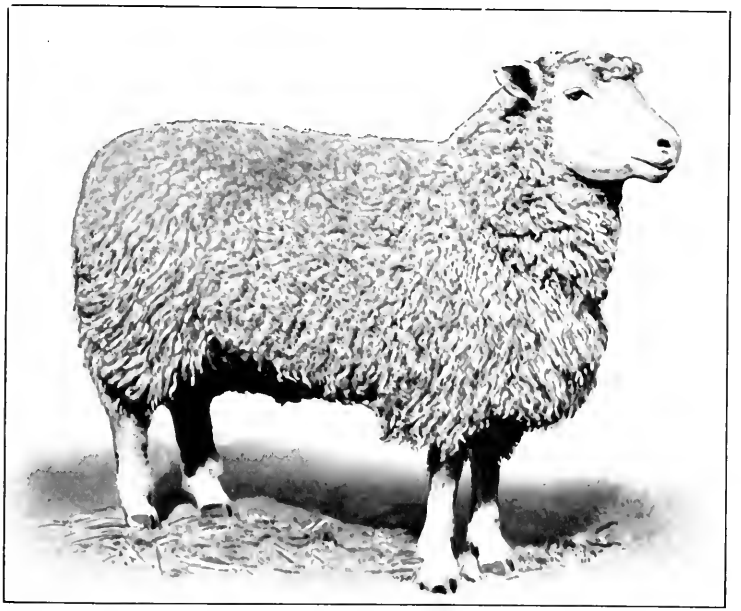

Fig. 26

COARSE-WOOL BREEDS

LINCOLN

29. General Description.—Sheep of the **Lincoln breed** are large, squarely built animals, and are nearly white in color. The head is large and hornless in the case of both the ram and the ewe; the face is rather long and usually is covered with fine, white hairs, but frequently has a grayish tinge over the nose; the poll is surmounted by a short tuft of wool; and the ears are large and often covered with brownish spots. Animals of this breed are noted for their broad, level, deep-fleshed back; deep, well-sprung ribs; and square, well-developed hindquarters. The legs are inclined to be rather long and are sometimes covered nearly to the hoofs with short wool. The wool is inclined to be coarse, but is long, strong, and lustrous, and lies in spiral locks or flakes.

A Lincoln ram is shown in Fig. 25 and a ewe in Fig. 26.

Lincoln sheep are the largest of any breed. Mature rams should weigh from about 275 to 300 pounds, and mature ewes from about 225 to 250 pounds.

30. Qualities.—*Adaptability.*—On account of their large size, Lincoln sheep are best adapted to level regions where the supply of feed is plentiful. A larger number of Lincolns are raised in Ontario and other provinces of Canada than in the United States, where the leading flocks are found in Michigan, Wisconsin, Illinois, and Ohio.

Breeding Qualities.—Lincoln ewes are not prolific breeders, but are better in this respect than those of either of the other coarse-wool breeds. They are good dams but do not produce a large quantity of milk. The grade sheep resulting from the cross of a Lincoln ram and ewes of the fine-wool breeds are favorites when it is desired to produce large, rapidly growing lambs that fatten easily and furnish large chops and legs of mutton. This cross has been practiced to some extent on the ranges of the western part of the United States, but

exceptionally large-bodied sheep have not been so popular in the United States as they have in England, where grade sheep showing the Lincoln cross are popular.

Mutton Production.—Lincoln sheep are good feeders and mature quickly, but they do not rank high as mutton producers. The carcass is too large to suit the modern market demand, yields too much fat, and the quality of the meat is not first class.

Wool Production.—Sheep of this breed produce longer wool and heavier fleeces than those of any other breed with the exception of sheep of the fine-wool breeds. The fleece, which should cover the entire body, including the under parts, is formed of many strands, or flakes, which have been known to measure 20 inches in length. The wool is bright and lustrous and of a quality known as *combing wool*. A mature ewe should produce a fleece weighing about 15 pounds, and a mature ram should produce a fleece weighing from about 18 to 20 pounds. The fleece of a ram of this breed has been known to weigh 30 pounds.

LEICESTER

31. General Description.—The **Leicester breed** is divided into two strains; the English, or Dishley, Leicester, and the Border Leicester. These names are derived from the sections of England where the two strains were developed. The sheep of the two strains are much the same in general appearance, and the same description will apply to both, except where differences are stated.

The heads of both the ram and the ewe are hornless and usually are white, although small black spots occasionally occur on the face and ears. The head of a Border Leicester is covered with fine, soft, white hair, but occasionally the poll of the head of a Dishley Leicester is covered with a tuft of short wool. The ears are thin, somewhat large, and stand rather erect. The nose is slightly Roman and the skin at the muzzle is black. The neck is short and blends with the deep, wide shoulders. The breast is deep, wide, and projects well

forwards. The ribs spring squarely from the backbone, making a broad, level back. The body is long—it is longer in the Border Leicester than in the Dishley Leicester—and very broad, but lacks in depth. The flanks are well filled and the under line of the body is parallel with the top line. The hindquarters are not so large as breeders desire, because the thighs are not sufficiently thick, especially near the hocks. The legs are straight, squarely set under the body, and are covered below the knees and hocks with soft, white hair.

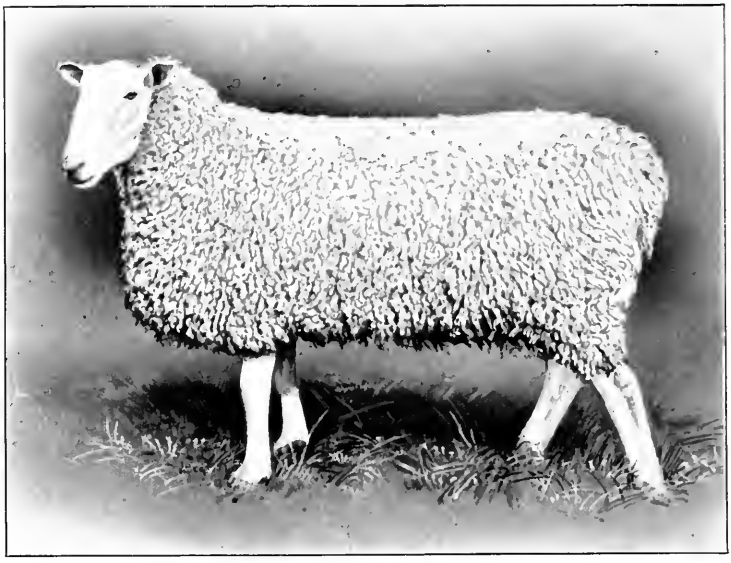

FIG. 27

The body is covered with an open fleece of medium-long wool arranged in small spiral locks.

A fine specimen of a Border Leicester ram is shown in Fig. 27 and a flock of Leicester ewes in Fig. 28.

Mature Leicester rams should weigh from about 225 to 250 pounds and mature ewes from about 175 to 200 pounds.

32. Qualities.—*Adaptability.*—The Leicester sheep are large, quiet, docile, and best adapted to localities where pastures are luxuriant and the ground not rough, and where

Fig. 28

there is an abundance of feed. On account of the open character of the fleece, Leicester sheep are sensitive to cold rains and therefore require shelter much of the time during winter months. They are more common in Canada than in the United States.

Breeding Quality.—Leicester ewes are not, as a rule, prolific breeders, although some flocks have been known to produce more than 125 lambs for each 100 ewes successfully bred. If a Leicester ram is crossed with American or Delaine Merino, Rambouillet, Hampshire, or Cheviot ewes, lambs are produced that are much valued for their ability to make rapid gains and to produce a good quality of mutton.

Mutton Production.—When mature and fitted for market, Leicester sheep carry too much fat to be popular. The lambs fatten readily and make desirable mutton if killed before they are 12 months old.

Wool Production.—The wool of Leicester sheep is about 6 inches long and is a fine grade of coarse wool. It is arranged in small spiral locks, which makes the fleece rather open and light. The average weight of the fleeces of a flock of Leicester sheep should be from about $8\frac{1}{2}$ to 11 pounds each.

COTSWOLD

33. General Description.—Sheep of the **Costwold breed** are large, long-wooled, and white in color, and somewhat resemble those of the Lincoln and the Leicester breeds. The head in the case of both the male and the female is hornless and carried high, and the poll is surmounted by curling locks of wool, which often almost cover the eyes and extend down as far as the nostrils. This forelock is one of the characteristic features of the breed and is not trimmed when the sheep are shorn or trimmed for show. The face is usually covered with white hair, but is sometimes spotted with gray or brown patches. The nose is straighter than that of the Leicester. The body has much the same broad-backed, squarely built conformation as that of a sheep of the Lincoln breed, but the heart girth is often greater in proportion to the girth around

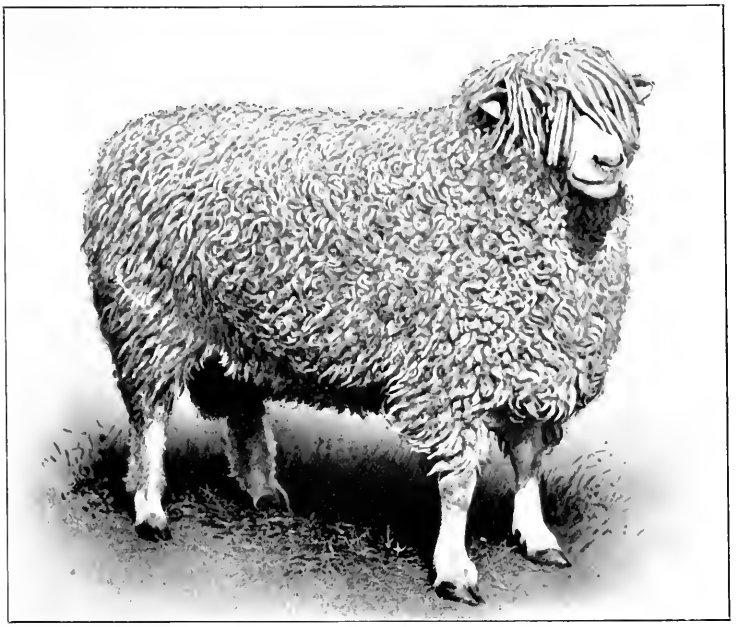

Fig. 29

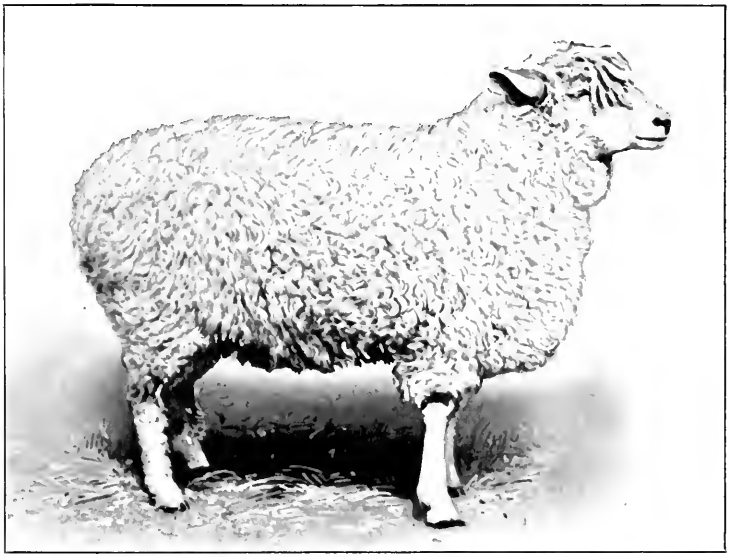

Fig. 30

the hind flanks than is the case with a Lincoln. The legs, especially the hind legs, are long compared with those of an animal of the Lincoln or the Leicester breed. The wool is rather coarse and hair-like, and hangs in spiral curls, or locks.

A Cotswold ram is shown in Fig. 29 and a ewe in Fig. 30.

In size, Cotswold sheep are larger than those of the Leicester and almost and sometimes fully as large as those of the Lincoln breed. The weight of these sheep will average about 25 pounds lighter than that of the Lincolns. A mature ram should weigh from about 250 to 275 pounds, and a mature ewe from about 200 to 250 pounds.

34. Qualities.—*Adaptability*—Like the Lincoln and Leicester, the Cotswold is best adapted to level countries where there is an abundant supply of feed.

Breeding Qualities.—Cotswold ewes, like ewes of the other coarse-wool breeds, do not rank high in prolificacy. The Cotswold ewes, however, give an abundance of milk and take good care of their lambs.

Cotswold rams crossed on pure-bred or grade ewes of the fine-wool breeds produce lambs that grow to a desirable size, yield fleeces of fair weight and quality, and have good mutton carcasses. This cross is extensively practiced on the ranges in the western part of the United States.

Mutton Production.—Cotswold sheep are good grazers and feeders, make rapid gains, and, if killed before 12 months of age, make a desirable grade of mutton. If they are allowed to grow to 2 years of age, the carcasses are too large, bear too much fat, and the flesh is not of as desirable quality as when the sheep are killed at a younger age.

Wool Production.—Cotswold sheep produce a lustrous combing wool, which often reaches 12 to 15 inches in length. The wool is coarser than that of either Leicester or Lincoln sheep. An average fleece should weigh from about 9 to 10 pounds.

SHEEP JUDGING AND BREEDING

SHEEP JUDGING

1. The aim of a sheep breeder should be to improve his flock from year to year. In order to bring about this improvement it is necessary that the breeder have the ability to judge sheep. **Sheep judging** is the art of ascertaining and weighing the merits of a sheep in comparison with those of other sheep or of an ideal sheep in the mind of the judge. If the breeder has an understanding of this art he will be able to select each year superior young ewes to replace the inferior old ones of his flock. The sheep breeder, therefore, should become familiar with the principal operations of a judge as he catches, handles, examines, and places, according to merit, the individuals of a ring of sheep at fairs and livestock exhibitions. By a **ring of sheep** is meant all the sheep of a class—that is, of the same breed, grade, or type, and usually of the same age and sex—gathered together for examination by a judge.

2. Catching of Sheep.—One of the first things the beginner in sheep raising or sheep judging should learn is how to catch and handle a sheep. Usually the best way to catch a sheep is to slip quietly up behind or alongside of it and quickly yet quietly and firmly grasp the hind leg just above the hock, as shown in Fig. 1. Some sheep men prefer to catch a sheep by the head or around the neck. Rather tame sheep can be caught by approaching from the rear and catching them by the flank, as shown in Fig. 2. A shepherd's crook is a valuable implement with which to catch sheep that are

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not sufficiently tamed to be caught with the hands. Sheep should never be caught by pouncing upon their backs and

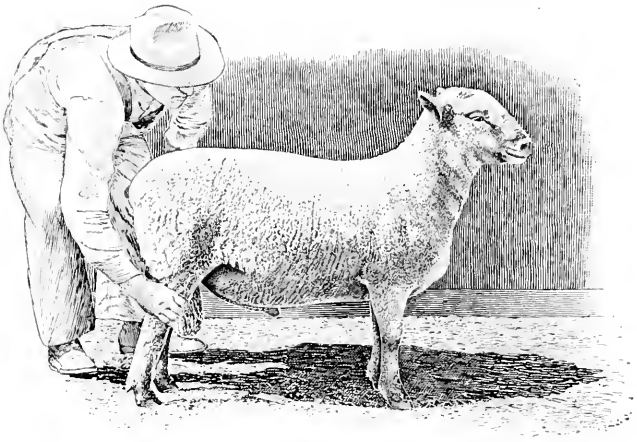

FIG. 1

grasping their wool. Such attempts at catching them usually terrorize the sheep, causing them to plunge and struggle in a

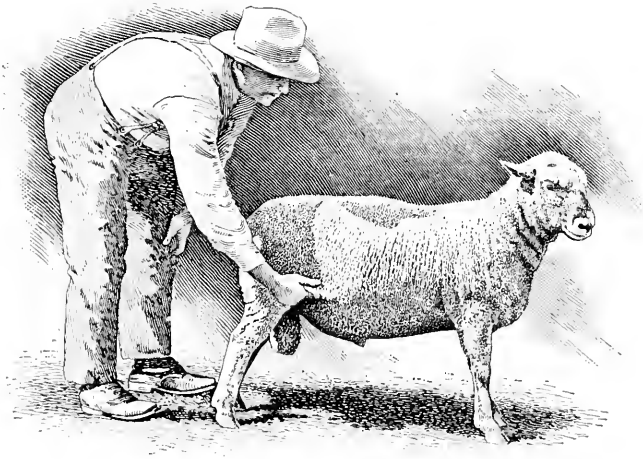

FIG. 2

frantic manner, which often results in pulling out or loosening quantities of wool and otherwise injuring the animals.

3. Handling of Sheep.—If sheep are caught by the hind leg in the way just described, their attention is usually diverted by the captured leg; they do not struggle much and can be held thus. But it is easier and presents a better appearance in the show ring to hold them by the head. While holding the animal as shown in Fig. 1, it is a simple matter to pass the left hand under the neck from the left side of the animal and then, releasing the hold on the leg, pass the right hand up over the side and on top of the neck, at the same time stepping forward to the neck of the animal. From the neck hold, it is easy to pass to the most common position of

FIG. 3

holding sheep, that is, with one hand under the jaw and the other hand over the forehead, the person holding the sheep standing somewhat to the rear of its head. If the animal is quiet, the one hand under the jaw is all that is necessary to hold it and the attendant may stand or sit in front of the sheep. If the sheep struggles, both hands should be used and a slight turn of the head and a little force will easily keep the animal under control and soon calm it.

4. Throwing a Sheep.—The sheep breeder and judge often has occasion to **throw,** or **set up**, a sheep; that is, to set it on its hindquarters with its back in a more or less vertical position. The proper way to throw a sheep is as follows:

Stand at its right side and with the right hand and wrist under its jaw, pass the left hand under the animal and grasp its left hind leg as shown in Fig. 3. Then pass the right arm under the animal's neck, make a quick, gentle side shove and lift the front legs up off the ground. These movements should be rapid but firm and gentle, and should not result in injuring or frightening the animal, but should set it on its hindquarters with its back almost vertical, fore legs hanging in the air toward the sides, and the head supported in the attendant's lap.

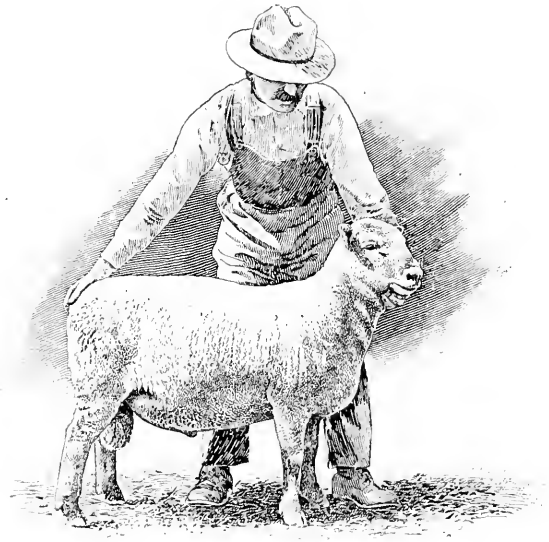

Fig. 4

5. Leading a Sheep.—A sheep that has not been trained to lead, is usually a very stubborn animal when occasion arises to lead it if the attendant does not know how to proceed. The best way to lead a sheep is to place one hand under the lower jaw and with the other hand grasp the root of the tail or the end of the dock, as shown in Fig. 4. A slight pressure on this part of the tail will cause the animal to march ahead and this without much effort on the part of the shepherd and without pain or fear on the part of the sheep. An

untrained sheep is almost sure to resent attempts to pull it along by the head, and to pull back as much as possible.

6. Results of the Training of Sheep.—Sheep that are handled frequently may be trained to do many things. Sometimes shepherds train their sheep to stand so that defects in conformation will be hidden. Animals that are narrow behind or in the chest, can be trained to stand with their legs wide apart, thus making the sheep appear full and well developed. A weak back can sometimes be momentarily strengthened by the sheep pressing against an attendant's knee. These little tricks seldom cover up faults so that a competent judge will be deluded. The greatest benefits to be derived from training is to make the animals tame and stand at ease in the very best position to show off to advantage while being inspected. This is a legitimate purpose, because the best animals do not do justice to themselves if they are frightened and restless while in the show ring.

7. System of Procedure in Judging of Sheep.—It does not matter what the system of procedure in the judging of sheep may be so long as it allows the judge to follow a definite scheme of examination of each part of each animal in the ring. The system usually followed by the best judges is to stand about 10 feet away and take a general view of each animal in the ring from the front, side, and rear to form an estimate of them as a whole and to decide upon certain points about each animal. This will save time and help to fix each animal in mind. Later each animal is handled and examined thoroughly.

8. General Examination in Judging of Sheep.—Pure-bred sheep should be typical of the breed to which they belong. An animal is said to show good or poor breed type according to the degree to which it approaches to the ideal animal of the breed. The ideal for each breed has been established by the breeders who have developed the breeds, and a judge should know the characters of each breed, such as the desirable size, color markings, shape of the head and body, length,

density, fineness, and crimp of the wool, and the length of the legs. These characters indicate breed type and should be noticed by a judge as he examines a ring of sheep. From the front view the judge can see the width of the breast and the straightness of the fore legs and the head. The head is one of the most important indexes of the animal. It is important in indicating whether or not the animal has vigor and is of the breed type that is desired in pure-bred animals. The head should be typical of the breed, broad and full in the forehead, the face short with a clean-cut appearance, and the eyes large and bright. From the side view, the judge can get the outlines and general balance of the animal. The neck should appear short and well carried; the legs should be short, giving the animal a low-set appearance. The thighs, the placing of the hind legs, and width of body can be viewed from the rear. These general views should indicate the form of each sheep. The form of a sheep should be attractive; the back from the top of the shoulders to the root of the tail should be a straight line, which is known as the top line. The under line, that is, the bottom line of the body from the fore legs to the hind legs, should also be straight. In specimens of the mutton type of sheep the body should be broad, deep, compact, rugged, and symmetrical; and the legs, short. The development of these characters is less, but the development of the quantity and quality of the fleece is much more in specimens of the wool type of sheep than in those of the mutton type.

9. Detailed Examination in Judging of Sheep.—After having made a general survey of a ring of sheep, the next step of a judge is to handle and examine each sheep thoroughly. As this examination is made the judge should study the condition and the quality of each animal. **Condition** is a relative term used to designate the quantity and the degree of evenness of the distribution of fat on an animal. Sheep frequently have too much fat, which is objectionable from every point of view. The fat should be firm and elastic under the hand and evenly laid over the body. One

way of judging the condition of a sheep is to determine the quantity of fat at the root of the tail by feeling that part of the sheep, as shown in Fig. 5. The higher the condition, that is, the fatter the sheep, the more fat will be deposited around the root of the tail. As the judge examines the loin, back, ribs, and breast of a sheep he should receive impressions of the condition of the animal.

The quality of a sheep is judged by the condition of the bone in legs, shoulders, and head. If the bone is smooth

FIG. 5

and rather small and gives the idea of compactness, the sheep is said to have good quality; if it is rough or large, the sheep is said to lack quality. The fineness or the coarseness of the wool, the pliability of the skin, and the elasticity of the flesh indicate, to a certain extent, the degree of quality that a sheep possesses. Quality is a difficult point for a judge to decide. Sheep that show coarseness or a lack of quality as well as those that have an excessive amount of quality

are undesirable animals, because they are not usually so rugged nor so useful as sheep with large frames and strong bones. Quality is, therefore, only a relative character. Its indications should be noted as the judge makes the detailed examination of each sheep. The plan of procedure in handling a sheep, as usually practiced by sheep judges, is to inspect (1) the hindquarters; (2) the back, loin, shoulders, and neck, in succession; (3) width of the body throughout;

FIG. 6

(4) depth of the body and chest; and (5) the wool. In making an examination of the different parts, the hands must be used. By keeping the hands almost flat the wool will not be injured and one can do the handling better than if the ends of the fingers are gouged into the fleece. Care should be taken not to allow the hands to work more rapidly than the brain and that some definite sensation is received each time the hands touch the animal.

10. The method of measuring the length of the hindquarter is shown in Fig. 6. One hand is placed in a vertical position in front of the hip bone and the other just back of the pin, or rump bone, and the distance gauged with the eye. This is the part of the animal that furnishes the valuable rump roast of mutton and should be long, straight, and well developed. A short, drooping hindquarter is very objectionable in sheep of the mutton type.

Fig. 7 illustrates how a judge uses his hands to determine the extent to which the flesh on the rump is carried out to

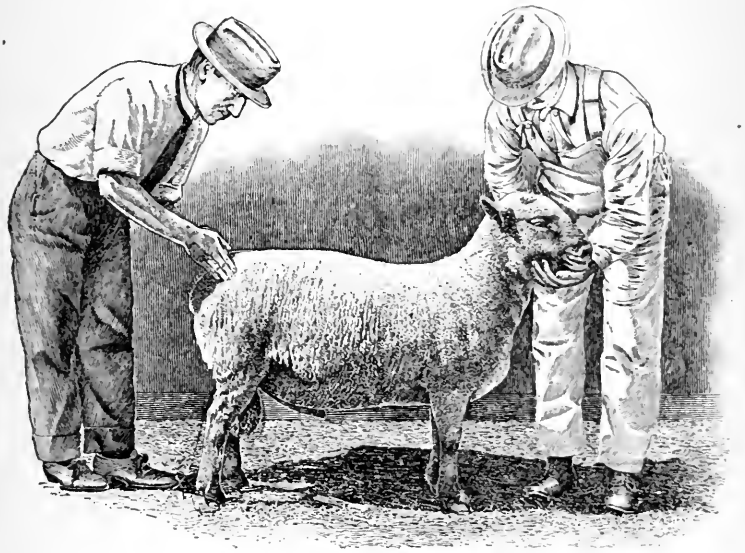

FIG. 7

the dock. The hands in this position should be from 4 to 6 inches apart, one hand on either side of a firm, meaty formation. Sometimes this region is covered with a great mass of fat, which indicates waste, and hence an overdone, undesirable, condition of the sheep. The position in which a judge places his hands to determine the development of that part of the sheep known as the leg of mutton, is shown in Fig. 8. This part of the sheep should be full, well muscled,

and fill the hands as they are held in the position illustrated. It must be remembered that animals well developed behind, with the twist especially low, seldom appear to have as large a leg of mutton as other animals that are cut up in the twist and with a poorly developed thigh. This is due to the fact that the more open an animal is in the twist and the poorer the development of the thigh on the outside of the leg the higher up one can get his hands in feeling the leg of mutton,

FIG. 8

and on account of this fact a judge must be careful not to call a poor leg of mutton a good one.

11. All sheep should have an approximately straight top line. A sag in the back is very much objected to, because it indicates a weakness in support and a lack of flesh on the back. This being in the region of high-priced cuts of mutton, it is important that the animal be smooth and well covered along the back and loin. Fine-wooled sheep are not usually

so well covered with flesh over the back and loin as are the sheep of the mutton breeds. Careful handling is necessary to detect imperfections in the top line, for an expert can easily clip the wool so that a weak back appears straight and strong. The handling is usually done by first placing the hand flat over on the backbone between the hips, then the region between the rump and neck is examined by four or more progressively forward movements of the hand. At each of these movements the hand should be pressed firmly against

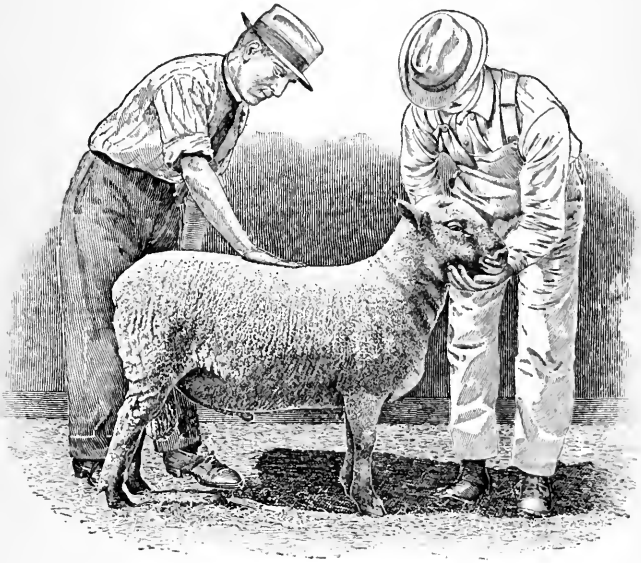

Fig. 9

the wool, and when in close contact with the back, a slight movement forwards and backwards will add to the thoroughness of the inspection. The correct position of the hand in examining the back to determine its strength, straightness, and covering of flesh is shown in Fig. 9. It will be noticed that the fingers are held together in a horizontal position so as to detect any differences in the straightness of the back.

12. The position of the hand for feeling the top of the shoulders is shown in Fig. 10. The hand, in this position,

is gently moved in all directions in order to determine whether the shoulders are compact—that is, smooth and close together on top—or are rough, open, and prominent. By examining the shoulders farther down, the judge is enabled to determine whether or not the shoulder is well laid into the body and covered with meat. After examining the shoulders the judge should pass to the neck, which should be short, refined at the juncture of the head, and blend well into the shoulders. A drop in front of the shoulders is objec-

FIG. 10

tionable. It indicates weakness and gives the animal the unsightly appearance known as "ewe neck." A ewe-neck condition, although it may have been concealed from the eye by shearing away some of the wool, can easily be detected with the hands.

13. To determine the width of back and spring of ribs, one hand is placed on each side of the back, as shown in Fig. 11, and the course of the ribs followed downwards. It is most desirable that there be a heavy, firm covering of flesh over

the ribs, giving them as much arch as possible. The hands are next moved to measure the width through the chest; it is desirable to have the fore flank low and full, because this indicates vigor and feeding capacity. The real width and substance of the sheep can be best ascertained by determining the width through the ribs and the depth of the body just back of the fore legs. The movements necessary to make these determinations press away the wool and enable one to get an idea of the weight of the sheep.

Fig. 11

14. A good method of determining the width of the loin is shown in Fig. 12. The length and the thickness of the covering of the loin should also be examined. Many good judges use one hand to feel the width and covering of the loin by placing the thumb on one side and extending the fingers until they pass the other side of the loin. This is a quick and effective method after one becomes familiar with it.

15. The chest is cheap meat and the butcher would like as little development here as possible, but the breeder and

feeder have found that a deep, broad, prominent chest is usually associated with hardy, vigorous, good-feeding sheep. To determine the depth of the chest, one hand should be placed on top just back of the shoulders and the other hand, between the front legs, as shown in Fig. 13, and the distance between the two hands noted. At this time the judge should notice whether the depth of the sheep is due to a high, sharp shoulder or to real depth of chest. When the hand is

FIG. 12

between the legs, the breast bone should be firmly grasped and its width and the quantity of flesh on it noted. A meaty breast with a deep groove running lengthwise through the middle indicates high condition; a poor, bony breast indicates an undesirable condition.

16. The last item to be considered in making a detailed examination of an animal is its wool. This should receive careful consideration and be valued from the points of quantity, quality, and condition. The quantity of the wool

is influenced most by the length and density of the fiber over the whole animal. The quality of the wool is judged from its fineness, softness, and uniformity. The finest and densest wool is found on the side just back of the shoulder; the coarsest is on the thigh; and the least dense is over the loin and on the belly. The condition of the wool is an index of the condition of the animal. A dry, harsh fleece indicates a lack of thrift in the sheep. The wool should be clean, free from foreign matter, and show a bright luster. Short fibers,

Fig. 13

a tendency of fibers to collect in masses, a lack of density and uniformity, the presence of kemp, or hair, dullness, harshness, and the coagulation of the yolk are common faults in fleeces, and a judge should watch for them as he examines the wool. The wool should be parted with the hands in a flat position against the wool and pressed in opposite directions. The ends of the fingers should never be thrust into the wool, for they muss it. The length and density of the wool may have been noted from time to time as the various parts of the sheep

were examined, but these qualities should now be studied in detail.

17. One position in examining the fleece is shown in Fig. 14. The finest wool in a fleece is found on that part of the body where the opening is shown. The evenness and the fineness of the crimp, and the length, fineness, and luster of

FIG. 14

the staple should be carefully examined at this point. The skin exposed by the parting of the wool should be pink. The second important position in examining a fleece is shown in Fig. 15. The coarsest wool on the body is found a few inches below the place where the wool is shown parted in the illustration. The wool over this part of the body, the thigh, is sometimes very coarse; the crimp, long and wavy; and the wool almost resembles hair. All tendency toward a hair-like condition of the wool is objectionable. The belly of a sheep

should be examined to see whether or not it is well covered with wool. Some judges set the sheep up on its hindquarters to examine the wool on the belly; other judges simply pass their hand under the belly to examine the wool there when they are examining the breast and chest of the sheep.

18. After a judge has thoroughly examined a sheep he should form a conception of the relation of the various parts

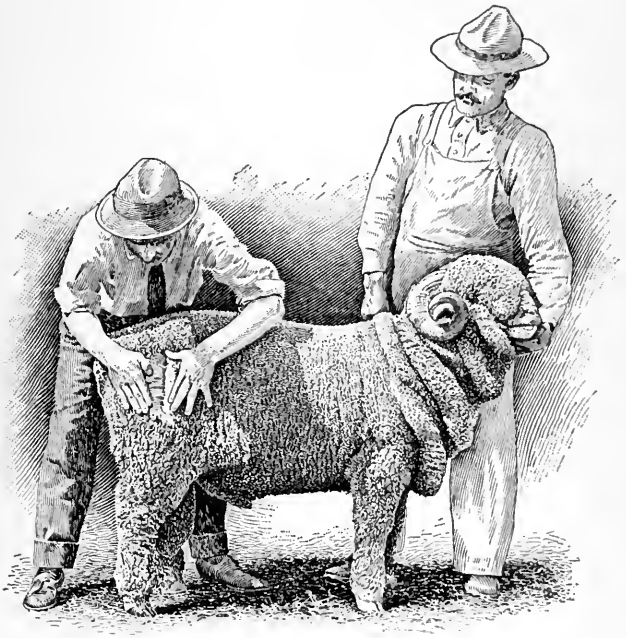

FIG. 15

as he has found them, and of the animal as a whole. If there are several sheep in a ring to be judged, the one that most nearly approaches the ideal animal of the breed or class is given first rank and the others are ranked in the order that they approach the ideal animal. If the examination has been carefully made a good idea will have been obtained of each animal judged. The ability to keep the impressions of more than one animal in mind while examining others, as

SCORE CARD FOR MUTTON TYPE OF SHEEP

No. or name of animal.....

	Perfect Score	Judge's Score
General Appearance		
Weight: score according to age and breed	4	
Form: straight top and under line; deep, broad, low set, compact, symmetrical	10	
Quality: hair fine; bone fine but strong; even covering of firm flesh; features refined but not delicate; stylish	10	
Constitution: chest capacious: brisket well developed; flanks deep; bone strong; movement bold and vigorous	10	
Condition: thrifty; skin pink; fleece elastic; well fleshed, but not excessively fat; deep covering of firm flesh	5	
Disposition: quiet but not sluggish	2	
Color and markings: According to breed	2	
Head and Neck		
Muzzle: mouth and nostrils large; lips thin	1	
Eyes: full, bright, clear	1	
Face: short, according to breed	1	
Forehead: broad, full	1	
Ears: texture, fine; size and form, according to breed	1	
Neck: thick, short, neatly tapering to head; throat clean, according to breed	3	
Forequarters		
Shoulder: covered with flesh; compact; smoothly joined with neck and body	4	
Brisket: well developed; breast wide	1	
Fore legs: straight, short, set well apart; pasterns upright; feet squarely placed, neither close nor sprawling	2	
Body		
Ribs: long, well sprung, thickly fleshed	3	
Back: broad, straight, thickly and evenly fleshed	5	
Loin: thick, broad, firm	5	
Flank: full, even with under line	1	
Hindquarters		
Hips: level, smoothly covered; width in proportion with other parts	1	
Rump: long, level, wide and even in width; not covered at tail-head with excessive fat	3	
Thighs: full, fleshed well down to hock	2	
Twist: deep, plump, firm, indicating fleshiness	5	
Hind legs: straight, short, set well apart; bones smooth, strong, being neither course nor fine; pasterns upright; feet squarely placed; neither close nor sprawling	3	
Wool		
Quantity: long, dense, even, according to breed	5	
Quality: structure and color true; fine, soft, even, according to breed	5	
Condition: strong, bright, clean, slight amount of yolk	4	
Total	100	

SCORE CARD FOR WOOL TYPE OF SHEEP

No. or name of animal.....

General Appearance	Perfect Score	Judge's Score
Form: level, deep, stylish; round rather than square..	8	____
Quality: clean, fine bone; silky hair; fine skin.....	6	____
Head and Neck		
Muzzle: fine; broad, wrinkly nose; pure white.....	1	____
Eyes: large, clear, placid.....	1	____
Face: wrinkly, covered with soft, velvety coat.....	1	____
Forehead: broad, full.....	1	____
Ears: soft, thick, velvety.....	1	____
Neck: short, muscular, well set on shoulders.....	1	____
Forequarters		
Shoulder: strong, deep and broad.....	4	____
Brisket: projecting forwards; breast wide.....	1	____
Legs: straight, short, wide apart, shank smooth and fine.....	2	____
Body		
Chest: deep, full, indicating constitution.....	10	____
Back: level, long; round ribbed.....	4	____
Loin: wide, level.....	4	____
Flank: low, making under line straight.....	2	____
Hindquarters		
Hips: far apart, level, smooth.....	2	____
Rump: long, level, wide.....	4	____
Legs: straight, short, strong; shank smooth, fine....	2	____
Wool		
Quantity: long, dense, even covering, especially over crown, cheek, armpit, hind legs, and belly.....	15	____
Quality: fine fiber; crimp close, regular; even quality, including tops of folds.....	15	____
Condition: bright, lustrous, sound, pure, soft; even distribution of yolk, with even surface to fleece.	15	____
Total.....	100	

well as proficiency in handling sheep and detecting slight differences quickly will be obtained by practice.

19. Use of Score Cards in Judging of Sheep.—As an aid to beginners in the judging of sheep, a score card prepared especially for sheep judging is often used.

Two score cards of this kind are shown on pages 18 and 19. The first is for the mutton type of sheep and the second is for the wool type. The difference in these score cards is largely in the number of points allowed for certain items. Thus, the total number of points allowed for wool in the score card for the mutton type of sheep is only 14; and in the score card for the wool type of sheep 45 points are allowed for wool.

20. Standard Scale of Points and Standard of Excellence as Aids in Judging of Sheep.—Most of the associations organized for the improvement and the development of a particular breed of sheep issue what is known as the **standard scale of points** or as the **standard of excellence** for that breed. The standard scale of points indicates the relative weight, or the number of points that the association desires to be given to the different parts or qualities of an animal of the breed, and is intended to be a guide for judges and breeders. The standard of excellence simply gives a brief statement concerning the various parts of an animal, but does not suggest the number of points to be given to each part.

Such standard scale of points and standards of excellence as are available are given on the following pages:

STANDARD SCALE OF POINTS FOR THE DELAINE MERINO SHEEP AS ADOPTED BY THE NATIONAL DELAINE MERINO BREEDERS' ASSOCIATION

	Points
Constitution	10
Heavy around the heart	6
Short, heavy neck	6
Good dewlap	5
Broad back	8
Well sprung ribs	5
Short legs	6
Heavy bone	8
Small, sharp foot	10
Length of staple, 1 year's growth, 3 inches	8
Density of fleece	8
Darkish cast on top	5
Opening up white	5
Good flow of white oil	5
Good crimp in staple	5
Total	100

STANDARD SCALE OF POINTS RECOMMENDED BY THE AMERICAN SUFFOLK FLOCK REGISTRY ASSOCIATION

	Points
HEAD.—Hornless. Face black and long, and muzzle moderately fine, especially in ewes. A small quantity of clean white wool on the forehead is not objected to. Ears, a medium length, black, and fine texture. Eyes, bright and full	25
NECK.—In ewes, of moderate length and well set; in rams, stronger, with a good crest	5
SHOULDER.—Broad and oblique	5
CHEST.—Deep and wide	5
BACK AND LOIN.—Long, level, and well covered with meat and muscle. Tail broad and well set up. Ribs long and well sprung, with a full flank	20
LEGS AND FEET.—Straight and black, with fine and flat bone. Wooled to knees and hocks; clean below. Fore legs set well apart. Hind legs well filled with mutton	20
BELLY (ALSO SCROTUM OF RAMS).—Well covered with wool	5
FLEECE.—Moderately short; close, fine fiber, without tendency to mat or felt together, and well defined, that is, not shading off into dark wool or hair	10
SKIN.—Fine, soft, and pink color	5
Total	100

STANDARD SCALE OF POINTS FOR THE SOUTHDOWN SHEEP AS ADOPTED BY THE AMERICAN SOUTHDOWN BREEDERS' ASSOCIATION

	POINTS
HEAD.—Medium in size and hornless, fine, carried well up, the forehead or face well covered with wool, especially between the ears and on the cheeks, and in the ewe slightly dished	5
LIPS AND UNDER JAW.—Fine and thin	1
EARS.—Rather small, tolerably wide apart, covered with fine hair and carried with a lively back-and-forth movement	2
EYES.—Full and bright	3
FACE.—A uniform tint of brown, or gray, or mouse color	3
NECK.—Short, fine at the head, but nicely tapering, and broad and straight on top at the shoulders	4
SHOULDERS.—Broad and full, smoothly joining the neck with the back	5
BREAST.—Wide, deep, and projecting well forwards, the fore legs standing wide apart	5
BACK AND LOIN.—Broad and straight from shoulders to rump	7
RIBS.—Well arched, extending far backwards, the last projecting more than the others	6
RUMP.—Broad, square, and full, with tail well set up	6
HIPS.—Wide, with little space between them and last ribs	6
THIGHS.—Full and well let down in twist, the legs standing well apart	6
LIMBS.—Short and fine in bone, and in color to agree with the face	3
FORE LEGS.—Well wooled and carrying mutton to the knees, but free from meat below	2
HIND LEGS.—Well filled with mutton and wooled to the hocks, neat and clean below	2
BELLY.—Straight and covered with wool, the flank extending so as to form a line parallel with the back or top line	5
FLEECE.—Compact, the whole body well covered with moderately long and close wool white in color, carrying some yolk	12
FORM.—Throughout smooth and symmetrical, with no coarseness in any part	9
GENERAL APPEARANCE.—Spirited and attractive, with a determined look, a proud and firm step, indicating constitutional vigor and thorough breeding	8
Total	100

STANDARD SCALE OF POINTS FOR PURE-BRED SHROPSHIRE SHEEP RECORDED OR ELIGIBLE TO REGISTRY IN THE AMERICAN SHROPSHIRE REGISTRY ASSOCIATION RECORD

	POINTS
GENERAL APPEARANCE.—Attractive, indicating breeding and quality, with stylish carriage and a symmetrical form covered with a dense fleece	25
CONSTITUTION.—Robust, as indicated by width and depth of chest, strength, and formation of neck, and by bold, active movement	10
SIZE.—In breeding condition when fully matured, rams should weigh not less than from 180 to 225 pounds, and ewes not less than from 125 to 170 pounds	10
WOOL AND SKIN.—Wool of good length, dense, elastic to touch, medium fine, free from black fiber, slightly crimped, with evenness of texture throughout; scrotum of rams well covered with wool. Skin light cherry color, free from dark spots	15
BODY.—Well proportioned, with shoulders well placed, fitting smoothly on the chest, which should be deep and wide; broad and straight back; thick loins well covered with firm flesh; hindquarters well finished; twist deep and full	20
HEAD AND NECK.—Head short, broad between the ears and eyes, bold and masculine in rams; without horns; well covered with wool; ears short and erect; eyes bright; color of face and ears dark brown. Neck of medium length, strong, and muscular, especially in rams; symmetrically joined to head and shoulders	15
LEGS.—Well set apart, broad, short, straight; color dark brown, and well wooled; pastern strong and upright	5
Total	100

STANDARD SCALE OF POINTS FOR OXFORD DOWN SHEEP AS ADOPTED BY THE AMERICAN OXFORD DOWN RECORD ASSOCIATION

BREED TYPE FOR ANIMALS	POINTS
Form of a good general appearance, made by a well-balanced conformation, free from coarseness in any part, and showing good style both at rest and in motion	15
Head of moderate length and width between the ears and between the eyes, and well covered with wool over poll and down to the eyes. Color of face an even dark gray or brown, either with or without gray spot on tip of nose	6
When fully matured and in good condition rams should weight from 250 to 350 pounds; ewes from 180 to 275 pounds	5
Ears medium size, not too thick, and of an even brown or dark-gray color	2
Legs short, strong in bone, flat and of even dark-gray or brown color, placed squarely under the body and well apart	2
CONSTITUTION	
Large around the heart and wide and full in the chest	10
The movement must be bold and vigorous	5
Eyes bold, prominent, and bright	4
Skin bright pink in color	3
Neck strong and muscular in rams and well set on in both sexes	3
MUTTON FORM AND QUALITY	
Wide and straight on top of shoulders, back, loin, and rump, from base of neck to tail	15
Full shoulders, and thighs well meated both inside and outside	5
Flanks well filled and strong so as to make the lower lines of the body as straight as possible, and side lines straight or rather full	4
The whole carcass evenly covered with good, well marbled meat	6
WOOL	
Fleece of moderate length, close and of even quality, covering the whole carcass well and free from black patches upon the body, neck, or head	15
Total	100

Standard of Excellence and Standard Scale of Points for the Hampshire Down Sheep as Adopted by the Hampshire Down Breeders' Association of America

Standard of Excellence

Head and Legs

Head.—Moderately large, but not coarse; well covered with wool on forehead and cheeks.

Nostrils.—Wide.

Color.—Head and legs dark brown or black.

Eyes.—Prominent and lustrous.

Ears.—Moderately long and thin, and of dark brown or black color.

Legs.—Well under outside of body, straight, with good size of bone; black.

Neck, Shoulders, and Chest

Neck.—A regular taper from shoulders to head, without any hollow in front of shoulders; set high up on body.

Shoulders.—Sloping, full, and not higher than the line of back and neck.

Chest.—Deep and full in the heart place, with breast prominent and full.

Body

Back.—Straight, with full spring of rib.

Loin.—Wide and straight, without depression in front of hips.

Hindquarters.—Long from hips to rump, without sloping, and deep in thigh. Broad in hips and rump, with full hams. Inside of thigh full.

Standard Scale of Points

	Points
Head, Legs and Feet.—Head, size and shape, 5; ears and eyes, 3; color, 5; legs and feet, 2	15
Neck, Shoulders, and Breast.—Neck, 5; shoulders, 10; chest and breast, 15	30
Body.—Back and loins, 15; rib, 5	20
Hindquarters.—Length, 10; width, 10; twist, 5	25
Wool.—Forehead and cheeks, 2; belly, well covered, 3; quality, 5	10
Total	100

STANDARD SCALE OF POINTS FOR THE DORSET SHEEP AS ADOPTED BY THE CONTINENTAL DORSET CLUB

	POINTS
HEAD.—Neat; face white; nostrils large; well covered on crown and under jaws with wool	5
HORNS.—Small and gracefully curving forwards rather close to jaw	5
EYES.—Prominent and bright	2
EARS.—Medium size, covered with short white hair	2
NECK.—Short, symmetrical, strongly set on shoulders, gradually tapering to junction of head	5
SHOULDERS.—Broad and full, at the top joining the neck and chine with no depression at either side (important)	15
BRISKET.—Wide and full forward; chest full and deep	8
FORE FLANK.—Quite full, showing little depression behind shoulder	8
BACK AND LOIN.—Wide and straight, from which ribs should spring with a fine, circular arch	10
LEG OF MUTTON.—Wide and full, with mutton extending down to hocks	10
BELLY.—Straight on under line	3
FLEECE.—Medium grade, of even quality, presenting a smooth surface and extending over belly and well down on legs	12
GENERAL CONFORMATION.—Of the mutton type; body moderately long; short, stout legs, placed squarely under body; skin pink; appearance attractive	15
Total	100

STANDARD SCALE OF POINTS FOR THE CHEVIOT SHEEP AS ADOPTED BY THE AMERICAN CHEVIOT SHEEP SOCIETY

	Points
GENERAL CONFORMATION AND QUALITY.—Deep and full of breast and large through chest. Back wide and straight, with well sprung, deep ribs. Legs well placed and leg of mutton full and thick. Body well fleshed; skin pink, with no blue or dark coloring; fleece compact and medium fine; bone strong and fine; general appearance graceful, symmetrical, active	20
SIZE.—In good flesh when fully matured a 24-months-old ram should weigh not less than 225 pounds, and a ewe not less than 150 pounds	10
HEAD.—Should be medium short and broad, with ample breadth between the eyes. Ears should be of medium length and usually erect when at repose. Head covered with clear white hairs, extending from nostrils to back of poll. Ridge of head from between eyes to nostrils straight or slightly arched in females and more strongly arched or Roman in rams. Color of tip of nose black	15
BODY.—Well proportioned, having notable depth, with thickness on top and at flanks. Loins should be very broad and thick; shoulders should set well back and be smoothly covered, and crops be full and well arched. The rump should be long, broad, and level	20
LEGS.—Should be short, well set apart, and covered with clean, white hair, with no wool below hocks and knees. The hind legs should be flat and deep below the hocks. Pasterns should be strong and not show weakness, supporting the body well	10
FEET.—Symmetrical, squarely placed when in repose, and black in color	5
FLEECE.—Should cover the body completely to behind the poll and ears and down to knees and hocks. Under part of the body should be well covered. On mature animals should be not less than 3 inches long for annual growth and be compact and of medium-wool class. Rams should shear at least 12 pounds and ewes 8 pounds when in mature form to be desirable representatives of the breed	20
Total	100

Objections: Scurs on the head, black spots on the head, flesh-colored or spotted skin about the nostrils, hair about the thighs or kemp on the body, reddish or sandy hair on head or legs, lack of wool on under part of body.

Disqualifications: All male lambs having scurs or horns exceeding 1 inch in length, shall be ineligible to registration.

STANDARD SCALE OF POINTS FOR LINCOLN SHEEP AS ADOPTED BY THE NATIONAL LINCOLN SHEEP BREEDERS' ASSOCIATION

	Points
CONSTITUTION.—Body deep, back wide and straight; wide and full in the thigh; bright, large eyes; skin soft and of a pink color	25
SIZE.—Matured rams not less than 250 pounds when in good condition. Matured ewes not less than 200 pounds	10
APPEARANCE.—Good carriage and symmetry of form	10
BODY.—Well proportioned; good bone and length; broad hindquarters; legs standing well apart; breast wide and deep	15
HEAD.—Should be covered with wool to the ears; tuft on forehead; eyes expressive; ears fair length; dotted or mottled in color	10
NECK.—Medium length; good muscle; well set on body	5
LEGS.—Broad and set well apart; good shape; color white, but some black spots do not disqualify; wooled to the knees	10
FLEECE.—Of even length and quality over body; not less than 8 inches long for 1 year's growth	10
QUALITY OF WOOL.—Rather fine, long wool; strong, lustrous fiber; no tendency to cot	5
Total	100

STANDARD SCALE OF POINTS FOR COTSWOLD EWE AS ADOPTED BY THE AMERICAN COTSWOLD ASSOCIATION

	Points
HEAD.—Moderately fine; broad between the eyes and nostrils, but without a short, thick appearance, and well covered on crown with long, lustrous wool	8
FACE.—Either white or slightly mixed with gray, or white dappled with brown	4
NOSTRILS.—Wide and expanded. Nose dark	1
EYES.—Prominent, but mild looking	2
EARS.—Broad, long, moderately thin, and covered with short hair	4
COLLAR.—Full from breast and shoulders, tapering gradually all the way to where the neck and head join. The neck should be fine and graceful, and free from coarse and loose skin	5
SHOULDERS.—Broad and full, and at the same time join at the top so gradually to the collar and chine, as not to leave the least hollow in either place	8
FORE LEGS.—The mutton on the fore legs should come quite to the knee. Legs upright, with heavy bone, clear from superfluous skin, covered with white or white and gray wool to fetlock	4
BREAST.—Broad and well forward, keeping the fore legs wide apart. Girth, or chest, full and deep	10
FORE FLANK.—Quite full, not showing hollow behind the shoulder	4
BACK AND LOIN.—Broad, flat, and straight, from which the ribs must spring with a fine circular arch	12
BELLY.—Straight on under line	5
HINDQUARTERS.—Long and full, with mutton down to the hock	8
HOCK.—Should stand neither in nor out	2
TWIST.—Deep, wide, and full, which will keep the hind legs wide apart and upright	5
FLEECE.—The whole body should be covered with long, lustrous wool	18
Total	100

STANDARD SCALE OF POINTS FOR COTSWOLD RAM AS ADOPTED BY THE AMERICAN COTSWOLD ASSOCIATION

	Points
HEAD.—Not too fine, moderately small, and broad between the eyes and nostrils, but without a short, thick appearance, and in young animals well covered on crown with long, lustrous wool	8
FACE.—Either white or slightly mixed with gray, or white dappled with brown	4
NOSTRILS.—Wide and expanded; nose dark	1
EYES.—Prominent, but mild looking	2
EARS.—Broad, long, moderately thin, and covered with short hair	4
COLLAR.—Full from breast and shoulders, tapering gradually all the way to where the neck and head join. The neck should be short, thick, and strong, indicating constitutional vigor, and should be free from coarse and loose skin	6
SHOULDERS.—Broad and full, and at the same time join at the top so gradually to the collar and chine as not to leave the least hollow in either place	8
FORE LEGS.—The mutton on the fore legs should come quite to the knee. Legs upright with heavy bone, clear from superfluous skin, and covered with white or white and gray wool to the fetlock	4
BREAST.—Broad and well forward, keeping the fore legs wide apart. Girth, or chest, full and deep	10
FORE FLANK.—Quite full, not showing hollow behind the shoulder	5
BACK AND LOIN.—Broad, flat, and straight, from which the ribs must spring with a fine circular arch	12
BELLY.—Straight on under line	3
HINDQUARTERS.—Long and full, with mutton quite down to the hock	8
HOCK.—Should stand neither in nor out	2
TWIST.—Deep, wide, and full, which will keep the hind legs wide apart and upright	5
FLEECE.—The whole body should be covered with long, lustrous wool	18
Total	100

SHEEP BREEDING

21. The prime object in the breeding of sheep should be to have the majority of the offspring of a flock superior to the majority of the ewes of the flock. In order that this object may be gained, the owner of a flock of sheep, if it is a grade flock, must first decide what breed of sheep is to be used to improve the flock and then select a good pure-bred ram of the desired breed, and one that is superior to the average ewe of the flock. If the ewes of the foundation flock are pure bred, care should be taken to use a superior ram. The use of a ram of one breed one year and one of another breed the next year on the same ewes and on their ewe lambs will seldom result in improvement of the offspring. The resulting flock will be utterly lacking in uniformity, especially in the quality and density of the fleece. The body will be unevenly covered, the length of the staple on the different parts of the body will vary, and the wool will have a tendency to become hairy. However, an inferior flock may be developed into an exceedingly uniform and superior breeding flock in 4 or 5 years if the better yearling ewe lambs are selected to replace the poorer old ewes each year and a new superior ram of the same breed secured to breed to them.

22. Age of Breeding Sheep.—When about 2 years of age, ewes of most breeds and grades of sheep should drop their first lambs. If they are properly fed and cared for, the ewes of the fine-wool breeds should be useful in the flock until they are 10 years old; ewes of the medium and coarse-wool breeds should be useful until they are about 7 years old. Rams are in their prime breeding condition when 3 and 4 years of age, although yearling rams may be used on from twenty to forty ewes if allowed to serve only one or, at the most, two each night and morning until each ewe of the flock has been served. A vigorous ram, if he is not over-

worked and is well fed and cared for, should continue to be useful until he is 6 years old. In fact, there is a decided advantage in using a ram that has been tried and whose offspring have proved him to be a desirable sire.

23. Condition of Breeding Sheep.—At breeding time, the ewes and the ram should be in good condition but not fat; they should be thrifty and vigorous, and if the regular pastures are poor and no other green forage crop is available at this time, a light grain ration of oats and corn should be given to them. After the breeding season is over the ewes should not be allowed to run down in flesh nor should they be fattened before the lambs are dropped. After the ewes have dropped their lambs, however, a liberal fattening ration may be fed.

Before the ewes are bred, the shepherd should go over the flock carefully and remove from it all ewes known to have poor udders, or to have been unable to raise a lamb the previous year. Also all those ewes that show a lack of thrift due to a loss of teeth, which will be almost sure to cause them difficulty in maintaining themselves and raising lambs, and those with some defect in conformation or with light, uneven, and kempy fleeces, showing a lack of covering on belly and legs, should not be bred.

24. Time for the Breeding of Ewes.—The time for the breeding of ewes will depend largely on environment and the ideas of the flockmaster. With farm flocks, where there are proper facilities to care for the lambs, it is well to have the lambs come late in January and the first part of February, as early lambs, as a rule, grow rapidly and escape many troubles to which later lambs are exposed. For instance, there is less danger of infection from internal parasites if lambs are 2 months old before the ewes are turned on pasture. The ewes are benefited by early lambing, because the lambs are weaned earlier and the ewes are given a better chance to recuperate and put on flesh and thus be prepared for breeding again or, if culled out of the flock, they may be more readily fattened for market than if the lambs were dropped late.

On the range, however, without shelter to protect them, the season should be pretty well advanced and the grazing good before the lambs are dropped. The ewes will be better able to care for the lambs then, than if the feed is scanty and the nights are cold.

Considering 5 months as the period of gestation, although the time may vary from 140 to 154 days, a ewe bred on the first of October will drop her lamb the last of February or the first of March, a very good time on the farms of the United States north of the Ohio River and east of the Mississippi River. But a good many flockmasters prefer to breed their ewes about the middle of September, so as to have the lambs come about the middle of February. Still others prefer to have them come about the first of February, especially in the southern part of the section mentioned or south of it. These early lambs will be strong and well grown when the grass of pastures has made a good start and the sod is sufficiently firmed for the sheep to be turned on the pasture. On the ranges in the western part of the United States, breeding may be deferred to the first week in November, which will bring the lambs about the last week in March or the first week in April. This may be too late in some southern localities and too early in the more northern sections, where grass is slow in starting and late storms are apt to occur. Each flockmaster under these differing conditions, must decide for himself as to the proper time for breeding his ewes.

25. Breeding of Sheep.—On farms where care is to be given to the breeding of the ewes and where the time and labor will allow, the ewes should be brought to the ram in the early morning and again in the evening. The ram is then placed with the flock of ewes, which should not number over fifty ewes for a mature ram. An attendant should carefully note the ewes that are in heat and as soon as the ram serves them they should be removed from the flock for a few days. A ewe should not be served more than once during one period of heat, which lasts from 1 to 3 days and recurs at intervals of from 15 to 30 days. To avoid the

possibility of failure to identify the ewes that the ram serves, they should be marked with a daub of paint, or the ram should be marked between the fore legs with paint that will rub off easily and mark the rump of each ewe as he serves her. The paint used for this purpose should, of course, be of such a nature that will not in any way injure the wool and will completely wash out of the fleece. Dry lampblack, red lead, and plumbers' chalk are good materials for this purpose. If more than fifty ewes are to be served more than one ram should be used.

26. On farms where high-priced, pure-bred sheep are raised it is often desirable to use a very valuable ram or one that has been highly fitted for exhibition purposes, and when it is desired to save his energy as much as possible, it will be advisable to use a cheaper ram to locate the ewes that are in heat and are willing to be served. The ram used to find the ewes is called a teaser, and he must have a piece of canvas placed securely on the under side of his body in such a manner that it will prevent him from serving a ewe. When he finds a ewe that is willing to be served she is removed from the flock and served by the more valuable ram.

A ram may be allowed to run with a flock of ewes during the breeding season, but the results of such a method of breeding are never so satisfactory as when the ram is allowed with the flock for a short time only, morning and evening, or when he is left with the ewes overnight. However, it requires less time and labor on the part of the shepherd when the ram is allowed to run with the ewes continuously. In this case, more than thirty or forty ewes should not be allowed to each mature ram.

On ranges where flocks of thousands of sheep are kept, it would, of course, be impracticable to handle the ewes and rams during the breeding season in the same way as on farms where only a small number of sheep are kept. With the large flocks, one ram for about forty ewes, or twenty-five rams per one thousand ewes, are turned with the ewes at the approach of the breeding season and allowed to remain with

Private flock No. of Ewe 197 Registry No. (if registered) 7561

Sire Napoleon 2nd 5238 Dam Evangeline Bred by J. H. Thomas

Date of Birth March 21, 1905 Purchased from J. H. Thomas P.O. Whigville, Ohio Price paid, $20.00

Sold to A. F. Shaw P.O. Albion, Mich. Price received, $55.00

Remarks Sold at Illinois State Fair 1909

WOOL RECORD OF EWE			SERVICE RECORD OF EWE				LAMBS					
								WOOL RECORD				
Dates Shorn	Days Growth	Weight of Fleece	Dates Served	Ram Used	Due to Lamb	Date Dropped	Sex	Dates Shorn	Weight of Fleece	To Whom Sold	Amount Received	Remarks
4-26-1906	402	12 lb.	Oct 3, 1906	Wonder 6347	Feb 27, 1907	Feb 28, 1907	Ewe Ewe	April 20, 1908 " 20, 1908	12 lb. 10 oz. 12 lb. 6 oz.	L. F. Dapp	$25.00	Sold Oct 7, 1908
4-23-1907	362	12 lb. 12 oz.	Oct. 10, 1907	"	Mar. 5, 1908	Mar. 5, 1908	Ram	Apr. 28, 1909 Apr. 26, 1910	18 lb. 6 oz.	P. J. Thomas	45.00	Sold Aug. 25, 1909
4-20-1908	363	14 lb. 4 oz.	Oct 7, 1908	Woodmaker 7921	Mar. 3, 1909	Mar. 3, 1909	Ram Ewe					
4-28-1909	373	14 lb. 10 oz.	Sept 28, 1909	"	Feb. 22, 1911							

FIG. 16

them until the season has passed. The rams should be pure bred, of the same breed, and as nearly uniform as possible.

27. Keeping of Breeding Records.—It is advisable for a breeder of pure-bred sheep and, in fact, for any one endeavoring to improve a flock of sheep, to purchase a sheep-breeding record book. Such books may be secured from the sheep-breeding associations or from breeders' supply houses. The form shown in Fig. 16, with the blanks filled in, indicates the information of which a breeder should keep a record. Such a form can be easily copied in an ordinary blank book if the breeder does not care to purchase a book especially for this purpose.

All the breeding ewes should bear ear marks as described elsewhere, by which they may be identified. As each ewe is bred and removed from the flock, her number, the date of service, and the name and number of the ram to which she was bred should be put down in a notebook and later transferred to a permanent record book. From these data and a gestation table for sheep, a copy of which is shown in Table I, the date on which the ewe may be expected to give birth to a lamb may be obtained. This date should then be set down in the proper column. The other data called for by the form should be set down in the permanent record as soon as the information is available.

In case the ewes have no ear marks for identification, they should be numbered with paint or marking fluid that is guaranteed not to harm the wool and will wash out completely when the wool is scoured. The numbers may be made on the side of the ewes with a stiff paint brush or with large wooden or metal stencils.

TABLE I

GESTATION TABLE FOR SHEEP

Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb
Jan. 1	May 27	Feb. 1	June 27	Mar. 1	July 25
2	28	2	28	2	26
3	29	3	29	3	27
4	30	4	30	4	28
5	31	5	July 1	5	29
6	June 1	6	2	6	30
7	2	7	3	7	31
8	3	8	4	8	Aug. 1
9	4	9	5	9	2
10	5	10	6	10	3
11	6	11	7	11	4
12	7	12	8	12	5
13	8	13	9	13	6
14	9	14	10	14	7
15	10	15	11	15	8
16	11	16	12	16	9
17	12	17	13	17	10
18	13	18	14	18	11
19	14	19	15	19	12
20	15	20	16	20	13
21	16	21	17	21	14
22	17	22	18	22	15
23	18	23	19	23	16
24	19	24	20	24	17
25	20	25	21	25	18
26	21	26	22	26	19
27	22	27	23	27	20
28	23	28	24	28	21
29	24			29	22
30	25			30	23
31	26			31	24

TABLE I—(*Continued*)

Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb
Apr. 1	Aug. 25	May 1	Sept. 24	June 1	Oct. 25
2	26	2	25	2	26
3	27	3	26	3	27
4	28	4	27	4	28
5	29	5	28	5	29
6	30	6	29	6	30
7	31	7	30	7	31
8	Sept. 1	8	Oct. 1	8	Nov. 1
9	2	9	2	9	2
10	3	10	3	10	3
11	4	11	4	11	4
12	5	12	5	12	5
13	6	13	6	13	6
14	7	14	7	14	7
15	8	15	8	15	8
16	9	16	9	16	9
17	10	17	10	17	10
18	11	18	11	18	11
19	12	19	12	19	12
20	13	20	13	20	13
21	14	21	14	21	14
22	15	22	15	22	15
23	16	23	16	23	16
24	17	24	17	24	17
25	18	25	18	25	18
26	19	26	19	26	19
27	20	27	20	27	20
28	21	28	21	28	21
29	22	29	22	29	22
30	23	30	23	30	23
		31	24		

TABLE I—(*Continued*)

Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb
July 1	Nov. 24	Aug. 1	Dec. 25	Sept. 1	Jan. 25
2	25	2	26	2	26
3	26	3	27	3	27
4	27	4	28	4	28
5	28	5	29	5	29
6	29	6	30	6	30
7	30	7	31	7	31
8	Dec. 1	8	Jan. 1	8	Feb. 1
9	2	9	2	9	2
10	3	10	3	10	3
11	4	11	4	11	4
12	5	12	5	12	5
13	6	13	6	13	6
14	7	14	7	14	7
15	8	15	8	15	8
16	9	16	9	16	9
17	10	17	10	17	10
18	11	18	11	18	11
19	12	19	12	19	12
20	13	20	13	20	13
21	14	21	14	21	14
22	15	22	15	22	15
23	16	23	16	23	16
24	17	24	17	24	17
25	18	25	18	25	18
26	19	26	19	26	19
27	20	27	20	27	20
28	21	28	21	28	21
29	22	29	22	29	22
30	23	30	23	30	23
31	24	31	24		

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TABLE I—(*Continued*)

Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb	Date of Breeding	Due to Lamb
Oct. 1	Feb. 24	Nov. 1	Mar. 27	Dec. 1	Apr. 26
2	25	2	28	2	27
3	26	3	29	3	28
4	27	4	30	4	29
5	28	5	31	5	30
6	Mar. 1	6	Apr. 1	6	May 1
7	2	7	2	7	2
8	3	8	3	8	3
9	4	9	4	9	4
10	5	10	5	10	5
11	6	11	6	11	6
12	7	12	7	12	7
13	8	13	8	13	8
14	9	14	9	14	9
15	10	15	10	15	10
16	11	16	11	16	11
17	12	17	12	17	12
18	13	18	13	18	13
19	14	19	14	19	14
20	15	20	15	20	15
21	16	21	16	21	16
22	17	22	17	22	17
23	18	23	18	23	18
24	19	24	19	24	19
25	20	25	20	25	20
26	21	26	21	26	21
27	22	27	22	27	22
28	23	28	23	28	23
29	24	29	24	29	24
30	25	30	25	30	25
31	26			31	26

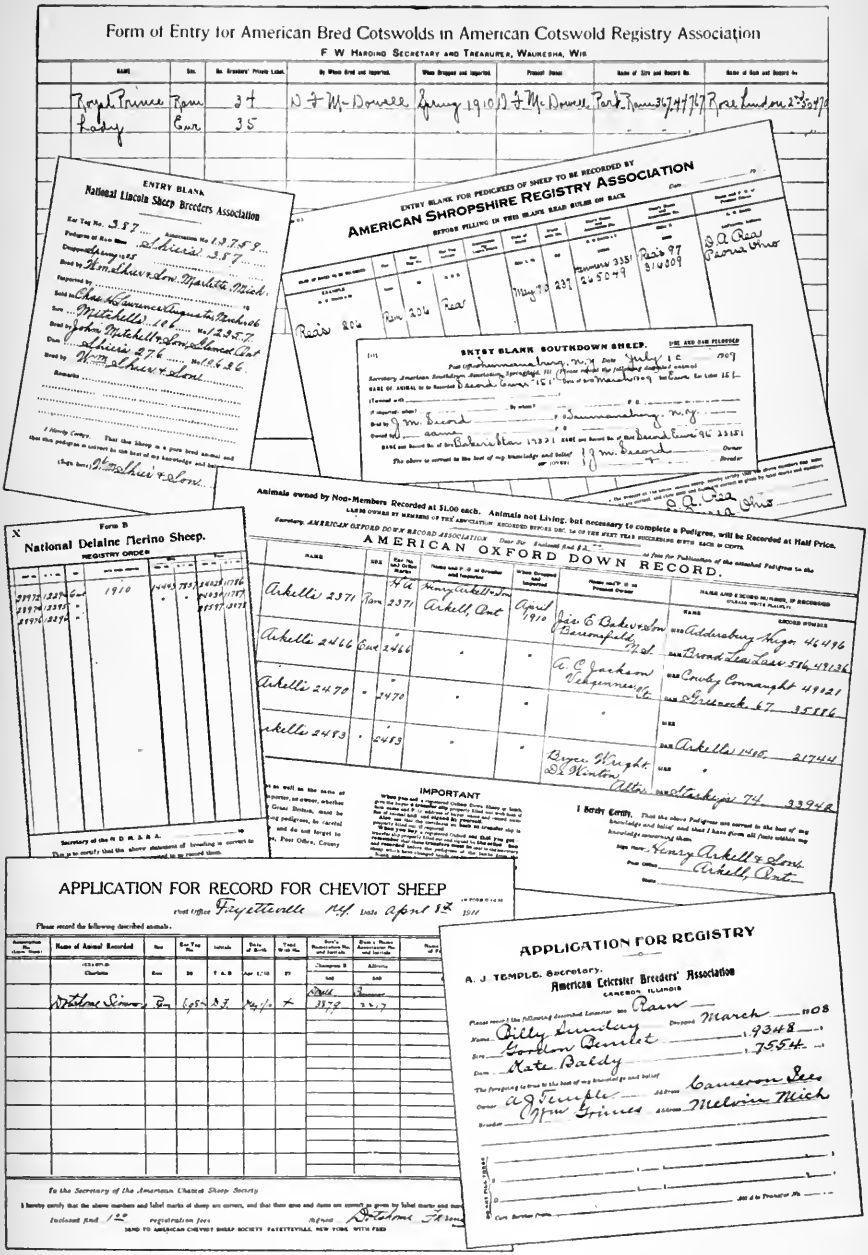
Form of Entry for American Bred Cotswolds in American Cotswold Registry Association
F W Harding Secretary and Treasurer, Waukesha, Wis
ENTRY BLANK
National Lincoln Sheep Breeders Association
ENTRY BLANK FOR PEDIGREES OF SHEEP TO BE RECORDED BY
AMERICAN SHROPSHIRE REGISTRY ASSOCIATION
BEFORE FILLING IN THIS BLANK READ RULES ON BACK
ENTRY BLANK SOUTHDOWN SHEEP.
Animals owned by Non-Members Recorded at $1.00 each. Animals not Living, but necessary to complete a Pedigree, will be Recorded at Half Price.
AMERICAN OXFORD DOWN RECORD.
Form B
National Delaine Merino Sheep.
REGISTRY ORDER
APPLICATION FOR RECORD FOR CHEVIOT SHEEP
APPLICATION FOR REGISTRY
A. J. TEMPLE, Secretary.
American Leicester Breeders' Association
CAMERON, ILLINOIS

Fig. 17

28. Recording Pure-Bred Sheep With Sheep Breeders' Associations.—Each sheep breeders' association will make a record of the pedigrees and of the transfers of ownership of pure-bred sheep of the breed that the association represents, on proper application of the owner and the payment of a small fee. It is desirable that the producer of pure-bred sheep should have his sheep registered and have proof of such registration to deliver to the purchaser of his stock. Such stock usually commands higher prices than non-registered pure-bred sheep. On application, the different sheep breeders' associations will supply breeders of sheep eligible to registry in the association with standard blank forms commonly known as **applications for registry.** The applications for registry in several different associations are shown in Fig. 17. Such forms provide for a description of each sheep, which usually consists in giving the name or number of the animal, the sex, the identification marks—that is, the ear tag number and initials of the breeder—the date of birth, the name and number of sire and dam, and the name and address of the breeder and present owner. When the forms are properly filled out and accompanied by the necessary fee of a few cents, they are presented to the secretary of the association, who records the data in the books of the association and fills out another form known as a **certificate of registry** and sends it to the person making the application. Certificates of registry of several of the sheep breeders' associations are shown in Fig. 18. These certificates simply certify that the animal described in the application for registry has been admitted to registry.

If a pure-bred registered sheep is sold, the seller notifies the secretary of the proper association of such transfer of ownership by sending him a form for this purpose. The secretary, after recording the transfer on the books of the association, sends a **certificate of transfer** to the purchaser of the animal. Specimens of forms of application for and certificates of transfer from different associations are shown in Fig. 19.


No. 5-7170
OFFICE OF THE
American Oxford Down Record Association
HAMILTON, BUTLER COUNTY, OHIO
CERTIFICATE OF REGISTRY
Arkell's 2483
Ewe
Bryce Wright, De Winton, Al
Henry Arkell & Son, Arkell, On
April 1910
Bowley Commander
Starkey's 74
H.A. 2483
W. A. Shafer
Form C
NATIONAL DELAINE MERINO REGISTRY.
CERTIFICATE AND RECEIPT
28972 12294 Ewe 1910 7857 11786
28974 12295 " " " 11787
28974 12296 " " " 12078
Received Jan. 14 1911 from Harry Clark the above 3 pedigrees for recording in Vol. 9 of the National Delaine Merino Register.
CERTIFICATE OF REGISTRY
IN THE FLOCK BOOK OF THE
AMERICAN CHEVIOT SHEEP SOCIETY
Name Hopkins Simmons 6986
Sex Ram
Dropped May 1st 1910
Ear Tag 6986
Breeder Hopkins Farms, Fayetteville N.Y.
Owner Hopkins Farms, Fayetteville N.Y.
Sire Dinah's Jr. Lad 3379
Dam Queen of Hopkins 3217
Entered April 15 1911
A.C.S.B. F. 101. 1. M. 10.
F. E. Dawley
CERTIFICATE OF REGISTRY
OFFICE OF
American Cotswold Registry Association
Upon application of the owner named below, there has been admitted to register in Volume XVI of The American Cotswold Sheep Record, the Cotswold Sheep known as—
Name. Sex. Ear Mark. Ass'n No
J. V. Snell's 180. Ewe. 180. 66634.
Lambed, 1910.
Sire, Swanwick's 84.44340.
Dam, J.V.Snell's 126.50776.
Bred by J. V. Snell.
Owned by J. V. Snell.
I hereby certify that the above is a correct pedigree of the Cotswold sheep described and numbered as above, and that this sheep is pure bred and has been duly registered in the said Record, established by this Association for Cotswold breed of sheep.
Dated, Waukesha, Wis. May 22, 1911.
Secretary
American Cotswold Registry Association
CERTIFICATE OF REGISTRY
OFFICE OF
American Shropshire Registry Association
Upon application of the owner named below, there has been admitted to register in Volume II of the American Shropshire Sheep Record, the Shropshire Sheep known as—
Name 1989 Sex Ear Mark Ass'n No
REA'S 206, Ram, 206 Rea, 332445.
Lambed, May, 1910. Twin.
Sire, Hanmer's 3351, 265049.
Dam, Rea's 97, 316009.
Bred by D.A.Rea.
Owned by D.A.Rea.
L.B.Palmer.
I hereby certify that the above is a correct pedigree of the Shropshire sheep described and numbered as above, and that this sheep is pure bred and has been duly registered in the said Record which established in this Association for the breed of sheep mentioned in same.
Dated, LaFayette, Ind 1/6/1911.
J. M. Wade Secretary
American Shropshire Registry Association
Association No. 13759. Ear Tag No. 387
National Lincoln Sheep Breeders Association
CERTIFICATE OF REGISTRY
This is to Certify that the Lincoln Ram Shiers 387
Sire Mitchells 106 No. 12357
Dam Shiers 276 No. 10636
Bred by Wm. Shiers & Son, Marlette, Mich. Sold to
Dropped April 19 05
Chas. H. Lawrence, Augusta, Mich.
has been Registered by this Association.
Burt Smith Secretary
Charlotte, Mich., R.F.D. May 22, 1911
SOUTHDOWN EWE
Flock No. 151 No. 24974
Name Second Ewe 151
Sire Baker's Star No. 19821
Dam Second Ewe '96 No. 23151
Dropped March 1909
Breeder J. W. Second
Owner same
Date of entry Aug. 8 1909
F. S. Springer Secretary
CERTIFICATE OF ENTRY IN THE AMERICAN SOUTHDOWN RECORD
Secretary's Office, Springfield, Ill.

FIG. 18


American Leicester Breeders' Association
SECRETARY'S OFFICE
THIS IS TO CERTIFY
That upon the application of A J Temple,
the following changes in ownership have been filed for publication in the forthcoming book
American Leicester Record
of Leicester Ram known as Billy Sunday, Record No. 12400,
as the property of A J Temple, P. O. Cameron Ill.,
was sold on the First day of November, 1909,
To J M Carmichael P. O. Maiden Rock
Sire Gordon Bennet (9348) Bred by John Smith
Dam Kate Baldy, (7554) Bred by A W Smith
Given under my hand and the Seal of the Association at Cameron
this First day of November, 1909
A J Temple
INCORPORATED 1889
CAMERON, ILL.
Post Office Cameron Ills Date of Sale Nov 1 1909
A. J. TEMPLE, Secretary
American Leicester Breeders' Association
CAMERON, ILLINOIS.
Transfer the ownership of the Ram Lot No. Billy Sunday Record No. 12400
From A J Temple P.O. Cameron Ills
To J M Carmichael P.O. Maiden Rock Wis
The above named animal was dropped March 1908
Bred by Wm Grimes P.O. Melvin Mich
Sire Gordon Bennet 9348 Bred by John Smith
Dam Kate Baldy 7554 Bred by A. W. Smith
Sign here A J Temple
Served on ____ day of ____ 191__ by ____
Sign here ____ Owner of Service Ram.
CERTIFICATE OF TRANSFER
AMERICAN SOUTHDOWN ASSOCIATION
SECRETARY'S OFFICE
Springfield, Ill. Dec. 23 1906
This is to certify that the ownership of the Southdown RAM
Jackson 44 13013
has been transferred on the books of the American Southdown Association, from J M. Secord
to J. C. Barton said transfer
to date from Aug 10 1906
O. S. Springer Secretary
CERTIFICATE OF TRANSFER
AMERICAN SOUTHDOWN ASSOCIATION
Springfield, Ill. Aug 8 1909
This is to certify that the ownership of the Southdown EWE
Second Lamb 151 24497
has been transferred on the books of the American Southdown Association, from J M. Secord
to Edward S. Hill
to date from July 10 1909 said transfer
O. S. Springer Secretary
Application for Transfer
I hereby certify that I sold to Elmer Simmons
of Allegan Mich the following Cheviot Sheep:
Ram Name Oshtemo Simmons Herd Register No. 6956
Ear marks 6986 Bred by Oshtemo Farms
Dropped May 1st 1910 Date of Delivery April 10th 1911
I hereby authorize the transfer of ownership as above to be recorded on the books of the American Cheviot Sheep Society.
Sign here Oshtemo Farms
Address of Seller Fayetteville N.C. U.S.A.
Form P.
National Delaine Merino Sheep.
TRANSFER RECEIPT.
DESCRIPTION OF SHEEP | NO. | SEX | DATE WHEN DROPPED
141399 7660 Ram April 1909
Received of J. M. Secord
$ 25 in payment for the above described Sheep from J. M. Secord
P. O. Ewenville N.Y. Sta.
to A. W. Moore
P. O. Washington Pa. R.D. 7 Sec.
J. B. Dickerson
Form E.
X
National Delaine Merino Sheep.
TRANSFER ORDER.
DESCRIPTION OF SHEEP | NO. | SEX | DATE WHEN DROPPED
141399 7660 Ram April 1909
This is to Certify that I have this 18 day of June 1910 sold the above described sheep to W. W. Moore
P. O. Washington Pa. R.D. 7
Sign Here Washington — State Ohio
Howard M. Day.
Certificate of Transfer
I hereby certify that I sold to Elmer Simmons
of Allegan Mich the following Cheviot Sheep:
Ram Name Oshtemo Simmons Herd Register No. 6956
Dropped May 1st 1910 Ear marks 6986
Bred by Oshtemo Farms
Date of Delivery April 10th 1911
I hereby authorize the transfer of ownership as above to be recorded on the books of the AMERICAN CHEVIOT SHEEP SOCIETY
Sign here Oshtemo Farms
Address of Seller Fayetteville N.C. U.S.A.
American Shropshire Registry Association
CERTIFICATE OF TRANSFER. To be sent WITH Certificate of Delivery
I have this first day of March 1911 sold to E. B. Olney of Pataskala O.
My Shropshire Ram known as Ross 204 Initials ____
Tag No. 204 Initials ____ Association No. 3224
Vendor Sign Here D. A. Rear
LAFAYETTE, IND. March 18, 1911
The above sealed Shropshire Sheep has been transferred on the books of the Association
J. M. Wade Secretary
CERTIFICATE OF TRANSFER
I have this fifth day of April 1911 sold to Geo. F. Herbst of Peachville, Geauga the Oxford Down Ram known as St. Johns 24 Initials G. F. H. Association No. 16283
Sign here Geo. C. Williamson
Office of AMERICAN OXFORD DOWN RECORD ASSOCIATION, Hamilton, Ohio. April 6, 1911
The above named Oxford Down Sheep has been transferred on the books of the Association
M. C. Shafer Secretary.
Certificate of Transfer
I have this 1st day of April 1911 sold to Chas. X Lawrence of Augusta, Michigan Lincoln Ram
as a Shearling Initials Am. Lincoln Association No. 643
Tag No. 387 Initials Am. Lincoln Association No. 643
Geo. M. Shirk
Office of the National Lincoln Sheep Breeders' Association
Charlotte, Mich. April 22 1911
The above named Lincoln Sheep has been transferred on the books of this Association
Burt Smith Secretary

FIG. 19

29. Signs of Pregnancy in Ewes.—About the only practicable way to judge whether or not a ewe is in lamb is to note her behavior to the ram when sufficient time has elapsed for her to come in heat after having been served. If she refuses to take the ram at such periods for two consecutive times it is reasonably certain that she is safe in lamb.

30. Signs of Approaching Parturition.—The approach of parturition with the ewe is often difficult to detect. A ewe about to lamb will usually become restless, will separate herself from the flock, frequently retiring to a more or less secluded spot if such is accessible. As the time for parturition draws near she will alternately lie down and get up at intervals until labor pains actually begin.

31. Assisting the Ewe in Parturition.—Usually there is no need for assisting a ewe in delivering her lamb. However, the shepherd should be watchful, and after the ewe has labored in vain from 5 to 8 hours, the exact time depending on the condition of the ewe and the manner that the lamb is presented, he should go to her assistance. The normal presentation of a lamb is front feet first, with the nose just between them. If the presentation is normal, the cause of the difficulty in lambing is probably due to a large lamb. In this case gently pulling the lamb and as gently pushing on the external parts of the ewe will greatly assist her while the head of the lamb is being delivered. For a short time after the head of the lamb is delivered the ewe usually stops straining. During this short cessation of labor of the ewe, the nose of the lamb should be wiped so that it may breathe. After labor has again begun, gently pulling on the lamb and pushing on the external parts of the ewe will assist in delivering the shoulders, which is the most difficult part of labor. After the shoulders have been delivered, the ewe should be left to herself, for the hips and hind legs of the lamb usually come away easily. A short time after the lamb is born, the ewe should get up, seek her lamb, and begin licking it with her tongue. The lamb will soon try to stand and in about 15 minutes will try to suck, and if it succeeds in finding the

teat and in getting its first meal unaided it is claimed by good shepherds to be half raised.

32. Sometimes prolonged labor is caused by abnormal presentation of the lamb. As soon as a wrong presentation is known to be the trouble, the shepherd should go to the ewe's assistance, even if she has labored only 1 hour or less. Usually, the wrong presentation of the lamb must be corrected before parturition can take place. If a shepherd has had experience in correcting abnormal presentations he may be able to use a pair of lamb forceps to advantage. But a shepherd without experience in this operation would probably meet with a much larger degree of success by using his bare hand, especially if he has a small hand. In this case his hand, wrist, and forearm should be thoroughly treated with a disinfectant and the hand and wrist anointed with lard, vaseline, or olive oil. The shepherd, knowing what the right presentation of the lamb should be, must carefully push the lamb back, if it has been partly delivered, push his hand into the vagina of the ewe, and gently arrange the lamb for proper presentation. Sometimes the lamb may be delivered hind feet first without great inconvenience.

33. Giving a Weak Lamb Its First Meal.—Lambs that are too weak to stand, and are, therefore, unable to suck, must be assisted in getting their first meal. This may be accomplished in a number of ways. One well-known shepherd and sheep breeder says that the easiest way to give the new-born lamb its first meal is for the shepherd to set the ewe on her rump, kneel down, and support her with his body and left arm, then, after starting the milk from the teats, lay the lamb on its side and place the teat in its mouth. The details of this operation can best be learned by practice. The lamb usually begins sucking as soon as the teat is placed in its mouth; but if it does not, a small quantity of milk should be caused to flow into the lamb's mouth. The lamb should be allowed to get a fair meal, after which it should not be necessary to give it further assistance. If, however, the lamb does not suck thereafter, it is advisable to place the teat in its

mouth this time with the ewe and lamb standing. Often the lamb seems able to offer considerable resistance in being made to suck, and the shepherd must exercise patience to insure success.

34. Care of Pregnant and Nursing Ewes.—Pregnant ewes should have plenty of exercise, pure fresh air, enough wholesome feed to keep them in good flesh but not fat, and should be kept dry. Ewes that are in good health and have been well cared for during pregnancy, will generally give birth to good strong lambs, and have well-filled udders for the nourishment of the lambs. As soon as a lamb is dropped the ewe and lamb should be placed in a pen by themselves or in a pen with other ewes with new-born lambs. The feed of the ewe should not be changed suddenly nor her milk flow stimulated immediately. But beginning the next day after lambing, a small quantity of grain should be fed and this quantity increased gradually until each ewe gets about ½ pound each of shelled corn and oats, ¼ pound of bran, and all the clover or alfalfa hay she will eat. Other suggested rations for pregnant ewes and ewes with suckling lambs are given elsewhere.

The next day after the lamb is dropped the ewe's udder should be milked clean, and if her lamb does not take all her milk, the ewe should be milked each day, after the lamb has sucked, for a week until the lamb does take all the milk that the ewe can produce.

35. Care of a Chilled Lamb.—Occasionally, in spite of the best watching on the part of the shepherd, a lamb will become so thoroughly chilled as to be helpless. Lambs chilled almost to the point of death can be revived by immersing them in water as warm as can be borne by the hand. The water soon becomes cool, and hot water must be added. Care, of course, is to be taken not to scald the lamb. As soon as revived the lamb should be wiped dry and taken to its dam and held up while it takes her milk. Ewe's milk is always preferred to cow's milk for young lambs, but where it is necessary to substitute cow's milk, it should be diluted with about one-fourth

its quantity of warm water. Where lambs are only slightly chilled, as is likely to be the case with the first one of twin lambs, they may be revived by rubbing them briskly with the hand or with cloths and then wrapping them in a blanket. Some shepherds keep in the sheep barn at lambing time a half barrel in which they keep a jug of warm water and clean dry straw, and as soon as the first one of twin lambs is dropped it is placed in this barrel until the ewe can give it her attention.

36. Teaching a Ewe to Own a Lamb.—It sometimes happens that a ewe, usually a young ewe, will not own her lamb. This condition may sometimes be corrected by placing the ewe and lamb in a small pen and assisting the lamb in securing its meals for a few days. If the ewe persists in refusing to allow the lamb to suck, or if she attacks it, the best remedy is to tie her with a halter so that she may eat and lie down but cannot get away from the lamb nor attack it. This treatment for a few days will usually cause the most obstinate ewe to own her lamb. It is not uncommon for a sheep breeder to have a lamb die, leaving the dam with an udder full of milk. In nearly all such cases, if one of a pair of twin lambs is given to a ewe that has lost her lamb, both the ewe and the lamb will fare better than where the one ewe has no lamb and another ewe has two lambs to suckle.

The best way to accomplish this transference is to skin the dead lamb soon after its death and fasten the pelt over the twin lamb as neatly as possible. Then place the dam of the dead lamb and the lamb wearing its pelt in a pen together and it is seldom that the ewe will not adopt the new lamb at once. After a few days the pelt may be taken off of the lamb.

SHEEP MANAGEMENT

(PART 1)

GENERAL REMARKS

1. Importance of Sheep Husbandry.—On account of the various purposes for which flocks of sheep may be maintained, sheep husbandry is one of the most important branches of the livestock industry. The prime object for which sheep are raised is the production of wool and mutton, but the use that may be made of a flock as a farm scavenger and to maintain the soil fertility, commends the raising of sheep to many farmers.

Wool has a wider range of usefulness as clothing than any other material. Woolen fabrics may be made of gossamer fineness and beautiful finish or they may be heavy, coarse and thick. Clothing made from wool is equally useful in tropical regions and in regions of intensely cold winters.

Mutton has always been a popular food with the people of the more highly civilized nations. This has led to the development of special breeds of sheep for the production of the finest quality of mutton.

2. Sheep as Farm Scavengers.—Sheep are a great aid to farmers in clearing land of brush and weeds. Land on which sheep have been pastured for one or two seasons is likely to be free from weeds and to be in better condition for the growing of crops or for pasture purposes than it would be without the work of the sheep. Wild mustard, bindweed, goldenrod, ragweed, lamb's quarter, oxeye daisy, wild carrot, foxtail, red root, sow thistle, cockle, and dandelion are

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some of the most troublesome weeds with which the farmer has to contend, and they can be completely exterminated by pasturing sheep on fields overrun with them.

When grain or roughage containing more or less weed seed is fed to farm animals other than sheep, a large portion of the weed seed will pass through the animals without losing its power to sprout and grow, but the process of digestion in sheep is such that the smallest and most resistant seeds are affected and their vitality destroyed. It is the ability to obtain nourishment from all kinds of plants and their seeds that enables sheep to clean so thoroughly a farm of most of its weeds.

Sheep not only clean the farm of weeds but also turn into wool and mutton the farm wastes, such as straw from the grain crops, culls from root and vegetable crops, damaged grain, screenings, etc.

3. Sheep as an Aid in Maintaining Fertility of Soil.—As an efficient aid in maintaining the fertility of the soil no domestic animal is superior to sheep. They are natural manure spreaders. In pasture fields the highest and barest knolls are always chosen by sheep for resting places at night, and their droppings soon enrich the knolls to such an extent, that they are capable of producing good crops. The beneficent effects of a flock of sheep on loose sandy soils cannot be overestimated, and they should be placed on all such soils to compact them and fit them for growing crops. It has fittingly been said of sheep, that they will not only improve the fertility of the farm on which they are raised but will pay the owner a profit for the privilege of improving his farm.

Authorities who have given the subject of farm manures careful consideration claim that a sheep produces annually manure valued at about $2.50. This value is determined from the quantities of nitrogen, phosphoric acid, and potash found in the excrement voided by a sheep in a year and the price paid for these quantities when they are purchased in the form of commercial fertilizer.

4. Land Adapted for Sheep Raising.—The land best adapted for sheep raising depends largely on the breed of sheep to be raised. If one of the mutton breeds is chosen, rather level or gently rolling land capable of growing good grain and forage crops, having luxuriant and well-watered pasturage, and with considerable lime in the soil, will give the best results. The long-wool mutton breeds, such as the Leicester, Lincoln and Cotswold, will find such conditions suited in every way to their requirements. The higher and richer the grass the better it will suit them, as their heavy bodies and quiet disposition render them less active than the lighter breeds. The lighter medium-wool breeds will also do well on such land. The pasturage relished best by the latter breeds, however, is not so rank in growth, and is produced on land that is dryer and more rolling than the land best suited to the long-wool breeds.

Land that is broken, rough, and hilly, and has scant pasturage is best adapted to the Merino breed. The Merino sheep flock well, are good travelers, can stand heat and also cold when once acclimated, and are not so quickly or seriously affected by a shortage of water as are the mutton breeds. In fact, the Merinos thrive well where the mutton breeds would soon become worthless.

The main thing in the selection of land for a sheep farm is to avoid low, marshy land that is liable to be overflowed and that produces rank growth of coarse grasses. Sheep husbandry can never be carried on successfully on such land, as the flock is sure to become affected with parasites. The pools of stagnant water, the marsh and swamp conditions, and the lack of nutriment in the coarse herbage will soon undermine the health of the flock and render it peculiarly susceptible to attacks of disease, especially those of parasitic origin. Frequently the flocks in such locations become affected with a species of malarial fever, which assumes a typhoid character and is generally fatal if the animals are not at once moved to higher ground and better pastures. If the prospective sheep raiser already owns a farm it is then a case of selecting a breed of sheep suited to his farm.

5. Number of Sheep that Land Will Maintain.—The margin of profit in sheep raising has nearly always proved greatest when a few sheep have been kept on a relatively large area, and it does not always follow that by abandoning other lines of farming and increasing the number of sheep kept on a farm that the margin of profit will be as great. The larger the number of sheep kept on a given area the greater the danger of losses from parasitic diseases, and the greater must be the ability of the raiser to keep the margin of profit as high as in small flocks. When sheep raising is conducted as a side line and not as a specialty, twenty-five breeding ewes, a ram, and the offspring until they are ready for market are a good number to keep on each 100 acres of land. When sheep raising is conducted as a specialty, the number that can be kept on 100 acres will be largely increased.

Eight Merino ewes are practically equivalent in the quantity of feed consumed, to one animal of the cattle kind. But, since the grade sheep of the country are largely infused with the blood of the larger English mutton breeds, this proportion may be decreased. It may be safely said that at least five or six times as many sheep as cattle may be kept. This proportion can be somewhat increased in case the farm is not especially adapted for cattle production but is suitable for sheep raising. Since sheep will thrive on much poorer feed than cattle, they are particularly adapted for cheap, hilly lands that are kept almost continuously in grass.

If a farm is capable of supporting 50 cows or steers on each 100 acres of land, each 100 acres will support 250 ewes and the necessary rams. Doubtless a larger number could be kept on the same area by the intelligent practice of intensive methods. Such methods, however, have not been well worked out in the United States, because land has been too plentiful and cheap, and sheep products have not been sufficiently high in price to make it advisable to adopt intensive methods.

A few sheep will be found profitable on nearly all farms. The beginner without practical experience should start with a small flock of 25 or at most 50 ewes. After marketing a

few crops of lambs, the owner will have secured valuable experience in the raising of sheep. This experience will greatly assist him in increasing the size of the flock up to the carrying capacity of the farm, and also to increase the sheep-carrying capacity of the farm.

SHEEP BARNS AND EQUIPMENT

BARNS FOR HOUSING OF SHEEP

6. General Requirements for a Sheep Barn.—In selecting a location for a sheep barn, the habits of the animals must be given due consideration. Sheep naturally favor a dry, sunny situation away from other farm buildings. In the northern part of the United States and in Canada more attention must be given to proper shelter for the flock than farther south, where the winter season is shorter and the weather less severe. The sheep barn should be well ventilated, clean, and free from drafts. It is not necessary or even wise to make the sheep barn too warm. During the winter season, sheep are in full fleece and if housed too closely they will lose their appetites and sudden changes of temperature are likely to cause some of the wool to become loose and fall out, thus making the fleeces ragged. This is all the more likely to occur if a large quantity of corn is being fed to the flock. Some successful sheep raisers, in cold weather, keep the temperature in the barn at about the freezing point by regulating the ventilation so that a thin layer of ice will be formed on water in the barn. If the barn is kept at this temperature the sheep will not suffer from cold when turned into the yard. Sheep that are being fattened do not require as much warmth as those kept for breeding purposes.

7. A sheep barn, especially a barn for a breeding flock, should have plenty of light. The windows should be large, so as to give free admission of sunlight. There is no better or surer destroyer of germs than sunlight, and it is essential

for young lambs, which will bask in it at every opportunity. An abundance of sunshine insures good appetite, vigorous growth, and freedom from sore eyes, a disorder that often afflicts lambs raised in dark barns. It is equally essential to the health of the older sheep. If a sufficient number of windows is provided for the admission of light and sunshine and they are either made to slide sidewise in a groove or are hinged at the bottom, the barn can be easily and properly ventilated and the air kept fresh and free from bad odors without interfering with the comfort of the flock. Air should be admitted at a sufficient height so that the sheep will not be subject to a direct draft. If a ventilating shaft is used it should reach to within 6 or 8 inches of the floor and extend 2 or 3 feet above the roof of the barn to insure a good draft. Two such shafts are sufficient in a barn of from 40 or 50 feet in length, and when it is convenient they should be placed at equal distances from each end of the building and from each other. Such shafts keep the air in the building in circulation but do not create drafts, or in any way tend to the discomfort of the flock. For this reason they furnish an excellent means of ventilation in a breeding or feeding barn, especially when the barn is tight enough to prevent drafts through cracks and crevices.

A dirt floor is all that is necessary for a sheep barn, provided, of course, that the barn is located where the floor will always be dry.

8. Feed racks should be provided in a sheep barn and should be so constructed that they can be moved and used to divide the flock or to fence off sections for ewes at lambing time or for rams or sick sheep. These racks can be built so as to provide a trough for grain and roots, as well as a place for hay, corn fodder, or other roughage. There should be 15 inches of feed rack provided for each sheep weighing from 90 to 110 pounds, and from 18 to 20 inches for each of those weighing from 125 to 150 pounds.

9. A constant supply of good, clean water at the barn, preferably from a deep well or from a controlled spring, is a

great help to the comfort and health of sheep. Small galvanized steel or concrete tanks can be placed under taps, and each tank should be provided with a waste pipe to allow the water to be drawn off after it has stood some time in them. They can then be cleaned out if necessary and refilled with fresh water. A large storage tank should be provided, so that in case of an accident of any sort a sufficient supply of water is available. Salt boxes should be placed near the tanks so that the sheep may have access to them at all times. Salt boxes should form a part of the equipment of all sheep barns or feeding sheds.

10. In sheep barns used to house a breeding flock, it is well to provide quarters for the shepherd. This can be done by partitioning off a portion of the building with tongued-and-grooved lumber such as is used for flooring. In this room should be placed a cot, a stove for heating water, and the apparatus required in caring for the flock, especially the ewes in lamb; also the instruments and tools required for castrating and docking lambs and for shearing. A cabinet in which medicinal preparations are stored for emergencies should also be provided, and a couple of galvanized-iron pails will be wanted for carrying water and holding hot water for the treatment of chilled lambs.

11. Plan for Construction of Sheep Barn.—The ground-floor plan of a barn designed to shelter about 50 breeding ewes is shown in Fig. 1. The pens are arranged about the watering trough, which is so situated that four different lots of sheep may have access to water at the same time. The floor is of earth with the exception of the space *a* shown at the left in the illustration. This space, which is 6 feet wide, is covered with a tight board floor and under it is a cellar 7 feet deep for the storage of roots. All the racks and the partitions except that next to the floored space are movable, which permits of driving into the barn with the manure spreader or wagon when manure is to be removed. The feed racks across the ends of the barn may be set back against the wall if more room is desired for the sheep. In this case,

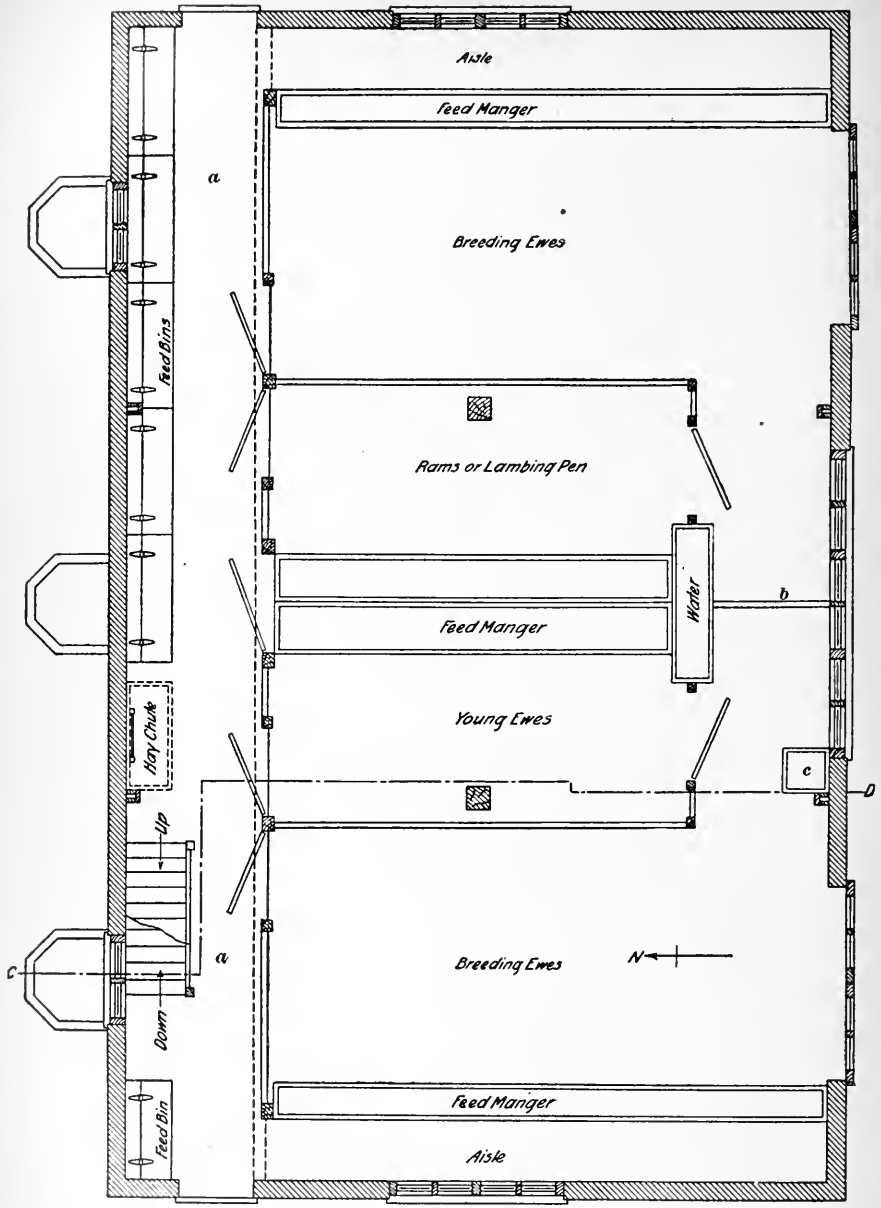

Aisle
Feed Manger
a
Breeding Ewes
Feed Bins
Rams or Lambing Pen
Water
b
Feed Manger
Hay Chute
Young Ewes
c
D
Up
a
C
Breeding Ewes
N
Down
Feed Manger
Feed Bin
Aisle

FIG. 1

however, the hay would have to be carried through the pens to be placed in the racks.

The large pens are for the breeding ewes. If these ewes are not uniform in condition and thrift and it is desirable to keep them separate so that they can be treated differently, it can be done by placing a partition *b* between the watering trough and the side of the barn. If there is no reason for dividing the ewes into two lots the partition need not be used. The small pens are adapted to a number of uses, such as space for young ewes, rams, lambing pens, a creep for lambs, that is, a place where the lambs may go but the mature sheep cannot; and if not needed at all, the partitions may be removed and thus the arrangement for the general flock made more simple. The doors shown on the right side of the barn open into the sheep yards.

At each end of the barn there is a 3-foot door that opens into the floored space at the left side of the barn. The windows, especially those on the right side of the barn, admit the necessary sunlight, and these, together with the ventilator shaft *c* make ample provision for a free circulation of air, which is of prime importance in a sheep barn. The ventilator shaft is built against the side of the barn and extends above the roof in a cupola. By being located thus it occupies but little space in the hay mow and is not an obstruction to the storing of hay.

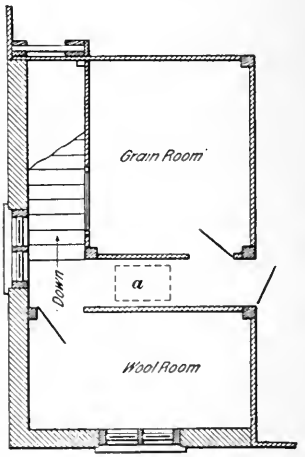


FIG. 2

12. On the left side on the second floor of the barn are a grain and a wool room, and the rest of the space is for the storage of hay. The arrangement of the rooms is shown in Fig. 2. The wool room may be used for a shepherd's room during the lambing season, since at that time it is not likely to contain wool. The space *a* shown inside of the

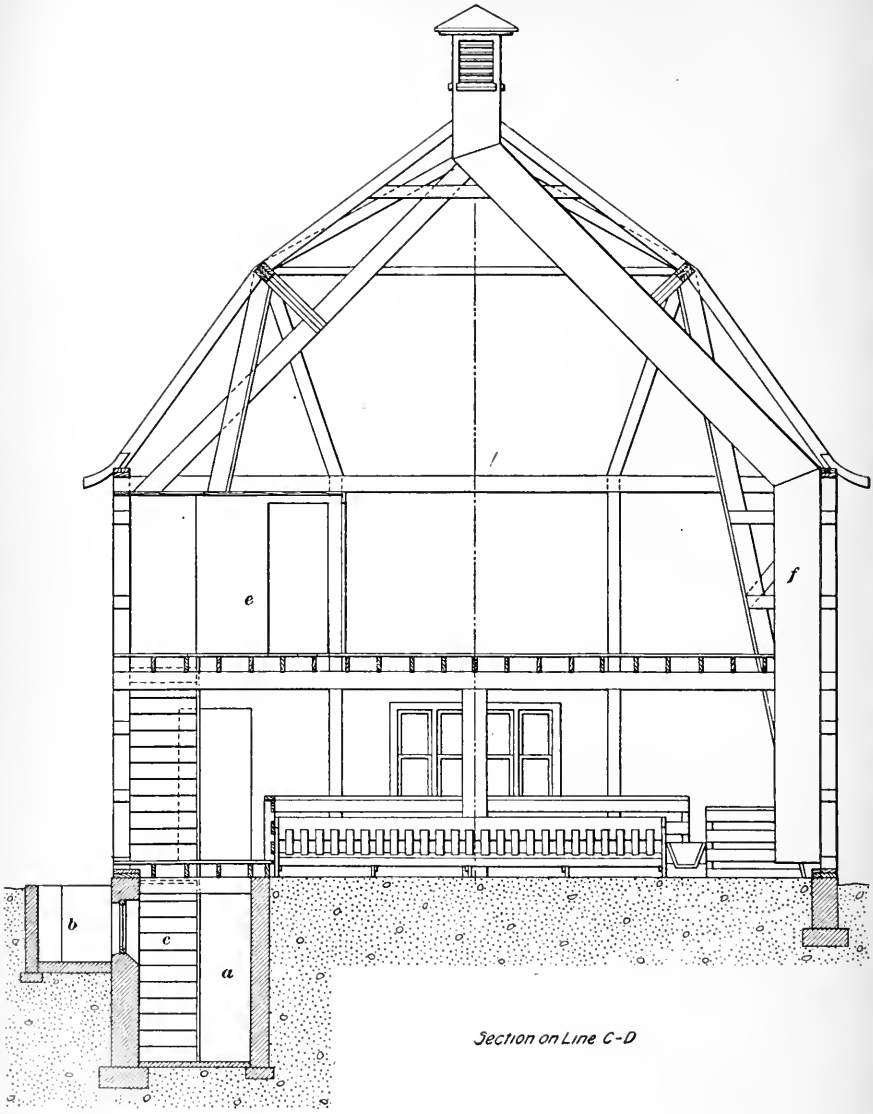


FIG. 3

dotted lines is for a trap door so that feed may be raised and lowered by means of a rope and pulley. This opening is a convenient place in which to place the bag when bagging the wool.

13. A sectional elevation of the barn taken on the line *C D*, Fig. 1, is shown in Fig. 3. The cellar, in which the roots

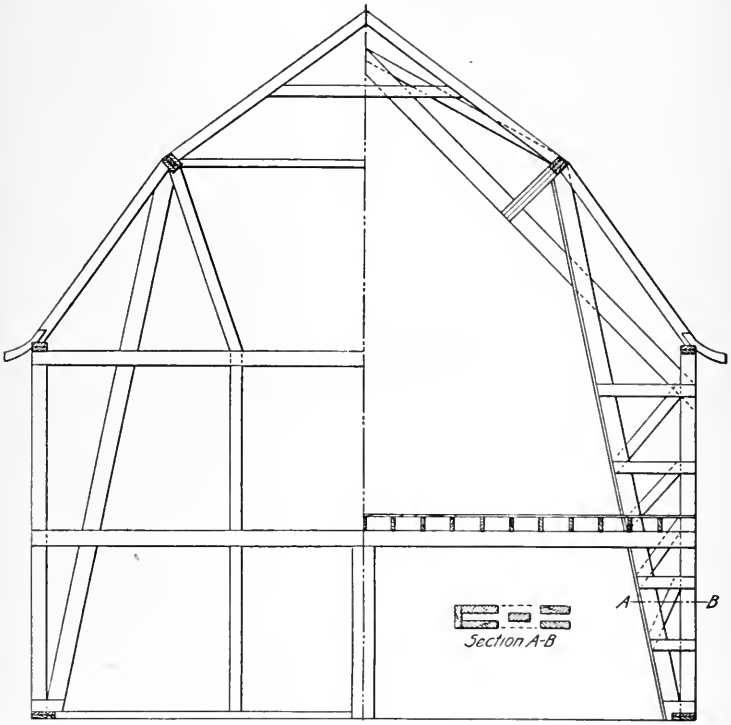


FIG. 4

for winter feeding are stored, is shown at *a*. At *b* is shown one of the windows for lighting the cellar, together with the masonry construction on the outside of it; the window is also a convenience for passing roots to the cellar to be stored. The cellar stairway is shown at *c*, and above this is shown the stairway to the second floor. The location of the wool

room on the second floor is shown at *e*, and *f* shows the ventilation shaft.

As shown in Fig. 4, the barn has a hip roof, which requires little dimension timber and allows for a maximum storage

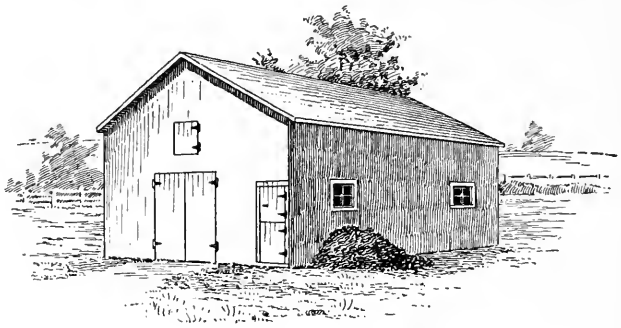


FIG. 5

place for hay or other roughage. At the right of the illustration is shown the construction of one of the middle bents. The section of this bent, taken on the line *A B*, is shown separately. On the left is shown the construction of one of the end bents.

The size of this type of barn can be easily changed to suit the needs of the size of flock handled. If the flock is a

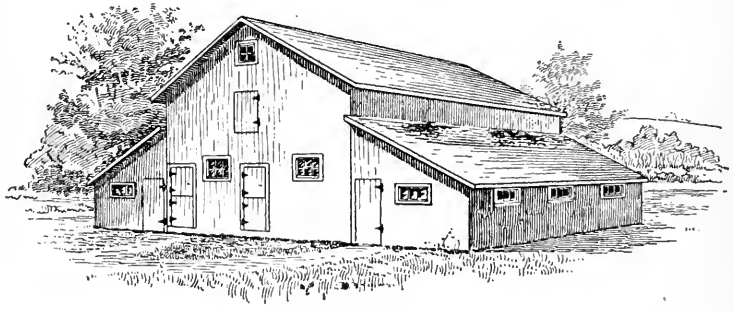


FIG. 6

large one there may be need for more than one watering place, in which case there may be a series of pens similar to those shown in Fig. 1.

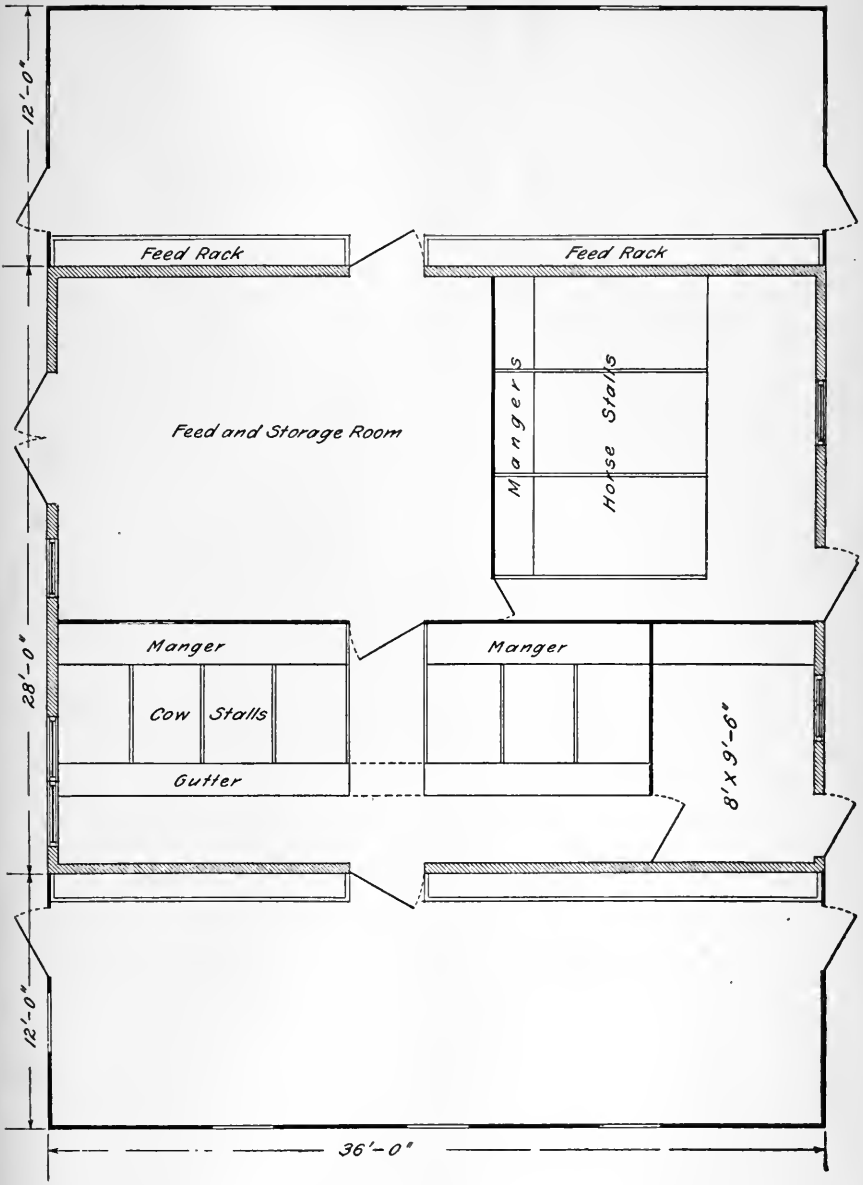

12'-0"
Feed Rack
Feed Rack
Feed and Storage Room
Mangers
Horse Stalls
28'-0"
Manger
Manger
Cow Stalls
Gutter
8'x9'-6"
12'-0"
36'-0"

FIG. 7

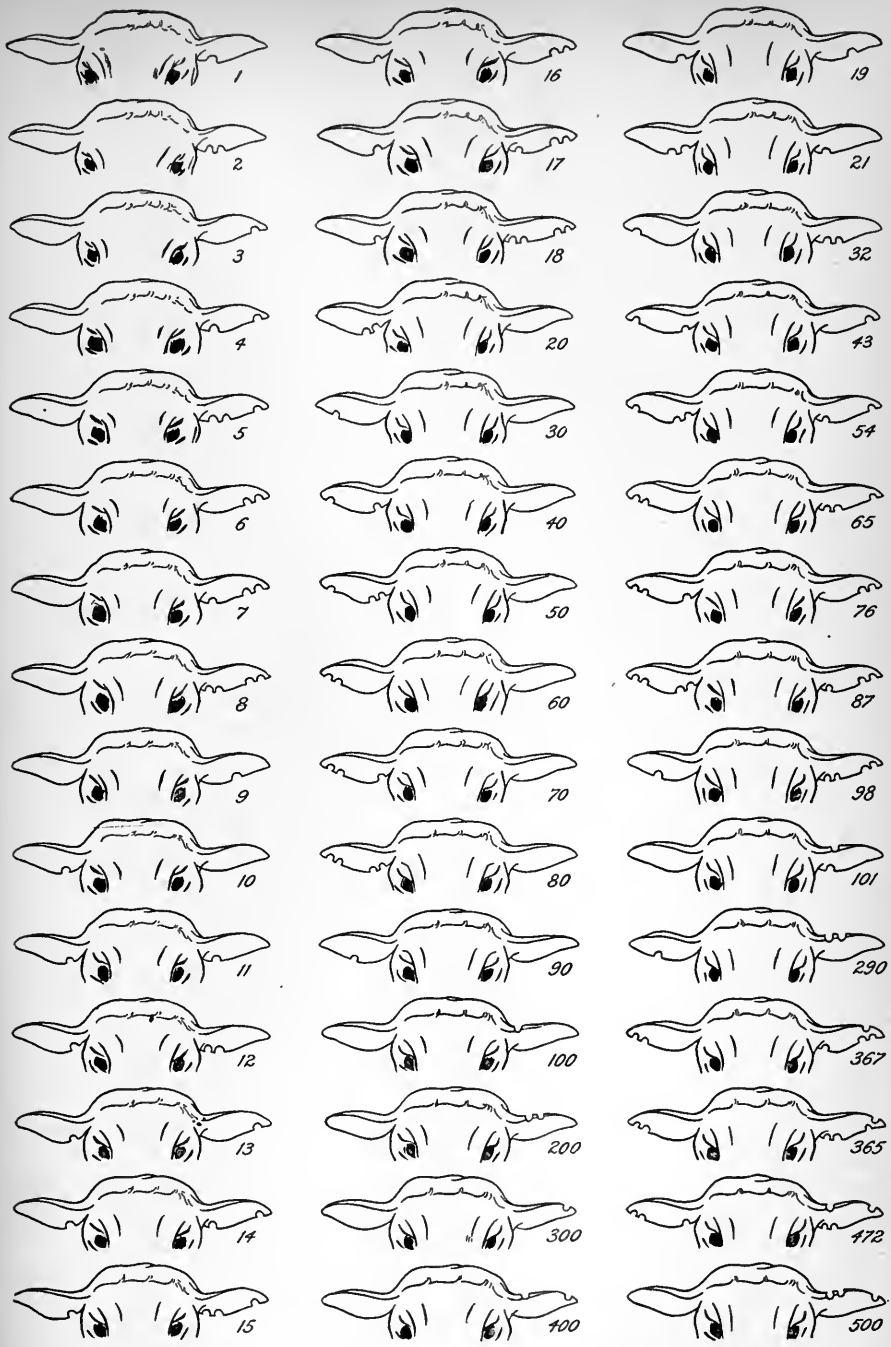
14. Remodeling of Old Barns.—Barns such as the one shown in Fig. 5, are found on many more or less dilapidated farms, on which a flock of sheep would prove useful in cleaning up and bringing the farms into a profitable state of production. If available room cannot be found in such barns for the accommodation of a flock of sheep, a cheap lean-to shed may be built on one or two sides, as shown in Fig. 6. Such sheds should have windows to admit as much sunlight as possible, and for the sake of convenience there should be a door between the shed and the barn through which hay and grain may be carried; the feed racks and troughs may be placed on the side next to the barn, as shown in the floor plan in Fig. 7, or, if necessary, they may be placed on both sides and at the ends of the shed.

Such a shed makes a very good shelter for a small flock kept for either breeding or feeding purposes.

15. Many farms are equipped with basement, or bank, barns, the basement of which may be used for sheep and the upper part for the storing of hay and roughage. In this case, the floor above the sheep should be made as tight as possible to prevent the chaff, seeds, and dust from falling on them and injuring their fleeces.

SYSTEMS AND EQUIPMENT FOR SHEEP MARKING

16. The careful sheep breeder will need to have each breeding sheep marked in some way, so that he may be able to keep a record of each sheep of the flock from its birth. Some breeders employ the plan of marking the ears so that any animal in a flock may be identified. A plan of such a system of marks, and one that is especially recommended for the marking of lambs, is shown in Fig. 8. By this system, lamb No. *1* is marked with one notch in the lower edge of the left ear near the head; No. *2*, with two such notches; No. *3*, with one notch in the lower edge of same ear near the tip; No. *4*, with a combination of the notches of Nos. *1* and *3*; No. *5*, with a combination of the notches of Nos. *2* and *3*; No. *6*, with two notches like the one for No. *3*; No. *7*, with a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365
472
500

15

FIG. 8

combination of the notches of Nos. *1* and *6*; No. *8*, with a combination of the notches of Nos. *2* and *6*; and No. *9*, with a single notch in the middle of the lower edge of the left ear. Nos. *10*, *20*, *30*, *40*, *50*, *60*, *70*, *80*, and *90* are marked, respectively, by the notches of Nos. *1* to *9*, but made in the lower edge of the right ear instead of in the left ear. Thus, No. *10* is marked with one notch near the head on the lower edge of the right ear; No. *20*, with two such notches; No. *30*, with one notch in the lower edge of the right ear near the tip; No. *40*, with a combination of the notches of Nos. *10* and *30*; No. *50*, with a combination of the notches of Nos. *20* and *30*; No. *60*, with two notches like the one for No. *30*; No. *70*, with a combination of the notches of Nos. *10* and *60*; No. *80*, with a combination of the notches of Nos. *20* and *60*; and No. *90*, with one notch in the middle of the lower edge of the right ear. Hundreds are indicated by making a similar arrangement of notches on the upper edge of the left ear. Thus, No. *100* is marked with one notch in the upper edge of the left ear near the head; No. *300*, with one notch near the tip; No. *500*, with a combination of the notches of Nos. *200* and *300*; etc. If it should be desirable, notches may be placed in the upper edge of the right ear to indicate the Nos. 1,000, 2,000, etc. to 9,000.

No. *11* is marked with a combination of the notches indicating Nos. *10* and *1*; No. *12*, with a combination of the notches indicating Nos. *10* and *2*; No. *13*, with a combination of the notches indicating Nos. *10* and *3*; etc. No. *21* is marked with a combination of the notches indicating Nos. *20* and *1*; No. *32*, with a combination of the notches indicating Nos. *30* and *2*; No. *43*, with a combination of notches indicating Nos. *40* and *3*; No. *76*, with a combination of the notches indicating Nos. *70* and *6*; No. *101*, with a combination of the notches indicating Nos. *100* and *1*; No. *290*, with a combination of the notches indicating Nos. *200* and *90*; No. *365*, with a combination of the notches indicating Nos. *300*, *60*, and *5*; etc. By a careful study of this system of marking it is readily seen that any number from 1 to 9,999 may be indicated by making notches in the edges of the ears.

The notches should be only small nicks in the edges of the ears.

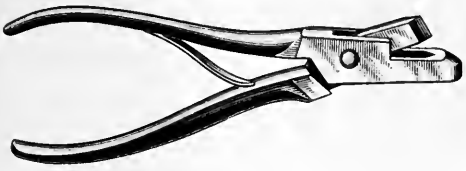

Fig. 9

Fig. 10

17. A punch for making ear marks on sheep is shown in Fig. 9.

Some breeders prefer to mark their sheep, especially mature animals, with ear labels or ear buttons. These are made of non-rusting metals, and are of a size that the owners' name, or at least the initials of the owners' name, can be stamped on one side and a number on the other. One of the most common labels is shown in Fig. 10. The punch used to make the hole in the ear for the label is shown in Fig. 11. The punch is also used to close the ends of the label together after it is placed in the ear. An ear button is shown in Fig. 12. It is made in two parts, each with a shank. The part with the shank *a*, which is the larger, is placed through a hole in the ear and the shank *b* on the other part is slipped into shank *a* and the two parts are clinched together as shown in the upper part of the illustration.

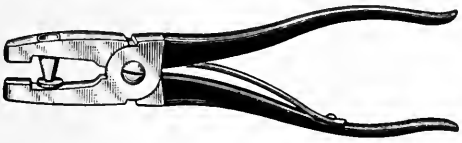

Fig. 11

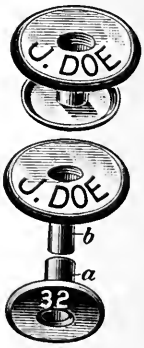

Fig. 12

Many farmers who do not care to keep an accurate record of each animal, but desire to mark all animals for identification

in case flocks of different owners get together, use a marking fluid, or paint, which is applied to the wool of the sheep by means of a marker, several of which are shown in Fig. 13. Some of the markers, such as the one shown in (*a*), are easily made of a single piece of soft wood; an extra large corn cob is hollowed out, as shown in (*b*), and made to answer for a circular marker; markers such as the one shown in (*c*) and the marking fluid may be secured from supply houses dealing in sheep breeders' supplies.

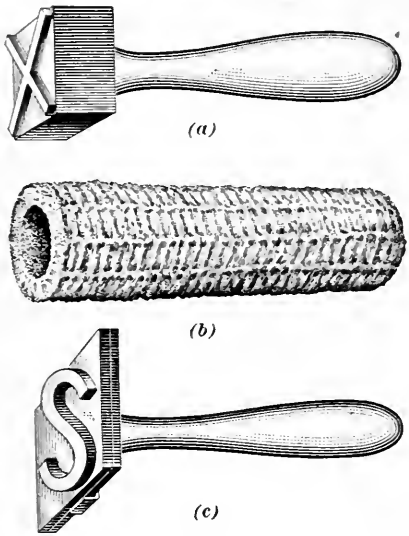

FIG. 13

MISCELLANEOUS EQUIPMENT

18. Feed Rack.—In Fig. 14 is shown the construction of a combination rack and trough highly recommended for

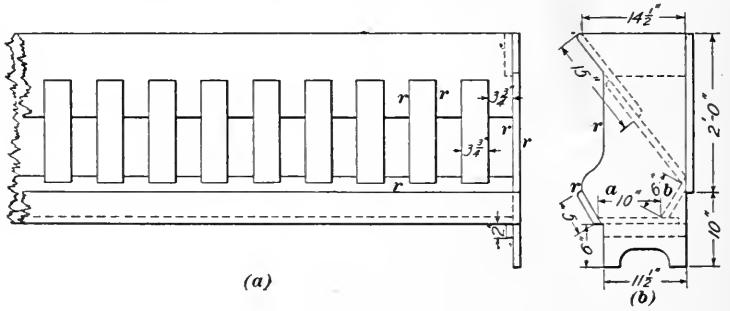

FIG. 14

the feeding of roughage and grain to sheep. The front view is shown in (*a*) and the side view, in (*b*). The feed trough *a*

is 10 inches wide at the bottom and 13 inches wide at the top. The front of the rack above the feed trough is made 15 inches wide, either of one board or of several boards closely matched, so that none of the loose particles from the roughage can fall on the backs and necks of the sheep, but all must fall in the trough where the sheep can easily get it. The 6-inch board *b* slanting from the bottom of the rack proper to the bottom of the trough prevents any of the small particles from falling out of the reach of the sheep. Experience has clearly demonstrated that by the use of this rack no hay or other roughage can be wasted if the sheep are not overfed and that the chaff and seed from the roughage cannot get into the wool of the sheep.

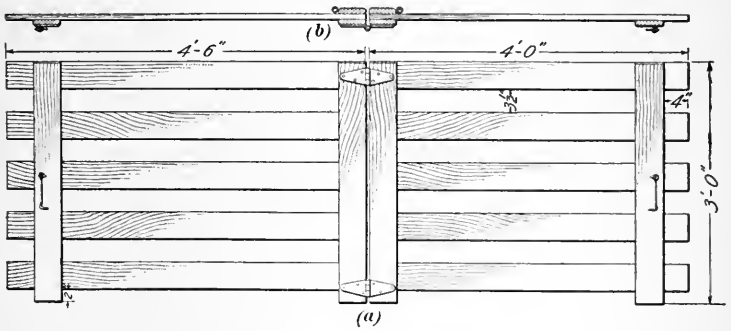

FIG. 15

All the material used in making this rack, except the front of the feed-trough and the $3\frac{3}{4}$-inch slats, should be of hard pine or similar lumber, dressed on one side. The front of the feed trough and the slats should be of soft pine or other soft wood dressed on both sides. All edges *r* with which the sheep come in contact should be rounded to prevent the wool of the sheep from being pulled out.

These racks may be set singly along an aisle, or feed alley, along the side of the barn, or they may be placed singly or back to back to form partitions in the barn. They are not cumbersome and when two are placed back to back to form a partition between two pens of sheep, those in each pen

may be fed entirely different rations, as is often found advisable.

19. Panels for Making Pens and Partitions in Sheep Barns.—Convenient appliances for making temporary pens or partitions in sheep barns are panels, either single or double. The latter is made by hinging two panels together, as shown in Fig. 15, which shows a side view in (*a*) and a top view in (*b*). The panels may be of the dimensions shown or of any other convenient size. Both ends of single panels are made like the free ends of the double panel shown. They will be most convenient if the boards are of soft pine or other light, durable lumber, 4 inches wide, $\frac{3}{4}$-inch thick, and planed on both sides. A double panel may be opened at right angles, placed in the corner of the barn, and the ends hooked to the walls of the barn so as to form a pen. A row of such pens may be made by fastening one end of a double panel to the wall of the barn and to the corner of the pen previously made. Pens of such size are desirable for a ewe at lambing time, for a sick sheep, or for a sheep that it may be desirable to separate from the flock. The panels are often convenient in making temporary partitions in the barn.

20. Sheep Yards.—Adjoining the barn should be a large yard into which the sheep may be allowed to run during pleasant weather. The yard should be at least double the area covered by the barn, well drained, surrounded by a good fence, and the ground gradually sloping from the barn and covered with gravel. If possible, the yard should be so divided that, by leaving the barn doors open, the separate pens of sheep in the barn may have free access to a definite division of the yard. If this arrangement can be made the sheep will, to a large degree, remain in the barn during inclement weather, but run in the yard during pleasant weather. Open feed racks should be placed in the yard and kept full of hay, corn fodder, or other roughage, so that the sheep may eat at their pleasure.

21. Dipping Outfit.—The prevalence on sheep of external parasites, ticks, mites, etc., that can best be killed by immers-

ing the sheep in a liquid known as dip, or dipping fluid, renders a dipping plant very useful wherever a flock of sheep is maintained. The outfit may be more or less elaborate, according to the size of the flock. For a flock of from 25 to 500 sheep an ordinary galvanized steel tank is all that is required. Such a tank is shown in Fig. 16; it is about 4 feet deep, 8 feet long at the top, 4 feet long at the bottom, 30 inches wide at the top, and 8 inches wide at the bottom. The tank should be sunk into the ground to within a few inches of the top, and may be placed either under cover or in the open, as may prove to be most convenient. A temporary fence should enclose a yard that narrows as it approaches the perpendicular end of the tank where a gate opens toward the tank and allows the sheep to be led or driven through, singly, and pushed into the tank. When in use, the tank should be filled to within 6 or 8 inches of the top with a dipping fluid, which may be secured in concentrated form from dealers in stockmen's supplies. The dipping fluid in the tank should be kept at a sufficient depth to compel the sheep to swim through it. Each sheep as it swims through the dipping fluid should be forced under the surface to insure getting the fleece thoroughly soaked. A pole with a crutch-shaped end is commonly used for submerging the sheep. As the animals reach the further end of the tank they will walk up the incline onto a platform known as the drip platform, where they should be compelled to stand and have the excessive dip squeezed out of their fleeces. This platform may be made permanent or movable, and should be sloped downwards toward the tank so that the drip from the sheep will run back into the tank.

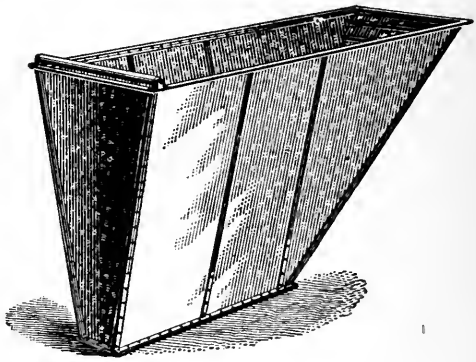

Fig. 16

It will be found convenient to put a temporary fence on the sides of the platform, to leave the end toward the tank

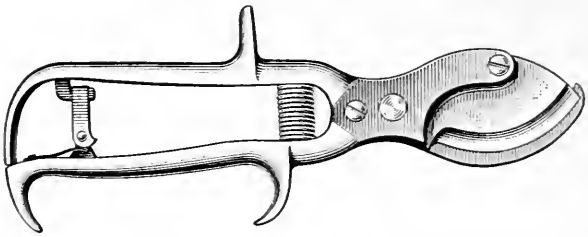

FIG. 17

open, and to close the opposite end with a gate, which can be opened readily to allow the sheep to pass into an adjoining yard.

A tank that will meet all requirements can be made of 2-inch plank. The tank should have the form and dimensions of an ordinary steel tank. The edges of the plank should be planed so they will fit tightly together and prevent any material leakage. It should be fitted with a yard, a platform, and a fence, as recommended for the steel tank. When the tank is not in use the platform can be utilized as a cover for the tank to prevent accidents and to keep out dirt.

When a large number of sheep have to be dipped, as is often the case on large sheep ranches, enlarged facilities must be provided, and tanks from 18 to 40 feet in length may be used. They may be of galvanized steel, plank, or concrete. The latter will be found the most durable and is the most desirable material to use where it is available.

22. Toe Clippers and Docking Pincers.—The implement shown in Fig. 17 and known as **sheep toe clippers,** also as a pruning shears, should be found in the equipment of every sheep raiser, whether the flock is a large or small one. This implement is sometimes used for the docking of lambs, although the **docking pincers** shown in Fig. 18 are made

FIG. 18

especially for the latter purpose and have proved satisfactory wherever used. When used, the docking pincers are heated to redness. The cutting edges are not made very sharp, but thin at the edge and thickening toward the middle so as to hold the heat. This construction enables the operator to cut off the tail and to cauterize the wound at the same time.

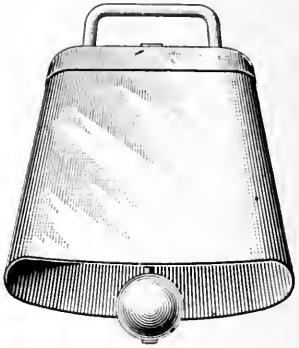

FIG. 19

23. Sheep Bell.—It is an old and good practice among sheep men to have each flock, however small, supplied with at least one **sheep bell,** such as is shown in Fig. 19. The bell is fastened to a sheep by passing a leather strap through the loop at the top of the bell and buckling it securely around the neck of the sheep. The tinkle of the bell will locate the flock if the bell sheep—that is, the sheep to which the bell is fastened—is moving. The vigorous ringing of the bell or bells, it is claimed, will sometimes frighten dogs when they chase a flock of sheep, and is also likely to attract the attention of the shepherd or other persons in the vicinity.

24. Lamb Forceps.—Among the instruments for which a shepherd has only occasional use is a pair of **lamb forceps,** also known as **lamb** and **pig forceps.** These are used in taking lambs from ewes, when the ewes are unable to give birth to the lambs without assistance. Lamb forceps, a pair

FIG. 20

of which is shown in Fig. 20, are made in several shapes and forms. The instrument illustrated is one of the simply constructed forms in general use by sheep breeders. It consists of two pieces of nickel-plated steel riveted together to form

in reality two instruments, one at each end of the implement. In the hands of careful and experienced shepherds this instrument may often be the means of saving the life of a ewe or of a ewe and a lamb at lambing time. Detailed directions for their use usually accompany each pair of forceps.

FIG. 21

25. Trocar.—An instrument always found in the fully equipped shepherd's outfit is the **trocar,** which is shown in Fig. 21. This instrument is intended for the tapping of bloated or hoven animals, and is much better than a penknife, which is sometimes used for this purpose. This instrument consists of a handle into which is fastened a piece of round-pointed steel, and over the steel is a neatly fitting metal sheath. When used, the point of the instrument is pushed through the skin and into the stomach of the bloated animal, the sheath is then held in place while the steel is with drawn. The gas in the stomach of the animal then escapes through the hollow sheath after which it is removed.

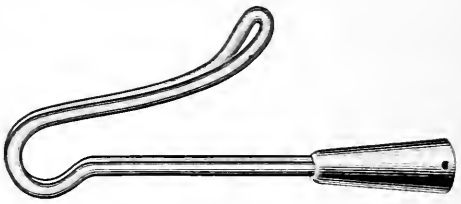

FIG. 22

26. Shepherd's Crook.—In Fig. 22 is shown an implement known as a **shepherd's crook,** which is fastened on the end of a staff from 6 to 9 feet in length. This is a most convenient implement in the sheep barn, yard, or field, when it is desired to catch any particular sheep in the flock.

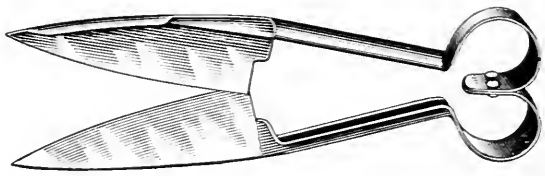

FIG. 23

27. Sheep Shears.—A pair of common hand **sheep shears** is shown in Fig. 23. The essential parts of a shears of this type are two blades, the handle, and a spring. The spring consists of the end of the shears opposite the blades, and is usually made as shown in the illustration or by one solid continuous steel bow connecting the two parts of the handle. The blades vary in length from 4 to 7 inches. Shears of this kind are indispensable in the operations of tagging, shearing, or clipping of wool in some way or other during the year, therefore, at least one pair of shears should be on every farm on which sheep are raised.

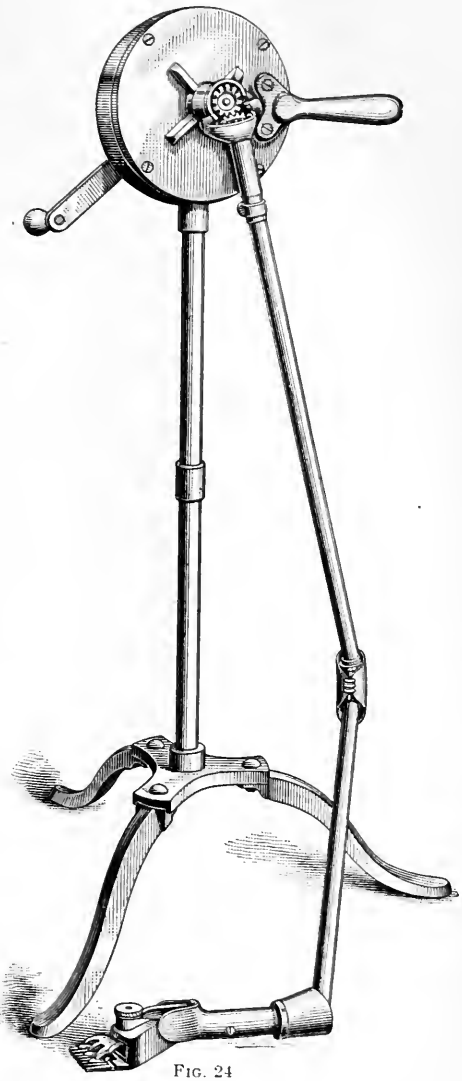

FIG. 24

A small, flexible-shaft **shearing machine** that is operated by hand power is shown in Fig. 24.

This machine consists of a metal stand, at the top of which is the crank-handle and a metal box in which are enclosed the gear-wheels. The shears are connected with the gear by means of a system of

shearing shafts connected by universal, and usually ball-bearing, joints. The cutting part of the shears consists of a knife that works back and forth over a comb very much as the knife on the cutter bar of a mower does over the guards of the cutter bar. The points of the comb project beyond the points of the knife, which usually has three divisions triangular in shape. They separate, support, and guide the fibers of wool to the cutting edges of the knife, which is driven by power transmitted by the flexible shaft. There is an arrangement for screwing down the knife to make it fit snugly to the comb. Full directions for the use and care of the shearing machine should accompany each machine.

28. Twine for the Tying of Fleeces.—The twine that has been in common use for the tying of fleeces is made of jute and is known as wool twine. Although this twine is acceptable to wool buyers, it is not entirely satisfactory to the manufacturers of woolen goods, because the fibers of jute cling to the wool and cannot be gotten out except by a laborious and expensive process. Some wool growers have used sisal, or binder twine, for the tying of fleeces. This twine is made of coarse, heavy fibers, which are more difficult and expensive to remove from the wool than the fibers of the wool twine. Wool dealers pay so much less for wool tied with sisal twine that it is poor economy for wool growers to use sisal twine for this purpose. In fact, dealers sometimes refuse to purchase clips of wool if sisal twine is used in tying the fleeces. The material that is highly recommended by wool dealers and manufacturers for the tying of fleeces is a twine made of paper, and is known as paper wool twine. This twine is but little, if any, more expensive than the other twines and there seems to be little excuse for wool growers not using it instead of the twines that are objectionable to the wool dealers.

29. Table for the Tying of Wool.—The plan of a device used for the tying of wool into neat bundles and which is variously known as a **wool table, wool box,** and **wool board,** is shown in Fig. 25 (*a*). This table is best constructed of three

boards of light lumber 12 inches wide, 3 feet long, $\frac{7}{8}$ inch thick, and planed on both sides. The board for the middle of the table is cut in three pieces, each 1 foot square, and hinged together as shown on the lines *a a*. The side boards are hinged to the center square on the lines *b b*. On each side of the table two notches *c* are cut of such a size and shape that they hold firmly in place the ends of the pieces of twine used in tying the bundles. A spring *d*, which may be made of hard wood or of steel, is set into each of the side boards in the manner shown in cross-section in (*b*). A

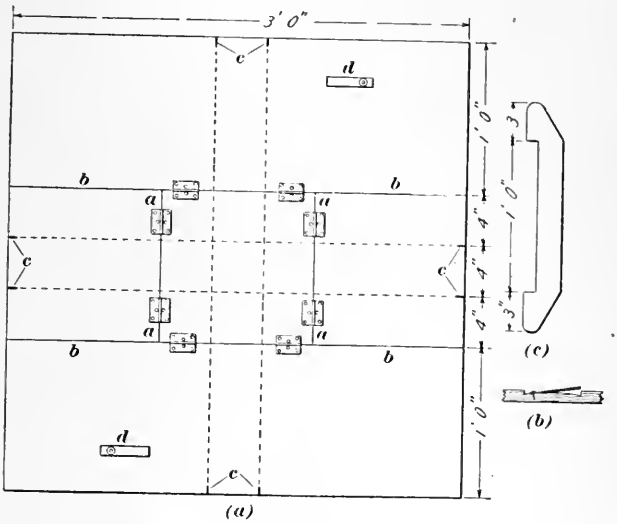

FIG. 25

wooden clamp used to hold the side boards in a vertical position, while the ends of the pieces of twine are tied together, is shown in (*c*).

When the table is to be used it is laid on a box or other suitable support of a convenient height and pieces of twine are placed in the position shown by the dotted lines and their ends drawn tightly in the notches. A fleece is then placed on the table with the outside of the fleece upwards, the staple neatly collected, and the edges folded over toward the center. The side boards are then raised to a vertical position and held

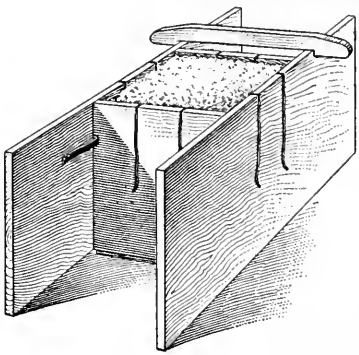

FIG. 26

in place by the wooden clamp; next the end pieces of the middle board are raised until they snap behind the springs, which hold them in a vertical position. The fleece is thus enclosed in the box as shown in Fig. 26. The opposite ends of the strings are then tied together and the clamp is removed. The last operation allows the side and end boards to drop, leaving the fleece tied up in a neat cubical bundle.

FEEDS FOR SHEEP

SUCCULENT FEEDS FOR SHEEP

30. Sheep, like other animals that chew their cud, thrive best when they have an abundance of succulent feed, such as is furnished by green pastures. Most successful sheep raisers have found that it pays them to supplement the common grass and clover pastures with special pasture crops and with other crops that will supply succulent feed during the winter, when the pastures are either frozen and undesirable or are covered with snow. The feeds specially recommended for these purposes are rape, thousand-headed kale, cabbage, root crops, pumpkins, corn silage, and rye.

31. Rape as Feed for Sheep.—One of the best succulent feeds for sheep is rape. It may be used as a soiling crop for sheep, but the more general and usually the more practical method of feeding it to sheep is to allow the flock to pasture in the rape field. The Dwarf Essex variety is the most suitable for sheep feeding.

The chief merit of the rape crop for sheep feed is the rapidity with which it grows under favorable conditions and

the palatability of the feed. It produces from 15 to 30 tons per acre of a luxuriant forage that sheep relish very much.

If the rape is to be fed as a soiling crop, the field sown to rape should be located near the barn or yard where the sheep are kept, because such a location requires less labor to cut and haul the crop to the sheep. If the rape is to be pastured, it is advisable to have the field of rape adjoining a grass pasture so that the sheep may be changed from rape to grass and vice versa. Sheep not accustomed to pasturing on rape should not be turned on a field of rape and allowed to feed on it without restriction. First, they should be turned on a grass pasture for a couple of hours or given a fair feed of hay, and then turned on the rape for a couple of hours each day for 4 or 5 days, after which they may be allowed to pasture on the rape all day. Sheep unaccustomed to rape should not be allowed on it while the plants are wet, either from rain or from dew, because wet rape, especially during hot weather, is likely to cause bloating or diarrhea. These troubles are particularly likely to occur if sheep are allowed to feed on frosted rape, or if hungry sheep are allowed to satisfy their hunger on rape. In the latter case, if the rape is frozen, the results are likely to be fatal. To avoid these dangers and at the same time to make use of a few acres of this most valuable succulent sheep feed, the rape field should be adjacent to another pasture or feed lot so that the sheep may be turned in the rape during the day and in the grass pasture or feed lot for the night. Rape may be sown alone, broadcasted, or drilled; it may be sown in the corn field just before the last cultivation of the corn; or it may be sown in the spring with oats. It is an advantage, if sown alone, to have the seed drilled in rows; first, in the extra cultivation possible; second, in the greater room for the plants; third, in wasting less feed, because the sheep will stand between the rows and do not trample the plants; and fourth, in having the plants more convenient for cutting if it is desired to practice soiling.

If sown in the corn field, it is best to broadcast 2 to 3 pounds of seed, before the cultivators. This can be done most easily

by the sower riding a horse, in which position he is above the growing corn and is free to sow the seed evenly. If the foliage of the corn is not too dense, the rape will make a large quantity of forage that will prove especially useful to those sheepmen who purchase western lambs to fatten for the late fall and winter markets. The most and probably the best feed is obtained when the plants have attained their most luxuriant growth, which usually occurs, if the seed was sown

FIG. 27

alone and the plants cultivated, when the plants are about 2 months old. In seasons of especially dry weather, the plants become somewhat stringy as they grow old and are not highly relished by sheep, but in seasons of abundant rainfall the plants remain fresh and crisp until after heavy frosts.

The quantity of land that should be sown to rape for any number of sheep will vary considerably, depending on the

soil, the season, and the quantity and nature of other feeds that are given to the sheep. As a general rule, however, 1 acre of rape for each 12 to 30 sheep will be a most valuable addition to a farmer's supply of sheep feed.

32. Kale as Feed for Sheep.—Thousand-headed kale, a field of which is illustrated in Fig. 27, is as yet used to a very limited extent by American sheep raisers. Some of the more progressive breeders have experimented with it and speak very favorable of it. Its appearance would perhaps be crudely described by saying that it is about midway between cabbage and rape. It is generally thought to be more difficult to raise than rape; but it is less watery and is considered to be a better feed for sheep. The best method of growing it seems to be to plant it in rows 18 inches apart. When it is well started it should be thinned to leave a kale plant about every 8 inches. It is desirable to have the plants rather close together or they will become too large and the stems woody.

33. Cabbage as Feed for Sheep.—Breeders of pure-bred sheep who exhibit their flocks at the fairs extensively find green feed of some kind a necessity to keep the show flock in good condition and use cabbage to a large extent for this purpose. Cabbage can be grown in almost every section of the United States and Canada and is one of the best succulent feeds for sheep. It can be stored and kept without difficulty and fed during late fall and early winter when the feeding of rape might prove to be dangerous.

34. Root Crops as Feed for Sheep.—Root crops, if properly grown and stored, afford a very desirable succulent feed for sheep. Some one has aptly said that well-preserved root crops carry summer succulence into the winter quarters of the sheep fold, creating and satisfying the appetite of the sheep at one and the same time. Roots form an important portion of the supply of sheep feed used by the British and Canadian sheep growers, who are among the best sheep husbandmen. Mangels, sometimes known as field beets or as cattle beets, can be kept easily and, for this reason they

are especially suitable as a sheep feed during late winter and spring. At this time mangels do not have the tendency to cause digestive trouble, as they sometimes do when fed shortly after they are harvested. They make an almost ideal feed for ewes that have suckling lambs. Mangels should be fed very sparingly or not at all to rams; sugar beets and half-sugar mangels should never be fed to rams and sparingly or not at all to other sheep.

In some sections, especially in the sheep-raising sections of Great Britain and Canada, turnips are used extensively as sheep feed, and meet with much favor. For fall feeding varieties of the common turnip are most suitable, but for winter feeding rutabagas are superior to common turnips. The common turnips are not so easily kept in storage as rutabagas, and rutabagas cannot be kept so easily as mangels. It has been claimed by some investigators that the excessive use of turnips as feed for pregnant ewes has been one of the chief causes of abortion among the flocks of Great Britain.

Kohlrabi is a root that is highly recommended as a sheep feed and has seemingly met with much success wherever it has been used as such.

35. Pumpkins as Feed for Sheep.—Pumpkins as feed for sheep are not generally used by sheep raisers, but those who have had experience with them strongly recommend them as a supplementary feed for sheep during the autumn and the early winter months. Pumpkins are usually grown in corn fields along with the corn, but they may be planted in a separate field. A good plan is to plant pumpkin seeds where it seems advisable to replant corn, that is, wherever the seed corn had failed to grow. By this plan it is not difficult to secure from 2 to 10 tons of pumpkins per acre without injuring the corn crop.

As a feed for sheep, pumpkins have considerable nutritive value and are not dangerous in any way. The seeds are known to be a good vermifuge, or worm expeller, and may be of a distinct medicinal value to sheep when the seeds are

freely eaten by them. A good method of feeding pumpkins is to scatter them on the pasture without breaking the pumpkins or, at most, only a few of them. As soon as the sheep get a taste for them they will gnaw without difficulty into the unbroken pumpkins and eat them. It is believed, too, that pumpkins will keep better scattered about the field than when piled in a heap, at any rate until cold weather sets in.

36. Corn Silage as Feed for Sheep.—Corn silage is a very desirable feed for sheep, and in the corn belt of the United States it is one of the most practical succulent feeds for sheep during the winter. The corn should be well matured for making silage for sheep feed. Sweet corn makes a more desirable silage for sheep feeding than does the common field corn, although the latter produces a larger quantity per acre. Silage must be fed cautiously. At first, sheep should be given about ½ pound daily and this quantity gradually increased until they get from 2½ to 3 pounds each, The refuse silage, if any, should be removed from the feed trough each day. Moldy, sour, or frozen silage should never be fed to sheep, because such silage usually causes digestive troubles.

37. Rye as Feed for Sheep.—The chief value of rye as a feed for sheep is to furnish early and late pasturage; that is, pasturage during the late fall and early spring, thereby extending the regular pasturing season to some extent. Rye should have sheep turned on it before the main stem, or stalk, makes its appearance, because after this stage of growth sheep show no special fondness for it and if they can get other feed they will allow the rye to grow. If rye is sown especially for sheep pasture, it is advisable to sow from 3 to 4 bushels per acre instead of the usual quantity of from 1½ to 2½ bushels per acre. The thicker sowing usually produces finer and more palatable plants than those best suited to produce grain.

DRY ROUGHAGE FOR SHEEP

38. Hay as Feed for Sheep.--Where alfalfa hay can be grown or secured at a reasonable price, it is the most valuable roughage that can be secured for sheep. When once accustomed to alfalfa sheep become very fond of it, and because of the relatively high percentage of protein that alfalfa contains it is a most excellent supplement to corn and other grains containing a relatively low percentage of protein.

Next in value to alfalfa hay is that made from clovers. Red and Alsike clover hay is especially recommended for sheep feeding. The coarse stems of hay made from Mammoth clover reduce its value somewhat as a feed for sheep. A very good hay for sheep feeding is made from oats and peas grown together. Pea straw and bean straw are excellent roughage feeds for sheep. Bean straw, however, is likely to cause scours in sheep if it is fed in large quantities as the only roughage. Of the two, pea and bean straw, pea straw is undoubtedly the more desirable. Corn stover and corn fodder make fair roughage for sheep, especially if alfalfa or clover hay can be fed with them.

Hay made from timothy and from the different varieties of millets is poor feed for sheep. Such hay usually contains too large a percentage of woody fiber, or if the hay is made before the woody fiber is developed in the plants it is likely to cause scours in sheep. If hay made from timothy or from millets must be fed to sheep, it should be used sparingly. Some sheepmen go so far as to advise selling the sheep and the hay in the fall rather than attempting to winter sheep on it. If hay made from millets after the seeds have hardened is fed to sheep it is believed to cause a derangement of the action of the kidneys.

39. Mature Peas and Pea Vines as Feed for Sheep.—The feeding of mature unharvested peas and pea vines to fattening lambs is very popular where the climatic conditions are such that the peas will mature and remain in the field in an unspoiled condition until eaten by the sheep. Such regions

have a climate that is cool, with but little or no rainfall during the fall, little snow fall, and the air is so dry that the moisture from the snow is evaporated as fast as it melts, thereby keeping the soil dry. These conditions are obtained in certain portions of the western part of the United States, notably in certain sections of Colorado and Wyoming. In such sections the pea vines grow until fall and ripen without danger from rains, which would blacken the vines and sprout the grain, thus spoiling the crop as feed for sheep.

The chief difficulty in the feeding of peas and pea vines is that the lambs are put on full feed immediately and the supply of feed decreases as time advances; the reverse order should be the case. To overcome this difficulty, sheep feeders keep the lambs moving to a fresh quantity of peas every few days. This is accomplished by having several fields of peas or one large field and a small portion cut off by temporary fences and turning the lambs onto a fresh portion before the feed in the first has become sufficiently scarce to check the growth of the lambs, and then allow hogs or cattle or both to eat what peas the lambs leave. The more common, and probably the more practical, method is to keep a herder with the sheep who will not allow them to run over the field, but who will permit them to advance a little each day onto a fresh area of peas. Each acre of mature peas will fatten from eight to fifteen lambs.

CONCENTRATES FOR SHEEP

40. Corn as Feed for Sheep.—Indian corn is undoubtedly the most valuable grain grown in the United States for fattening sheep and lambs, and it may advantageously form a large part and in some instances the sole concentrated part of their ration. It has a much more limited use in the ration of the breeding flock. It is preeminently a fattening feed and is usually fed in the shelled form. It is not necessary to grind it except for feeding to aged ewes with poor teeth. It is sometimes fed with the stalks before husking and, of course, without shelling. The use in this form is not com-

mon, and is not generally recommended. In the shelled form, there is no grain that is more palatable and keenly relished by sheep. Because of its relatively low content of protein and ash, it is not adapted for growing young lambs. If a few ears of corn are placed where they are accessible to young lambs, 6 to 8 weeks old, they will shell and eat the corn with much apparent satisfaction. Fed in this form, there is little danger that they will get too much. Before they are 6 weeks old, it is desirable to shell and crack the corn for them. Corn should be supplemented with a good leguminous roughage like clover or alfalfa, and it is generally advisable to include oats, bran, or oil meal as a part of the ration.

41. Oats as Feed for Sheep.—Oats come nearer being an ideal grain feed for breeding sheep than any other single grain or concentrate. They are nutritious and perfectly safe. They are less fattening than corn, but are admirably suited for balancing the corn ration for fattening purposes. If they are used alone or in mixtures they make excellent feed for a breeding flock. On account of the relatively high price that oats usually command, they have not been used as extensively as feed for sheep as their merit justifies.

42. Barley as Feed for Sheep.—Barley is about midway between oats and corn in regard to its value as a feed for sheep. Its chief use is in feed mixtures intended for fattening purposes. Equal parts of oats and barley have been found to be of about the same value as equal parts of oats and corn for starting lambs on full feed. In some sections of the United States and Canada, barley is more available than corn, and is an excellent substitute for it for the fattening of sheep.

43. Peas as Feed for Sheep.—Peas are one of the desirable concentrates for use in sheep feeding and may be fed unthrashed or thrashed and cracked with oats to good advantage. In Canada, peas are more largely used for sheep feeding than in the United States. Care must be exercised in starting to feed pea grain to sheep, because sheep are so

fond of peas that they will eat too large a quantity if they are allowed to do so. It is not advisable to feed pea meal alone, on account of its tendency to become sodden and to compact in the stomachs of sheep. The meal should be lightened by mixing it with bran, oats, or corn.

44. Beans as Feed for Sheep.—Beans mixed with three to five times their quantity of corn or oats make good feed for sheep. Beans of good quality are, of course, usually too valuable to use for sheep-feeding purposes. Sometimes, however, they become damaged by unfavorable weather conditions at the time of harvest to such an extent that a considerable quantity becomes available for purposes other than human food. Where beans are grown extensively there is always a limited quantity of cull beans that can be utilized as feed for sheep.

45. Dried Beet Pulp and Dried Molasses Beet Pulp as Feed for Sheep.—Dried beet pulp and dried molasses beet pulp, two by-products of beet-sugar factories, are valuable feeds for sheep in the immediate vicinity of the factories, but the freight on this bulky material makes it unprofitable to use at points remote from the factories. Experiments have shown that these feeds possess about the same feeding value as corn. In fact, rations containing beet pulp have produced more mutton at less cost than similar rations of corn alone.

46. Wheat Screenings as Feed for Sheep.—Wheat screenings have been largely used for the fattening of sheep in Canada, in the wheat-growing sections of the United States, and to a more limited extent in those sections around Chicago where sheep are fattened for market. It is good evidence that, where available, screenings are an economical feed for fattening sheep, since they are used so extensively by those feeders who annually fatten large numbers of them.

47. Bran as a Feed for Sheep.—Wheat bran is one of the best feeds to induce an abundant flow of milk in ewes suckling lambs. However, the price of wheat bran is usually so high

that its use for sheep-feeding purposes has been more or less on the decline. There is no question as to its being desirable where it is available and the price is such as to make it an economical feed.

48. Oil Meal as Feed for Sheep.—Ground linseed cake, or oil meal, pea size, is looked upon as one of the most desirable feeds containing a high percentage of protein that is available for sheep-feeding purposes. It makes an excellent supplementary feed to corn. It is extensively used in Great Britain and to a lesser extent in the United States and in Canada. It is one of the best feeds to induce formation of flesh and is particularly valuable during the winter season. The value of oil meal for preparing sheep for the show ring is generally recognized by breeders of sheep for show purposes. As a rule, oil meal may safely form one-tenth of the concentrated part of the ration of either fattening sheep and lambs or of the breeding flock. It is mildly laxative in its effects and is believed to exercise a beneficial influence on the digestive organs.

SHEEP MANAGEMENT
(PART 2)

DETAILS OF SHEEP MANAGEMENT

SELECTION AND CARE OF SHEEP

SELECTION OF SHEEP

1. Foundation Flock.—The beginner in sheep husbandry should, as a rule, purchase grade rather than pure-bred ewes, because the successful breeding of pure-bred sheep requires special fitness, training, and ability on the part of the breeder, and a beginner would be very likely to fail if he started with a pure-bred flock. But, by keeping a flock of grade sheep for several years, he will gain experience that will be a valuable asset to him in case he desires ultimately to engage in the breeding of pure-bred sheep.

Conditions vary so much from year to year that little can be said as to the best time of the year to purchase a foundation flock of sheep. However, if it is practicable for the beginner to obtain the help of a reliable, experienced sheepman to assist him in selecting good animals for his foundation flock, generally it may be purchased to advantage in the late summer, when flock owners are culling out and selling their surplus stock. Sheep require but little attention during the latter part of summer, and by securing them at this time the purchaser will have an opportunity to become familiar with the flock before the important matters connected with their care need be considered.

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Usually the beginner will find it convenient to purchase his foundation flock in the vicinity of his farm; but, if this is not practicable, it may be purchased at some large livestock market, although, in the latter case, he is likely to be somewhat handicapped. If he lives remote from the market his personal expenses and the freight and commission charges will be practically the same for the purchasing of twenty-five as for one hundred sheep.

In order that sellers may not take advantage of his inexperience, the purchaser should be in frequent correspondence with some reliable commission firm from which valuable help may be secured at a minimum cost.

Ewes selected for a breeding flock should not be over 4 years of age and should show evidence that they are in vigorous health. They should also be in good flesh, but not fat, rugged in constitution, of good form, sound in mouth and udder, and bear good fleeces. If they are thin it indicates that they have been poorly nourished or are suffering from some disease, and in either case, especially the latter, they should not be selected. In some instances, sheep that have been poorly nourished for a short time and are temporarily out of condition, but which are healthy and thrifty, can be brought back to condition by good feeding. Often such sheep can be purchased at a price sufficiently low to be attractive, but in such cases the assistance of an experienced sheepman is especially desirable.

2. Determining the Age of Sheep by Their Teeth.—In selecting sheep for a breeding flock it is very desirable to know their age. Persons familiar with the teeth of sheep are usually able to determine their age by the number, shape, and condition of the front, or incisor, teeth in the lower jaw. Sheep, like most other classes of animals, have two sets of teeth, although they are unlike many classes of animals in that they have no front teeth in the upper jaw. They have eight front teeth, or incisors, in each set; the first two teeth of the first, or lamb, set of teeth are present at birth or appear a short time thereafter; the last two, one on each side of the

front of the jaw, appear in from 6 to 9 months after birth, Lamb teeth are smaller and are usually smooth and white as compared with the corrugated, dark-colored, permanent teeth that replace them.

The middle pair of lamb teeth are replaced by a pair of permanent teeth when the lamb is from 10 to 18 months old. The permanent teeth are almost twice as wide and much longer than the lamb teeth on either side, as shown in Fig. 1 (*a*). When the sheep is from 2 to 2½ years old, the second pair of lamb incisors, one tooth on each side of the middle pair of permanent teeth, is replaced by permanent teeth, as shown in (*b*). When the sheep is from 3 to 3½ years old, the third pair of lamb incisors will be replaced by per-

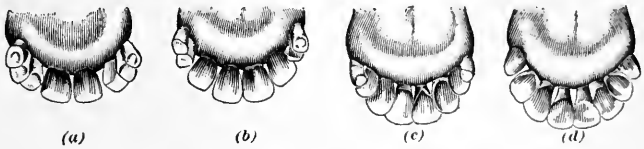

FIG. 1

manent teeth, as shown in (*c*). The fourth pair of lamb incisors, or those at the sides, are replaced by permanent teeth as shown in (*d*), when the sheep is from 4 to 4½ years old. The outer incisors are never as large as those in the middle.

After sheep are 4½ years old it is difficult to tell their exact age. However, as sheep grow older their teeth usually grow longer and narrower, and when sheep are 6 years old their teeth begin to resemble shoe pegs in shape. Although if sheep are living on short pasturage, and have to bite a considerable quantity of sand with the grass, they wear their teeth short even in old age.

3. Selection of Ram.—The breed that is to be raised or used in improving the flock is the first matter to be considered in selecting a ram for a flock. A careful study of the characters of the various breeds as given in another Section will give a clear idea of the breed that is best adapted to certain conditions.

The ram selected should be masculine in appearance, compact in body, short in the legs, have a short, thick neck, a broad, short head, well-sprung ribs, and carry a good, even fleece of fine quality for the breed. The ram should give proof of being vigorous and strong in constitution, and be free from any tendency toward delicacy. A yearling or a 2-year-old ram is to be preferred to a lamb. The continued selection of high-class individuals as it becomes necessary to purchase new rams will, with systematic and judicious methods of feeding, breeding, and management, bring about constant improvement in the flock.

CARE OF SHEEP

4. Handling of the Flock on Its Arrival at the Farm.—In case the flock is purchased in the open market, the sheep are likely to arrive at the farm in a hungry, thirsty, and more or less exhausted condition; therefore, careful attention should be given to them. They should not be turned on a luxuriant pasture of clover or rape, but should be given a light feed of clover, alfalfa, or mixed hay, plenty of good clean water, and should be kept in a lot for a couple of days. They should then be dipped, as described elsewhere, and turned on a pasture in which there is some shade and the grass is rather short. When the flock is first placed on pasture, a small handful of salt for each ten sheep should be sprinkled on the ground every 3 or 4 days until they have become accustomed to it, after which they may be allowed all the salt they will eat. As a rule, sheep require but little more feed than pasture during the summer season. They enjoy and thrive best on pastures containing mixed grasses, such as blue grass, White and Red clovers, orchard grass, and timothy. The pasture should be well fenced, as sheep easily contract the habit of jumping over poor fences, and if once they get the habit of jumping, they take on some of the goat characteristics of climbing over fences as well as jumping over them. Such a flock becomes a constant source of annoyance. As the time for breeding approaches, the ewes should have

access to more luxuriant pasture than they have had during the summer; if better pasture is not available, each should be fed daily about ½ pound of oats or of oats and shelled corn mixed.

5. Care of a Ram.—During the non-breeding season a ram should be kept in a field, lot, or yard with a few other sheep with him for company. He should have access to pure water and shade, and should have enough feed to keep him in good condition but not enough to fatten him. Frequently a small apple orchard is a desirable place in which to keep the ram. If during the non-breeding season ewes are kept in the same enclosure with a ram, they should be separated from him about a month before the breeding season begins. If the ram is not in strong condition he should be given a small feed of oats and bran or similar feed twice daily until the breeding season is over.

Particular care should be taken to avoid placing a ram in an enclosure in which sheep suffering from internal parasites have been previously kept.

6. Care of Pregnant Ewes.—Pregnant ewes require much more care, especially in the way of shelter, than do fattening sheep or lambs. As far as practicable, breeding ewes should be kept dry, because nothing is more disastrous to the health and thrift of sheep, and especially of pregnant ewes, than to compel them to go about with wet wool and wet feet. Dry cold is not injurious to sheep, but they should not be subjected to drafts. In fact, during winter, cool shelter is to be preferred to warm barns, particularly where ewes are to be turned out in the open most of the time and housed at night. In many instances it has proved good practice to so arrange the shelter and yard, or lot, that the ewes may go out and in at will. The ewes may prefer to spend a good part of their time in the open and should be allowed to do so; but during storms they should receive shelter in a barn or shed, to which they have access at all times. However, if sheep fail to go, of their own accord, under available shelter, but must be

driven into it during storms, there is usually something wrong with the shelter.

Although exercise is an important feature in promoting the health and thriftiness of a breeding flock, the ewes should not be allowed to roam over large pastures during the winter months. Such exercise has a tendency to cause the ewes to become restless, and the cold, scanty feed that they are likely to pick up provides them with but little nourishment. If the lots in which the ewes are confined are dry and clean, a good way to allow the sheep to exercise is to scatter their roughage thinly over the ground. Each ewe will then take a certain amount of desirable exercise in walking about the lot to get her share of the feed.

Pregnant ewes should not be chased by dogs, driven through mud, compelled to jump over obstacles, or allowed to crowd through narrow doorways or openings. If, at any time, it is found necessary to have the sheep brought rather closely together, care should be taken that they are quietly handled and are not allowed to crowd or huddle too closely together, because crowding and rough handling are likely to cause abortion.

7. Feeding of Pregnant Ewes.—Pregnant ewes should be kept in good condition, but should not be fattened. The coarser roughage, such as corn stover or corn fodder, intended for the ewes should be fed to them during the fall and early winter. Such feeds deteriorate through exposure to the weather, and besides, pregnant ewes thrive better when such feeds are given during the early part of the gestation period than when they are given during the last part of it. A good condition of the ewes is usually insured if they are supplied with some succulent feed during the entire gestation period. However, when the feeder has only a limited supply of succulent feed, it is especially beneficial if fed to the ewes during the latter part of the gestation period, and after they have given birth to lambs. Four rations that have been fed with satisfactory results for a period of 84 days to pregnant ewes weighing about 150 pounds each are given in Table I.

TABLE I

RATIONS FOR AND DAILY GAINS BY PREGNANT EWES

Ration	Feed	Quantity per Day Pounds	Daily Gain per Head Pounds
No. 1	Shelled corn	.5	
	Corn silage	2.5	.23+
	Mixed hay	2.0	
No. 2	Whole oats	.5	
	Corn silage	2.5	.23−
	Mixed hay	2.0	
No. 3	Wheat bran	.5	
	Corn silage	2.5	.20+
	Mixed hay	2.0	
No. 4	Dried brewers' grains	.5	
	Corn silage	2.5	24+
	Mixed hay	2.0	

Several rations for pregnant ewes weighing from 140 to 160 pounds are given in the accompanying list.

SUGGESTED RATIONS FOR PREGNANT EWES NOT ON PASTURE

Rations	Pounds
No. 1—	
Shelled corn or oats	.4
Wheat bran	.1
Corn silage	2.0
or root crops	3.0
Clover hay	2.0
No. 2—	
Shelled corn or oats	.4
Wheat bran	.1
Corn silage	2.0
or root crops	3.0
Alfalfa hay	2.0
No. 3—	
Shelled corn or oats	.4
Corn silage	2.0
or root crops	3.0
Soybean hay	2.5
No. 4—	
Oats or shelled corn	.4
Wheat bran	.1
Corn silage	2.0
or root crops	3.0
Corn fodder	1.0
Clover or alfalfa hay	1.5

SUGGESTED RATIONS FOR PREGNANT EWES NOT ON PASTURE

RATIONS	POUNDS
No. 5—	
Shelled corn	.4
Wheat bran	.1
Corn silage	2.0
or root crops	3.0
Oat or wheat straw	1.0
Clover or alfalfa hay	1.5
No. 6—	
Shelled corn	.3
Oats	.2
Wheat bran	.2
Clover, alfalfa, or soybean hay	2.2
No. 7—	
Shelled corn	.2
Oats	.2
Wheat bran	.2
Oil meal	.5
Corn fodder	1.0
Clover, alfalfa, or soybean hay	2.0
No. 8—	
Shelled corn	.2
Oats	.3
Wheat bran	.2
Oil meal	.1
Corn fodder	3.0
No. 9—	
Shelled corn	.3
Oats	.2
Wheat bran	.2
Oil meal	.1
Oat or wheat straw	1.5
No. 10—	
Shelled corn	.2
Oats	.2
Wheat bran	.1
Oil meal	.1
Corn silage	2.5
or root crops	3.8
Corn fodder	2.5
or oat straw	1.0
No. 11—	
Shelled corn or oats	.5
Wheat bran	.2
Oil meal	.1
Timothy hay (not advisable to use)	1.5
No. 12—	
Shelled corn or oats	.4
Wheat bran	.2
Oil meal	.1
Corn silage	2.5
or root crops	3.8
Timothy hay (not advisable to use)	1.2

NOTE.—Wheat, barley, and spelt closely approach corn and oats in feeding value if used as suggested above. Gluten feed and cottonseed meal approach oil meal, but they are less satisfactory to use.

8. Care of the Ewes With Suckling Lambs.—After lambs are about 2 weeks old their appetites and requirements for milk are considerable; and an effort should be made by the flock master to feed the ewes such a ration that they will

give a liberal quantity of milk without seriously reducing their flesh and constitutional vigor. It is to be expected that ewes, especially those that are giving a large quantity of milk, will become somewhat reduced in flesh while they are suckling vigorous lambs, but this reduction in flesh should not be permitted to go too far.

During the period that the lambs are suckling and the ewes are yarded at the barns and kept in a dry lot, it is essential

TABLE II

SUGGESTED DAILY RATIONS FOR EWES WITH SUCKLING LAMBS

Kind of Feed	No. of Ration					
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Mixture of: Shelled corn, 5 parts by weight; Whole oats, 5 parts by weight; Wheat bran, 2 parts by weight; Oil meal, 1 part by weight	1.33	1.33	1.33	1.60	1.33	1.40
Corn silage	3.00	4.00			2.50	2.50
Root crops	3.00		5.00		2.50	2.50
Clover, alfalfa, or soybean hay	2.00	2.50	2.50	3.00	1.50	1.50
Corn stover						2.00
Oat straw					2.00	

to provide, daily, grain or concentrates at the rate of from 1 to 2 pounds per head, the quantity depending on the condition of the ewes and their size. These concentrates should be of such a nature that they will have a tendency to enable the ewes to produce a large quantity of milk; oats, wheat bran, oil meal, and corn are all useful concentrates in a ration for

ewes; among the roughages, corn silage, roots, clover, alfalfa, soybean hay, and, to a limited extent, corn stover and oat straw are good feeds. As a rule, after a liberal quantity of concentrates has been provided, the ewes should have all the roughage that they will consume. The importance of succulent feeds, such as corn silage and roots, can not be too strongly emphasized.

Six suggested rations for ewes that weigh from 140 to 160 pounds, are kept in a yard or dry lot, and have suckling lambs, are given in Table II.

9. Feeding of Suckling Lambs.—The lambs will, at an early age, need special attention. If given the opportunity, they will frequently begin to eat grain and roughage when they are from 2 to 3 weeks old, at which age feed should be given to them in small quantities. They usually learn to eat by following the example of their mothers and of older lambs. Crushed oats, corn meal of the pea size, and wheat bran are good feeds for young lambs, and at 5 to 6 weeks of age whole grains may be fed to them. As soon as the lambs begin to eat concentrates and roughages, and, in fact, as an aid in teaching them to eat such feeds, a separate place for feeding them should be provided; the lambs should have constant access to this place and their dams should be excluded. Such places are usually referred to as lamb creeps; they should be built in the lightest part of the barn; in fact, if the sun shines into the creeps much of the day, so much the better. The creeps should be separated from the main part of the barn or the pen in which the ewes are kept by upright slats from 4 to 6 inches wide and fastened in a frame made so that the distance between the slats may be varied from about 7 inches, while the lambs are young and small, to greater distances as the lambs grow larger. The slats may be held in place by wooden pins or by iron bolts placed through the frame and the slats at the top and at the bottom. The edges of the slats and all other material used in the creeps and against which the lambs may rub, should be rounded so as not to catch and pull the wool from them.

10. Pasturing of Ewes and Lambs.—The ewes and the lambs are usually turned on pasture as soon as the pasture crops have made a good start in the spring, although the change from rather close confinement and largely dry feed to the range of the pasture and its more succulent feed should be made with as little abruptness as possible. This change should be brought about by turning the ewes and lambs on pasture in the morning, bringing them to the barn early in the evening, and keeping them there for the night. While at the barn they should be fed a ration of concentrates and dry roughage. The exact length of time for the continued shelter and feeding must be determined by the way the ewes and lambs thrive. If the pasture is a good one, the feeding of grain and roughage for from 2 to 3 weeks while they are on pasture may be sufficient; but, if the pasture is a poor one, it may be desirable to continue to feed the grain ration and the roughage for a month or more.

11. Weaning and Later Care of Lambs.—A definite date can not be given for the weaning of lambs, because the time for this depends on the age of the lambs and on the time of the year that they are dropped. Thus, lambs dropped in February should be weaned in July, and lambs dropped in May should not be weaned until August. When a lamb is old enough to take care of itself, which will be in from 3 to 5 months, it is better for both the lamb and its dam for the lamb to be weaned, because the lamb should not get in the habit of completely depending on milk for nourishment, and the ewe should be allowed time to recuperate and gain some flesh before being bred again.

Where practicable, lambs should be taught to eat grain, as has been mentioned, before they are weaned, and when they are separated from their dams the lambs should be placed on the best pasture available, so that the succulent pasturage will, in a measure, take the place of their mothers' milk. The pasture for the lambs and also that of the ewes must be well fenced, for the ewes and lambs make strenuous efforts to get together. In addition to good pasture, the

lambs should have a light grain ration. If it is desired to fatten the lambs, the grain ration should be continued after the lambs are reconciled to their new conditions; if they are not to be fattened before winter sets in, the supplementary grain ration may be discontinued, provided they have good pasture.

The ewes from which the lambs have been removed should be placed on a rather short pasture to check their milk flow. It may be necessary, in order to assist in drying up the milk without injury to the udder, to milk some of the ewes that give large quantities of milk. The milking is done every other day for a week or 10 days.

12. Fattening of Lambs.—Feeds that are grown on the farm, or that can be secured at reasonable prices, should be selected by the farmer for fattening a flock of lambs. Feed of good quality must, of course, be secured if success in fattening is to be achieved, and a ration must be made from such feeds as the lambs relish. A slight change of rations is often one of the best means of increasing the appetites of the lambs, but changes from rations of a succulent nature to those of a dry nature should be made gradually or digestive troubles will generally be the result. One of the commonest errors made by novices in the feeding of lambs is that of feeding them too much. Lambs thrive best if they receive only such a quantity and such kinds of feed as will supply them with the quantity of digestible nutrients that they can assimilate. If more feed than this is given to them, it is wasted and is, therefore, a loss to the feeder.

In general, it is recommended that the fattening period be commenced by feeding a relatively large quantity of dry roughage and a small quantity of concentrated feed and gradually reversing this order as the period of feeding advances. Thus, at the beginning of the feeding period about $\frac{1}{3}$ pound of concentrated feed and about 2 pounds of dry roughage may be fed to each lamb; near the end of the period each lamb may be fed about 2 pounds of concentrated feed and $\frac{1}{2}$ pound of dry roughage.

The kind of crops most available as feed for sheep, will to a large extent determine the materials that should be selected to make the most desirable ration for the fattening of lambs. However, practical sheep feeders in various sections of the United States and Canada recommend as satisfactory, the rations given in the accompanying list. They were fed to lambs weighing about 70 pounds at the beginning of the feeding period and at the end of a feeding period of 14 weeks the lambs weighed from 95 to 105 pounds.

Daily Rations for Fattening One Lamb in the Corn Belt

Rations	Pounds
No. 1—	
Shelled corn	1.4
Clover hay	1.1
No. 2—	
Shelled corn	1.0
Clover hay	2.0
No. 3—	
Shelled corn	1.2
Linseed meal	.4
Oat straw or shredded or cut corn stover	1.0
No. 4—	
Shelled corn	1.0
Soybeans	.5
Soybean straw	.5
Oat straw	.5
No. 5—	
Shelled corn	1.0
Linseed meal	.3
Silage	1.5
Oat straw	.6

Daily Ration for Fattening One Lamb in the Western Portion of the United States

Rations	Pounds
No. 1—	
Barley	1.5
Alfalfa hay	1.5
No. 2—	
Barley	.8
Alfalfa hay	2.8
No. 3—	
Barley	1.4
Wheat bran	.3
Prairie hay	1.0
No. 4—	
Oats	.7
Peas	.7
Oat straw	.5
Pea straw	1.0
No. 5—	
Barley	1.5
Sugar-beet pulp (wet)	6.0
Prairie hay	.5

DAILY RATIONS FOR FATTENING ONE LAMB IN CANADA OR IN THE NORTHERN AND EASTERN PORTIONS OF THE UNITED STATES

RATIONS	POUNDS	RATIONS	POUNDS
No. 1—		No. 3—	
Barley	1.3	Barley	.5
Linseed meal	.2	Peas	.5
Clover hay	1.2	Wheat bran	.2
No. 2—		Mixed hay	1.0
Oats	.4	Root crops	1.2
Barley	.4	No. 4—	
Peas	.4	Barley	1.4
Wheat bran	.2	Linseed meal	.1
Root crops	1.4	Silage	2.0
Pea straw	.5	Mixed hay	.5
Oat straw	.5		

13. Docking of Lambs.—Docking, or the removal of the tail, is usually recommended for all lambs that are not to be slaughtered before they are 90 or 100 days old. However, some successful sheep raisers in certain dry sections of the United States do not dock their wether lambs, and meet with no bad results; but this practice cannot be recommended in sections where a wet climate is likely to prevail for a part of the year. The tail is cut off because it is of little or no value to the flock owner, is an encumbrance to the animal, and causes its hind parts to become foul; and by cutting off the tail the animal appears more blocky, that is, better filled out, than with it.

The ewe lambs should be docked even in the sections where the wether lambs are not, because the ewes are more likely to become foul behind than are the wether lambs. Docking should be done in from 10 to 14 days after the birth of the lambs, because at that age the shock to them is very slight and the parts heal more readily than when they are older. The danger of having the wounds caused by docking become infested with maggots is less if the operation is performed early in the season before flies become numerous. If the

docking is done late in the season, the stumps of the tails should be watched closely until they are thoroughly healed; if maggots are discovered in any of the wounds they should be thoroughly cleaned and a disinfectant and a fly repellent applied.

14. The methods of docking are numerous. Some flock masters use a pocket knife; others use a chisel and light mallet; still others prefer to use the docking pincers. When a knife is to be used, an assistant takes the lamb in his arms, places its back against his shoulder, and holds it firmly. The skin of the tail is pulled toward the body, and the tail is severed at about 1 inch from the body with one stroke of the knife. There will be sufficient skin to form a flap to cover the cut, and the application of a disinfectant or a daub of tar to keep off the flies will complete the job. The usual method of using the mallet and chisel is as follows: Lay the lamb, with its belly upwards, on a plank or table, pull the skin of the tail toward its body, place the chisel where the cut is to be made, and strike the chisel a light blow with the mallet, when the tail will be severed. To complete the operation, pull the skin toward the cut so as to cover it, and daub a little tar or apply a disinfectant and fly repellent to the wound. A much more simple method of using the chisel and mallet for docking purposes is to take the lamb in the arms, hold it with its back upwards, place the hind quarters of the lamb close to an upright hardwood post with a smooth, flat top over which the tail of the lamb is placed on a line with its back. An assistant then places the chisel in place and strikes the blow by which the tail is severed.

The most expeditious and the safest method of docking, however, is to use a pair of docking pincers. The docking pincers are heated to a red heat, the animal is held in position by an assistant, and the operator severs the tail with one cut of the pincers. The wound generally heals quickly, because the hot iron sears the exposed flesh and little or no bleeding takes place. It is advisable, however, to apply tar or a disinfectant and fly repellent to the wound.

15. Castration.—Castration should be performed on all male lambs that are to be fed for market, when they are from 10 to 14 days old. If it is not done while the lambs are young they soon show a thickening of the neck and other signs of masculinity and will never develop into first-class market animals, no matter how well they may be fed. It is best to have two persons work together in castrating, one to hold the lamb in position and the other to use a knife or a pair of docking pincers. The lamb should be held against the shoulder, back downwards, by an assistant, who grasps a fore and a hind leg to keep the animal steady. The operator pushes the testicles back toward the body, then with a sharp knife, sometimes with the docking pincers, cuts off about a third of the scrotum, or purse. The testicles are then worked out until they can be grasped by the finger and thumb by which they and the adhering cords are drawn completely away. If done properly, there is little danger of trouble from the operation. A mixture of lard and turpentine or a good coal-tar disinfectant mixed with vaseline should be used to daub on the wound.

In the castration of old rams, the docking pincers can be used to advantage. To perform this operation, the ram is placed on his rump and held by one person; the scrotum and testicles are held away from the body and severed at one operation by the use of pincers, which are heated to a red heat. Tar or a disinfectant and fly repellent is then applied to the wound.

When the docking pincers are used for either docking or castrating, a thin board or a piece of heavy strawboard with a hole cut in it to allow the tail or scrotum being pulled through should be used to protect the other parts of the body from being affected by the heat from the hot pincers. If a mature ram is to be castrated, two pieces of thin board with a notch cut in one edge of each piece in such a position that, when the edges of the two pieces are placed together, the notches will surround the base of the scrotum should be used to protect the adjacent parts of the body from the heat from the pincers.

16. Use of Dogs as Herders.—Some difference of opinion exists as to the value of dogs as herders of sheep. It is a significant fact, however, that whenever sheep are herded in large flocks, sheep dogs are considered practically indispensible, and also that a man who has ever owned a really intelligent, well-trained sheep dog speaks in high praise of it. By a sheep dog is meant a collie or an Old English sheep dog, either of which, if well trained, is worth more than a man for sheep-herding purposes. A good sheep dog can herd and drive a flock of sheep more easily and with less confusion to the flock than a man can. The kind of dog that, by all means, should be kept away from the flock is the common, worthless cur. Likewise, a badly trained sheep dog should not be used as a shepherd. The well-trained sheep dog is a valuable acquisition to any man who handles sheep in the open country, and such dogs are sufficiently scarce to command high prices. The inexperienced sheep raiser should not assume that, because he invests ten dollars or more in a collie puppy, he has necessarily secured a valuable sheep dog. A dog may have had the proper breeding to make an acceptable sheep dog, but without proper training and management it will prove of little use. If a dog is kept, care should be taken to keep it free from tapeworms, as dogs assist in propagating and scattering an infection of certain tapeworms among sheep.

17. Protection of Sheep Against Dogs.—Sheep raising in some sections of the United States is claimed to be practically impossible because of the losses sustained on account of the attacks of sheep-killing dogs, and in no part of the country is a flock entirely free from the possibility of such attacks. The flock should, therefore, be safeguarded as far as possible.

Sheep are seldom annoyed by dogs during the day, especially where the flock is in the vicinity of the buildings on the farm or where people frequently pass near the flock. Occasionally, however, flocks are attacked during the day, particularly when they are pastured in out-of-the-way pastures not often seen or visited.

Experience has proved that it is not safe to rely too much for protection on so-called dog-proof fences about large pastures. However, dogs do not usually attack sheep that are closely herded, and when danger from dogs is anticipated it is advisable to herd the sheep rather closely at night in a small lot surrounded by a dog-proof fence. When such a plan is impracticable, the liberal use of sheep bells is advised. A flock of from 50 to 100 sheep should have a good bell on from six to ten of the liveliest and most vigorous sheep in the flock.

18. Dipping the Sheep.—If sheep have been shipped from other states; have been purchased in the large markets; have occupied cars, sheds, or pens that other sheep had previously occupied; or have in any way been exposed to a possible infection of external parasites, they should be kept in strict quarantine for a couple of days after reaching the farm and then be thoroughly dipped and moved to new quarters. If the dipping is thorough, all the external parasites, such as scab mites, ticks, and lice, will be killed and the sheep will be in a condition to thrive. This will not be the case if they are worried and their vitality is weakened by the attacks of parasites. However, the dipping will not kill the eggs of the parasites, and the eggs of some of them hatch in about 4 days, and in 7 more days the young parasites may begin to lay eggs. It is imperative, therefore, to dip a flock of sheep a second time, in from 5 to 10 days after the first dipping, to insure the eradication of all parasites.

The farm flock, whether maintained for breeding purposes or for the production of wool and mutton, should be dipped each year after shearing, as dipping is much more effective when the fleece is short than when it is long. Lambs should also be dipped at the same time, as the ticks and lice naturally seek them for shelter when the older sheep are shorn. If the sheep are dipped when the wool is short, the ingredients of dips that are likely to affect the fleece injuriously, such as lime in the lime-and-sulphur dips, will not cause much if any injury. The use of a lime-and-sulphur dip is not advised if

the sheep have fleeces of considerable growth. Wool dealers object to it because of its deleterious effect on the wool, and some sheepmen claim that its use may stop the growth of wool for a time.

The lime-and-sulphur dip is especially recommended, if properly made and applied, as an inexpensive and one of the most efficient dips for the eradication of sheep scab. The dip is made as follows: Carefully weigh 10 pounds of clean, unslaked lime and place it in a mortar box or other convenient receptacle; add enough water to slake the lime and mix to a creamy paste; sift into this paste an accurate weight of 30 pounds of flowers of sulphur and mix thoroughly; place the mixture in a boiler, add 25 gallons of water, and boil for at least 2 hours, keeping the mixture well stirred; then allow the sediment to settle, carefully drain or dip off the clear liquid and add to it enough water to make 100 gallons. A good way to drain off the clear liquid is to place the boiled mixture in an ordinary oil barrel with a spigot 4 inches from the bottom; when the sediment has collected at the bottom of the barrel, gently turn the spigot, which allows the clear liquid to run out of the barrel. If a larger quantity of the dip is desired, the proportion of the lime, sulphur, and water given above should be used.

This dip should be kept at a temperature from 100° to 110° F. while the sheep are being dipped. Each sheep should remain in the dip 2 minutes, and its head should be immersed in the dip at least once. The time that each sheep is in the dip should not be guessed at but measured by a watch; and a thermometer should be used in regulating the temperature of the dip.

If the sheepman will not take the necessary care to make and use the lime-and-sulphur dip as directed, he will probably meet with greater success in killing the parasites on his sheep and in lessening their suffering by using one of the many proprietary dips that may be found on the market. The proprietary dips are usually preparations containing coal tar, sulphur, arsenic, or nicotine, and are variously known as coal-tar, sulphur, arsenic, or tobacco dips. In using any

of these dips the sheepman should rigidly follow the directions that always accompany each package of the dip.

19. Washing of Sheep.—The washing of sheep consists in immersing them in water, either in a tank or in a stream or pond, through which they are compelled to swim from 10 to 30 feet. While the sheep are in the water their wool is sometimes squeezed to a slight extent in the hands of attendants. Often the sheep are simply pushed under the water and made to swim a short distance. After this washing the water is allowed to drain from the fleeces, and after from 7 to 14 days have elapsed the sheep should be shorn. The practice of washing sheep is, in general, not to be recommended, because the washing removes some of the yolk, or oil, in the fleeces of the sheep, and thereby reduces their weight. It does not, in any way, prepare the wool for the manufacturer of woolen goods, and sheep are sometimes handled roughly during the washing. Washing may be excusable in some localities where wool buyers persist in offering less for unwashed wool than they do for the so-called washed wool.

HOTHOUSE LAMBS

20. Hothouse lambs, also called *winter lambs* and *early lambs*, are those dropped at a time of the year that will permit of placing them, when 8 to 12 weeks of age, on the market during the season extending from Christmas to the first of May. Such lambs should weigh from 25 to 60 pounds. During the time mentioned, lamb is considerably out of season and consequently commands high prices. To raise lambs for market at this time of the year requires special management of the breeding flock and, as a rule, special equipment.

For raising early lambs successfully and profitably, the farm should be located within a few miles of a railway station on some line having well-equipped, fast express and freight trains to a city or cities in which there is a good market for all the first-class early, or hothouse, lambs that are likely to

be shipped into them. It is not often wise to ship more than 200 miles nor to undertake the development of a market for early lambs in cities where such a market has not previously existed. The cities in the eastern part of the United States are much better markets for early lambs than are the cities in the middle and western parts of the country.

In addition to a well-ventilated and a well-lighted barn, provision should be made for a lamb creep, which should be built in the lightest part of the barn. If the creep can be placed so that the sun shines directly into it much of the day, so much the better. In fact, some of the most successful early-lamb raisers have glass-roofed sheds on the south side of the sheep barn for their lamb creep. The name of hothouse lambs was given to lambs raised in these glass-roofed sheds.

21. Large-bodied, hardy ewes that give a large quantity of milk and that may be made to take the ram during the summer months must be used to produce early lambs. The Dorset ewe is preeminently the ewe for this purpose, although cross-bred Merino-Shropshire ewes have proven to be very satisfactory. It is not normal for ewes to breed during the summer months, and to induce the ewes to breed at this time of the year sheepmen practice a treatment of the ewes known as **flushing.** This consists in restricting the ewes to a ration of hay and straw or of short dry pasture for a couple of weeks, then turning them on fresh pasture and feeding them a little grain at the time it is desired to have them bred. This practice usually brings the ewes in heat. The same details in regard to breeding and to the keeping of records should be practiced in breeding for early lambs as for the regular crop of lambs. In case there are ewes that do not get with lamb during the special breeding period, they should be bred at the regular time for breeding in the fall.

22. Care of Ewes for Early Lambs.—Ewes bred to drop lambs for the early-lamb market should have especially good care and be kept in a good, thrifty condition. Provision should be made to supplement the regular pasture, in case it becomes short on account of drought or other cause, by

some soiling crop such as oats and peas, rape, or thickly sown sweet corn.

As the ewes will be heavy in lamb by early fall, they should be brought from the fields to the barns to be sheltered from storms that may occur at this time of the year. If it is practicable, they should be divided into small flocks each of about 15 ewes due to lamb on nearly the same date, and each flock placed in a separate pen. This arrangement will facilitate the work of the shepherd during the lambing period. As soon as the ewes are placed in their winter quarters they should be fed a ration containing clover or alfalfa hay, silage, or roots, and about ½ pound of grain. After the lambs are dropped, the grain ration for the ewes should be increased until they receive daily 2 pounds each, or all they will eat. With the exception of straw, feeds should never be placed before the sheep in such quantities that any will be left after their appetites are satisfied. Regular times should be selected for feeding, and the time selected should be rigidly adhered to. In the morning after daylight, noon, and before dark at night are good times to feed sheep. Sheep should not be disturbed after dark.

23. Care of Hothouse Lambs.—Lambs form the habit of nibbling at solid food at a surprisingly young age, apparently in imitation of their dams, and at about 10 days of age they will eat small particles of grain feed; as the raising of hothouse lambs is more or less of a stuffing process, the chief object of which is to produce fat and not bone and muscle on the young lambs, the habit of early eating should be encouraged in every way possible. The lamb creep should be ready for them as soon as they have learned to eat. Troughs about 12 inches wide, 3 inches deep, and as long as may be convenient, should be placed in the creep. It is well to have the end pieces of the trough extend about 12 inches above the sides and sharpened to a right angle, and to have a cover made of two light 6-inch boards as long as the trough and with short boards nailed over the ends so that the cover will fit down over the top of the upright end pieces. This makes

a cover the shape of an inverted **V** for the trough and prevents the lambs from getting into it with their feet, which they seem to take a delight in doing. The cover should be set on the trough and not nailed to it, because the trough can be easily cleaned if the top can be lifted off. Lambs seem to eat more feed when a variety of grains and concentrates is furnished than when such a variety is not furnished. The best way to supply a variety of concentrates is to keep each kind of feed in a separate part of the trough. To do this, the trough can be divided into separate compartments by placing upright partitions, similar in shape to the end pieces, at intervals in the trough. The choicest clover or alfalfa hay and silage should also be fed to the lambs in the creep, where the ewes can not get them.

24. Preparing Hothouse Lambs for Market.—As soon as the very earliest lambs attain a weight of from 25 to 35 pounds, they may be slaughtered and marketed to advantage, but lambs weighing about 40 pounds usually command the most attention from buyers. Generally, a local butcher can be secured to kill and dress the lambs for market. They are commonly "hog-dressed," that is, they are hung up by the hind legs, thoroughly bled from the neck, and opened along the median line of the belly; the esophagus, stomach, and intestines are removed, but the kidneys are left in place. During rather mild weather the lungs, heart, and liver should also be removed; during very cold weather these organs should be left in place. The head is often and the pelt and legs are usually left on the body. To give the carcass a full, round, thick appearance, the back is broken by pushing with one hand just back of the kidneys and pulling backwards on the breast with the other hand, and then the sides are spread and held apart in the following manner: One end of a *backset*—that is, a piece of wood 12 to 18 inches long, about $\frac{3}{4}$ inch thick, and from 1 to 2 inches wide—is placed into the outside of the belly near one edge, then the sides are spread outwards and backwards until the other end of the backset can be placed across the back and into the other side

of the belly; the caul is then spread neatly over the kidneys and hooked on the ends of the backset. The body is allowed to hang until it is thoroughly cooled, when it is sewed up in a piece of clean muslin or cheese cloth and carefully packed in a shipping crate. Such lambs, if choice and marketed at the proper time and place, command prices ranging from $7 to $15 each.

MARKETING OF SHEEP AND LAMBS

25. The size of the flock and the number of surplus sheep or lambs for sale at any one time will determine, to a large degree, the best way of selling them. If a sufficiently large flock is kept to produce a carload—that is, from 100 to 125 sheep for single-deck cars and from 200 to 250 sheep for double-deck cars—or more of surplus stock for sale at any one time, it is generally desirable to ship the sheep direct to a reliable commission firm at the most accessible large livestock market.

The principal sheep markets in the United States are in Chicago, Omaha, Kansas City, Mo., Buffalo, Pittsburg, St. Joseph, Mo., St. Paul, St. Louis, Indianapolis, and Fort Worth, Texas.

If, as is usual on a majority of farms, only a few sheep or lambs are to be disposed of, a market should be sought among local butchers or shippers. Before selling his sheep, the owner should familiarize himself with the market value of the grade of sheep or lambs he has to sell, and, after estimating and deducting the probable freight charges for shipping to the chosen market arrive at the approximate value of his product on the farm. This procedure will help him in placing a fair and reasonable valuation on his sheep so that he may avoid losing by not asking enough or by the loss of a sale because of insisting on getting more than the product is worth. In almost every case, surplus stock should not be sold before it is fattened. Breeding ewes that have been discarded because of advanced age or of failure to breed can often be sold to good advantage in the summer or early fall after they have become fattened on pasture.

There is no best time to sell sheep or lambs unless it is just as soon as they are fat, and they should be fattened as rapidly as is consistent with judicious feeding methods.

If a sheep raiser does not have and cannot secure the necessary feed to fatten his surplus sheep, it is usually best to sell them to some one who is able to do so.

26. Market Classes and Grades of Sheep.—Almost the entire number of sheep and lambs received at the large livestock markets are classed as *mutton sheep, feeder sheep,* or *breeding sheep.*

All sheep and lambs that are shipped to a large market and sold for slaughter, no matter what their condition, age, or weight may be, are classed as **mutton sheep,** a term that must not be confused with the term mutton type of sheep. The largest part of the sheep received in the market consists of this class, which is divided into the following subclasses: *Lambs, yearlings, wethers, ewes, bucks,* and *stags.* **Lambs** are animals that are mostly under 12 to 14 months of age, at about which age they pass into the yearling, the ewe, or the buck subclasses. **Yearlings** are the castrated lambs from about 12 to 14 months of age until they are about 2 years old, or mature, after which they are known as **wethers.** An index that sheep dealers use in determining whether a sheep is a yearling or a wether is the condition of the joint immediately above the pastern joint, and is known as the *break joint.* This joint is present only in lambs and in castrated males until they are about 2 years old; it disappears in ewes when they are about 14 months old. A bony-like prominence just above the pastern joint is a true indication of the presence of the break joint. When the sheep matures this prominence disappears and the sheep cannot be classed as a yearling. All female sheep received in the markets and that are older than lambs are known as **ewes.** Rams after they have passed out of the lamb subclass are designated in the market as **bucks.** Male lambs that are castrated after they are 12 to 14 months old are classed in the market as **stags.** Each of the subclasses described and the subclasses

of the other market classes of sheep are further divided into market grades of sheep. The grades usually given in market reports are *prime* or *fancy selected*, *choice*, *good*, *medium*, and *common*, or *culls*. The grades rank in the order named in regard to the quality and the condition of the sheep constituting each grade.

The class known as **feeder sheep** consists of sheep that are received in the markets in poor condition and that are sold to be fattened. The recognized subclasses of feeder sheep are lambs, yearlings, wethers, and ewes.

The class known as **breeding sheep** consists of those sheep that are bought in the large markets for breeding purposes. By far the larger number of the breeding class of sheep purchased are ewes. The rams, or bucks, as they are known in the markets, are few in number and most of them show a form and a mixture of blood that make them undesirable for breeding purposes.

A miscellaneous class of sheep should probably be mentioned, since there are certain sheep on the markets that cannot be placed in any of the classes previously described. The miscellaneous class consists of *hot-house lambs*, *export sheep*, *throw-outs* or *rejects*, and *dead sheep*. Hothouse lambs have been described elsewhere. **Export sheep** are usually sheep in excellent condition and are of the prime and choice grades of any of the subclasses of the mutton class of sheep. **Throw-outs** are the sheep first placed in the feeder class on account of their poor condition and then rejected, or thrown out, by purchasers of feeder sheep, a privilege allowed by the market authorities. Such sheep are usually purchased by local butchers who cater to a cheap trade. **Dead sheep** are those that are killed in transit. They are sold for their wool and for fertilizing purposes.

The market classifications of sheep are shown in the accompanying diagram.

Classes	Subclasses	Grades
Mutton sheep	Lambs	Prime, Choice, Good, Medium, Common, or culls
	Yearlings	Prime, Choice, Good
	Wethers	Prime, Choice, Good, Common
	Ewes	Prime, Choice, Good, Medium, Common, or culls
	Bucks and Stags	Choice, Good, Common
Feeder sheep	Lambs	Fancy selected, Choice, Good, Medium, Common
	Yearlings	Choice, Good, Common
	Wethers	Choice, Good, Medium, Common
	Ewes	Choice, Good, Medium, Common
Breeding sheep	Ewes	Fancy selected, Choice, Good, Common
	Bucks	(Not graded)
Miscellaneous: Hothouse lambs; Export sheep; Throw-outs; Dead sheep		

27. Uniformity of Shipments.—If it is possible to do so, it is an advantage to make shipments of several hundred animals, because then there is an opportunity to grade the animals so that all sheep in each car are nearly alike in conformation and condition. Bunches of uniform sheep, especially of lambs, in the large markets usually meet with a quick purchase and command top prices for the grade of sheep to which they belong. Buyers in the same markets are slow to purchase flocks of mixed grades, although there may be many animals of desirable grades among them. It is useless for the shipper to expect that a few animals of the poor grades, mixed among sheep of better grades, will go unnoticed in the markets. A shipment of sheep upon their arrival at the large market is usually handled by an expert, who quickly finds the low-grade animals if they are present.

28. Shipping of Sheep.—In order that a shipment of sheep may appear to the best advantage at the time of sale, the floor of the car in which they are shipped should be well covered with dry straw or other material for keeping the animals clean. It is not necessary to give each sheep in the car more space than enough to allow it to stand comfortably, but overcrowding should be avoided. In hot weather overcrowding results in losses, especially if lambs are mixed with larger sheep. In such cases the lambs are likely to be suffocated by being crowded in between the larger sheep.

At the time of shipment, the fleeces of sheep or lambs should be dry. If they are wet it is difficult to keep them clean in appearance even though they are well bedded; and when they reach the market buyers do not like to bid on them, or if they do they offer less for them than if they were dry. If, at the time of shipment, some of the sheep or lambs are foul behind from dung lodged in the wool, it is well to clip this soiled wool off before they are placed in the car, because the close crowding in the car causes the sheep that are foul to soil the sides of those that are clean; this soiled wool detracts from the appearance of the animals and often results in a low price being paid for them.

PRODUCTION OF WOOL

29. **Wool** is one of the most valuable products of sheep husbandry. The entire quantity of wool produced during any one season is known as the **wool clip.** The quantity of wool produced by one animal is known as a **fleece,** whether the wool is on the animal or has been removed by shearing. Wool is classed, in a general way, as *clothing*, *combing*, and *carpet* wools. **Clothing wools** are the wools produced mostly by sheep that have a preponderance of blood of the fine-wool breeds and that have wool the fiber of which is less than $2\frac{1}{2}$ inches in length. When the fiber is more than $2\frac{1}{2}$ inches in length, the wool is classed as **combing wool.** The Delaine Merino and the Rambouillet breeds grow the finest quality of combing wools. **Carpet wools** are those wools that have a strong, coarse, wiry, fiber, and are more like hair than wool. Such wools are not suitable for cloth but are well adapted for the manufacture of carpets.

In the production of wool, the characters that should be sought are evenness of quality in the fleece, density, and an evenness of length of fiber over the entire body. To produce such wool, the health of the flock must be maintained at all times, as an unthrifty condition of the sheep, from whatever cause, is certain to be shown in their fleeces. The fiber will always be found weak and attenuated at that portion of its growth made when the animal was suffering from some disease, from injurious feeding, or from anything that reduced its natural vigor. Although the fiber may make a strong and healthy growth afterwards, that weak place in the fiber cannot be remedied. The attenuated condition of a fleece is especially bad in the case of combing wools, as the fiber, when placed on the combs, breaks at the weak spot and produces a quantity of short, broken fibers known to the wool trade as *noils*, or *waste wool.*

The wool of sheep is greatly influenced by environment, feeding, and shelter. A dense, even fleece is more readily grown in a climate where the winter season is very cold. Zero weather stimulates the growth of wool on sheep just as

it stimulates the production of the finest fur on the fur-bearing animals that inhabit the frozen regions of the north. The production of wool and fur is Nature's provision for fitting animals to their environment. To grow sound, even fleeces, sheep must be fed regularly, have good clean water, be protected from the attacks of external and internal parasites, and be sheltered from rains, severe winds, and snows, in barns that are well lighted and ventilated, and not too warm.

30. Shearing of Sheep.—The removal of the fleece from a sheep by means of implements known as sheep shears is spoken of as the shearing of sheep, or simply as sheep shearing, and the person doing the shearing is called a shearer. The skill of a sheep shearer is gauged by his ability to remove a large quantity of wool in a given time without injury to the fleeces or to the sheep. The quantity of wool removed depends on how close to the body the shearing is done as well as on the number of sheep shorn. The best and heaviest wool is next to the body; hence, the necessity of shearing closely. The number of sheep that one man can shear in a day depends on the breed of sheep and on the skill of the shearer. It takes a much longer time to shear a densely covered, oily, wrinkled American Merino than it does to shear a smooth, imperfectly covered Southdown; an unskilled man in the art of shearing may be able to shear 25 sheep in a day with hand shears; skilled men have been reported to have shorn as many as 200 sheep in a day with hand shears.

To remove a fleece in good condition involves keeping it intact and free from second cuts. Second cuts are made by cutting the fibers of wool after they have been shorn from the sheep. In order to prevent making second cuts, it is necessary for the shearer to keep the blades of the shears close to the skin of the sheep and to have the wool fall away from the sheep as it is shorn. The shearer cannot do this well until he becomes thoroughly familiar with the general shape of a sheep in whatever position it may be held while it is being shorn. He must also learn how to hold a sheep so that it will not struggle, thereby preventing it from kicking and

tearing the fleece apart. Finally, the work of a shearer cannot be pronounced a good job if he inflicts many wounds by cutting the skin of the sheep. To prevent making wounds, the shearer should keep the skin of the sheep just in front of the shears as smooth and free from folds and wrinkles as possible.

31. Time of the Year to Shear Sheep.—Formerly it was considered good practice not to shear sheep until about the first of June, because shearing at that time permitted of washing the sheep, and many sheep raisers thought that the warm weather made the fleeces more oily and thereby heavier than they would be earlier. The most desirable time for any particular farmer to shear his flock of sheep will necessarily depend largely on the climatic conditions and on the shelter that can be given to the flock a few weeks after the sheep are shorn. If the weather is inclined to be warm and mild or if shelter can be easily provided for the sheep, early shearing—that is, about the first of April—is advisable; but if cold and stormy weather is expected, shearing had best be deferred until May or possibly until early in June. The majority of successful flock owners living east of the Rocky Mountains and near the 40th parallel of north latitude—which parallel passes through or near Philadelphia, Pa., Columbus, Ohio, Indianapolis, Ind., Springfield, Ill., and St. Joseph, Mo.—advocate and practice the shearing of their flocks about the first week in April. They claim that the discomfort of the sheep is less than when the sheep are shorn later; that while in short fleeces the sheep will go under shelter as soon as the first drops of rain hit them, but that if they are in full fleece they will remain out in the rain until their fleeces are soaked. Some sheepmen claim that if the fleeces are removed during the cool weather of spring and the flock is given shelter at night, the appetites of the sheep improve; the wool makes quick, rapid growth and thus protects the backs of the sheep from the sun during the hot days that follow; and that a larger quantity of wool is produced during a year than when sheep are shorn late. Persons living north or south of the

40th parallel should make due allowance for the distance that they live from it in deciding on what would be early or late shearing for that particular locality.

32. Shearing Floor.—For the shearing of sheep, a well-lighted, clean, floored space about 7 or 8 feet square or of other suitable dimensions that will allow the shearer ample room in which to work is needed. The floor should be of wood, because there is less likelihood of damaging any shearing apparatus that may be accidentally dropped. A pen in which the sheep are kept should join the shearing floor so that the shearers will loose as little time as possible in getting the sheep to and from the pen. Arrangements should be made to remove the fleeces from the shearing floor as soon as they are removed from the sheep, and, if the wool is to be stored in the large burlap bags in which it is usually marketed they may be arranged so that, as the fleeces are tied, they can be tossed directly into the bags.

33. Comparison of Hand and Machine Shears.—Hand shears have been largely superseded by power machines in the central and western sections of the United States. It has been demonstrated that power machines cut closer and leave a more even surface than the hand shears. Because they cut closer, more wool is secured than when the hand shears are used. At the Louisiana Purchase Exposition, held at St. Louis, Missouri, in 1904, an expert English shepherd with hand shears sheared a sheep having a thin, dry fleece. The sheep was then placed in the hands of a skilful operator who secured 13 ounces of wool by going over it with a shearing machine. The skin of the sheep is less likely to be cut with the shearing machine than with the hand shears. No matter how careful the operator of the hand shears may be, he will do some cutting of the skin; on the other hand, there is practically none with the shearing machine, provided care is exercised in its use. The shearing machine not only does neater work than the hand shears, but it does work more rapidly. This is especially true if the operator with the hand shears is not a skilled shearer. It has been said

that professional operators using the shearing machine have many times done their best and most rapid work in the first season of their experience. It is not probable that the same can be truthfully said of operators with hand shears.

Notwithstanding the advantages of shearing machines, there are conditions under which it would be preferable to use hand shears. If the owner of a small flock of from 25 to 50 sheep chooses to do the shearing, it would scarcely pay him to buy a shearing machine. If one is bought it should be of the hand-power type, and this calls for an extra laborer. Again, it is almost impossible to shear some of the more wrinkled, oily Merino sheep with the power machines. The oil and short, fine fibers of wool collect on the knife and comb to such an extent that the knife refuses to cut.

If hand shears are used, it is essential that the blades be bright and sharp. The spring that forces the blades apart should be of medium strength, because if it is too strong it soon tires the hand; and if too weak, the blades fail to separate and do not reach deep into the wool. Shears with blades from 5 to 6½ inches long are preferred for most shearing. Shorter blades may be more suitable for the shearing of sheep with exceedingly dense, oily fleeces. As a rule, shearers wrap the handles of the shears with twine; this gives a firmer grip and one that is less tiring than a grip on the unwrapped steel handles. The proper position of the hand in grasping a pair of shears is exactly like the position the hand naturally takes in gripping a stick about the size of a man's wrist. When a pair of shears is used, enough pressure should be used to bring the edges of the blades quickly together along their entire length. If the edges near the points of the blades do not meet, poor shearing is sure to result.

Shearing machines are made by various manufacturing companies and in several sizes, although nearly if not all machines are built on the same general plan. The speed at which the knife should be run depends somewhat on the nature of the wool to be removed, but if the knife is sharp and properly adjusted the proper speed can soon be deter-

mined. The friction between the knife and comb is great, hence, it is necessary to oil these parts often. A rather thin oil and one that does not combine with the oil in the wool to form a gum should be used.

Shearing machines that are operated by hand are smaller and less efficient from the standpoint of speed in shearing than are the machines that are operated by some mechanical motor. This is true not only because they have less capacity but also because the power applied to them is not even and regular. In places where large numbers of sheep are to be shorn, a large shearing plant is often established with a number of machines, which are driven by steam, gasoline, or electric power.

34. Detailed Operations in Shearing a Sheep.—Whether hand or machine shearing is employed, much of the skill in speed and in properly removing the fleece depends on the way in which the sheep is held. Briefly stated, proper holding involves keeping the sheep in such a position that the operator can easily get at the different parts of the body and at the same time keep the feet of the sheep from any solid surface. Whenever the feet touch a solid surface the animal usually begins to struggle, and the result is likely to be a torn fleece. The method of holding sheep while they are being shorn that is described here will, if carefully studied and practiced, prove a great help to shearers in overcoming some of the many difficulties usually encountered.

After making everything ready for shearing—that is, having cleaned the shearing floor of all chaff, dust, or dirt; completed arrangements for storing the fleeces; sharpened and placed the shears in position for use; and placed the sheep in an enclosure, near at hand, where they can be caught easily—the shearer catches a sheep, leads it on to the shearing floor, throws and sets it on its hind quarters in the manner described for handling a sheep as given elsewhere.

The shearer then assumes the position shown in Fig. 2 and holds the sheep with his legs and left hand. The shearing is done with the right hand and is begun by opening the

fleece from the brisket to the under side of the lower jaw as shown in the illustration. After shearing a few swaths up along the throat, the head of the sheep is turned toward the shearer and the left side of the head and neck is shorn. The left arm of the shearer may then be used to control the sheep's head, and his left hand will be free to aid in keeping the skin of the sheep smooth just in front of the shears. The fleece

FIG. 2

should remain intact; it should not be pulled or pushed but should fall away from the animal as it is shorn. The shearer then removes the wool from the side of the neck and shoulder, as shown in Fig. 3, by shearing from the throat, leg, and the under side of the sheep to within about 2 inches of a line immediately over the backbone. It is considered poor practice to shear over the backbone at this time, because it

is almost sure to result in an unevenly shorn surface. As soon as the left fore leg and shoulder are shorn the sheep's left fore leg is placed behind the shearer's right leg. This gets the sheep's leg out of the way of the hand operating the shears and partly stretches the skin over the side of the sheep, thus making a comparatively smooth surface over

FIG. 3

which to work while shearing the left side of the sheep from belly to back, as shown in Fig. 4.

After shearing the side, flank, and front part of the left hind leg, the shearer's left hand should be pressed on the flank and against the stifle joint of the sheep so as to force its hind leg to remain extended as shown in Fig. 5. This position allows the operator to shear from the hoof up over the thigh to the back, and over the back of the hind leg to the tail.

FIG. 4

FIG. 5

It is by making long swaths through the wool that the shearer is able to make good time and to do nice, smooth work. The sheep's head, as shown in the illustration, is practically free but the shearer is usually able to keep it in control by means of his left elbow and legs. After shearing down over the left hind leg and around the tail, the shearer should gently grasp the sheep just back of its right ear with his left hand. The neck is then extended almost straight with the back and is supported by the shearer's left hand and leg. At the

Fig. 6

same time the shearer's right foot is placed back of the sheep's left hind leg, and the shearer's right knee pressed firmly but lightly against the left side of the sheep. In this position, shown in Fig. 6, the shearer can quickly and smoothly remove a considerable portion of the fleece by cutting a few swaths over the back from the tail to the ears. After shearing about 3 or 4 inches past the middle line of the back, the shearer should remove his knee from the sheep's side and with the left hand lift the sheep to nearly an upright position,

supported by the shearer's right leg at its back and side, as shown in Fig. 7, and by his left leg, which is placed between the fore legs of the sheep and along its left side. Then, after the right side of the head and neck is sheared, the shears can be pushed well into the wool and the fleece rolled off at a rapid rate, the shearer changing his position slightly as he

FIG. 7

cuts down over the right side, from back to belly, to the position shown in Fig. 8. In this position the shearer supports the sheep's breast and shoulders with his legs, controls its head with his left elbow, and shears down the side to the flank, allowing the sheep to drop gradually toward him so as to obtain the position shown in Fig. 9. This is a good

FIG. 8

FIG. 9

position from which to shear over the side of the sheep's right hind leg; and by allowing the sheep to recline more and more until its left shoulder rests on his feet, the shearer is in a good position to shear the back part of the sheep's right hind leg, thus detaching the main portion of the fleece, which should be moved a little to one side. The sheep is then set up on its hind quarters, as shown in Fig. 10, in which position

Fig. 10

the brisket can be easily shorn, and by raising the forelegs with the left arm the shearer has the sheep in a good position to shear its belly. After shearing the belly, the shearer should place his left hand against the sheep's flank, catch the skin and by pressing against the sheep's right hind leg will cause it to extend, as shown in Fig 11. In this position the shearer should have little or no trouble in cleaning the leg of all wool from the hoof to the body. By turning the

sheep a little to the left and by pressing the hand on its left flank and hind leg, that leg will be in a good position to be cleaned by shearing from the body to the hoof. The shearer should not attempt to hold the sheep's foot while shearing the hind legs, because the animal is almost sure to kick and struggle to get loose. After turning the sheep loose, the fleece should be removed from the floor, tied in a neat bundle and stored.

FIG. 11

35. Marketing of Wool.—Wool may be sold to a local wool buyer or it may be consigned to some commission house. If there is a strong demand for wool at shearing time and manufacturers are waiting for the clip, the wool grower will probably be offered liberal prices for his wool clip as soon as it is shorn. On large sheep ranges where the annual clip ranges from 10,000 to 20,000 pounds, the clip is often sold before it is shorn. On the other hand, if the demand for wool is light, the local buyers are indifferent about buying and usually offer only the lowest market price. Likewise,

the producer is likely to feel disinclined to consign his wool clip to a commission house, and producers who can afford to do so usually hold their wool clip; that is, they refuse to sell their wool for a year or so, hoping for higher prices. Each wool grower must decide for himself whether or not he can afford to sell his wool clip for the current market price at the time or shortly after the clip is shorn.

HORSE BARNS AND PADDOCKS

HORSE BARNS

GENERAL REQUIREMENTS FOR HORSE BARNS

1. A structure of any kind designed for the storage of farm products or the sheltering of farm animals, or both, is termed a **barn.** A barn may be an elaborate building or a simple shed with either open or enclosed sides, according to the purpose it is intended to serve. A barn designed wholly or partly for the sheltering of horses is usually termed a **horse barn.** Barns of this type and auxiliary buildings are the only structures that will be discussed in this Section.

A horse barn should be constructed so that it will be adapted to the climate of the region in which it is built, be suitable for the purpose for which it is intended, and possess as many conveniences as possible. It should be warm enough to protect the animals against cold weather, and cool enough to protect them from excessive heat in summer. The interior should be protected from rain or snow, and the site should be dry or well-drained ground where water will not flow into the barn from the surface.

One of the most important requirements for a horse barn is that it have suitable sanitary provisions. Although the barn should be built as cheaply as possible, economy should not be practiced to the extent that the efficiency of the barn will be impaired or the health and vigor of the animals endangered. If a barn is constructed so that it affords a breeding or a hibernating place for disease germs, it will

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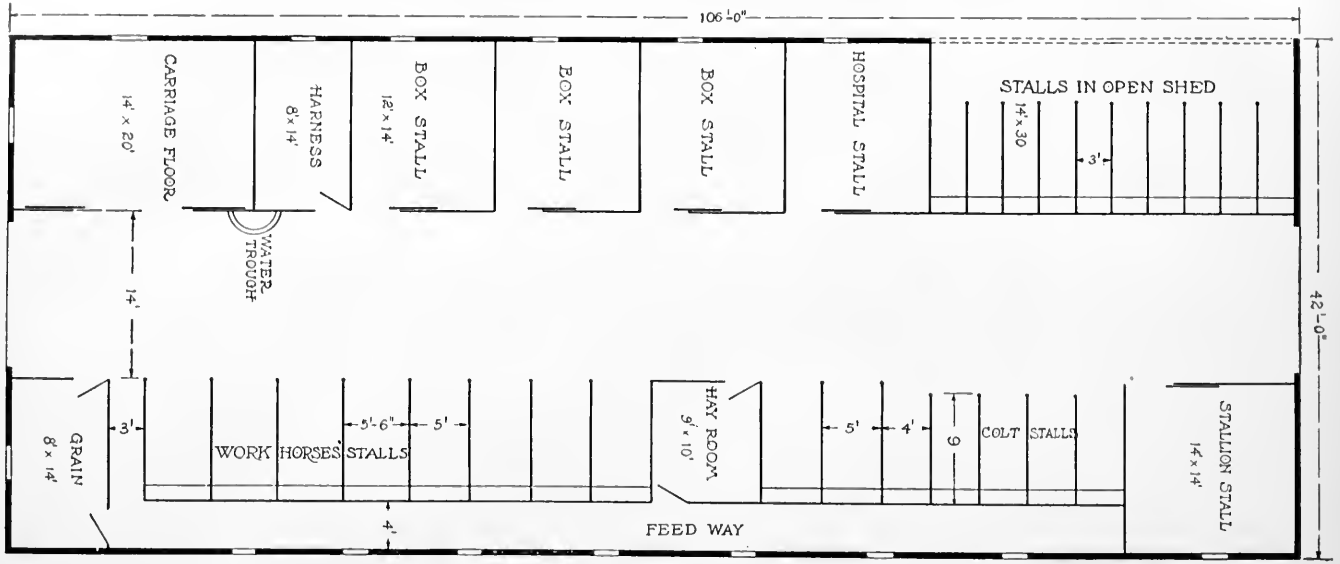

106'-0"
CARRIAGE FLOOR
14' x 20'
HARNESS
8' x 14'
BOX STALL
12' x 14'
BOX STALL
BOX STALL
HOSPITAL STALL
STALLS IN OPEN SHED
14' x 30
3'
42'-0"
WATER TROUGH
14'
GRAIN
8' x 14'
3'
WORK HORSES' STALLS
5'-6"
5'
HAY ROOM
9' x 10'
5'
4'
9
COLT STALLS
STALLION STALL
14' x 14'
4'
FEED WAY

FIG. 1

likely prove to be an expensive building, no matter how cheaply it may have been built. Likewise, if the barn is dark, damp, or poorly ventilated, it will not be conducive to health and vigor in the animals. Horses, perhaps, more than any other kind of domestic animal, require quarters in which their health and consequently their efficiency will not be impaired.

HORSE BARNS FOR VARIOUS PURPOSES

2. General-Purpose Horse Barns.—In planning a general-purpose horse barn such as is commonly used on farms, the farmer or horseman should be largely guided by the size of the farm and the number of horses to be housed. Such a barn should have stabling capacity for all of the work horses, brood mares, foals, and young growing horses on the farm, and there should be additional space to allow for any possible future increase. There should also be ample room for the storage of grain and hay.

In Fig. 1 is illustrated the first-floor plan and dimensions of a well-arranged horse barn for general purposes. This plan provides a number of valuable features, although it is likely that the farmer or horseman will find it desirable to vary somewhat from it in order to meet the requirements of his particular case.

It is advisable to have the work stock stabled in one part of a general-purpose horse barn and the breeding horses and young growing stock in another. The barn should be equipped with a few box stalls for brood mares, a few small stalls for colts, a hospital stall for sick animals, and a number of single and double tie stalls for the work stock. Tie stalls are those in which the animals are confined by means of halters. More horses can be accommodated on the same floor area by using double tie stalls rather than single tie stalls, but the chances for injury to the animals is greater. To overcome, in a measure, the risk of injury, a swinging bail such as is illustrated in Fig. 2 is convenient. In (*a*) is shown the bail in place, suspended in the middle of the stall about 3 or 3½ feet from the floor, one end being fastened to the

manger and the other supported by a rope suspended from the loft floor; in (*b*) is shown the method of fastening the front end of the bail to the manger so that the bail will have free play. Such a bail can be made by fastening two planks together by means of iron straps and rings, as shown in the illustration. If made in this way, a bail is flexible and it is almost impossible for an animal to be injured by it. A double tie stall 8 feet wide is sufficiently large for a pair of 1,000-pound horses, each of which would require a 4½-foot single stall; a pair of 1,250-pound horses should have a 9-foot stall;

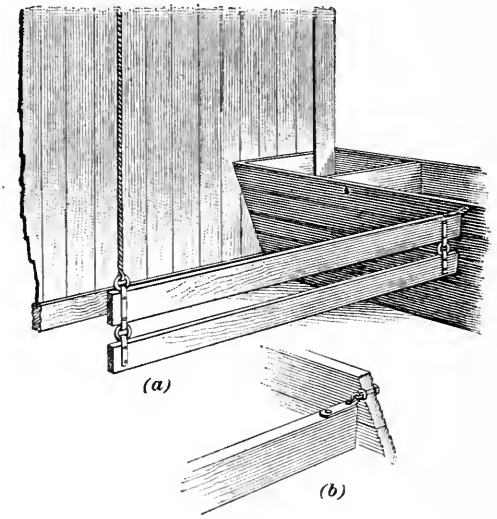


Fig. 2

and a pair of horses each weighing 1,600 pounds or over, should have a stall 10 feet wide. Single tie stalls should be at least 6 inches wider than one-half the widths just given for double stalls, in order that there may be room enough for the animals to lie down in comfort. The partitions between the stalls should be from 9 to 10 feet long, depending on the size of the horses.

A harness room should be provided in the section in which the work stock is stabled. The custom of hanging the harness on hooks behind the horses is to be severely criticised,

as the harness is likely to be knocked down and tramped in the dirt, or chewed by rats, and there is certain to be more harness and special parts about than are used regularly. In addition, the ammonia gas that arises from manure is very destructive to leather, and a new harness left hanging

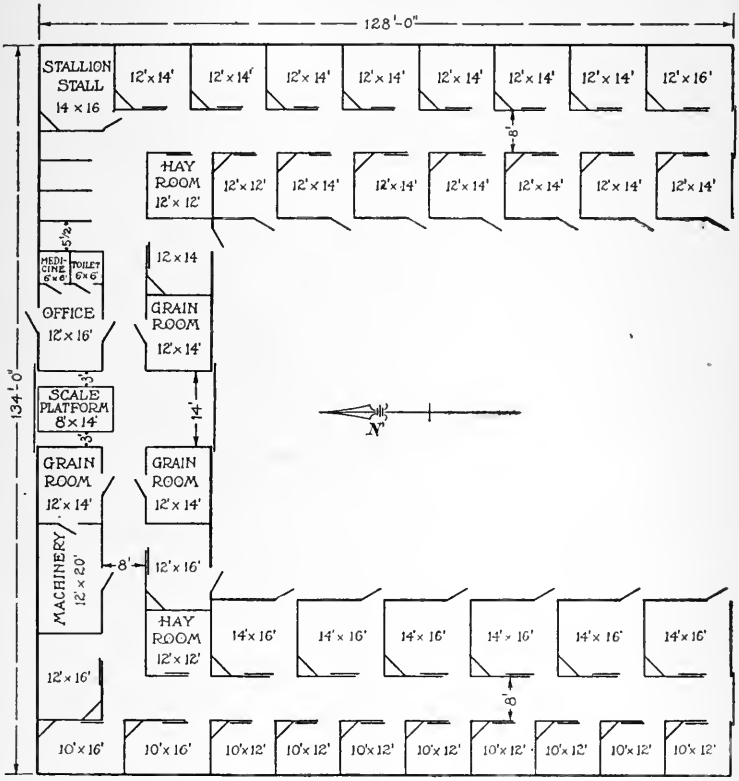


FIG. 3

exposed to it will deteriorate and become worthless quite as soon as those in daily use that are given good care.

It is usually not advisable to arrange for a carriage room in a general-purpose horse barn, because of the presence of ammonia gas, which is destructive, also, to varnish, and because more or less dust and trash will be blown by the wind

into the rig or rigs if the doors and walls of the room are not absolutely tight. However, a carriage house within the barn has the advantage of affording a dry place in which horses can be hitched to vehicles during muddy times and in bad weather.

A watering tank or trough located within the barn will be found convenient for watering the stock, especially during bad weather, and water in such a tank will not freeze as readily as it would if out of doors; hence, less difficulty will be experienced in keeping the tank free from ice during winter.

3. Barns for Breeding Horses.—In Fig. 3 is illustrated the first-floor plan and dimensions of a barn for the breeding of

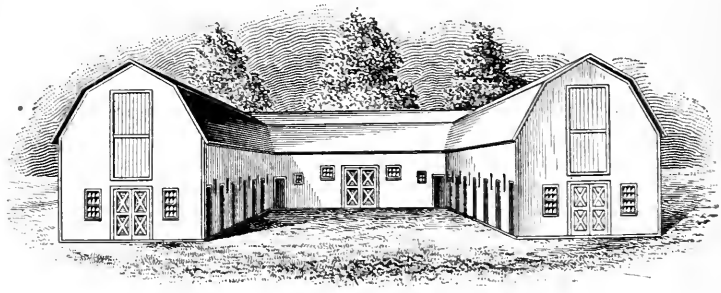


FIG. 4

horses. Fig. 4 shows an elevation view of the same barn. This barn is built on the three sides of a rectangle, thus providing an open court between the wings. The second floor can be arranged as desired. Although the plan shown provides the essential features required in a breeding barn for horses, it is probable that some variations will be found desirable by different farmers or horsemen.

A breeding barn should be equipped principally with box stalls, although there should be a few tie stalls in which extra horses can be cared for. Some of the box stalls should be built with a manger and two feed troughs, so that they will accommodate two horses in case it becomes necessary to house an extra number of animals. The extra trough also

furnishes a place to feed a foal beside its mother and where it may be taught to stand tied. The best plan for a breeding barn is one with the box stalls on each side and an alley through the central part of the building.

It is not advisable to board box stalls up higher than is necessary, as it obstructs ventilation and also the view from one part of the barn to another; usually 5 feet will be sufficient. Wire stall guards made for this purpose, or railings made of ½-inch hollow iron rods set vertically, should be used above the solid part of the partition to prevent the horses from playing and fighting with companions in adjoining stalls. The solid part of the partition should be made heavy and strong for stallions; it is advisable to use some hard wood for this purpose. An inclined wainscoting around the bottom of the wall, as shown in Fig. 5, will aid in preventing the horses from bumping their hocks and rubbing their tails. This wainscoting need not be over 2½ feet high and should stand out about 1 foot from the wall at the bottom, as shown by the dimensions given in the illustration.

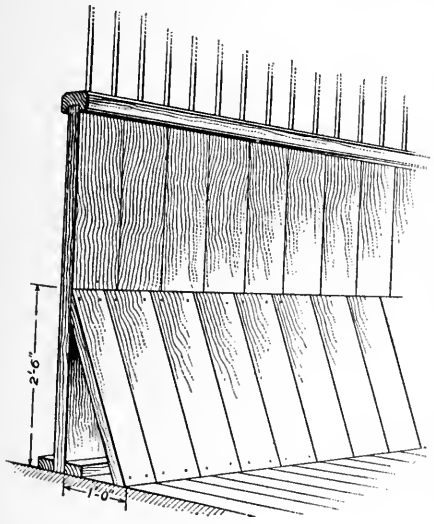


FIG. 5

A few box stalls for the use of brood mares at foaling time should be planned for, and these should be provided with portable mangers and feed troughs. Such stalls should be light and airy, and arranged so that as much sunlight as possible may penetrate them in order that they may be kept in a sanitary condition. There should be no sharp projections or openings that would be likely to injure the foal; foals are sometimes lost after being cast by getting their legs beneath

a partition that does not fit close to the floor. Box stalls used for draft brood mares previous to foaling should not be less than 12 ft. × 14 ft., and 14 ft. × 14 ft. is a better size. Foaling stalls should be at least 14 ft. × 16 ft. for draft mares and 12 ft. × 14 ft. for light mares. There is a difference of opinion as to the best kind of a stall for a service stallion. Some horsemen prefer one absolutely tight so that the stallion cannot see what is going on about the barn; others claim that he is more content when he has the companionship of other horses stabled near him and can see about. Notwithstanding these differences of opinion, it is a fact that stallions usually fret a good deal when the other horses are out of the barn. If stallions are worked until they are tired each day, as they should be, it makes little difference whether the stall is open or closed; but, where they are not worked and are given only limited exercise, spending most of their time in the barn, a closed box stall is best. A box stall for a draft stallion should be 14 ft. × 16 ft.; a light stallion will have sufficient room in one 12 ft. × 14 ft.

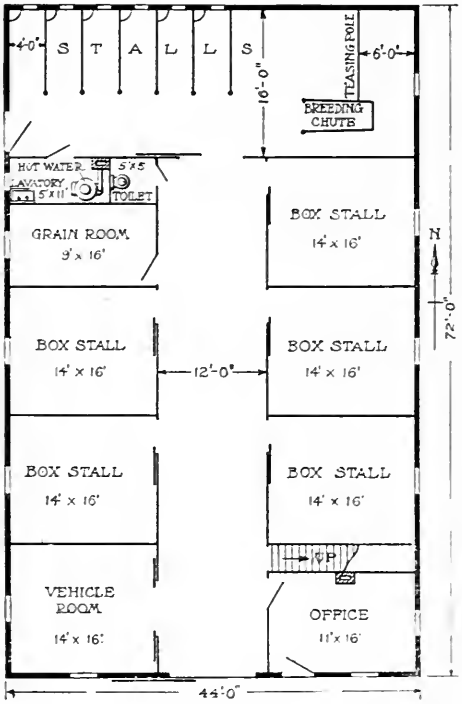


FIG. 6

The feeding of hay in a breeding barn may be arranged for by providing chutes from the mow to the mangers, or it may be done from the alley, the latter method being the more

desirable from the standpoint of the health of the horses. The grain can be fed from a cart or feed carrier run through the alley.

4. Barns for Stallions.—If more than one service stallion is kept, it is advisable to build a small barn in which all of them may be stabled. This serves the purpose of keeping the stallions quiet and away from young stallions, which they would excite. Fig. 6 illustrates the first-floor plan and dimensions of a convenient barn for stallions, and Fig. 7 shows the front and side elevations of the same barn. The

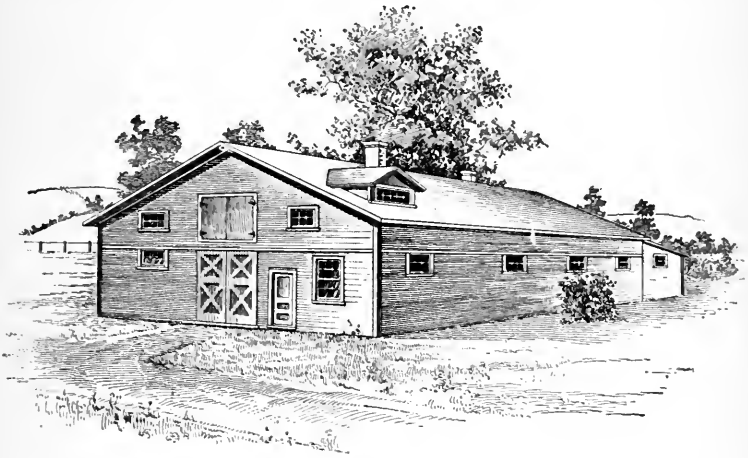


FIG. 7

mares are teased and bred in an enclosed lean-to shed at the rear end of the barn; the lean-to is provided with a teasing pole and breeding chute, the detailed appearance and arrangement of which are shown in Fig. 8. The teasing pole *a* should be a round piece of timber of sufficient strength to withstand considerable strain. It should be fastened securely about 3 feet above the ground and be about 10 feet in length. The breeding chute *b* should be constructed of strong material; it should be about 9 feet in length and about 2 feet 8 inches wide. The highest point of the sides should be 3½ feet above the ground. The use of a teasing pole and breeding chute is explained in a subsequent Section.

A stallion barn should be equipped with box stalls only, and these should be made strong. To allow for other use,

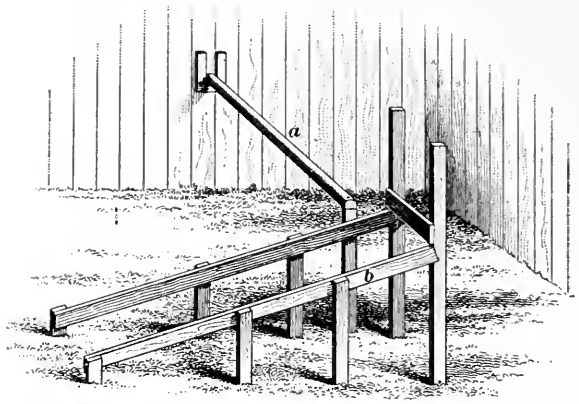


Fig. 8

some of the stalls may be built with a combination feature such as is shown in Fig. 9; by this means a box stall can be converted into two tie stalls should occasion demand. In the figure, (*a*) shows a box stall with a permanent swinging door *a* and a removable door *b*. In (*b*), the swinging door *a* is shown in place after having been merely swung around at right angles to its former position, and the removable door *b* has been removed from its former hinges and hung on other

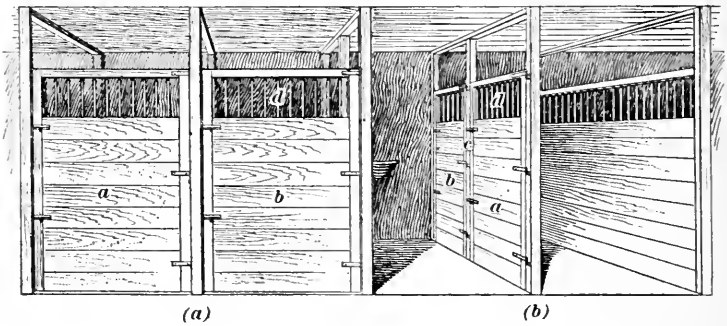


Fig. 9

hinges in the manger end of the stall so that it joins *a* at the jamb *c*, which is an extra piece that must be fitted in place

when the change is made. By having the upper part of the partitions provided with metal stall guards *d*, as shown in both (*a*) and (*b*), rather than having each stall tightly enclosed, it is much easier to provide thorough ventilation.

There should be an office and sleeping quarters for attendants, and a harness room for bridles, blankets, and all necessary trappings. Provision should be made inside of the barn for water, for machinery for crushing grain and chaffing hay, and for a feed mixing room.

When it is the custom to keep stallions in small individual paddocks, a convenient arrangement is to provide a small building at the intersection of two or more of the paddocks.

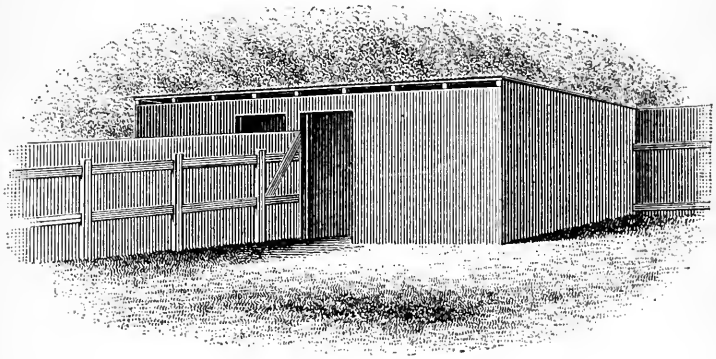


FIG. 10

Such a building may have a loft for the storage of feed, or be a simple shed like that illustrated in Fig. 10. The shed illustrated is of a type commonly used in Scotland. It is placed at the intersection of two paddocks and is designed to accommodate two animals.

5. Barns for Brood Mares and Colts.—Where the winters are not too severe, an open shed facing the south or a combination of three sheds, forming a court, can be used to advantage in the feeding and care of brood mares that are not too far advanced in pregnancy and of colts that are past their first winter. Such animals, if they are healthy and vigorous and have plenty of feed and the protection of

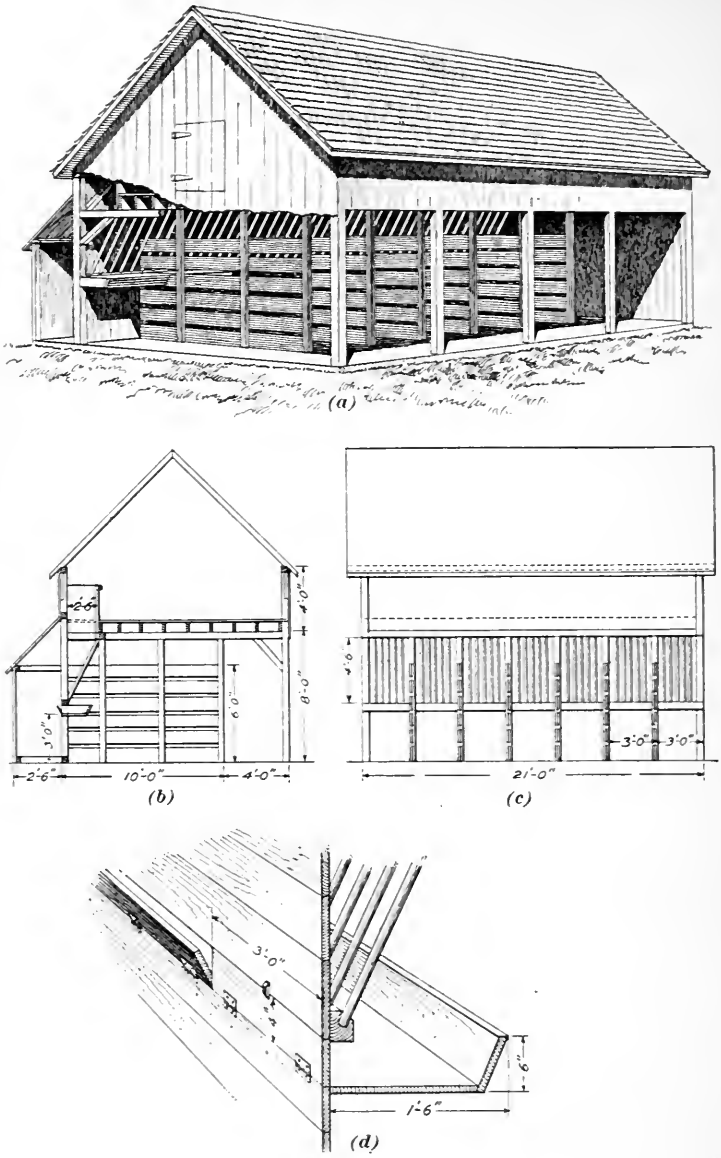


FIG. 11

an open shed in which to run, will do as well as when stabled, and much less work will be required in caring for them. The greatest danger of their injuring each other by kicking and biting is while feeding. In Fig. 11 is illustrated a small open barn that is provided with the proper kind of stalls for safe feeding. In (*a*) is shown the general plan of the barn with a section cut away to show the feed racks; in (*b*) and (*c*), end and open side elevations, respectively, with dimensions; and in (*d*), the details and dimensions of the feed rack and grain box. The grain boxes are located in the front end of the stalls, and in front of the stalls is a narrow feed alley through which the feeder can pass in feeding the grain. The hay or other roughage is fed from the loft above, which should be large enough to provide storage for at least several loads at a time. The grain is fed from the alley through openings, two of which are shown in (*d*). The stalls are constructed 3 feet wide so as to admit a single animal without any spare room on the side, and 10 feet long to prevent them from kicking each other while feeding in the stall. Scarcely ever will even the most vicious horse attack another directly from the rear, because of the fear of being kicked. A colt or brood mare can feed in one of these stalls in perfect safety and without fear of being driven away by the other animals. The stall partitions should be constructed out of strong material and erected in a substantial way.

6. Sale Barns.—The matter of convenience in feeding and caring for horses is of less importance in a sale barn than in any other. The first consideration is the presenting of the horses to the public in the most attractive way. It frequently happens that the first impressions of a customer are lasting; it is a good plan, therefore, to use every influence possible to make a good impression on him as he enters the barn. It is generally conceded that this is best done by arranging the stalls in two rows so that the heads of the horses are toward the outside of the building, and the rear ends toward the inside. When in a stall, more of a horse can be seen from a rear than from a front view. The space between the

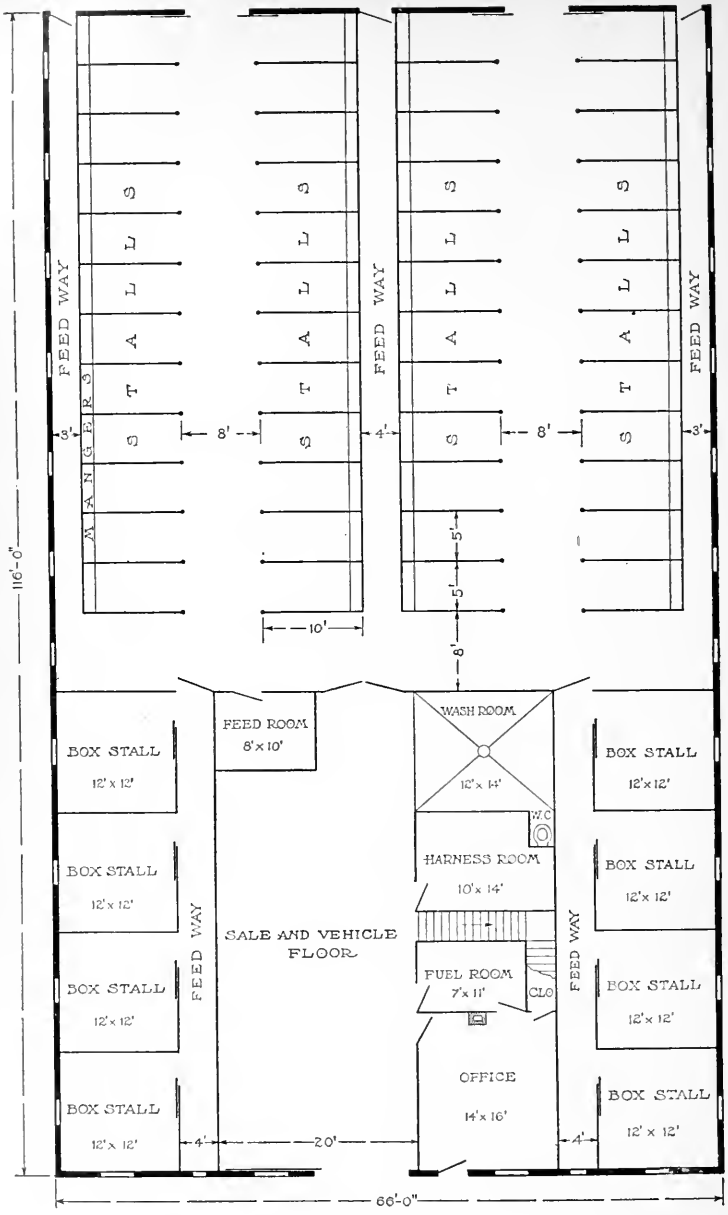

FEED WAY
STALLS
MANGER
3'
8'
4'
8'
3'
FEED WAY
STALLS
FEED WAY
STALLS
FEED WAY
STALLS
5'
5'
10'
8'
116'-0"
BOX STALL
12' x 12'
FEED ROOM
8'x 10'
WASH ROOM
12'x 14'
W.C
BOX STALL
12'x12'
BOX STALL
12' x 12'
HARNESS ROOM
10'x 14'
BOX STALL
12'x 12'
FEED WAY
SALE AND VEHICLE
FLOOR
FUEL ROOM
7'x 11'
CLO
FEED WAY
BOX STALL
12'x 12'
BOX STALL
12' x 12'
OFFICE
14'x 16'
BOX STALL
12' x 12'
4'
20'
4'
66'-0"

FIG. 12

two rows of stalls should be sufficiently wide to furnish ample room for standing a pair of horses on the floor for inspection. Some part of the barn should be provided with artificial light, and as much natural lighting from above as possible, so that the horses can be shown to good advantage at any time, day or evening. An exercise, or run, shed, where the action of horses may be shown in bad weather, will be found useful, although this is not necessary. The first-floor plan and dimensions of a good sale barn are shown in Fig. 12, and the front elevation is shown in Fig. 13.

Generally, in planning a sale barn, no provision is made for feeding the animals from in front of the stalls; the usual

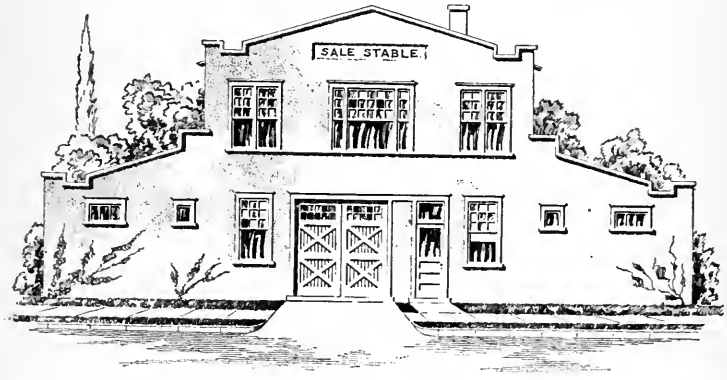


FIG. 13

practice is to provide a chute leading from the hay loft to the mangers for the feeding of hay and to have the attendant carry the grain feed through the stalls to the mangers. A more convenient way to feed grain is to provide a narrow alley in front of the mangers; if the hay is to be fed from the alley, it should be fairly wide.

As a rule, only single and double tie stalls are used in a sale barn, but it is a good plan to have a few box stalls for sick animals.

A litter carrier that runs on a steel track at the rear of the stalls is a convenient device for removing the manure; or the manure may be raked into the alley, and by means of a

scraper, such as the one shown in Fig. 14, dragged to one end of the barn and carted away. Such a scraper can easily be made by attaching shafts and a pair of handles to a 12-inch hardwood board about 6 feet long. Still another method of disposing of the manure is to haul it away on a wagon driven through the barn, the manure being pitched into the wagon directly from the stalls.

7. Combination Carriage Houses and Horse Barns.—In a combination carriage house and horse barn, the carriage room should be as far away from where the horses are stabled as possible, because of the destructive effect of ammonia gas from the manure on the varnish on the vehicle. The part

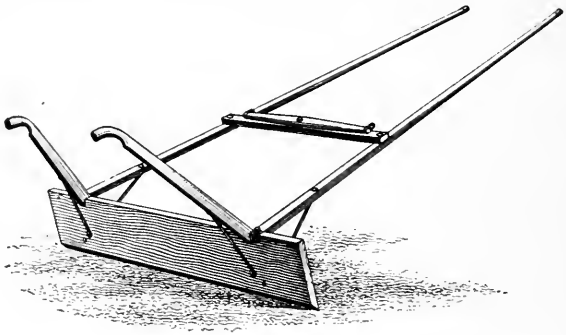


Fig. 14

of the barn set apart for carriages should be partitioned off from the main part and closed with tight doors to exclude any ammonia gas that may reach this part of the barn, and also to shut out the dust and chaff carried by the wind.

If the building is made warm enough to prevent freezing inside in the winter, the necessity for the immediate washing of muddy rigs as they come in will be somewhat lessened, although it is always destructive to the varnish on vehicles to permit mud to dry on them. For the proper washing of rigs in winter, a wash floor and some means of heating the water are required.

Some horsemen prefer a barn arranged for keeping the carriages on the second floor, an elevator being used for hoisting

and lowering them from and to the first floor, where the hitching is done. This makes a satisfactory arrangement, provided the elevator can be easily operated. Where the location will permit, a basement barn can often be used to good advantage for a combination carriage house and horse barn, the basement floor being used for the horses and the second floor for

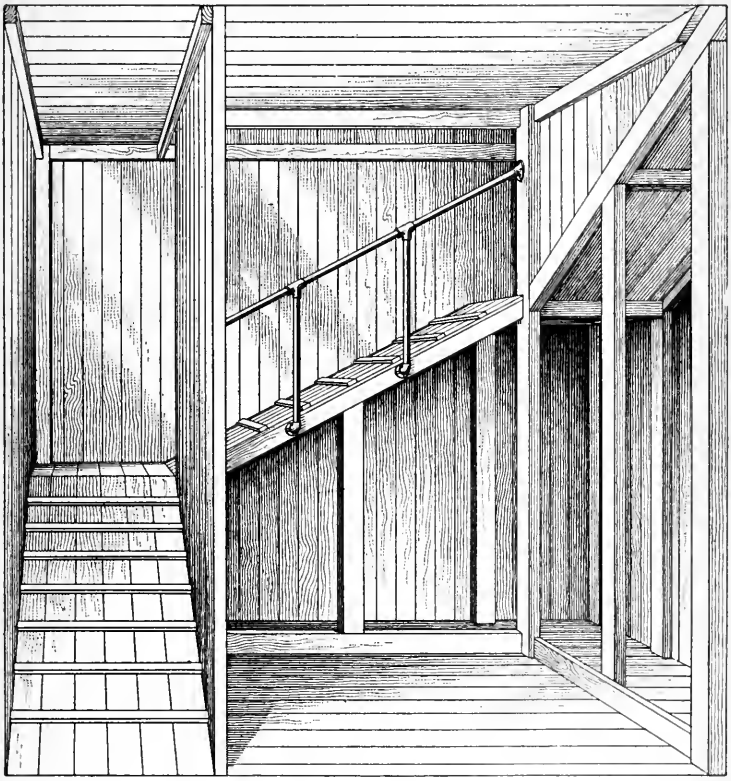
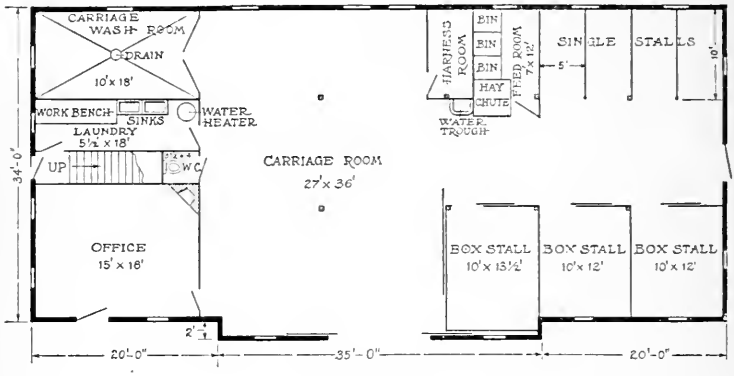


Fig. 15

the carriages. The principal difficulty of such an arrangement is in getting the horses to the second floor. One way of doing this is by means of a winding incline, such as is shown in Fig. 15. Although most horses will readily ascend and descend this incline, brood mares should not be made to go up and down it, for but few colts have been raised where

mares have been required to climb such a steep slope every day.

8. **Fanciers' Horse Barns.**—The construction and arrangement of a fancier's horse barn should not be considered



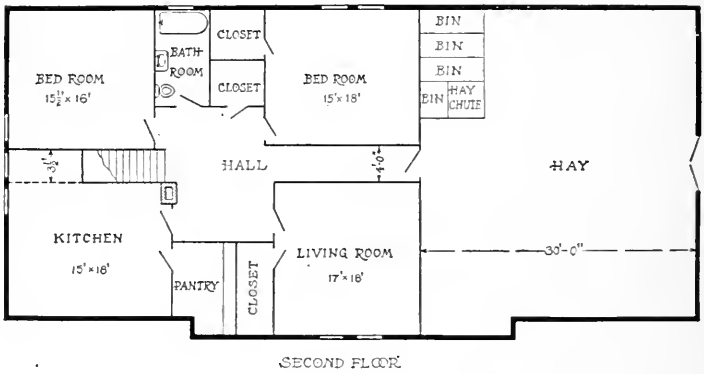


FIG. 16

wholly from the standpoint of utility. A great deal of attention should be given to the architectural effect of both the exterior and the interior, and a beautiful setting should be given by means of landscape gardening. In such a building, everything should be kept scrupulously clean and fit for

inspection by visitors at all times. When this condition is maintained, there is no objection to having the vehicles housed within the same building, although it is desirable to have them enlosed in a tight room as a protection against dust. Most, if not all, of the horses should be provided with box stalls; stalls 10 ft. × 12 ft. will be of ample size for light horses.

The harness room should be commodious, the harness hung in full view, and the trappings displayed in cases. There should be a small room equipped with sinks, a stove, and some provision for the heating of water so that the harness may be cleaned at any time; it will also be found convenient to have in the room a work bench and the necessary tools for making small repairs about the stable. There should be a room in which to prepare feed, a cupboard for the stable tools, and an office equipped with fixtures and furnishings in keeping with the character of the barn. If the proprietor is a lover of saddle horses and hunting, the walls of the office can be appropriately decorated with scenes of hunting and cross-country riding, crop sticks, a bridle or two, etc. The building should also contain quarters for the coachman and other attendants, if such are employed; these quarters can best be provided for on the second floor. The living rooms for all attendants should be properly ventilated and heated, and there should be a bathroom and toilet facilities, so that those who care for the horses can keep clean and comfortable.

Fig. 16 illustrates the plans and dimensions for the first and second floors of an attractive building suitable for a fancier's barn, in which many of the common features of a horse barn are absent. Fig. 17 shows the front elevation of the same barn.

9. Horse Barns for Town Lots.—A town-lot horse barn is generally a small building, as there are usually not more than two or three horses to be accommodated in such quarters. The architecture of the barn should harmonize with that of the dwelling and give as little of the appearance of an ordinary barn as possible. Where the floor space will permit, each

horse should have a box stall, as they will then get a little exercise even if they are not taken out of the barn every day,

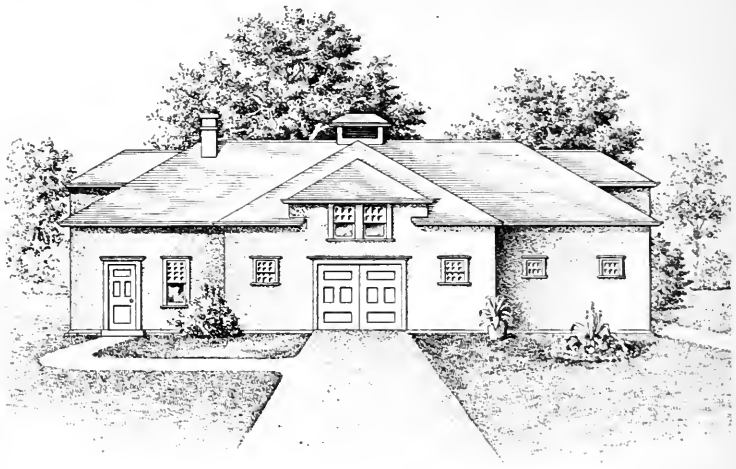


FIG. 17

and, in addition, the horses are not so likely to become injured by being kicked. There should be floor space where a horse may be groomed, harnessed, and hitched, and cupboards for the harness and trappings. The barn should be piped for water, and there should be a drained floor where carriages may be washed, and some means provided for artificial lighting, electricity being preferred.

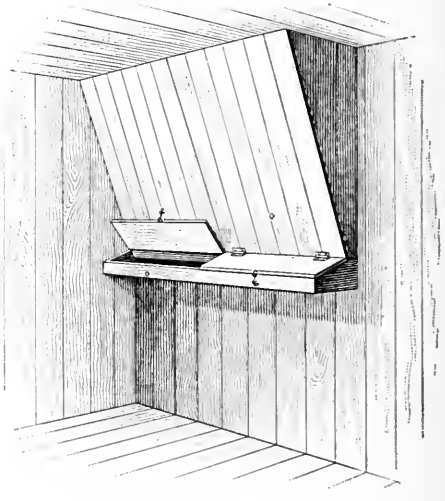


FIG. 18

Because of the limited floor space in such buildings it is usually best to place the feed bins on the second floor and

spout the grain below by means of a partitioned chute, such as that illustrated in Fig. 18. A chute about 4 ft. × 4 ft. leading from the mow to the main floor below will be found convenient for feeding hay. One side of the lower end of this chute should be provided with a door from which the hay can be taken, or the chute can be placed so that the hay may be dropped directly from the mow to the manger. A tight manure box fitted with a lid should be provided for the manure and emptied frequently. By keeping the lid closed, foul odors will be confined and flies will be prevented from making a breeding place of the manure.

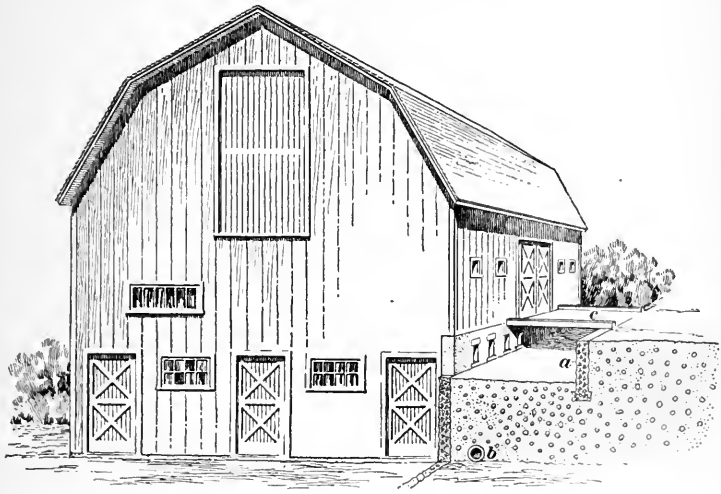


FIG. 19

10. Basement Barns.—Basement barns in which the lower floor is partly or wholly underground are not to be recommended for horses unless ample provisions are made for light, ventilation, and drainage. When these features are carefully worked out, a basement barn is a desirable place for keeping horses, because it is warmer than a barn set entirely above ground, and usually offers a maximum of convenience in the handling of feed and manure.

The best location for a basement barn is on a hillside with a southern exposure. The first-story walls, particularly the

parts that are underground, should be built of brick, stone, or concrete; the second-story walls may be of wooden material, or the walls of the first story may be continued on up. In Fig. 19 is illustrated a desirable method of obtaining plenty of light for the first floor of a basement barn. On the embankment side of the barn, the hillside is excavated to a width of from 8 to 10 feet and to a depth sufficient to permit of small windows being placed in the basement on that side. In the illustration, *a* is a retaining wall to hold the bank; *b*, a tile drain; and *c*, a bridge across the excavation.

11. Accessory Carriage Houses.—A carriage house should have enough room on the floor so that the vehicles will not be crowded. For convenience, it is a good plan to have the entrance somewhere near the middle of one side of the building so that the carriages can be backed off to either side of a central driveway. The art of arranging carriages in the most attractive way should be studied. They should be grouped according to size and style; as a rule, they look best when placed so that they present a front, or a front and side view as a person enters the building. Any vehicle on the floor should be readily accessible so that it can be immediately run out for use. The door to the main entrance of the building should be not less than $10\frac{1}{2}$ feet wide and about the same in height.

There should be a wash room in the carriage house and this should have good drainage, a suitable floor of some non-absorbent material, preferably cement, and some means of warming the water so that the task of washing carriages in the winter will be less disagreeable than when cold water is used. The wash room should be well lighted, so that the work of cleaning the vehicles may be accomplished with satisfaction, but direct sunlight should be avoided in the rest of the building, as it fades the upholstering, dulls the varnish, and attracts flies.

LOCATION AND CONSTRUCTION OF HORSE BARNS

SITES FOR HORSE BARNS

12. Elevation of Site.—In selecting the site for a horse barn, the first consideration should be the elevation of the land with reference to the adjoining land. The best site is on a rather high elevation, where the surface water will drain away from the building, but, of course, it is possible to build barns on almost any site, if proper surface drainage and

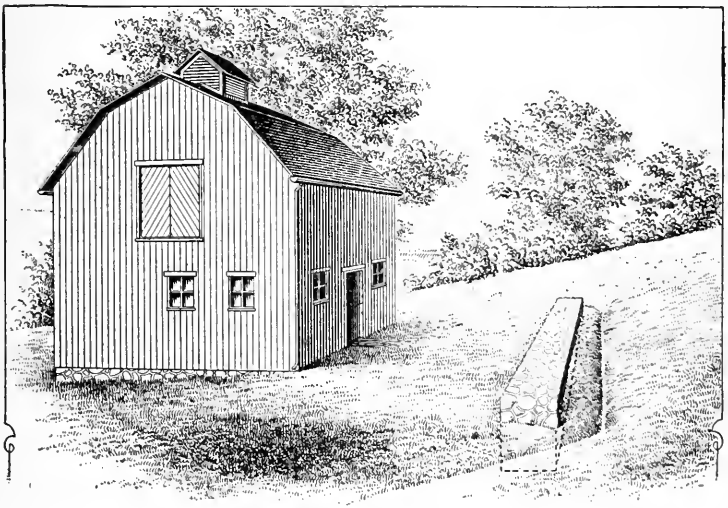


FIG. 20

underdrainage is provided. The inclination of the land should be just enough to insure good surface drainage, as on a steep hillside the animals are likely to slip and injure themselves when the surface is wet or covered with ice. If a steep hillside must be used, it is usually advisable to construct a drainage wall on the hillside, as shown in Fig. 20, so as to shed the water from around the barn and paddocks. The wall may be constructed of stone, concrete, or brick; dirt would serve the purpose, but it is unsightly. All that

is necessary is to check the surface water, hence the wall need not extend into the ground much below the frost line.

13. Exposure of Site.—An exposure with a gentle slope to the south is preferable to all others for a horse barn. Such an exposure is warm in winter and the surface dries off rapidly in wet weather through natural drainage and evaporation. If a southern slope cannot be had, one to the southeast is preferable to a southwestern slope. In cool climates, a windbreak consisting of a grove of trees on the north and west is desirable as a protection against the northwest winds of winter, but in no case should it be located so as to exclude sunlight and prevent a free circulation of fresh air around the barn.

14. Soil Requirements of Site.—The best kind of soil on which to build a horse barn is a sandy or slightly gravelly loam having a sandy or gravelly subsoil; both the soil and subsoil should have depth enough to permit good drainage and at the same time to serve as a filter for the impurities of the water that may later find its way to a well, spring, or running brook and be used for drinking purposes. A soil containing a large quantity of vegetable matter or refuse may be very unhealthful and is especially objectionable because the decomposition constantly going on may cause an unequal settling of the building.

15. Artificial Drainage of Site.—When both the surface soil and the subsoil of the barn site are inclined to be impervious to water, it is necessary to provide tile drains around the building. These drains should be laid below the frost line and about 1 foot outside of each wall. In excavating for the foundation of a barn, it is a good plan to make the excavation a little larger than is necessary for the building, and then put the tile in place before the dirt is filled in around the foundation. Ordinarily, medium-sized field drain tile, if carefully laid, will prove satisfactory.

16. Proximity of Different Barns.—As a matter of protection against fire, it is not a good plan to put horse barns

that are constructed of inflammable material very near each other or very near other buildings. When several barns are located near each other there is danger, also, of a contagious or infectious disease getting started in one and infecting the animals in all the barns. This danger is lessened, if not entirely eliminated, by having the barns more widely separated, and having the attendants exercise care not to go directly from an infected barn to one not infected. In addition to these points, there is also an advantage in the matter of arrangement of paddocks about the barns if the latter are not located close together.

17. Other Factors Influencing Choice of Site.—In selecting a site for a horse barn, it is advisable to know something of the depth at which water can be obtained in the ground adjacent to the site. If it would be necessary to sink a well to a considerable depth in order to have water the year round, it might be more economical to choose a location for the barn where water can be provided more easily. A stream of pure water running near the barn, or a spring from which water may be piped for the animals, is a valuable asset to the barn site.

If the barn can be arranged with reference to the pastures so that the horses will be obliged to come near the barn for water, they will become more accustomed to persons and can be more carefully watched than if the relative arrangement of the barn and pastures will not permit this. If many horses of various ages are to be accommodated, it may be advisable to provide barns on different parts of the farm in order that the animals may be kept separated; this will be desirable also in that the distance to haul the hay to the barns and the manure to the fields will be short.

FOUNDATIONS FOR HORSE BARNS

18. Cement blocks, stone, brick, and concrete are the only materials suitable for horse-barn foundations. Of these materials, concrete is usually the cheapest where the materials for making it are available, as all the labor of construction

can be done by the regular farm help, if desired. Cement blocks can be rapidly laid up in a wall, are durable, and, when available, are usually cheaper than stone or brick. Stone is more durable than brick, and, as it is usually laid into a heavier wall, it is somewhat more desirable, but the advantages of stone are so slight that where brick is cheaper it should be used instead, provided a good quality can be obtained and there is no discord produced in the architectural effect of the barn. Well-burned, hard, non-pervious bricks are the best to use, and if they are laid up into a hollow wall they have a tendency to make the building warmer than would be the case with a solid stone foundation.

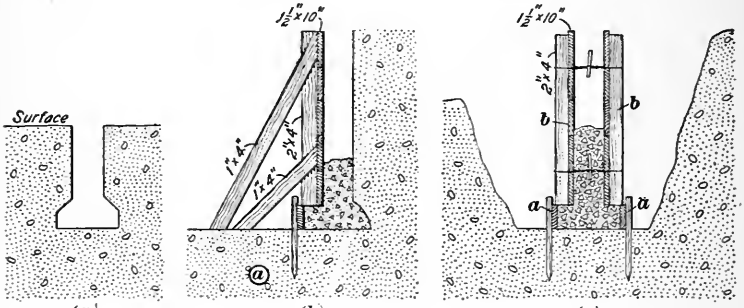


Fig. 21

A concrete foundation for a horse barn should be put down to solid soil or rock, and below the frost line. The width of the foundation will depend on the weight to be supported; widths of from 8 to 20 inches are commonly used. If care is exercised in digging the trench, forms for filling in the concrete are not necessary below the surface, except where the trench has to be dug wider than is required for the wall to permit the laying of a drain tile, or because the depth of the trench is so great that more room than the width of the trench is needed for digging it. The bottom of the trench should be from 8 to 12 inches wider than the regular thickness of the wall to allow for a footing of the wall to spread the weight of the barn over a greater area. This is illustrated in Fig. 21 (*a*). The widened portion should be from about 6 to 8 inches in

depth. If the trench is to be excavated on a hillside, it may be more convenient to dig one side in line and erect a wooden form opposite the bank, as shown in (*b*), which gives dimensions for the form material and shows at *a* the place for locating a tile drain. The dimensions for the form material given in the illustration are suitable for any width of barn foundation. Another method of form construction for foundations is shown in (*c*). In this method the trench is dug or plowed out considerably wider than the wall is intended to be; then the form *a* for the widened bearing base is put in place. After this has been filled with concrete and the latter thoroughly tamped, the upper form *b* is put in place, the two halves being fastened together by means of twisted wires.

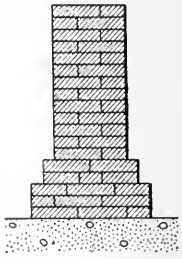


FIG. 22

Opinions vary concerning the proper strength to make concrete for foundations, but a mixture that has usually given satisfaction is 1 part of Portland cement, 3 parts of clean, sharp sand, and 5 parts of crushed stone. Another good mixture is 1 part of Portland cement and 6 parts of unscreened gravel.

Cement block, stone, and brick foundations should be constructed with a widened bearing base, such as is shown in Fig. 22. This base should be of about the dimensions given for concrete bases, depending on the weight to be supported.

WALLS FOR HORSE BARNS

19. Wooden Walls.—For many years the principal material used for horse-barn walls has been wood set on a brick or stone foundation, but the present scarcity and high price of wood in most localities will prevent it from being used as much in the future as in the past. Where wood is plentiful and can be had at a price that will permit of its use, it makes a fairly satisfactory material; however, it absorbs water and decays rather quickly, harbors vermin and parasites, is liable to burn, is apt to shrink and warp, and, although it is a poor conductor of heat, it fails to keep out heat in summer and

cold in winter as well as other materials, on account of the joints, or cracks. Wood makes a comparatively warm building, however, if the walls are made of several thicknesses, but, on account of its absorbing qualities, it is not as well adapted, from a sanitary or hygenic standpoint, as a non-absorbent material for the finishing of the interior and stalls.

When wood is used for horse-barn walls in exceptionally cold climates, it is necessary to make the walls double, and to provide an interlining of heavy building paper, in order to protect the interior of the barn from drafts. Fig. 23 shows a desirable form of wall construction for such climates; *a* is drop siding; *b*, tongued-and-grooved oak flooring; and *c*, heavy building paper. In most sections of the United States where horses are raised, a single wall of tongued-and-grooved lumber or barn boards with the cracks tightly battened will prove satisfactory; but as a matter of protection to keep the walls from being kicked to pieces, there should be a wainscoting of strong lumber around the inside of the part in which the horses are stabled. This construction is shown in Fig. 24. In (*a*) is shown a wall made of barn boards with the cracks battened with grooved strips; in (*b*) is shown the interior wainscoting, which should be not less than 5 feet high. For keeping out the rain, it is best to run the outside boards perpendicularly, as water will follow down a crack and not be so likely to go through. Drop siding is usually put on horizontally; it presents a better appearance than vertical siding, but is not so satisfactory for keeping out the rain.

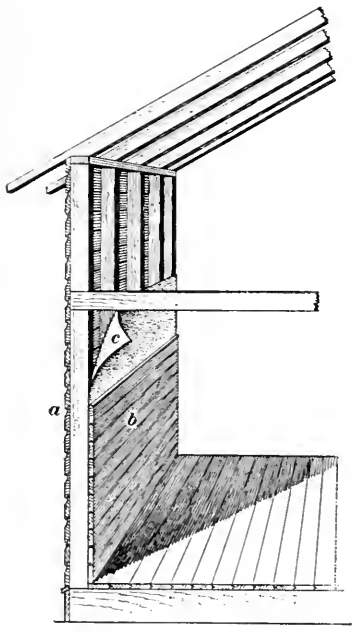


FIG. 23

Another form of wooden-wall construction that makes a warm and artistic building is illustrated in Fig. 25. In this

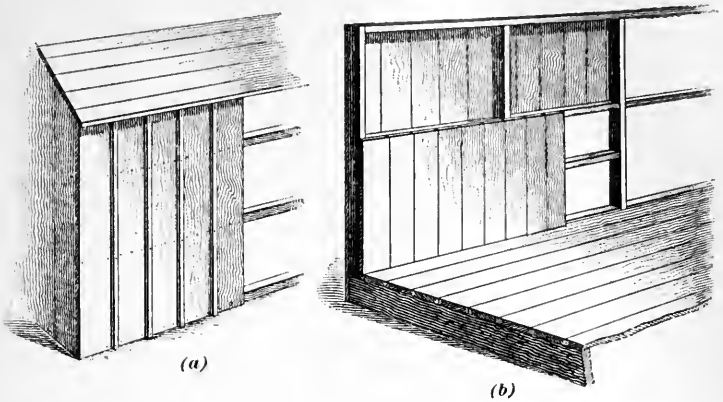


Fig. 24

construction, the building is first sided with ship-lap lumber, which is covered with building paper, and this, in turn, with shingles. If the shingles are stained before they are nailed on they will last longer and make the building more attractive.

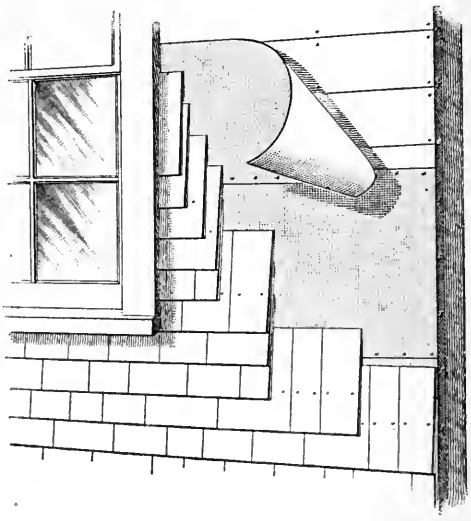


Fig. 25

20. Stone Walls. Stone is a good building material for horse barns, as it is non-absorbent and not inflammable. In localities where building stone is plentiful, it can be used to advantage, as a barn constructed of good stone has greater permanency than one of either wood or brick, and is, when good cement mortar

is used, equal to concrete. However, stone walls have the disadvantage of not being easily altered when changes in the building may be necessary.

In some sections of the country, stone suitable for building purposes can be obtained directly from the land, thus making it a cheap building material. If the available stone is not suitable for laying in a wall, it may be of such nature that it can be crushed into small particles of from 1 inch to $1\frac{1}{4}$ inches in diameter, mixed with sand and a good grade of Portland cement, and thus made into the best form of concrete. A building constructed of stone is warm in winter and cool in summer, but unless the walls are laid up double and with an air space between them, they are likely to be damp in cold weather, due to a condensation of moisture on the inside, although this trouble is not so marked when the building is

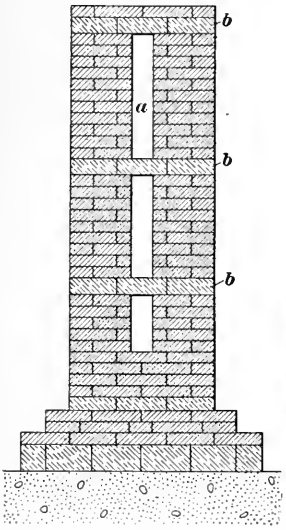


Fig. 26

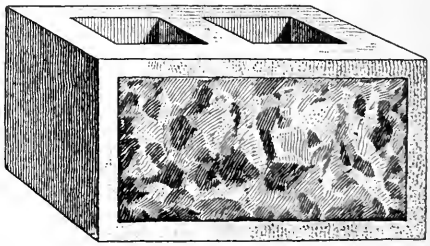


Fig. 27

kept well ventilated. Fig. 26 shows the air space *a* in a double wall; the layers *b* are binding courses to give strength to the wall.

21. Cement Block Walls.—Building blocks made of Portland cement, sand, and stone screenings are sometimes used as a wall material for horse barns. A common type of hollow cement block that is suitable for this purpose is illustrated in Fig. 27. Such blocks are made in various sizes and designs. Like concrete, they are durable provided the proportion of

cement used in their construction was sufficient to make them compact and without interstices which would allow them to absorb more or less moisture. Walls of cement blocks are useally somewhat more expensive than those of hollow or solid concrete, and are, therefore, not to be preferred.

22. Brick Walls.—Brick is a desirable material for horse-barn walls in localities where its cost is not excessive. In many sections, the initial cost of a brick barn is but slightly more than that of one constructed of wood, and considering the fact that brick is more durable than wood and does not need to be painted, the advantage is often in favor of the former material. Brick walls to be satisfactory should be laid up with an air space of about 2 inches between the outer and inner walls.

23. Combined Brick and Wooden Walls.—Some durable and attractive horse barns are made with walls of combined brick and wood. Where these materials are combined in a wall, the wall consists of a wooden framework lined on the inside with boards and on the outside with brick, as shown in Fig. 28. This form of construction is sometimes designated as brick veneering. If 2″×4″ studding is used, there will be a 4-inch air space between the brick and the wood. The single course of brick on the outside takes the place of a layer of wood and saves the expense of painting, and will not decay. If walls of a greater warmth are desired, a layer of building paper can be placed back of the sheathing on the inside and the outside sheathed with matched lumber before the brick wall is laid up.

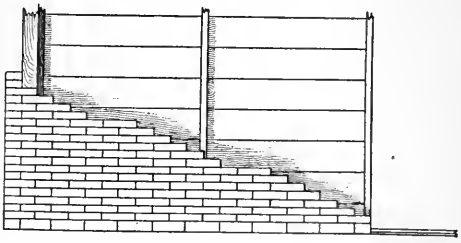


FIG. 28

24. Concrete Walls.—Concrete has not always been looked on with favor as a suitable building material for horse barns, because it absorbs moisture, thus making the building

damp. It is worse than either brick or stone in this respect, and walls of this material, like those of brick or stone, should be built with an air space. This can be done satisfactorily in several ways, as described later.

The usual method of mixing concrete is to use 1 part of Portland cement, 2 parts of clean, sharp sand, and 4 parts of crushed stone. If unscreened gravel is employed instead of crushed stone, the proportion should be 1 part of Portland cement to 5 or 6 parts of gravel. If the gravel is free from any mixture of sand, then sand should be added. Ordinarily, when gravel is used, a little more cement will be required than for crushed stone, as gravel does not have sharp projections for the cement to adhere to. For posts, columns,

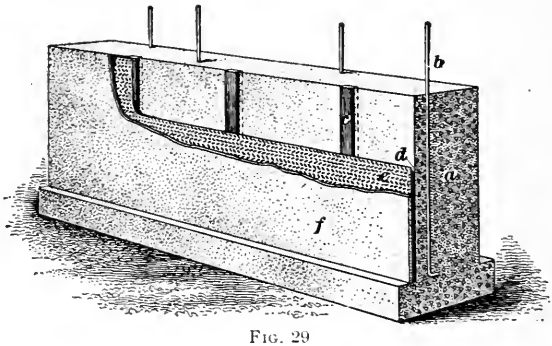


FIG. 29

and other structural parts subjected to high stress and requiring an exceptionally strong wall, the proportions sometimes used are 1 part of cement, 1½ parts of sand, and 3 parts of crushed stone. A good mixture for light work, such as for retaining walls, abutments, piers, etc., is 1 part of cement, 2½ parts of sand, and 5 parts of crushed stone.

25. It is likely that a wall of from 8 to 12 inches in thickness will be amply heavy for most horse barns. If the walls serve simply as a foundation or extend only to the second story, a well-built, 10-inch wall with a good footing should be satisfactory. If the wall is to extend the entire height of the building, it will probably be necessary to make the wall

a little heavier. The builder will necessarily have to be governed largely by his own judgment in building concrete walls, as it is impossible to give specific directions for such work without a knowledge of the materials available and the purpose the walls must serve.

A method of constructing a solid concrete wall so as to prevent dampness on the inside is to embed strips on the interior surface of the wall as it is built, nail metal lath to them, and plaster a thin coat of cement over the lath. This construction is shown in Fig. 29, in which *a* is a section of solid concrete wall; *b*, a reinforcing rod; *c*, a wooden strip; *d*, an air space; *e*, metal lath; and *f*, the finishing coat of cement. It is advisable to fasten the wooden strips, which

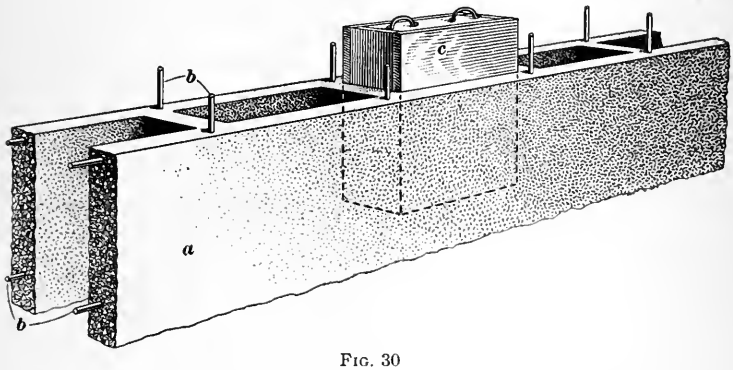


FIG. 30

should be about 1 inch in thickness, to the concrete by means of bent nails, wire, or some similar device.

26. One method of constructing a double concrete wall is to make two single walls connected by reinforced-concrete ties, as shown in Fig. 30. In the illustration, *a* is a completed section of the wall, *b* are reinforcing rods running in horizontal and vertical directions, and *c* is the box-shaped core for making the air spaces. The air space may be made from 6 to 10 inches wide, depending on the forms used; the width is not important except for convenience in making. Each half of the wall should be from 3 to 4 inches thick, depending on the weight to be placed upon it. The walls should have heavy

galvanized wire or iron rods placed horizontally in them every foot and vertically every 2 feet. Wall ties should be put in about 24 inches apart, and a new course inserted every time the forms are raised, so that the ties will be solid and continuous from the bottom to the top of the wall. It is not advisable to build collapsible forms more than 36 inches high, because they would be too heavy to handle; a 24-inch or 30-inch form is preferable. The forms should either be made of green lumber or be thoroughly saturated with water before they are used, otherwise they may swell and injure the work, and will be hard to remove. The wall foundation should have a footing. All corners should be built with a solid wall and when the hollow wall has reached within 6 inches of the

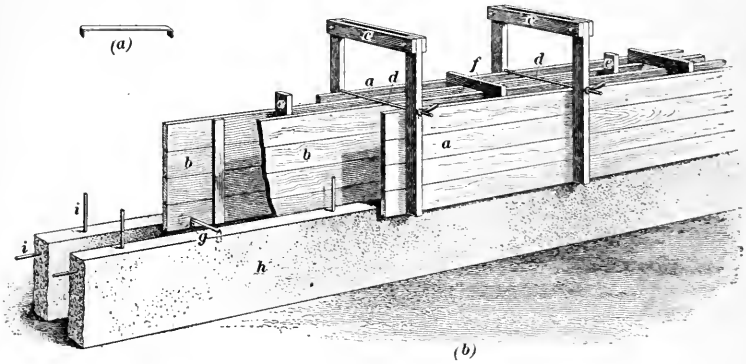


FIG. 31

top it should be bridged over with sheet iron, brick, or something imperishable, and the top made solid. In filling the forms, the concrete should be made wet so that it can be slushed in and all space filled without tamping; if made somewhat dry, it should be rammed down. The concrete mixture should be rich enough in cement to fill all interstices so as to make it strong and impervious to moisture. When the concrete has set and the forms are removed, the outside of the wall should be plastered with a mixture of 1 part of cement and 2 parts of sand to close all open spaces and keep out moisture, which, if allowed to enter and freeze, will cause the walls to disintegrate and crumble. In removing the

forms, the inside sections should be taken out first, but not until the cement is well set. Door and window casings should be made before the work is started and then set as the wall is being built.

27. Instead of using reinforced-concrete ties, it is possible to use metal ties of the shape shown in Fig. 31 (*a*). These metal ties are embedded in the concrete before it hardens. They should be placed not more than 2 feet apart horizontally; they are sometimes placed closer than this to add strength to the wall. Strap iron about 1 inch wide, or even heavy wire, can be used for this purpose. When metal ties are used, the forms can be constructed as shown in (*b*). The outer forms *a* and the inner forms *b* are made of $1\frac{1}{2}'' \times 8''$ planks fastened together with cleats. The outer forms are held in place by stays *c* made of $2'' \times 4''$ scantlings and braced by iron rods *d*, which can be tightened or loosened by means of nuts. The inner forms are held in place by wedges *e* made of $2'' \times 4''$ strips and stays *f* made of 1-inch material. The wedges are beveled on one edge so that they can be easily knocked out when it is desired to remove the forms. A notch *g* is cut in each section of the inner form so that the form will rest on the metal tie of the preceding course. A finished section of wall is shown at *h*, and vertical and horizontal reinforcing rods are shown at *i*.

28. Stucco Walls.—Satisfactory walls for a horse barn can be made by using wood for the structural work of the walls and covering the exterior with concrete. This process is known as stucco veneering and the walls are called stucco walls. Such walls are durable, artistic, and impervious to the weather. The method of making stucco walls is illustrated in Fig. 32. The studding of the walls is first covered with two thicknesses of roofing paper; furring strips are then nailed on over the roofing paper about 1 foot apart and to these are nailed metal lath *a*, as shown in the illustration. The stucco is usually put on in two coats. The first coat *b* is known as the scratch coat and should be pressed partly through the openings in the lath. The surface should be

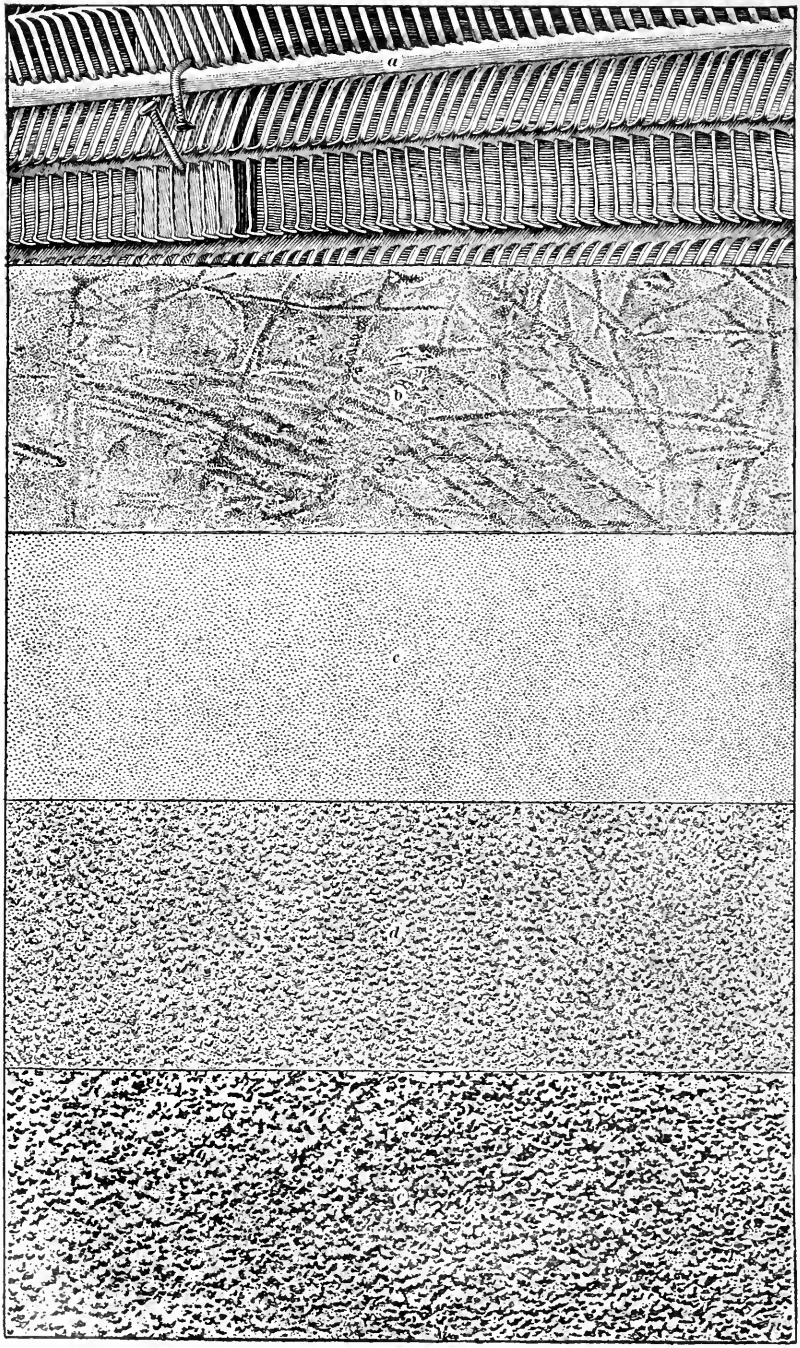


FIG. 32

roughened with a stick or trowel and allowed to set before the second coat is applied. The latter should be put on from ½ to 1 inch thick. For the second coat there are three finishes that can be used: the smooth finish *c*, the spatter-dash finish *d*, and the pebble-dash finish *e*. For producing the smooth finish, a wooden float is used. The spatter-dash and pebble-dash finishes give a rough effect that is usually considered more artistic than that obtained in the smooth finish. The spatter-dash finish is produced by throwing the last coat on with a stiff-fiber brush. The cement for this finish is mixed by using 1 part of Portland cement to 3 parts of coarse sand. The cement used for the pebble-dash finish is mixed in the same way with the exception that only half as much sand is used, pebbles not less than ¼ inch in diameter being substituted for the part of sand not used. This cement is put on with a trowel, the rough effect being obtained by the pebbles.

Because of the appearance of stucco work it is sometimes used in the finishing of brick and stone buildings. The cement mortar adheres directly to the walls of the building without the aid of metal lathing, if the walls are first cleaned and thoroughly dampened. Stucco may be colored by the addition of dry mineral colors such as lampblack, Prussian blue, ultramarine blue, yellow ocher, burnt umber, Venetian red, Chattanooga iron ore, and red iron ore, so as to produce almost any shade.

ROOFS FOR HORSE BARNS

29. Wooden-Shingle Roofs.—Wooden shingles are by far the most common roofing material used for horse barns. A good quality of cedar shingles, if well nailed on, will ordinarily last on a roof from 15 to 20 years, although some have lasted much longer; the steeper the roof, the longer the shingles will last. The life of shingles can be greatly lengthened by dipping them into boiling linseed oil before they are laid and securely nailing them with galvanized or cut nails that have sufficient body not to rust off within a few years and allow the shingles to become loose. When shingles are to be dipped, they should be taken out of the pack and dipped

separately or in handfuls; dipping them in the pack as they come from the mill is not advisable. A quantity of dry powder color added to the oil to stain the shingles, will add to the appearance of the roof. It is said that a cedar-shingle roof treated with linseed oil will last for 40 years or more. Painting a roof after it is laid is not to be recommended, as the paint cannot be applied under the lap where it is needed the most.

30. Slate-Shingle Roofs.—Slate is one of the most durable roofing materials that can be used for horse barns, but there are two objections to it, namely, the initial cost of the slate shingles and the large quantity of material required in the framework of the roof to support their excessive weight. Slate shingles laid with a single lap are coming into favor for barn roofs because they eliminate, in a measure, these objections, but single-lap roofs are not so effective as double-lap roofs in keeping out rains. An important advantage of slate as a roofing material that should not be overlooked is the fact that buildings covered with this material are less liable to be set on fire by sparks from engines or other sources than those covered with wooden shingles.

31. Tile-Shingle Roofs.—Tile shingles, like slate shingles, are durable, fireproof, heavy, and require strong timbers in the roof structure to support them. They are, however, artistic and especially suitable for brick, stone, and concrete buildings. The principal objection to their use is their cost.

32. Galvanized-Iron Roofs.—Galvanized iron, if kept painted, is a satisfactory roofing material for horse barns and lasts almost indefinitely, but if the painting is neglected the iron rusts out in from about 5 to 8 years. Galvanized-iron roofing can be purchased in either flat or corrugated sheets, either of which are satisfactory if kept properly painted. This material has the merit of being easy to put on and of not requiring a heavy framework for its support. Also, it is fireproof from the exterior. Its greatest disadvantage lies in the fact that it becomes intensely hot under

the direct rays of the sun, thus heating the interior of the barn to a disagreeably high temperature in summer.

33. Specially Prepared Paper Roofs.—Specially prepared paper, which is made of building paper treated with some material such as creosote to make it durable and impervious to rain, is extensively used for covering horse barns. In order to make specially prepared paper roofing last well, it should be laid on a smooth surface, as any irregularity between the sheathing boards will cause the paper to break. The sheathing boards holding the paper should be well supported by rafters and studding so that there will be but little spring and variation between them; otherwise, in putting on the paper, it will be broken by one part springing down below another. The strips of specially prepared paper roofing must be nailed down with small nails and caps, and the capped edges cemented together, in order to prevent the wind from entering between the edges and tearing the paper off. When specially prepared paper roofing is properly laid, it will last from about 5 to 12 years, depending on the quality of the paper used.

34. Tar-Coated Building-Paper Roofs. Building paper coated with tar is frequently used as a roofing material for horse barns where comparatively little pitch can be given to the roof. The sheathing is covered with heavy building paper, a coat of coal tar is applied, a layer of fine gravel is put on over the tar, and then an additional layer of tar and of gravel is laid on top of these coats. This makes a satisfactory roof, if properly laid, and by repairing it every 4 or 5 years with a new coat of tar and gravel, it will last almost indefinitely. A roof made of this material is fireproof from the exterior.

FLOORS FOR HORSE BARNS

35. It is likely that different flooring materials will be used in different parts of a horse barn. For instance, it may be that a wooden floor will be the most satisfactory in the feed alley and a cement floor the most desirable in the stalls,

or vice versa. The relative merits of the different flooring materials are discussed here with especial reference to their use for stalls, and it is recommended that the person constructing the barn use his own judgment in selecting materials for the other parts of the barn, if it is desired to use in such parts a different material from that used in the stalls.

36. Clay Floors.—Clay, if well underdrained and properly cared for, is fairly satisfactory for a stall floor and has the advantage of being cheap. Being slightly springy, clay is easy on a horse's feet and is not slippery or destructive to bedding, although, in order to make it an efficient floor, a large quantity of bedding may be used in order to absorb the liquid manure. Clay floors should be thoroughly cleaned and aired each day to keep them in a sanitary condition. They must also be repaired frequently with new clay to keep them level. Clay floors are more satisfactory for use in a box stall where the animal has plenty of room than in a single stall where a hole soon becomes worn, due to the constant tramping in one place. Thus, because clay floors require constant cleaning and repairing, and are not wholly sanitary, they cannot be unreservedly recommended.

37. Sand Floors.—Sand, being soft, is extremely easy on a horse's feet and allows them to sink in until the weight of the animal rests partly on the soles and frogs, an advantage not possessed by any other kind of floor. Because of this fact, sand floors are especially well adapted for horses that work on pavements and hard streets, because such horses must always be kept shod with calked shoes, which prevent the frogs and soles of their feet from coming into contact with the ground and sustaining a part of the weight. Dry sand serves also as a bedding material, and when it is used but little other bedding is needed, although care must be exercised to keep the stable clean. The old sand should be replaced with a fresh supply occasionally for sanitation. For farm horses, brood mares, and colts, sand floors are not as desirable as those made from more solid materials.

38. Wooden Floors.—Wood has been extensively used for many years as a flooring material for horse stalls. Because it is a poor conductor of heat, it affords a far more comfortable surface for animals to lie on than brick, stone, or cement, particularly where little or no bedding is used. Also, the bedding is not broken up so badly on wooden flooring as it is on brick, stone, or cement, due to the greater softness and resiliency of the former.

When wood is used for stall floors it is generally laid in the form of a platform of single thickness on stringers close to the ground or on floor joists some distance above the ground. Board floors are rarely given any preparation before or after being laid; consequently, being porous and more or less open at the cracks, they are not sanitary and soon decay or are worn out by the tramping of horses and the use of tools in cleaning the stalls. A comparatively good floor can be made, however, by using good tongued-and-grooved oak plank flooring, filling the joints with coal tar, and then laying a second floor on top of the first, with the joints treated in the same way but lapping those in the first floor. If well-seasoned lumber is used, such a floor should last for 10 years, provided the air can circulate underneath to prevent decay.

In some sections, short, round wooden blocks are often used as a flooring material for horse stalls. The blocks are sawed into uniform lengths and are set on end, the interstices being filled with concrete. The blocks should be thoroughly seasoned and then treated with cresote before they are laid; after they are laid a brushing of coal tar should be given to them before the concrete is filled in. Wooden blocks are not so hard and slippery as brick or concrete, and are comparatively noiseless and impervious to moisture when put down properly, but they do not last well under horses that are kept sharply shod.

39. Concrete Floors.—Concrete is one of the most desirable flooring materials for horse stalls. It is somewhat objectionable on account of being slippery, cold for the animals to lie on, and in affording little rest for their feet;

but its advantages, from the standpoint of sanitation, are so great that many farmers and horsemen prefer it to all other materials. When concrete floors are used, plenty of bedding should be kept under the horses to prevent them from breaking their front hoofs in stamping. Unless covered with wood, concrete is not well adapted for use in a livery barn where horses must be kept shod with sharp-calked shoes in winter.

In constructing a concrete floor for horse stalls, it is advisable to put in a good foundation. An excavation of about 24 inches should first be made, and this should then be filled with about 18 inches of cinders or small stones. It is possible to leave out a part or all of the cinders or stones if these materials are not readily available, but the floor will be much more substantial if they are used. On top of the cinders a layer of concrete about 5 inches thick should be laid. A safe strength of concrete to use for this purpose is 1 part of Portland cement, 2 parts of sand, and 4 parts of crushed stone, or, if the latter is not available, an equal quantity of fairly coarse gravel. The finishing coat, which should be about 1 inch thick, should then be put on. For this coat it is advisable to use concrete made of about 1 part of Portland cement, 1 part of sand, and 1½ parts of crushed stone. This method of construction is illustrated in Fig. 33; *a* is the foundation of cinders; *b*, the first layer of concrete; and *c*, the second layer. The concrete should be rammed down to proper grade, which, for single tie stalls, is an inclination to the rear of about 1½ inches in 9 feet. By allowing the crushed stone to come to the surface the floor is prevented from wearing smooth and slippery, and is better than a sand finish, with the surface roughened.

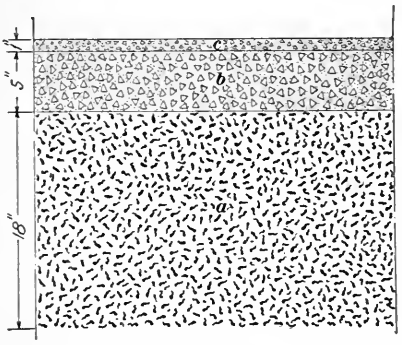


Fig. 33

If desired, a gutter can be constructed in the concrete at the rear of the stall, but if this is done the gutter should be covered with either perforated metal or wood. Because of it being a non-absorbent, the former is better than the latter, although it is somewhat more expensive. The passageway at the rear of the stall may be laid with either concrete or bricks; the latter are preferable because they are less slippery, although the former is satisfactory if the surface coat is made of fairly coarse crushed stone.

If it is desired, the concrete can be covered with wood in order to gain some of the advantages of both kinds of floors and to avoid some of their disadvantages. When this is done, the wooden portion should be made in the form of a slat grate such as that illustrated in Fig. 34. The spaces between the planks, which should be of hardwood, preferably oak, and about 2 in. × 8 in. in dimension, are about ½ inch wide. The planks are bolted together at each end by means of a long bolt that passes through each plank, and are held apart by metallic washers. A grate of this kind can be easily removed and the stall flushed out with water.

Fig. 34

40. Asphalt Floors.—Asphalt laid on a concrete base is more springy, and hence is not so hard on the feet of horses or so wearing on shoes as concrete. However, it cannot be recommended for a stall floor, because it is slippery when wet and not very durable under the tramping of newly sharpened shoes.

41. Brick Floors.—Brick floors, if made properly, are fairly satisfactory for horse stalls, but they are not very easy to clean. Only the best quality of paving bricks should be used for stall floors, as common soft bricks are too absorbent, chip readily, and wear away unevenly. In order to make a brick floor impervious to moisture, the interstices should be filled with either asphalt or dry sand and cement; the

latter mixture, when moistened, will set and form a fairly durable floor and one that is not absorbent. If the bricks are to be subjected to heavy loads, they should be laid on a concrete foundation; at other places, a 6-inch layer of gravel or crushed rock, if well rammed down and covered with a ½-inch layer of sand, will do.

42. Stone Floors.—Stone blocks are sometimes used as a flooring material for stalls and are fairly satisfactory, but floors made of such are not as smooth and hence not as sanitary as concrete floors. If stone blocks are used for stall floors, they should be laid on a concrete bed, or on 6 inches of gravel or cinders rammed down and covered with ½ inch of sand. Some kinds of stone blocks are very slippery unless the cracks are left open to catch the calks of the horses' shoes. Because of their unevenness, stone-block floors are usually not to be preferred to concrete floors.

LIGHTING AND VENTILATING OF HORSE BARNS

43. Windows for Horse Barns.—Because sunlight has a good effect on horses and is also a powerful disinfectant, the horse barn should be provided with a sufficient number of windows to keep the interior bright and sunny. Windows in the south side of a barn will, of course, furnish more sunlight than those in any other side, but each side should have its complement of windows. It should be borne in mind that high windows admit much more light than low ones, as more light comes from high above the horizon than lower down. Buildings that have thick walls should have larger windows than those having thin walls, because in the case of the former a part of the light coming from above is excluded by the thickness of the wall. This same principle may be observed when a projection, such as an awning, is placed above a window.

Stalls cannot be made too light, but the direct sunlight should not strike the eyes of a horse, as it is likely to injure the sight. Horses stabled in darkened stalls are more subject

to weak eyes than those kept in light stalls. Whitewash applied to the walls and ceiling of a stall adds greatly to the lightness and also serves as a disinfectant.

Cloth-covered windows, which are sometimes used in horse barns, are discussed later, as they are used largely for ventilation.

44. Artificial Light for Barns.—It is an advantage to have the horse barn lighted by means of artificial light. Electric light is the best for this purpose and is often used when it is available. Natural and acetylene gas are also extensively used for lighting horse barns. The person managing the barn must, of course, be governed by local conditions in deciding whether an artificial lighting system would be an economical investment, and if so, on the kind of light to use.

45. Ventilation for Horse Barns.—In planning a horse barn, one of the first considerations should be its ventilation. The size of the barn should be determined not only by the actual space required for the comfort of the animals but also by the amount of air space needed to give them fresh air at all times. Of course, the air space alone is practically worthless unless there is some means of bringing fresh air to it and carrying away the bad air.

In designing a barn, about 1,000 cubic feet of air space per animal should be allowed. As a rule, with a good system of ventilation and in a barn for several horses, this space per horse will be ample, although some authorities put it much higher. When the building is small, accommodating only one or two horses, more air space may be allowed, but in no case does it need to exceed 2,000 cubic feet per animal, even for the highest class of race horses when in training. In calculating the available air space per animal, the minimum cubic air content of the barn should be figured; that is, the air content of the barn when it is filled to its greatest capacity with hay and grain. This makes it necessary to take into consideration only the part of the barn in which the animals are stabled and the feeding alleys are located. After the

cubic content of air has been figured for these parts, the sum should be divided by the number of animals and the result will be the available air space for each animal.

46. There are two general methods of ventilation, namely, forced ventilation and natural ventilation. Forced ventilation is accomplished by forcing a current of fresh air in the building by means of a fan or other device. This system of ventilation is rarely applied to barns, being almost entirely confined to large office and public buildings in which the air is first heated and then sent through air ducts to the various rooms. Natural ventilation takes place with or without special devices and is based on the fact that cold air is heavier than hot air and has a tendency to replace it.

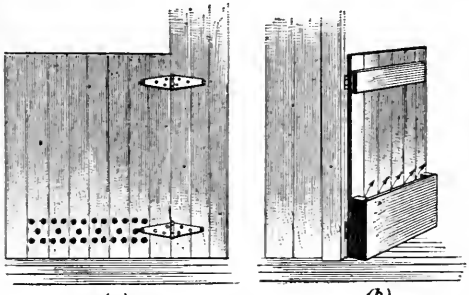


FIG. 35

Although natural ventilation takes place without the assistance of artificial agencies, its extent and efficiency can be controlled by various devices. The most common means of regulating ventilation is by doors and windows. Ventilation of this kind is satisfactory when no draft is created that strikes the animals. The air in a stable can readily be changed by opening windows or doors on opposite sides of a building, but such ventilation usually creates drafts. In order to avert drafts when windows or doors are used for ventilation, the intake should be constructed so as to break the direct force of the outside air and diffuse it throughout the building. Among the means devised for this purpose, that shown in Fig. 35 is perhaps the simplest and cheapest. In (*a*) is shown a door bored full of holes at the bottom, and in (*b*) a device nailed to the inside of the door. This device is made by nailing two $2'' \times 4''$ strips to the edges of the door at the bottom and on these nailing a wide board, thus forming a box open

at the top; the incoming current of air strikes the board forming the side of the box and is deflected upwards. Such devices are not wholly satisfactory, because the fresh air is not admitted at a point high enough in the stable.

A more satisfactory method of ventilation is to provide double-sash windows and raise the lower sash a few inches so that a board can be inserted under the sash to close up the opening; this allows fresh air to enter between the sashes

Fig. 36

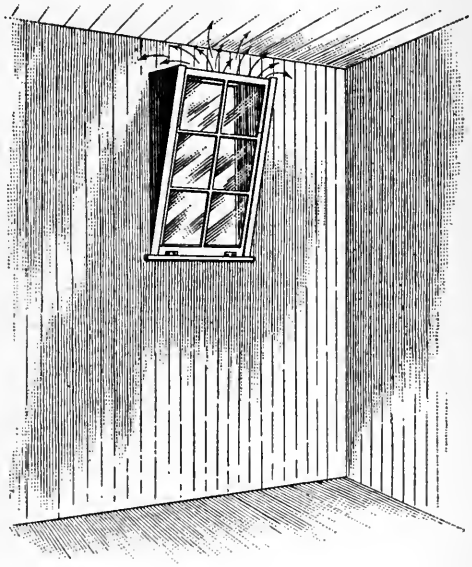


Fig. 37

and the air-current is turned upwards. This arrangement is illustrated in Fig. 36.

A still better plan is to use a single-sash window hinged at the bottom so that it may be allowed to drop inwards at the top, thus directing the current of air upwards. This method of ventilation is illustrated in Fig. 37. Such an arrangement admits the air near the ceiling, where it should be admitted, breaks the force of a direct current, and excludes rain.

47. Cloth-covered windows are satisfactory air intakes, the cloth breaking the direct inward current of cold air and allowing diffusion to take place rapidly. When ventilation is dependent on cloth-covered windows, the windows should not be too large but should be numerous on all sides of the building. Cloth-covered windows, however, will likely lower the temperature of the barn more than any other system of ventilation. Fine-mesh screen wire windows, also, will break the force of direct drafts but are not as good in this respect as cloth-covered windows, and cannot be as well recommended.

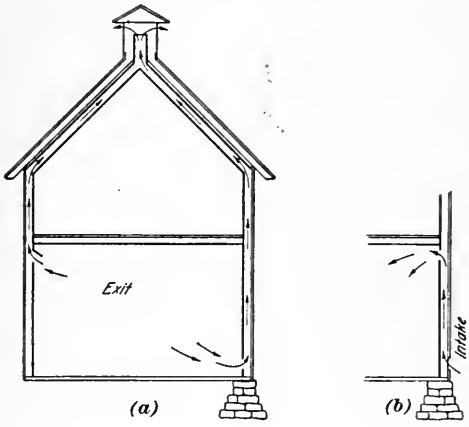


FIG. 38

48. One of the best systems of ventilation, known as the King system, admits the air by means of an air-shaft constructed in the wall of the building so that cold air is taken in near the ceiling and the contaminated air is taken out near the floor. The impure air laden with carbonic-acid gas, being warm when given off, tends to rise to the ceiling. The current of the fresh air tends to cool and drive the warm, impure air downwards, thus creating a current toward the exit ventilator through which the impure air passes and is carried out by means of an air-shaft, which should have its opening in a cupola. Also, as the impure air rises to the ceiling it becomes cooled and the carbonic-acid gas, being heavier than air, settles near the floor and is carried out by a current of air. The exit courses of the impure air are illustrated in Fig. 38 (*a*). The lower right-hand exit is the one commonly used, the upper left-hand ventilator exit being kept closed except when it is desired to lower the temperature in the building. In (*b*) is illustrated the intake of the King system.

49. In Fig. 39 is illustrated another system of ventilation that is sometimes used for horse barns. In this system, there is an air duct with a fresh-air inlet some distance from the building. A hood with a vane attached so that the hood opening is always facing the wind is erected at the outer end of the air duct, which should be some distance away from the barn and preferably on a hilltop. The other end of the air duct is usually located under the mangers and is provided with adjustable openings to regulate the intake. It is claimed

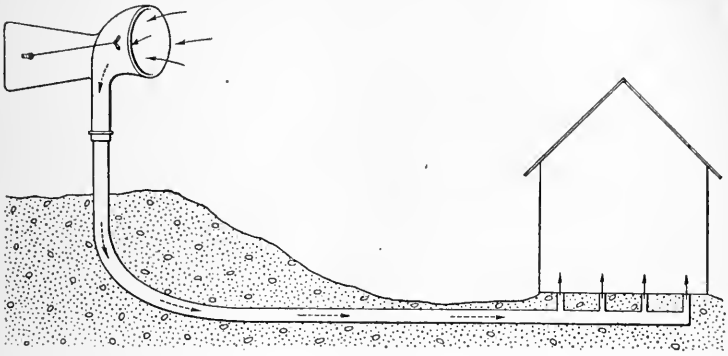


FIG. 39

for this system, which is, in a measure, forced ventilation, that the fresh air is admitted at the head of each animal, where it is needed, and the contaminated air is driven back to other parts of the building where it finds its escape; thus, the animals always have fresh air to breathe. Although this plan at first thought appears to be a good one, the proper regulation of the air intakes is somewhat difficult and requires close attention in cold weather. In addition, the cost of installing such a system is greater than for the King system, which is much better.

EQUIPMENT FOR HANDLING FEED AND MANURE IN HORSE BARNS

50. Equipment for Handling Feed.—In every horse barn where it is possible, there should be a number of bins for grain and ample storage room for all of the hay needed during the

year. As dampness in hay must be avoided, it should be stored in a dry loft rather than on the ground. The loft should be well ventilated, and, if it is located over the stalls, should be tightly floored and otherwise kept closed from below to exclude dust, foul odors, and damp, warm air, all of which would damage the hay. If corn is kept in the barn, it should be stored, preferably in the ear, in cribs sided on both sides with slats so that plenty of air can circulate through the corn. The floor of the crib should be at least a few inches from the ground in order to avoid dampness. Oats, like corn, should not be stored on the ground, for they are even more likely than corn to become musty if slightly damp. If not thoroughly dry when stored, oats should be turned occasionally or they will become musty and unfit for horse feed, even when stored in a proper place.

The best location for the grain bins depends on the plan of the barn; as a rule, they should be at one end and on the second floor, with spouts leading below to feed boxes in a feed-mixing room. If the number of horses will justify the expense, there should be a fanning mill for the cleaning of grain, and an oat and corn crusher for preparing the grain feed. A small pair of portable scales will also be found useful about the feed room.

51. The principal kinds of feed boxes for use in stalls are those made of wood and of iron or steel. Iron feed troughs have the merit of being sanitary and durable, but they cost more than wooden boxes and become so cold when the temperature is below freezing that the lips of the horses are liable to become sore. Horses frequently waste considerable of their feed by rooting it out when fed in small boxes, and, as most of the iron feed boxes are small, this type of box is not economical. Wooden boxes constructed of some hard lumber, such as oak, are usually satisfactory. They can be made any size and shape to suit the needs, and the edges can be ironed to prevent the horses from chewing them. Fig. 40 illustrates a convenient wooden swinging feed trough that is suitable for a box stall and especially well adapted

for the feeding of stallions, as the feeder does not need to enter the stall. When the box is hung in place and is ready to receive the feed, it stands as shown in Fig. 40. When swung around so the horse can feed, nothing is seen from the front but a plain wall. When not in use, the trough should be swung out of the stall so that no projections will be left for the horse to rub against.

A combined feed and water trough, of which there are several on the market, is not recommended, and the same may be said of the patent hoppers that are operated by clock

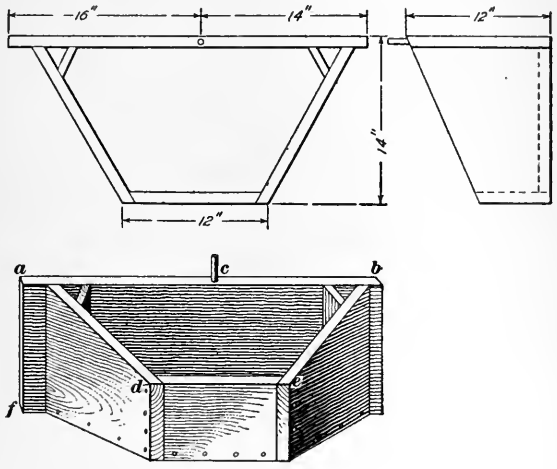


Fig. 40

movement. The latter may be set as an alarm clock is set, so as to feed all the horses in the barn at a given hour, and if everything works properly the hopper opens and the feed drops into the horses' troughs; however, there is a possibility that some horse may be sick and hence is not in shape to receive its regular feed of grain. Automatic feeding of animals is impractical.

If a barn is arranged so that all the horses can be fed at one trip through the barn, a great deal of labor will be saved. Where there is a smooth floor in the feed alley a feed car built of galvanized steel is one of the most convenient means of

FIG. 41

handling grain. In Fig. 41 is illustrated a low-wheeled cart that runs easily on a smooth floor. The cart has several compartments for different kinds of grain and is equipped with a pair of spring-balance scales by which weights may be taken occasionally as a check on the quantity fed. A quart or a half-gallon cup that holds a standard quantity will be found convenient for measuring out the feed.

52. Hay racks may be built of wood or iron and located to suit the desire of the horseman. In Fig. 42 is shown one form of a corner hay rack that is commonly used; it is somewhat objectionable because it cannot be easily filled save from the loft above and the hay often lodges in the top so that the horses cannot reach it. A form of collapsible iron rack that is used by some horsemen is shown in Fig. 43. A metal spring causes the rack to close up as the hay is eaten out, so that the hay is always within reach of the horse.

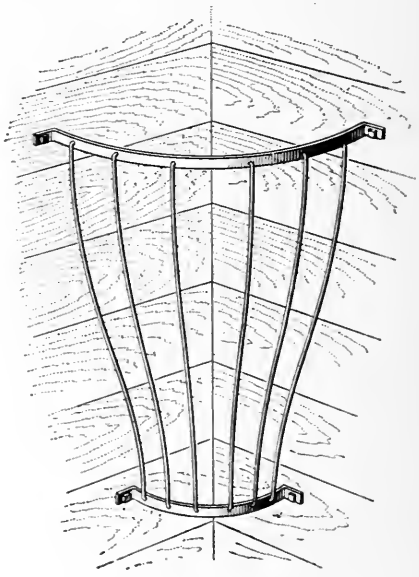


FIG. 42

For all purposes and conditions, the common manger and hay chute illustrated in Fig. 44 is cheap, convenient, and

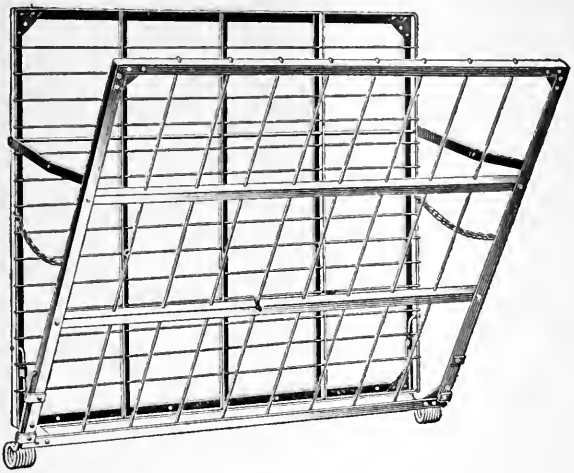


FIG. 43

practical. When such a device is used, however, there should be some means for closing the chute during cold weather, in order to prevent drafts. Horsemen who have used such a

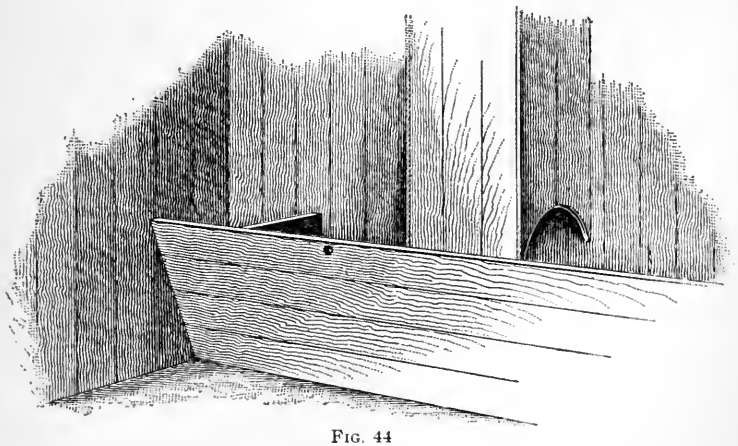


FIG. 44

manger and chute without a means of closing the chute, report trouble with pneumonia and lung fever in their horses.

When horses are kept in box stalls, it is the practice of many horsemen to feed the hay by simply throwing it on the ground in the stall. It is claimed by those who follow such a practice that there is less wasted than when it is placed in mangers.

Weighing the hay for each feed is too much trouble to prove practical, but an arrangement whereby an occasional weight may be taken as a check is a good thing. A sheet about 60 inches square with an eyelet placed in each corner or a 200-pound bran bag will be found convenient for holding the hay to be weighed. A little experience gained through weighing the hay will enable the feeder to estimate very closely the quantity of hay each horse receives.

53. Equipment for Handling Manure.—A number of litter carriers that are on the market are convenient for removing the manure from horse barns. These carriers run on steel tracks or cables that extend from the rear of the stalls to a manure pit or manure wagon.

Some horse barns have a manure pit in the basement, in which case the horses are stabled on the first floor. The pit is usually large enough to accommodate a wagon or a manure spreader so that the manure can be dumped directly into it as the stalls are cleaned. Sometimes the manure is allowed to accumulate in the pit and is hauled away as opportunity permits. Pits are not very desirable, as the odor arising from decomposing manure is offensive and unsanitary, and where the pit is underground, the driveway is likely to be slippery during the winter.

Sometimes a gutter is constructed in the back of the stall to catch the liquid manure. In this case the gutter may be kept filled with some absorbent material or it may have connections leading to a cistern or to the manure heap. There is considerable disagreement among authorities as to the most economical method of handling liquid manure, consequently no definite instructions can be given relative to this point. However, in the case of a concrete floor a gutter is practically a necessity for sanitary reasons.

HORSE PADDOCKS

54. Size and Location of Horse Paddocks.—The term **paddock,** as used by horsemen, designates a small lot, usually turfed, that adjoins or is near to a horse barn. Paddocks are usually used chiefly as places in which horses can get exercise, and should be sufficiently large to eliminate danger of injury when several animals are turned into them. A small paddock is desirable for a horse that has not been out of the barn for some time, as he will not be so likely to overexert himself in running and playing as he would in a larger one. A paddock for the special use of a stallion should be large enough to provide plenty of grass for pasture; in most localities, two acres will be ample.

The size and number of the paddocks must, of course, be determined largely by the area of the land available for this purpose and the number and kind of horses to be accommodated. There should be a separate paddock for brood mares and their colts, and also for yearling stallions and fillies, which should not be allowed to run together. It is not a good practice to allow draft colts and light colts to run together, as light colts play too fast for draft colts, and the latter, in their endeavor to keep up, overexert themselves, which is likely to result in unsound legs.

If possible, paddocks should be located where there is good natural drainage so that they may be used at all seasons of the year. If, however, they are poorly located with regard to drainage, they may be improved by tile draining. If a paddock is to be used merely as an exercise lot and the material is available, the surface of a part or all of it may be covered with cinders, gravel, or crushed rock. This will help to keep the horses out of the mud at times when the ground is wet and soft, and will probably lesson the number of cases of scratches, a disease often resulting from keeping horses in muddy lots or stalls.

55. Fences for Horse Paddocks.—When possible, permanent fences should be used around the paddocks, and they should be built high enough to prevent all danger of horses trying to go over them. Any material that can readily be

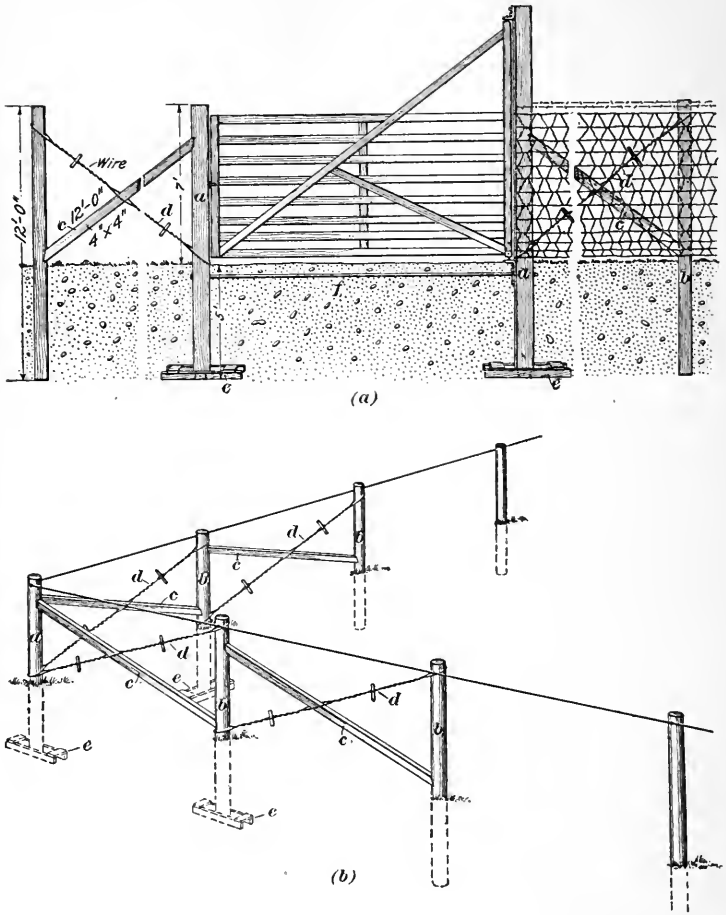


FIG. 45

seen, such as wood or concrete, makes a better fence for turning horses than a material that is almost invisible, such as wire. The only justification for using a wire fence for a horse paddock is that of economy, and then, as a rule, only

woven-wire fences should be used. Many accidents happen to horses from barbed-wire fences around paddocks; the annual loss of animals due to injury from this source is large.

If woven-wire fencing is used around the paddocks, both the horizontal and the vertical strands should be of No. 9 wire. It is desirable to have the fence at least 5½ feet high and preferably 6 feet; then, if one or two barbed wires are put on top there is little danger of the horses trying to go over it, provided that they are familiar with its location and that the fence is tightly stretched. Two barbed wires can be placed to good advantage on a level on opposite sides at the tops of the posts. This will prevent horses from bearing down on the top of the fence and pushing out the staples. In building this kind of a fence, there should be posts every 10 or 12 feet, and they should extend into the ground about 3½ feet. The corner and end posts should be set at least 5 feet deep and be braced. The proper method of setting these posts is illustrated in Fig. 45. In (*a*) is shown the end posts *a*, a bracing post *b*, wooden braces *c*, wire braces *d*, anchors *e*, and an iron tie-rod *f*. In (*b*) is shown a corner post *a*, bracing posts *b*, wooden braces *c*, wire braces *d*, and anchors *e*. A woven-wire fence with the posts set in this way will be firm and rigid and will stand up better and last longer than a fence built of wood, as there will be little wind pressure against it. As a protection against lightning being carried on the fence, wires having a contact with each horizontal wire in the fence and the lower end buried in the ground should be erected every 6 rods. When good material has been used, the durability of a woven-wire fence is largely determined by the tension of the wire and the rigidity of the posts to which it is tied. The stay wires should be as heavy as the horizontal strands; otherwise, they will soon rust out and shorten the life of the fence.

56. For enclosing small paddocks, where the fence is subjected to considerable strain due to the animals crowding against it, wood is preferable to woven wire, because of its rigidity. A fence built with the boards running horizontally

requires at least two posts to the rod, and three posts will make it stronger. Fig. 46 shows a desirable form of con-

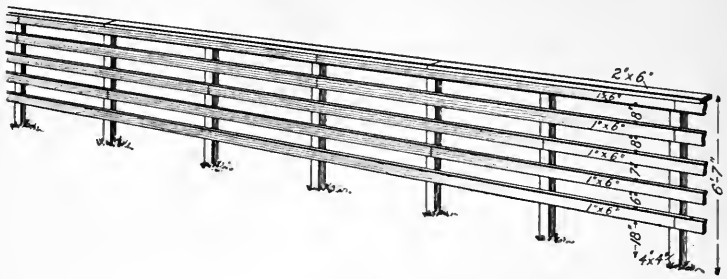


Fig. 46

struction for wooden fences, and gives dimensions for the various materials. If the fence is subjected to hard usage, the boards should be 2 in.×6 in. instead of 1 in.×6 in. as given, and the rail should be 2 in.×8 in. instead of 2 in.×6 in.

Another form of wooden fence is shown in Fig. 47. Frequently old material can be used for the pickets of such a fence.

Concrete is sometimes used for paddock fences when expense is of no consideration. The construction of concrete fences for horses, however, is still in the experimental stage, hence they are not to be recommended unless the horseman or farmer is willing to experiment until the proper strength of materials has been determined.

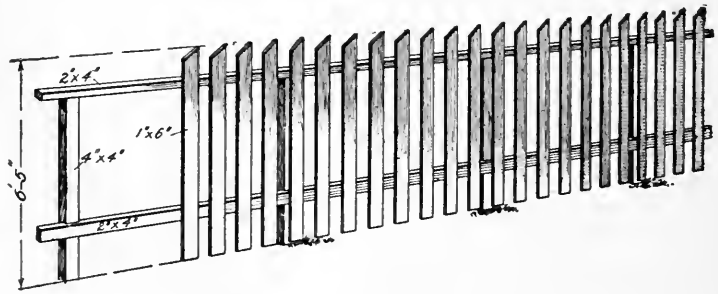


Fig. 47

Temporary and portable fences for paddocks are not to be unreservedly recommended, but in special cases it may be

necessary to use them. A portable panel fence with dimensions for the various materials is illustrated in Fig. 48. In (*a*) is shown the method of construction and the dimensions of the materials for the panel; in (*b*) is shown the construction and dimensions for the supporting crotch; and in (*c*) is shown two panels and a crotch in place as a fence. The crotch merely sets on top of the ground and the panel is supported by it. The sections can be moved from place to place at will.

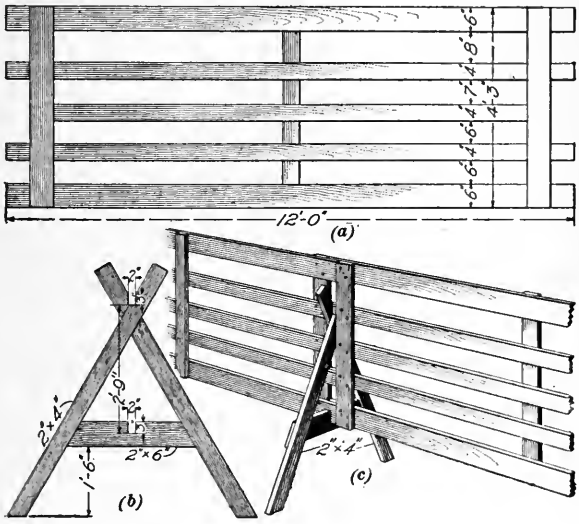


Fig. 48

57. Water Supply for Paddocks.—When a running spring is accessible, there is no better source of water supply for the horse paddocks. Spring water is pure, if obtained directly as it comes from the ground, and is always cool and refreshing. However, the number of farms where springs are accessible is very limited and it is likely that a creek or well will have to be used. Creek water is fairly satisfactory, but there is always the danger of disease germs being carried down stream from a farm lying above. Water pumped from a well that is known to be pure, and piped to tanks where it is needed, is by far the most common source of water for horses. Where

this system is used care should be given the place where the animals drink to keep it from becoming muddy or slippery. All tanks should be fitted with a waste pipe to carry off the overflow.

58. Shade for Paddocks.—In paddocks in which horses are kept in summer there should be ample shade under which the animals may gather during the heat of the day. A few trees growing in the paddock will supply sufficient shade for several animals; however, there is an element of danger in having trees in a horse paddock, as limbs and tops are likely to be blown off during storms and thus injure some of the horses. There is danger, also, that a tree may be a conductor of lightning.

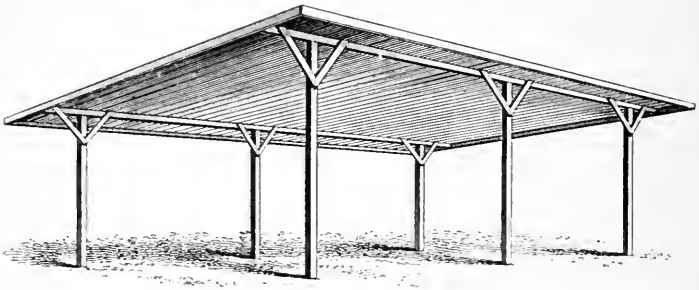


FIG. 49

Where there are no trees available for shade, a sunshade similar to that shown in Fig. 49 should be erected. This may be built of any dimensions desired.

59. Care of Paddocks.—The paddocks surrounding a horse barn should be kept clean and free from filth by occasionally raking up the surface, and removing the coarser parts, and allowing the action of the sun to disinfect the surface soil. Frequent cultivation aids in renovating a soil, but, as a rule, it cannot be recommended for lots and paddocks on account of the undesirableness of a loose surface soil, which, on a hillside, washes more or less into gullies.

If horses are kept too long on one pasture, the land is likely to become what in England is called *horse sick*. Just

what this is no one seems to know, but horses do not thrive on grass from a horse-sick pasture, even when there is an abundance of it. This condition has been noticed only on small pastures that have been grazed heavily for a number of years, and does not seem to exist, or at least has never been observed, in pastures of large area. To avoid such conditions, horses should be put on fresh soil at intervals of a few years and another class of livestock grazed for a year or two on the horse pastures, or the pastures may be plowed up and cropped for a year or two.

TYPES, BREEDS, AND MARKET CLASSES OF HORSES

(PART 1)

INTRODUCTION

1. Horses are classified, in a general way, according to *type*, *breed*, and *market class*. The term **type,** as applied to horses, is used to denote a group of animals that bear close resemblance in their natural and acquired fitness for a particular purpose. For instance, horses of the French Coach, German Coach, Hackney, and Cleveland Bay breeds are similarly adapted for the drawing of light vehicles over roads or streets, and hence are classed as a type—the coach, or carriage, type. Most of the modern breeds of horses may be classed as belonging to some type; however, a few of the breeds, at the present time, can scarcely be said to be of any particular type. For example, some horses of the Morgan breed are of the roadster type, some are of the carriage type, and some are of the saddle type.

By the term **breed** is meant, as in the case of all other classes of domestic animals, a race, or strain, the members of which have the power to transmit their distinguishing characters with a reasonable degree of certainty. The breeds of horses have such distinctive names as Hackney, Percheron, Belgian, Clydesdale, etc., the name being derived, in most instances, from the country or province in which the breed was originated.

A **market class** of horses is a group of animals each of which meets the requirements of the market for that particular

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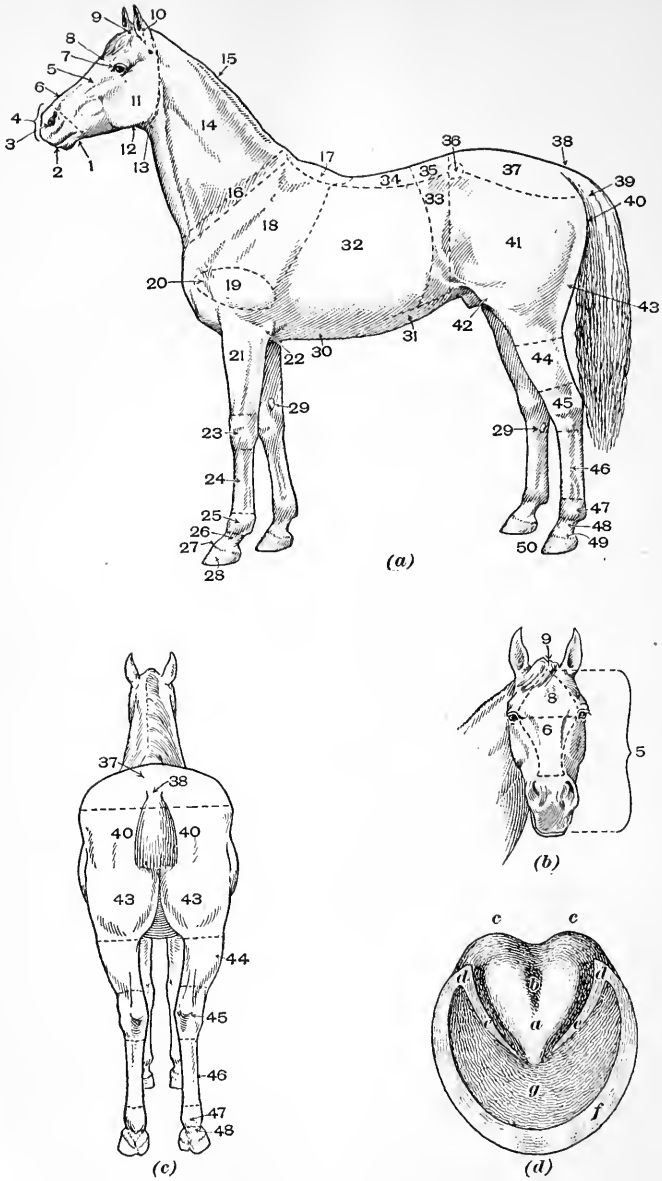
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47
48
(c)
9
8
6
5
(b)
c
c
d
d
a
a
g
f
(d)

FIG. 1

group. The market classification of horses is based on the general qualities of size, conformation, height, weight, style, and action, regardless of breed. Because of conditions governing supply and demand, and varying opinions among those who buy and sell horses, the market classifications must necessarily be somewhat flexible and the limitations

NAMES OF THE EXTERIOR REGIONS OF A HORSE SHOWN IN FIG. 1

1, Chin groove
2, Lips
3, Nostril
4, Muzzle
5, Face
6, Nose
7, Eye
8, Forehead
9, Poll
10, Ear
11, Lower jaw
12, Angle of lower jaw
13, Throat latch
14, Neck
15, Crest
16, Juncture of neck and shoulder
17, Withers
18, Shoulder
19, Arm
20, Point of shoulder
21, Forearm
22, Elbow
23, Knee
24, Front cannon
25, Front fetlock
26, Front pastern
27, Front coronet
28, Front hoof
29, Chestnuts
30, Floor of chest
31, Belly
32, Ribs
33, Flank
34, Back
35, Loin
36, Hip
37, Croup
38, Dock
39, Tail
40, Point of buttock
41, Thigh
42, Stifle
43, Quarters
44, Gaskin
45, Hock
46, Hind cannon
47, Hind fetlock
48, Hind pastern
49, Hind coronet
50, Hind hoof
a, Frog of foot
b, Cleft of frog
c, Upper heel
d, Lower heel
e, Bars of foot
f, Outer wall
g, Sole

of the various classes somewhat variable. A large number of horses go to market and help to supply the demand that are not altogether typical of the market class in which they are sold, but such animals should not be confused with those of the approved type. In attempting to meet the market demands, if there are not enough horses of a certain

type, dealers attempt to supplement, as far as possible, with animals not altogether typical of the class. The name of the market class into which a group of horses is placed is suggestive, in most instances; of the use to which the horses are put. For example, horses that meet the market demands for draft purposes are placed in a class termed the draft class. Likewise, horses that meet the market demands for light driving on the road are grouped in a class known as the road class.

2. In order to obtain a clear understanding of the characteristics of each type, breed, and market class of horses, it is necessary to have a knowledge of the different exterior regions of a horse. In Fig. 1 (*a*) is shown a profile view of a horse with the exterior regions numbered; in (*b*), a front view of the head; in (*c*), a rear view of the animal; and in (*d*), a view of the bottom of a hoof. The names of the numbered regions are given on the page opposite the illustration.

The common unit of measurement for the height of horses is the *hand*. A **hand** is 4 inches, or the supposed width of the human palm. Thus, if a horse were 5 feet 4 inches tall, its height would be expressed as 16 hands; if it were 5 feet 6 inches tall, its height would be expressed as $16\frac{1}{2}$ hands. The measurement of a horse's height is taken from the ground to the top of the shoulders.

TYPES OF HORSES

PRIMITIVE TYPES

3. The Prehistoric Horse.—The evolution of the horse from an extremely low form of animal to its present state of general excellence has been traced by naturalists by means of a series of successive modifications in fossils. These fossils have been found in various parts of the world, but in greatest numbers and most complete sequence in North and South America. In the United States, they have been found in greatest numbers in Utah, Wyoming, and New Mexico.

The earliest form of the primitive horse of which a more or less complete skeleton has been found was a small animal not more than a foot high at the shoulders, and possessing five digits on the front feet and four on the hind feet, one digit being rudimentary in each case. This animal is known by naturalists as the Eohippus, or dawn horse. Roughly speaking, it is supposed that the dawn horse existed more than three million years ago. Fossils representing later ages show a gradual increase in the size of the animals and a change in the conformation of the feet.

4. Norse and African Types.—At about the dawn of civilization there were two recognized types of horses, the Norse type, or the Norseman's horse, of Northern Europe, and the African, or, as it is sometimes called, the Oriental type. Horses of the Norse type possessed heavy coats of hair, heavy manes and tails, and large tufts of hair on the fetlocks. They had coarse heads with rounding, obtuse noses, and very little speed but great endurance. It is supposed that they were, as a rule, dun in color with a black median stripe down their backs. Horses of the African type, commonly spoken of as the Arab and the Barb horses,

possessed fine coats of hair and refined heads with heavy jaws and broad foreheads. Horses of the Norse and African types have been largely used in the foundation and development of modern breeds. The blood of the Norse-type horses predominates in many of the draft and coach breeds, and that of the African-type horses in most of the breeds of light horses.

MODERN TYPES

5. Among modern breeds of horses four types are recognized, namely, the *saddle type*, the *roadster type*, the *coach*, or *carriage, type*, and the *draft type*. The roadster type is sometimes called the light-harness type, and the coach, or carriage, type, the heavy-harness type. The saddle type will be discussed in connection with the American Saddle Horse.

6. Roadster Type.—The roadster type of horse is represented principally by the horses of two breeds, the *American Trotter* and the *Orloff Trotter*, although some horses of other breeds are roadsters. Horses of this type are similar in having great speed and endurance, and hence in being particularly adapted for the rapid drawing of light vehicles over streets and roadways. The roadster type is less uniform than any of the other types, the animals included in it exhibiting a wide variance in height, weight, and conformation.

The best specimens of the roadster type are from about $15\frac{1}{4}$ to $15\frac{3}{4}$ hands high and weigh about 1,000 pounds. They are decidedly angular but very muscular, especially at the croup and quarters. The joints and muscles are usually prominent. The head is lean and refined, but spirited; the neck is long and slender; the shoulders are long, sloping, and deeply set in the back at a point nearest the withers; the legs are thinly fleshed, and have prominent tendons and well-developed muscles; the pasterns should stand at an angle of about 45° with the ground, and be long and elastic; the feet should be of fair size, round, and preferably dark in color. The body of the roadster is usually closely coupled, strongly ribbed, and heavily muscled in the loin; the thighs and hindquarters are long and narrow.

Quality and action are essential in the roadster, and in the best animals are usually strongly marked. In such animals, the bone is of fine texture and smooth; the hair is glossy and fine; the skin is soft; and all of the parts are refined and symmetrical but strong and durable. The action is snappy, the feet being lifted high and the legs carried far forwards and backwards, thus giving a long stride.

7. Coach, or Carriage, Type.—The coach, or carriage, type of horse is represented principally by horses of the following breeds: *Hackney*, *French Coach*, *German Coach*, and *Cleveland Bay*. The horses of this type are especially adapted for the drawing of vehicles, such as coaches and carriages, that are too heavy for horses of the roadster type. They are used for various other purposes, however, on account of their strength and endurance.

Good specimens of the coach, or carriage, type are about 16 hands high; mares and geldings weigh from about 1,100 to 1,250 pounds, and stallions from about 1,250 to 1,450 pounds, according to breed. They are not nearly so angular as the roadsters nor are they as speedy. In the best animals of the coach, or carriage, type the head is lean and graceful; the neck is somewhat long and arched; the chest is medium in fulness; the shoulders are long and sloping; the body is round, broad in the back, short on top, and long below; the croup is long, rather level, and heavily muscled; the thighs are muscular and clean in outline; the legs are clean cut and spare; the pasterns stand at an angle of about 45° with the ground line; and the feet are round, fair sized, wide at the heel, and of dark, hard horn.

In quality and action, the best animals of the coach, or carriage, type are highly developed. The bone is smooth and of good texture; the hair is glossy and fine; the skin is soft; and the muscles and veins are somewhat prominent and clean cut in outline. The action is snappy and true, the legs being carried forwards in a straight line. Horses of the coach type have higher action than those of the roadster type, but do not have the reach of the latter. Gen-

erally speaking, a coach horse is expected to have a speed of from 8 to 10 miles an hour, if traveling at a normal gait.

8. Draft Type.—Horses of the following breeds constitute the draft type of horse: the *Percheron*, the *Clydesdale*, the *Shire*, the *Belgian*, the *Suffolk*, and the *French Draft*. Horses of these breeds have massive frames and hence are capable of drawing heavy loads. They usually stand from 16 to 17½ hands high. As a rule, the mares and geldings weigh from about 1,500 to 1,800 pounds, and the stallions from about 1,700 to 2,000 pounds.

In the best animals of this type the head is lean, broad between the eyes and at the muzzle, the nostrils are wide, and the jaws are powerful; the neck is strong, slightly arched, and joined smoothly and deeply to the body; the shoulders are less sloping than those of roadster and coach horses; the chest is full and deep; the legs are smooth but heavily muscled; the pasterns slope at an angle of about 45° with the ground line; the feet are large, concave at the sole, and of dense, hard horn; the body is short on top and long below, broad along the loins, with the ribs strongly arched; the croup is broad, flat, and heavily muscled; and the thighs are thick and full.

The quality and action of draft-type horses are not so important as in the case of horses of the roadster or the coach type. The draft horse owes his efficiency more to his weight and muscle than to speed or appearance. Notwithstanding, quality and action in draft horses are given much attention by horsemen. It is desirable that draft horses have massive but smooth bone that is of good texture, fine hair and skin, and clean-cut lines. The action should be bold and true. As viewed from the front or rear, the movement of the limbs should be in a straight line. The feet should be picked up with snap and lifted clear of the ground, the soles being shown in the movement. Hock action is relatively unimportant, but there should be a full, free action in these parts. As the draft horse does most of his work at the walk, it is desirable that he should have a rather rapid gait when thus moving.

BREEDS OF HORSES

THE ARAB

9. Origin and Development.—The native home of the **Arab breed** of horse is in Arabia, an Asiatic country of vast extent, but it is probable that the breed is not indigenous to that country. The question of the origin of the Arab horse has been the cause of much discussion and still remains unsolved. The Arabs have kept no written records of their horses, preferring, rather, to depend on memory, consequently information concerning the breed is meager and obscured in myth. Arab horses began to become noted for their superior qualities about the 13th century. Practically nothing is known of their history prior to that time, although the breed is known to have existed for many centuries.

According to tradition, a certain Arabic tribe, the Anezah, at about 1635 B. C. owned five famous mares and from these mares has come the purest and best Arab blood. These mares were designated as *Al Khamseh*. The Al Khamseh mares were the ancestors of five great families, each of which was subdivided into a number of subfamilies. Of these five families, that of Keheilet Ajuz, which has seventeen subfamilies, is the most popular and prized.

So carefully have the Arabs preserved the early stock from admixture and so closely have they followed the true lines of breeding that the Arab horses of the present day possess a degree of perfection that is unequaled in the horses of any other country.

A few notable Arab stallions of pure breeding that have become famous are: Kismet, Maidan, Kouch, El Emir, Kars, Shahwan, Cunningham, and Himyarite. The most noted modern mares of the breed are Haidee, Naomi, Keziah, and Nazli.

10. Influence on Other Breeds.—Arab horses have been widely used for cross-breeding. The blood of the Arab has been used for improving the English Thoroughbred, the Hackney, and, to a slight extent, various other breeds of Britain and continental Europe, among which may be mentioned the Percheron, the French Coach, the German Coach, and the Orloff Trotter. Wherever used, Arab horses have transmitted quality, intelligence, constitution, and style to the breeds with which they have been crossed. Of late years an important use of Arab sires is the breeding of them to Welsh, New Forest, Exmoor, or similar ponies, to produce ponies for use in polo playing.

11. The Arab in North America.—Arab horses in small numbers were first imported into North America many years ago. The first volume of Bruce's American Stud Book contains the names of forty-two stallions and twelve mares of the breed that were imported into the United States between the years 1760 and 1860. Since that time there have been many importations of horses from Arabia to the United States for the purpose of improving and rejuvenating American strains of race horses, and a number of pure-bred Arabian studs have been established.

12. Description.—In Fig. 2 is shown a typical Arab stallion. Fig. 3 shows the pure-bred imported Arab mare Markesa, owned by Doctor Dutton, of Oregon. Arab horses range from 14 to 15 hands in height, rarely exceeding $15\frac{1}{4}$ hands. The head is of splendid appearance, being broad and high, the muzzle short and fine, the face bony, the veins handsomely coursed, the nostrils large, the ears small and well set, the eyes large and prominent, and the jaw heavy and wide, giving an abundance of room for the windpipe. The neck is deep where it joins the shoulder, of good length, and nicely turned in the throat latch. The shoulders are long and obliquely set, but the withers are often too thick and are inclined to be rather low for saddle purposes. The body is rather short and usually deeply ribbed, the ribs springing out well from the spine with a symmetrical curve; the back is

FIG. 2

FIG. 3

well sustained with heavy muscles; the loins are broad and muscular; the croup is rather long and level, and the tail is set high and usually carried with style; the quarters are long and deep, but the gaskins and hocks are not of the most approved shape. The legs and feet are of good size and shape for strength.

Contrary to popular opinion, the prevailing color of the Arab is not snow white, or coal black, or spotted. The best authorities state that about 50 per cent. of the animals are bays, about 20 per cent. are chestnuts, and about 30 per cent. are grays and whites with dark skin; occasionally a brown specimen is found and very rarely a black.

As a saddle horse the Arab ranks high. Animals of this breed have always been accustomed to being ridden, and have developed remarkable powers of endurance, carrying riders day after day, in a scorching sun, with little feed and water. When hitched to a carriage, the Arab horse is attractive and easily controlled.

13. Registration.—In America, the registration of Arab horses is in charge of the Arabian Horse Club of America. This organization publishes a studbook entitled, Stud Book of the Arabian Horse Club of America. In Great Britain, registration is provided for in the General Stud Book. The Arabs have never recorded the pedigrees of their animals, but have handed them down from generation to generation by word of mouth.

THE THOROUGHBRED

14. Origin and Development.—The **Thoroughbred breed** of horses, or the breed of *British racing horses*, the animals of which are sometimes spoken of as *blooded horses*, originated in the southern part of England. The breed had its origin in a union of the blood of Arabian, Barb, and Turkish horses with that of the lighter native horses of England. These native horses were the progeny of animals that were imported from Flanders, Normandy, Germany, Spain, and the Orient at an early date.

The first attempt at the breeding of horses in England was for the purpose of obtaining larger animals for the drawing of chariots and the bearing of armored knights in time of war. When warfare by chariot and armored knight became obsolete, the nobility turned their attention to the breeding of a lighter type of horses for racing purposes. It was not, however, until the latter part of the 17th century that breeding along definite lines, especially for the production of race horses, began. At about this time many importations of oriental horses were made. Of these imported animals, three stallions exercised an extremely important influence in the formation of the Thoroughbred breed, namely, the Godolphin Barb, the Byerly Turk, and the Darley Arabian. Three English-bred horses that were instrumental in founding the breed were: Herod, Matchem, and Eclipse. From this miscellaneous foundation stock of merely light horses the Thoroughbred breed has been gradually developed to one in which speed is the most conspicuous character.

The term thoroughbred was first used as an adjective, much as it is used at the present time in describing purity of breeding, but having been first applied to these light, speed horses, it has become adopted as a noun, and now constitutes the name of the breed.

15. The Thoroughbred in North America.—The first Thoroughbred to be brought to North America, it is said, was Bulle Rock, imported into Virginia in 1730. During the 18th century some of the most famous horses of the breed were imported. Horsemen of Kentucky, Virginia, South Carolina, and Maryland became interested in Thoroughbred horses in early times and exerted a strong influence in the exploitation of the breed and the promotion of horse racing. At the present time there are a large number of Thoroughbreds in North America, but they do not have a large economic place, inasmuch as they are used almost entirely for sporting purposes. In Table I is given a list of the most famous American Thoroughbreds, with the year that each was foaled, and the sire and dam of each animal.

16. Description.—In Fig. 4 is shown a typical animal of the Thoroughbred breed. Fig. 5 shows Water Color, a famous Kentucky thoroughbred. The modern Thoroughbred is from 15 to 16 hands high, and weighs from 900 to 1,200 pounds. According to a noted authority, the average height of Thoroughbred horses increased from 14 hands in the year

TABLE I

FAMOUS AMERICAN THOROUGHBREDS

Foaled	Name	Sire	Dam
1805	Sir Archie	Diomed	Castianira
1814	American Eclipse	Duroc	Miller's Damsel
1833	Boston	Timoleon	Sister of Tuckahoe
1850	Lexington	Boston	Alice Carneal
1858	Australian	West Australian	Emilia
1860	Norfolk	Lexington	Novice
1860	Emperor	Leamington	
1867	Longfellow	Leamington	Nantura
1867	Enquirer	Leamington	Lida
1872	Tom O'Chiltree	Lexington	Katona
1874	Parole	Leamington	Maiden
1875	Himyar	Alarm	Hira
1876	Spendthrift	Australian	Aerolite
1877	Luke Blackburn	Bonnie Scotland	Nevada
1878	Foxhall	King Alfonso	Jamaica
1878	Iroquois	Leamington	Maggie B. B.
1883	The Bard	Longfellow	Brademante
1884	Firenzi	Glenelg	Florida
1884	Ormonde	Bend Or	Lily Agnes
1884	Hanover	Hindoo	Bourbon Belle
1885	Emperor of Norfolk	Norfolk	Marian
1886	Salvator	Prince Charlie	Salina
1891	Hamburg	Hanover	Lady Reel

1700 to 15½ hands in the year 1900. The Thoroughbred has a fine, lean head that possesses quality, eyes that are prominent and intelligent, ears of medium size, a broad forehead, a heavy jaw, and a refined muzzle. The neck is long and rather thin, the crest fairly straight from the withers to the poll, and the head carried somewhat low with the nose pointing

Fig. 4

FIG. 5

forwards when the animal is running. In the best specimens of the breed, the shoulders are obliquely set and well covered with muscle, and the withers are high and thin. The chest of a Thoroughbred has a tendency to be narrow and deep; very narrow chests, however, are objectionable. It is desirable that the front legs, from the bottom, or floor, of the chest to the ground, should be little more than half the height of the horse. The back and loins are comparatively short and well muscled, the conformation of these parts indicating an ability of the animal to carry weight. The ribs are long and well sprung. The croup is of good length, rather level, and curved gracefully with the tail, which is attached at a medium height and is somewhat lightly haired. The Thoroughbred is heavily muscled in the thighs and quarters, which are long and deep, exhibiting great propelling power. The gaskins, or lower thighs, should be broad, and the feet and joints should show strength and quality. The cannons are broad and the pasterns are longer than those of any other breed and frequently too sloping. It is desirable that the hind legs should be a trifle straighter than in the case of harness horses.

In color, Thoroughbred horses are variable. Bay and brown are the most common and the most popular colors, although chestnut is by no means uncommon, and black, sorrel, gray, and roan occasionally occur.

The Thoroughbred is nervous and mettlesome in temperament and possesses great spirit and endurance.

17. Speed Records of Thoroughbreds.—The Thoroughbred breed is preeminent in speed performance. Races between Thoroughbreds are run at a running gait under the saddle, with jockeys up. One of the fastest records of a Thoroughbred is that of 1:35½ for the mile, made by Salvator in 1890 on a straightaway track at Monmouth Park, New Jersey. In 1903, Dick Wells ran a mile in 1:37⅖ on the Harlem track, and Alan-a-Dale went a mile on the Washington Park track in 1:37⅗. In 1855, Lexington ran 4 miles in 7:19¾ in a race against time. Ten Broeck, in 1876, in a race against

time, lowered the 4-mile record to 7:15¾. This same year he ran a mile in 1:39¾, which was the record for about 13 years. Luke Blackburn, a famous Thoroughbred, when 4 years of age, ran a mile at Jerome Park in 1:45.

TABLE II

SPEED PERFORMANCE OF THOROUGHBREDS IN ANNUAL SUBURBAN HANDICAP FOR 1¼ MILES, AND THEIR WINNINGS

Year	Horse	Weight Carried	Time	Winnings
1890	Salvator	127	2:06⅘	$6,900
1891	Loantaka	110	2:07	9,900
1892	Montana	115	2:07⅖	17,750
1893	Lowlander	105	2:06⅖	17,750
1894	Ramapo	120	2:06⅕	12,070
1895	Lazzarone	115	2:07⅘	4,730
1896	Henry of Navarre	128	2:07	5,850
1897	Ben Brush	123	2:07⅕	5,850
1898	Tillo	119	2:08⅕	6,800
1899	Imp	114	2:08⅖	6,800
1900	Kinley Mack	125	2:06⅘	6,800
1901	Alcedo	112	2:09⅗	7,800
1902	Gold Heels	124	2:05⅕	7,800
1903	Africander	110	2:10⅖	16,490
1903	(Renewal)—Water Boy	112	2:04⅗	9,900
1904	Hermis	127	2:05	17,000
1905	Beldame	123	2:05⅖	16,800
1906	Go Between	116	2:05⅕	16,800
1907	Nealon	113	2:06⅖	16,800
1908	Ballot	127	2:03	19,750
1909	Fitz Herbert	105	2:03⅖	3,850
1910	Olambala	115	2:04⅖	4,800

One of the great running races formerly held annually in America was the Suburban Handicap of 1¼ miles, which was run at Sheepshead Bay, New York. In Table II is shown

a list of some of the winners of this event with the year of the race, the weight of the jockey, the time, and the money won by the winning horse.

In England, the three so-called classic races run each year are the Derby, the Oaks, and the St. Leger, each of which is very old. The Derby was founded at Epsom in 1780; the Oaks in 1779, for fillies only; and the St. Leger in 1776. Of these events, the Derby probably attracts the most attention. Since 1784, the distance run in the Derby has been $1\frac{1}{2}$ miles.

18. Registration.—Nearly 200 years ago racing calendars were established in England. Bailey Brothers' Racing Register, which first appeared sometime between 1720 and 1730, was one of the best of these early registers, or calendars. In it were the names of the horses that had appeared in the various races of the year prior to its publication, their records, and their sires. This publication has been continued up to the present time with but slight alterations. In 1791, the English Stud Book, then called Weatherby's Stud Book, assumed its present form. William Pick, of York, England, a rival of Weatherby, published the first volume of Pick's Turf Register in 1793, the same year that Weatherby's Stud Book first appeared; however, Pick published a collection of pedigrees in 1786, antedating Weatherby's publication by 5 years. Pick's Turf Register continued for 75 years, and four volumes in all were published. Weatherby's Stud Book, which has been changed to the General Stud Book, has published twenty-two volumes. American Thoroughbreds are registered in the American Jockey Club Stud Book, which has published nine volumes.

THE AMERICAN SADDLE HORSE

19. Origin and Development.—Between 1830 and 1840 many horses were taken into Kentucky, principally from Virginia and other eastern states and from Canada. Most of the horses from Virginia were either Thoroughbreds or animals largely permeated with Thoroughbred blood. Many

of those taken from New York and the New England states were pacers, and were descendants from crosses of the early French-Canadian mares with the stallions of New York and New England. It is probable, also, that many of them were descendants of the Naragansett Pacer, a well-known strain that existed in the eastern part of the country in colonial times.

Naturally, these pacing horses, when taken to Kentucky, were crossed with the Thoroughbreds that had been brought from Virginia. In early days, many Thoroughbred horses were bred in Kentucky, as was the case in Virginia, but many of the early settlers preferred the cross-bred animals, because they were stronger and more useful, particularly for saddle purposes. Horseback riding was the principal mode of traveling in those days, as the roads were but little more than bridle paths, and pleasure vehicles were almost unknown.

In time it was observed that certain Thoroughbred crosses produced better horses than others for saddle purposes, and the strains most useful were sought. Most notable in the siring of good saddle horses was Denmark and his three sons, Gaines's Denmark, Rob Roy, and Muir's Denmark. These animals became the tap root of the **American Saddle Horse breed**. Although the Denmark family of horses was indigenous to Kentucky, other states contributed to the founding of the breed, namely, Tennessee, the Virginias, Ohio, Indiana, Illinois, Missouri, and Arkansas. Wherever the country was rough or mountainous, saddle horses could be found, as they were a necessity in the development of the region.

When the National Saddle Horse Breeders' Association was organized, fifteen stallions were recognized as being the foundation stock of the American Saddle Horse breed. From time to time non-producing sires were stricken from the list until in 1904 only ten remained; and in 1908 the association decided to recognize only the Thoroughbred horse, Denmark, as the foundation stock and gave the other horses numbers, as deceased sires, as follows: Cabell's Lexington, 3,234; John Dillard, 3,235; Davy Crockett, 3,236; Tom Hall, 3,237; Coleman's Eureka, 3,238; Van Meter's Waxy, 3,239; Stump

the Dealer, 3,240; Peter's Halcorn, 3,241; and Pat Cleburne, 3,242.

A family that should be mentioned in connection with the American Saddle Horse breed, although not recognized as foundation stock, is that of Mambrino Chief, a horse that figured prominently in American trotting horse history. Mambrino Chief sired Clark Chief, and he Harrison Chief, from whose loins have come many good saddle horses. Another horse whose name should be mentioned is Rex McDonald 833, a line-bred Denmark that defeated all comers in the show ring and was finally barred because no one would show against him, feeling that it was entirely useless.

The two most famous saddle-horse sires were Black Squirrel 58, sired by Black Eagle 74, tracing to Old Denmark; and Montrose 106, by Diamond Denmark 68. Black Squirrel sired more good saddle horses than any other horse of his time. His most celebrated son was Highland Denmark 750. Monte Cristo 59 was the best son of Montrose 106.

The development of the American Saddle Horse suffered two severe setbacks: first, the civil war; second, the sudden springing into popularity of standard-bred horses. Although the breed suffered because of the civil war, it may also have gained something, for in this severe test it proved its merit, and horses of the breed were unequaled by those of any other breed. At the end of the civil war admirers of the saddle horse picked up the fragments of the breed that were left and began once more to develop it. When the speed craze swept over the United States it affected to a marked degree the breeding of saddle horses. Because of the extremely high prices paid for standard-bred horses, a large number of saddle mares were bred to standard-bred stallions for the purpose of producing animals that would be worth more money. Such breeding, meeting with indifferent success, was abandoned in time and the breeding of saddle horses was resumed on a more firm and substantial basis than ever before.

20. Description.—In Fig. 6 is shown Rex McDonald, a noted animal of the American Saddle Horse breed. The

Fig. 6

size most desired for animals of this breed is a height of from 15 hands 1½ inches to 15 hands 2½ inches and a weight of from 950 to 1,100 pounds. The saddle horse exhibits much style in carriage of head and in arch of neck and tail. In the best animals of the breed, the back is very strong and hence capable of sustaining considerable weight. The shoulders and pasterns are usually long, obliquely set, and springy. The croup is long and level, and the tail is long, set high, and stylishly carried.

The most distinguishing feature of the saddle horse is his variety of gaits. The three natural gaits of a horse are the *walk*, *trot*, and *gallop*. The gallop, in the case of the saddle horse, has been changed by training to the canter. The *canter* is performed by practically the same movement of the legs as the gallop but is slower and easier on the rider. Some saddle horses have only the three gaits, the walk, the trot, and the canter; and are known as walk-trot-canter horses or merely as plain-gaited horses. Many saddle horses have acquired through training two additional gaits, the rack and a slow gait. The *rack* is a gait in which each foot strikes the ground separately and in a peculiar rhythm. The rack was formerly termed the single-foot gait, but the American Saddle Horse Breeders' Association has officially adopted the term rack. The *slow gait* may be either the running walk, the slow pace, or the fox trot, all of which are closely allied. The running walk is faster than the common walk but is performed with the same rhythm; that is, each foot strikes the ground independently of the others. The slow pace is a slower, modified form of the common pace. The fox trot is a slow trot or a jog trot. A horse that can show the walk, the trot, the canter, the rack, and the running walk or the slow pace or the fox trot is called a gaited horse.

21. Registration.—In 1891, the breeders of saddle horses organized the National Saddle Horse Breeders' Association for the promotion of the breed and the keeping of records. In 1899, the name was changed to American Saddle Horse Breeders' Association. After publishing six volumes and

recording over 2,500 stallions and 3,000 mares and geldings, the association has set about to revise the registration by correcting some errors and ejecting some fraudulent pedigrees that unavoidably crept in.

THE MORGAN

22. Origin and Development.—The **Morgan breed** of horses originated in the New England States, particularly in Vermont and New Hampshire. The breed owes its origin to a famous stallion, Justin Morgan, foaled in 1789 at Springfield, Massachusetts. This horse had phenomenal powers of prepotency, a statement that is borne out by the fact that certain characters which he possessed and which are called Morgan are even yet being transmitted to his descendants. Not much is definitely known of the early ancestors of Justin Morgan, but it is generally believed that he traced to Thoroughbred blood through both his sire and dam. It is believed that his sire was True Briton, a horse that is said to have been captured from Col. James De Lancey, an officer in the British Army, during the Revolutionary war. His dam was a medium-sized, light-bay animal with a brownish mane and tail.

Justin Morgan stood about 14 hands high, weighed 950 pounds, and was dark bay in color, with black points. He sired three sons that were noted sires, namely, Sherman Morgan, Bulrush Morgan, and Woodbury Morgan. Sherman Morgan, the most illustrious of the sons, did more to establish and popularize the breed than any other. When he was 24 years old, he sired Black Hawk, who, in turn, sired Ethan Allen, a horse that as a 4-year-old made a trotting record of 2:15 for the mile. Ethan Allen became very noted and his blood was sought after as a desirable introduction into the American Trotting horse for speed production. His most popular son was Daniel Lambert. Sherman Morgan was a small horse standing $13\frac{3}{4}$ hands high and weighing 925 pounds. Most of his immediate descendants were small horses standing from 14 to 15 hands high and weighing from 900 to 1,050 pounds.

Through the descendants of Bulrush Morgan came Morrill, and he sired Fearnaught, who made a record of 2:23½ for the mile and was the sire of many good horses. The horses of this family were small also but were less speedy, and, in general, were a little more blocky and had a little heavier bone than the descendants of Sherman Morgan.

Woodbury Morgan sired Gifford Morgan, and he Green Mountain Morgan, the most noted son of this branch of the family. Woodbury Morgan, also, was a small horse, standing 14¾ hands high and weighing 1,000 pounds.

The speed craze that swept over the country a few years ago nearly ruined the breed, and the Morgans were as ruthlessly discarded and pronounced of no value as they had been popular in Ethan Allen's day. Only a few breeders had the courage to continue to breed the much despised Morgan, as it was considered a work of charity to continue to breed a horse so universally rejected as to make profitable sales almost an impossibility. At the present time, however, Morgan blood is strongly appreciated and an infusion of it on the dam's side is usually regarded as strengthening an animal either for speed, carriage, or saddle purposes.

The Morgan type is much sought for by lovers of heavy-harness horses, but Morgan horses are not large enough for this class. Whether it is possible to increase their size to that of the coach horse and still retain the breed type and characteristics is yet to be determined. The United States government has taken up the problem to see what can be done along this line, and has established, in cooperation with the Vermont Experiment Station, a stud of Morgan horses, at Middlebury, Vermont.

23. Description.—In Fig. 7 is shown the noted Morgan stallion, Gen. Gates, who was chosen to head the government stud in Vermont. Gen. Gates is a great grandson of Ethan Allen. In Fig. 8 is shown a 2-year-old Morgan filly.

The Morgan horse is small, standing from 14 to 15½ hands high, and weighing from 900 to 1,200 pounds. The head is small and neat, the forehead being broad and high. The eyes

Fig. 7

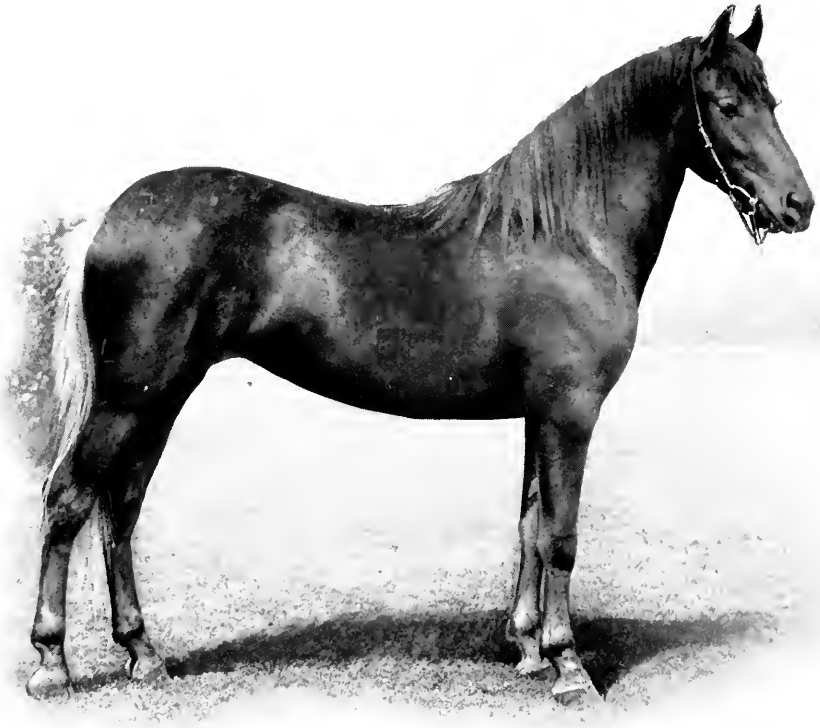

Fig. 8

are large and brown, sometimes spoken of as hazel, and are neatly set in the head, giving the animals the appearance of being spirited yet docile. The head and ears are smaller and more refined than those of the American Trotter, and the neck is longer, has a better crest, and is set better, being carried higher. The shoulders are long and obliquely set, and the chest is deep and capacious, indicating endurance and hardiness of constitution. The latter is one of the characters of the breed, as many of the early Morgans lived to be from 30 to 35 years old. The back is short and well muscled; the ribs spring well from the spine, giving a round barrel; the croup is long and the tail neatly set; and the limbs are clean and cordy, the bone being of the best quality. The prevailing colors are bay, chestnut, brown, and black. Although but few Morgans ever attained phenomenal speed, most of them have good action and are clean, open-gaited trotters. Many of them with a little schooling readily acquire saddle gaits.

24. Registration.—The registration of Morgan horses is in charge of the American Morgan Register Association, whose headquarters are at Middlebury, Vermont. The first volume of the register was issued in 1892.

BREEDS OF THE ROADSTER TYPE

THE AMERICAN TROTTER

25. Origin and Development.—The **American Trotter breed,** the animals of which are commonly known as *standard-bred horses*, includes both the trotter and the pacer. In fact, the trotting and the pacing gaits are somewhat interchangeable and many of the so-called trotting horses possess both. This breed is far from having a fixed and established type. In its early development, breeders failed to recognize any standard toward which to breed, but simply bred for speed. The American Trotter horse is scattered

widely throughout the United States, being found in almost every section. He is distinctly the product of America and has been developed because of the love of Americans for horse racing at the trotting and pacing gaits. The breed was at its height of favor prior to 1893, and horses with speed commanded fabulous prices. Since 1893, breeding has resumed a saner course. The most extensive breeding has been carried on in Kentucky, Tennessee, Missouri, Illinois, Iowa, and Kansas. However, some of the eastern and western states also have had a number of large breeding farms located within their borders.

The history of the trotting horse in America extends back into colonial times. At a time as early as the year 1629, light horses, probably runners, were imported from England to Massachusetts. Horses of this class were bred also in Virginia and the Carolinas. Notwithstanding this early existence of light horses in the eastern part of the United States, no marked progress was made toward the foundation and development of a breed until a period beginning about the year 1800. From this to about 1820, the real foundation of the American Trotter breed was brought about. This great breed traces its ancestry to two noted sires, Messenger and Jary's Bellfounder.

Messenger, commonly known as Imported Messenger, or by the abbreviated name, Imp. Messenger, was a Thoroughbred. He was foaled in England in 1780, and made his first appearance on the turf when 3 years old. He ran two successful races at that age and continued on the turf until 1785, winning eight races and losing six, which indicates that he was of only ordinary merit as a race horse. The pedigree given with him states that he was sired by Mambrino and that his pedigree traces in direct male line to the famous Thoroughbred horse Flying Childers, who was sired by the Darley Arabian. He was imported in 1788 to Philadelphia, Pennsylvania. Neither Messenger nor his sires were trotters. His chief fame came through his son, Mambrino 11, who sired Abdallah 1 and he Hambletonian 10, commonly known as Rysdyk's Hambletonian.

Jary's Bellfounder was foaled in 1815 and was imported from Norfolk, England, in 1822. He was a bright bay with a black mane and tail, stood 15 hands high, and was a natural trotter. He came from a trotting family; his dam, Velocity, was said to have trotted 18 miles in 1 hour and 47 seconds. Bellfounder was imported into Orange County, New York, where he was being used in the stud when he sired the Charles Kent Mare, which became a famous dam.

26. Since the time of Messenger and Bellfounder, several trotting families of note have been developed in America. The most important of these are: the *Hambletonian family*, the *Mambrino family*, the *Morgan family*, the *Clay family*, the *Blue Bull family*, and the *Pilot family*.

The **Hambletonian family** of trotting horses was founded by Hambletonian 10, one of the most famous horses of history. Hambletonian 10 was foaled in 1849, his dam being the Charles Kent Mare by Bellfounder, and his sire Abdallah 1, the grandson of Messenger. He was not a fast horse; however, as a 3-year-old he made a record of 2:48½ for the mile over the Union Course, New York. During 20 years of service in the stud he sired 1,287 foals and his service fees amounted to $185,715. His most famous sons were: George Wilkes, Electioneer, Happy Medium, Harold, Dictator, Volunteer, Strathmore, Abdallah 15, Aberdeen, Egbert, Messenger Duroc, Edward Everett, Administrator, and Jay Gould.

The **Mambrino family** of trotters derives its name from that of Mambrino Chief, foaled in 1844. Mambrino Chief was the son of Mambrino Pay Master, by Mambrino 11, the son of Messenger. When 7 years old he passed into the hands of Messrs. Cockroft and Williams, who kept him two or three seasons in Ulster County, New York, where, under the saddle, he trotted a mile in 2:36. He was sold to James B. Clay, of Kentucky, in 1854, and then to Messrs. Grey and Jones in 1857. His blood has proved of more value to the American Trotter than that of any other horse except Hambletonian 10. The best results have been secured when the blood of these two horses was coupled together. Many of the progeny of

Mambrino Chief paced, and his blood was especially valuable to the American Saddle Horse.

The **Morgan family** dates back to the time of Justin Morgan, the founder of the Morgan breed, who has already been described. The fame of the Morgan family as trotters came largely through that of Ethan Allen and his progeny.

The **Clay family** was founded by Grand Bashaw, a horse imported from Tripoli in 1820 to Montgomery County, Pennsylvania. His most famous son was Young Bashaw. Young Bashaw sired Andrew Jackson, one of the fastest trotters of his day. Andrew Jackson was bred to a Canadian trotting mare named Lady Surrey, owned by George M. Patchen, in 1836, from which service she foaled Henry Clay in 1837, the real head of this family. While Henry Clay was considered a fast horse in his day, he sired only one or two horses that could trot a mile in 2:30. His most famous son was Henry Clay, Jr., who sired Cassius M. Clay, the most celebrated of the Clay family. Cassius M. Clay sired George M. Patchen, who made a record of 2:23½ in 1860, and was the sire of sixteen sons who made excellent records. Since that time the family has been practically absorbed by other strains and is scarcely ever mentioned today.

The **Blue Bull family** derives its name from the famous sire, Blue Bull. At one time this horse stood at the head of the list of all trotting sires of the world, taking the supremacy from the great Hambletonian family. He was not a trotter, himself, but possessed amazing pacing speed, being able to step a quarter in 30 seconds. The breeding of Blue Bull is very obscure. He sired fifty-six trotters and four pacers that were placed in the 2:30 class, and five of his get made trotting records of 2:20 or better. Although he was a pacing horse and pacing bred, he proved extremely prepotent in siring trotters, but for some reason his progeny were not as great progenitors of speed as the Hambletonian family.

The greatest fame of the **Pilot family** came through Pilot Jr., a gray horse foaled in 1844 and sired by Old Pacing Pilot, a black pacing horse. Pilot Jr. possessed the trotting

gait and was raced a few times but he never showed any great speed. Owing to the fact that many of his progeny lived at the time of the civil war and were widely scattered,

TABLE III

WORLD'S TROTTING RECORDS

Name of Horse	Date of Record	Record
Boston	1810	2:48½
Trouble	1826	2:43½
Sally Miller	1834	2:37
Edwin Forrest	1838	2:36½
Dutchman	1839	2:32
Lady Suffolk	1845	2:29½
Pelham	1849	2:28
Highland Maid	1853	2:27
Flora Temple	1856	2:24½
Flora Temple	1859	2:19¾
Dexter	1867	2:17¼
Goldsmith Maid	1871	2:17
Goldsmith Maid	1874	2:14
Rarus	1878	2:13¼
St. Julien	1879	2:12¾
Maud S.	1880	2:10¾
Jay-Eye-See	1884	2:10
Maud S.	1885	2:08¾
Sunol	1891	2:08¼
Nancy Hanks	1892	2:04
Alix	1894	2:03¾
The Abbot	1900	2:03¼
Cresceus	1901	2:02¼
Lou Dillon	1903	2:00
Lou Dillon	1903	1:58½

he, perhaps, does not show as good a record as a breeding animal as some other horses. His best offspring was the mare Miss Russell, the dam of the famous Nutwood 600 and Maud S., who at one time held the world's trotting record.

Fig. 9

Fig. 10

27. Description.—In Fig. 9 is shown Dan Patch, holder of a pacing record of 1:55¼ for the mile, and in Fig. 10, Lou Dillon, holder of a trotting record of 1:58½ for the same distance.

No breed of horses is characterized by such a great variation in size, conformation, and color, as the American Trotter. In fact, there is so little of breed type found among these

TABLE IV

WORLD'S PACING RECORDS

Name of Horse	Date of Record	Record
Drover	1839	2:28
Fanny Ellsler	1844	2:27½
Unknown	1844	2:23
Pet	1852	2:18½
Pocahontas	1855	2:17½
Sleepy George	1879	2:15½
Sleepy Tom	1879	2:12¼
Little Brown Jug	1881	2:11½
Johnston	1884	2:06¼
Direct	1891	2:06
Hal Pointer	1892	2:05¼
Mascot	1892	2:04
Robert J	1894	2:01½
John R. Gentry	1896	2:00½
Star Pointer	1897	1:59¼
Prince Alert	1904	1:57
Dan Patch	1905	1:55¼

light-harness horses that some persons refuse to recognize them as belonging to a breed. In the best of these animals there is great symmetry of form. The head is inclined to be a little large and coarse; the neck rather short, lean, and straight; the shoulders sloping and well laid; the back and loin longer than is desired; and the croup short and somewhat drooping. American Trotters usually possess deep

chests indicating stamina and constitution and usually have short, clean, fine-boned legs, and strong feet of excellent quality. The action is quick and the stride long. Breeders desire a weight, in the case of stallions, of about 1,150 pounds and, in the case of mares, of about 1,050 pounds. Bay and brown are the most common colors of these horses.

28. Speed Records.—As the American Trotter has been preeminently a speed animal since the inception of the breed, many notable records have been made. In Table III is given the world's trotting records for 1 mile from the year 1810 to 1911. Table IV gives the world's pacing records from 1839 to 1911.

29. Registration.—The American Trotter register was first published by J. H. Wallace and appeared under the name of Wallace's American Trotting Register. In 1876, an organization known as the National Association of Trotting Horse Breeders was organized. Finally, the American Trotting Register Association succeeded the National, and Wallace sold his publications to the new organization. This organization has charge of the registration of trotting horses and publishes the American Trotting Register.

THE ORLOFF TROTTER

30. Origin and Development.—The **Orloff Trotter breed** of horses is of Russian origin and there are but few animals of the breed in America. This breed derives its name from that of Count Alexis Orloff, who, it is claimed, in 1780 made a journey to Constantinople as the emissary of Catherine II of Russia, and on his return to Russia took with him, as a gift to the ruler, a famous Arab stallion, Sinetanka, an animal of superior merit and unusual size. This Arab horse was bred to a Danish mare, from which came a male foal that was named Polkan. In time, Polkan was bred to a large Dutch mare, and from this union came a male foal that was named Bars 1st. This latter animal is regarded as the first of the Orloff breed. Although, in the evolution of the breed,

outcrosses with mares have been made, the line of descent from Bars 1st on the sire's side has been carefully guarded. In 1845, the Russian government purchased the Orloff stud from Countess Orloff and now has charge of the breeding.

31. **Description.**—The Orloff Trotter has the characteristic conformation of light-harness horses and is used chiefly for driving purposes. The average height is about 16 hands, and the weight varies considerably, running from about 1,000 to 1,300 pounds. Gray, white, and black are the most common colors of these horses, although chestnut and bay are not uncommon. It is said that Orloff Trotters are lacking in quality. The head is usually small and the face dished. In good animals of the breed, the neck is strong, well arched, and carried high. The back is short and strong, and the loin full and muscular. The croup is somewhat sloping, being commonly criticized in this respect, but is heavily muscled. The shoulders are sloping but lack heaviness of form. The legs are strongly muscled and the bone and feet are regarded as of superior quality. In its native home the Orloff Trotter has a heavy coat of hair and a heavy mane and tail. This heaviness of hair gives it a somewhat rough appearance.

32. **Registration.**—The registration of Orloff Trotters is conducted by the Russian government by means of the Record of the Imperial Horse Breeding Society. There is no organization for the promotion of the breed in America.

BREEDS OF THE COACH, OR CARRIAGE, TYPE

THE HACKNEY

33. **Origin and Development.**—The **Hackney breed** of horses is indigenous to the eastern and northeastern parts of England, particularly the counties of Norfolk, Suffolk, and York. The foundation of the breed dates back as far as the 16th century. The breed had its origin in a mixture of the blood of Arabian, Turkish, Barb, and Norwegian horses with

that of native English horses. This heterogeneous foundation stock was later improved by an infusion of Thoroughbred blood. The Hackney breed was developed in much the same way as the Thoroughbred; but instead of cultivating the running gait, Hackney breeders sought to develop the trot. The name Hackney was derived from the term "haquenee," signifying a horse for both riding and driving.

The Hackney breed, as is true in the case of most other breeds of horses, traces back to a famous sire that proved very prepotent. In the case of the Hackney, this progenitor was Shales, known also as Schales, Shields, and the Original Shales. This animal was foaled in 1755 and was sired by Blaze, a son of Flying Childers, who has already been mentioned in connection with the Thoroughbred breed. Shales sired two notable sons, Scot Shales 692 and Driver 187. Although neither of these animals had great speed, they were prepotent breeders and sired good stock out of common mares. In 1782, Scot Shales was esteemed the best stallion in England for the getting of good road horses. Driver was foaled in 1765 and from him descended many of the best Hackney horses of today. He sired Jenkenson's Fireaway 201, and he Wroot's Pretender 596, and he Steven's Bellfounder 52, and he Bellfounder 55, who was imported to the United States and later became famous because of his influence on the American Trotter. Driver became famous in Hackney breeding largely through the Fireaway family of his progeny, among which may be mentioned Phenomenon Fireaway 585 and Denmark 177.

34. The Hackney in America.—The history of theHackney in America dates back to 1822, when James Booth, of Boston, imported from England Jary's Bellfounder 55, a famous horse that has already been mentioned in connection with the American Trotter. In 1881, a valuable consignment of English Hackneys was imported by H. M. Cochrane, of Hillhurst, Quebec. This consignment was headed by a superior horse named Fordham, a son of the renowned Denmark 177, and who, when coupled with the mares brought

over with him, and the native mares, produced a large number of valuable horses. It was through this importation that the blood of Denmark was widely spread throughout Canada, and thus Cochrane is given the credit for making the first real start toward the establishment of the Hackney breed in America. In 1883, the well-known Hackney stallion, Little Wonder, and two Hackney mares, Patience and Buttercup, were imported by H. J. Cassatt, of Philadelphia. These animals, with Stella, a chestnut mare by Confidence 158, formed the first Hackney stud in the United States. Little Wonder was first exhibited in 1883 at the Madison Square Garden Horse Show, and although only 14 hands high, attracted much attention on account of his great power and substance and other meritorious qualities. Prescott Lawrence showed the Hackney, Fashion, in 1884 at New York, Boston, Philadelphia, and other large shows and almost invariably won prizes. To Little Wonder and Fashion belong much of the credit for acquainting the American people with the Hackney horse and his merits. Pennsylvania, Virginia, New York, Massachusetts, Illinois, and Wisconsin are the principal breeding centers for Hackneys in the United States.

35. Description.—In Fig. 11 is shown the famous Hackney stallion, Prickwillow Connought, a two-time prize winner at the International Livestock Show, held annually at Chicago. Fig. 12 shows the Hackney mare, Hildred, owned by E. H. Bedford, of Brooklyn, New York.

The most desirable height for the Hackney is from $15\frac{1}{2}$ to $15\frac{3}{4}$ hands, but the breed shows a wide variation in this regard. Some animals are less than 14 hands and others range over 16 hands. In England, the horses of this breed under 14 hands are called Hackney ponies; those from 14 to 15 hands Hackney cobs; and those 15 hands and over, Hackney carriage horses. They have all been bred much alike with the exception of size, which represents a difference of the breeders' ideas as to what is most desired and useful. The largest Hackney rarely weighs over 1,250 pounds. Animals of this breed are usually stoutly built, compact, strong boned,

FIG. 11

FIG. 12

muscular, and of kindly disposition. The head is light, clean cut, and intelligent in appearance; the neck is strong, well arched and muscular, but free from coarseness; the shoulders are smooth and oblique; the body is rotund, short, and compact; the legs are short, strong boned, and flattish; the tendons are prominent; and the hoofs are symmetrical and of good quality. The action of the Hackney is high, quick, elastic, and regular, the hocks being well flexed. The common colors are bay, chestnut, and brown, although black, roan, gray, and buckskin occasionally occur.

36. Registration.—The English Hackney Horse Society was established in 1883 and published its first Stud Book in 1884. The American Hackney Horse Society was organized in 1891 and the first volume appeared 2 years later. Since that time only one other volume has been issued.

THE FRENCH COACH HORSE

37. Origin and Development.—The **French Coach breed** of horses, as the name implies, originated in France. The name French Coach, however, is an American one, there being no breed of that name in France. The breed known in America as French Coach is termed in France the *Demi-Sang*, meaning half blood. The founding of the French Coach, or Demi-Sang, breed began as far back as the 17th century. At this time the royal haras, or royal stud, was established at Le Pin for the purpose of improving the native breeds by an infusion of the blood of oriental and other horses. By order of Louis XIV importations of Arab, Barb, and Thoroughbred stallions were made. These stallions were carefully selected and were bred to the best mares of the old saddle breeds that existed in the district then known as Normandy. The first offspring of this cross were termed demi-sang, or half blood, whence the name of the breed. The blood of the Hackney was widely used in the subsequent development of the breed and there has been a very slight infusion of Morgan blood. Thus, it can be seen that the foundation

stock was drawn from a great variety of sources. At the beginning there was much experimental breeding, which resulted in considerable variation in the type. Since 1840, French-bred horses have been used almost exclusively in propagating this breed. In 1885, a law was passed in France that prohibited the use of stallions not approved by the French government.

One of the most famous early sires in the improvement of this breed was Young Rattler, a Thoroughbred. He was on the stand in Normandy from 1820 to 1834, and his descendants are so numerous that his name is almost always found in the pedigrees of outstanding stallions. His grandson, Voltaire, was the sire of Kapirat, that sired Conquerant and Kapirat II, two horses that have sired a great number of outstanding good ones, many of them famous trotters. Normand, foaled in 1869, a descendant of Young Rattler, sired one of the most illustrious stallions of France, the celebrated Cherbourg. The Heir of Linne, a Thoroughbred, was imported into the government haras in 1859. He sired Phaeton, one of the most remarkable sires of the breed. The famous stallion Indre 385, champion of the World's Fair at Chicago in 1893, was a grandson of the Heir of Linne on the sire's side.

38. **The French Coach Horse in America.**—Large numbers of French Coach horses were imported into America between 1880 and 1890, many of these animals coming to the eastern states. Those that were sent west were largely taken to Illinois and Ohio. In the Middle West they have met with considerable favor. When mated with light American Trotter or Thoroughbred mares, the offspring produced are usually very marketable horses. Although some have developed into good carriage animals, the cross has not, as a rule, been wholly satisfactory for carriage purposes, the offspring lacking the uniformity of the Demi-Sang.

39. **Description.**—In Fig. 13 is shown the noted prize-winning French Coach stallion, Paladin, owned by W. S. Dunham, of Wayne, Illinois. The horses of this breed are, on an average, about 16 hands high. The average weight

Fig. 13

of the stallions is about 1,350 pounds, and of the mares about 1,200 pounds. There is, however, considerable variation in the size. French Coach horses have a good length of body; a refined, well-placed neck; and a neat head. The back is short, broad, and well muscled; the croup is level and of good length; and the tail is well carried. The limbs are well placed, of good shape, and possess quality; and the feet and pasterns are of superior quality. The trot of the French Coach horse is not so snappy and high as that of the Hackney, but the stride is longer and more powerful. Bay and brown are the prevailing colors, but black and chestnut are not unusual, and sometimes other colors occur.

40. Registration.—The registration of French Coach horses in America is conducted by two organizations: the French Coach Stud Book of America, with headquarters at Chicago, and the French Coach Registry Company, with headquarters at Columbus, Ohio. In France, the registration of these horses is conducted by the French Stud Book.

THE GERMAN COACH HORSE

41. Origin and Development.—The **German Coach breed** of horses, as the name suggests, is a product of Germany. Under this generic term, which has been applied by the American people to all horses coming from Germany, is included the Oldenburg, the Hanoverian, the East Friesland, and the Holstein horses, all of which are registered in separate stud books in the respective provinces in which they are bred and from which they receive their names.

The German horse, like the French, is the result of breeding for war purposes rather than for the carriage. The breed is very old, and as much or more obscurity surrounds its beginning than that of any other breed. According to history, horse breeding was carried on in Germany as early as 1500, and Government studs were established at various points as early as the middle of the 17th century. From a catalog issued in 1708 by Prince George Albrecht, it appears that his

stud contained horses from Turkey, Poland, Hungary, Transylvania, Denmark, England, and Iceland; this shows the mixed character of this early stud, which probably represents the foundation stock of the German Coach breed.

For centuries the German government has exercised a supervision of horse breeding within the confines of its jurisdiction. At first this supervision was enacted by means of royal edicts that permitted the breeding of certain animals. Later, a law was passed that prohibited the use for breeding purposes of any stallion that had not been inspected by the government. At the present time both the government and agricultural societies encourage intelligent horse breeding. Prizes are awarded for animals of exceptional merit, and horses so honored must remain in the country for a specified time.

42. The German Coach Horse in America.—German Coach horses were first brought to America in the decade between 1880 and 1890. Since that time stallions have been extensively imported into the United States, but mares have not been brought over in any great numbers; consequently, there are but few pure-bred studs. The type of German Coach horses seen in this country possesses considerable variation, as might be expected because of the failure of Americans to differentiate between the different varieties. It is claimed by many authorities that when German Coach stallions are to be crossed with the light American mares, extreme care should be exercised to select spirited mares; otherwise, the progeny is likely to be coarse, too large, and lacking in stamina and spirit and consequently undesirable for carriage purposes.

43. Description.—In Fig. 14 is illustrated the noted German Coach horse, Hannibal, owned by Crouch & Son, of Lafayette, Indiana. Horses of this breed range in height from 15½ to 17 hands, and weigh from 1,250 to 1,600 pounds. The usual height is from 16 to 16½ hands, and the weight from 1,300 to 1,500 pounds. The Oldenburg horses weigh from about 1,450 to 1,650 pounds. Of the Hanoverian horses that have

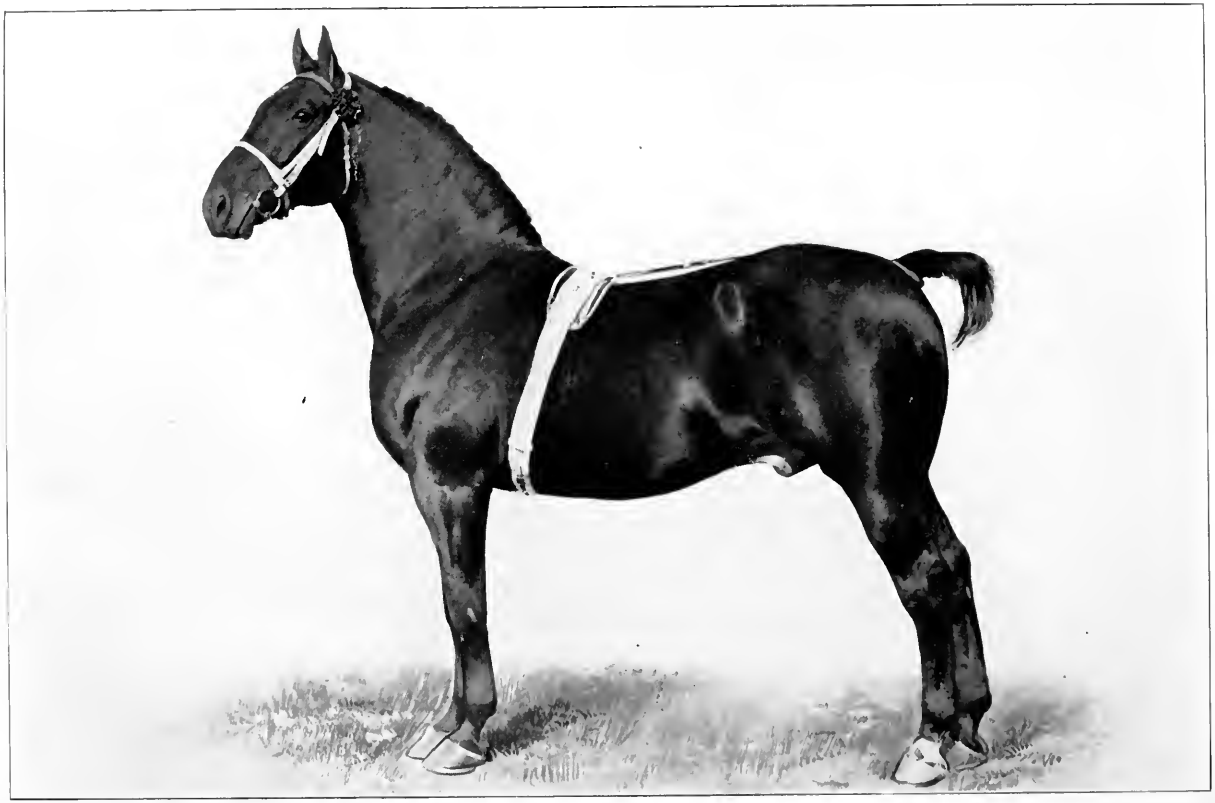

FIG. 14

been imported into the United States, the lighter types, standing from 16 to 16¼ hands high and weighing from 1,300 to 1,400 pounds, are the more popular. The Holstein horse is much like the Hanoverian horse, but instead of being used under the saddle, they are used more for carriage and general agricultural purposes, due principally to their inferior action. The East Friesland horses closely resemble the Oldenburgs. The head of the German Coacher is neat, the neck is long and arched; the shoulders are oblique and well placed; and the withers are prominent. The German Coach horse is larger than the French Coach horse, the body being longer and heavier. The colors of the German Coach horses are bay, brown, and black, brown and bay being more prevalent than any other color.

44. Registration.—In 1892, an organization known as the German, Hanoverian, and Oldenburg Coach Horse Association was organized in America. Shortly after this the Oldenburg Coach Horse Association was incorporated. Both of these organizations are in existence at the present time. In Germany, as has already been stated, the breeding and registration of these horses is in charge of the government.

THE CLEVELAND BAY

45. Origin and Development.—The native home of the **Cleveland Bay breed** of horses is in the Vale of Cleveland, a region that comprises the counties of Durham, Northumberland, and York, which lie in the northeastern part of England. The origin of the breed is very obscure. Different assumptions have been made as to the nature of the foundation stock, but these have never been substantiated. It seems probable, and is generally believed by most authorities, that the native Cleveland mares were crossed with Thoroughbred stallions at an early date and that this cross resulted in the production of a rangy type of horses that posssessed great endurance. The early purpose of the Cleveland Bay in its native land is recognized as having been agricultural or

general utility. However, when the region began to be developed agriculturally and iron mines were opened, a heavier type of horses was in demand and the Cleveland Bay fell into disfavor and was neglected. It now appears that in the course of time the breed will become extinct.

46. The Cleveland Bay in America.—The Cleveland Bay has never proved a widely popular breed in America. In the decade between 1880 and 1890 a considerable number of Cleveland Bays were imported and an organization was instituted for the promotion of the breed, but the public has never been favorably impressed and practically all interest in the breed has died out. Cleveland Bays are now almost unknown in American horse shows.

47. Description.—In height, the Cleveland Bay ranges from about 16 to 16¾ hands, and weighs from 1,200 to 1,550 pounds. The body is of the large coach type. The neck is of moderate length and the head is neat. The shoulders are long and sloping; the back and loins short and broad; and the croup high. These animals have an abundance of bone of good quality, and their action is good, although by no means as high as that of the Hackney. The color of the Cleveland Bay horse is always some shade of bay, either light or dark, with black legs, mane, and tail.

48. Registration.—The registration of Cleveland Bays is looked after in England by the Cleveland Bay Horse Society. In America, the Cleveland Bay Horse Society of America, which was organized in 1885, has charge of the registrations.

THE YORKSHIRE COACH HORSE

49. The **Yorkshire Coach breed** is recognized as a distinct breed in England, but is registered in the same stud books as the Cleveland Bay in the United States. The Yorkshire horse is bred in the same country as the Cleveland Bay and is permeated with much the same blood as the latter. His origin is even more obscure than that of the Cleveland Bay.

The Yorkshire Coach horse is not so heavy as the Cleveland Bay but is a little taller, often standing 17 hands high. He is finer in bone, with more quality and refinement about the limbs, head, and neck, and is also a little more snappy in his action. In the best animals, the color is bay or brown, with black eyes; and there is an abundance of mane and tail. The Yorkshire, as is true of the Cleveland Bay, has only a small following in England, and it is doubtful whether the breed will ever become prominent in the United States. In England, the registration of Yorkshire Coach horses is conducted by the Coach Horse Society.

TYPES, BREEDS, AND MARKET CLASSES OF HORSES

(PART 2)

BREEDS OF HORSES—(Continued)

BREEDS OF THE DRAFT TYPE

THE PERCHERON

1. Origin and Development.—The native home of the **Percheron breed** of horses is in the northwestern part of France, in the district of La Perche, from which the breed derives its name. The country is uneven and hilly, and is cut up in every direction by small valleys that are fertile and furnish an abundance of grass. The origin of the breed is very obscure. For many centuries horses of a draft type were in existence in the vicinity of La Perche and these, it is believed, constituted the foundation stock of the Percheron breed. According to most authorities, these native horses were crossed with oriental horses that came into France at the time of the Saracen invasion in the 8th century. Arabian blood was extensively used in the improvement of the breed as late as 1820, when two noted Arabian stallions, Godolphin and Gallipoli, were imported and freely used on the French stock. Most of the present-day Percherons trace to Gallipoli.

When the government studs were established at Le Pin and Pompadour in the 18th century the breeding of horses

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received a great impetus. The systematic breeding of Percherons along definite lines, however, did not begin until about the decade between 1860 and 1870. At the present time, the French government is active in fostering the interests of native horses. Government studs are maintained in which select animals are kept for breeding purposes. In the case of privately owned stallions, a severe inspection is made by government veterinarians and if the animals are found to be of sufficient merit they are designated as *subsidized*, and a cash bonus is paid to the owner for keeping them in the country. Horses that are not quite good enough to be subsidized are designated as *authorized*, and the owners are given a certificate, which is, in substance, a government recommendation. There is a third class known as *approved*, the animals of which are permitted to be in service but neither a bonus nor a certificate is given for them. All stallions not coming within these classes are excluded from public service. This system of government supervision, which has obtained in France for several years, has proved very beneficial to the Percheron and other native breeds.

2. The Percheron in America.—The first importation of Percheron horses into America of which there is any positive knowledge was made about 1839 to Moorestown, New Jersey, by Edward Harris. Two of the animals imported by Mr. Harris were Diligence and Bonaparte. These animals were small in size, standing about 15 hands high and weighing about 1,500 pounds. In 1851 the stallion Louis Napoleon was imported into Ohio. This horse proved to be a great breeder, and, it is claimed, was one of the best draft horses ever brought to America. It is said that over 400 of his sons were successful breeding animals. The Massachusetts Society for the Promotion of Agriculture imported several stallions and two mares in 1864 and made a second importation in 1882. It is said that some of the horses of the second importation weighed as much as 2,200 pounds. W. T. Walters, of Baltimore, Maryland, made an importation of both stallions and mares in 1866, and several other importations in later years.

He always imported more mares than stallions, and was the first to establish an important breeding stud of Percherons in America. Of the later importers, mention should be made of Mark W. Dunham and Daniel Dunham, of Wayne, Illinois; Ezra Stetson, of Neponset, Illinois; the Stubblefields, of Bloomington, Illinois; the Dillon Brothers, of Normal, Illinois; John Huston, of Blandinsville, Illinois; and the Fullingtons, of Ohio.

The Percheron breed has proved very popular in America and may be said to be increasing in public favor. Percherons have crossed extremely well with native American mares, imparting quality and size and producing marketable horses. Due to their being clean-limbed, free from superfluous hair, and of good disposition, they have always been great favorites with the American farmers, and users of heavy horses in cities show decided preference for grade Percherons. In the United States the number of recorded Percherons is greater than the number of recorded horses of all the other draft breeds combined, which fact indicates that the breed is very popular.

3. Description.—In Fig. 1 is shown a typical Percheron stallion, and in Fig. 2 the prize-winning Percheron mare Mouvette. Percherons range in height from about 16 to 17½ hands and weigh from about 1,600 to 2,200 pounds. An average weight for a Percheron stallion in good condition is from 1,900 to 2,000 pounds. The Percherons are not quite so heavy as the Belgians or the heaviest Shires, but they weigh more than the Clydesdales or the Suffolks. The Percheron has a deep, thick, compact body on rather short legs, which are devoid of the long hair characteristic of the Clydesdale and the Shire. The head is neat and refined, of good width between the eyes and the jaws, and tapers to a refined muzzle; the forehead is broad and full, indicating intelligence; and the ears are small, pointed, and carried erect. The neck is of moderate length, rather arched, and is usually set well on the shoulders, giving poise and dignity to the head; the crest is not so heavy as that of the Belgian, but it is well developed. The shoulders are long and usually obliquely set;

FIG. 1

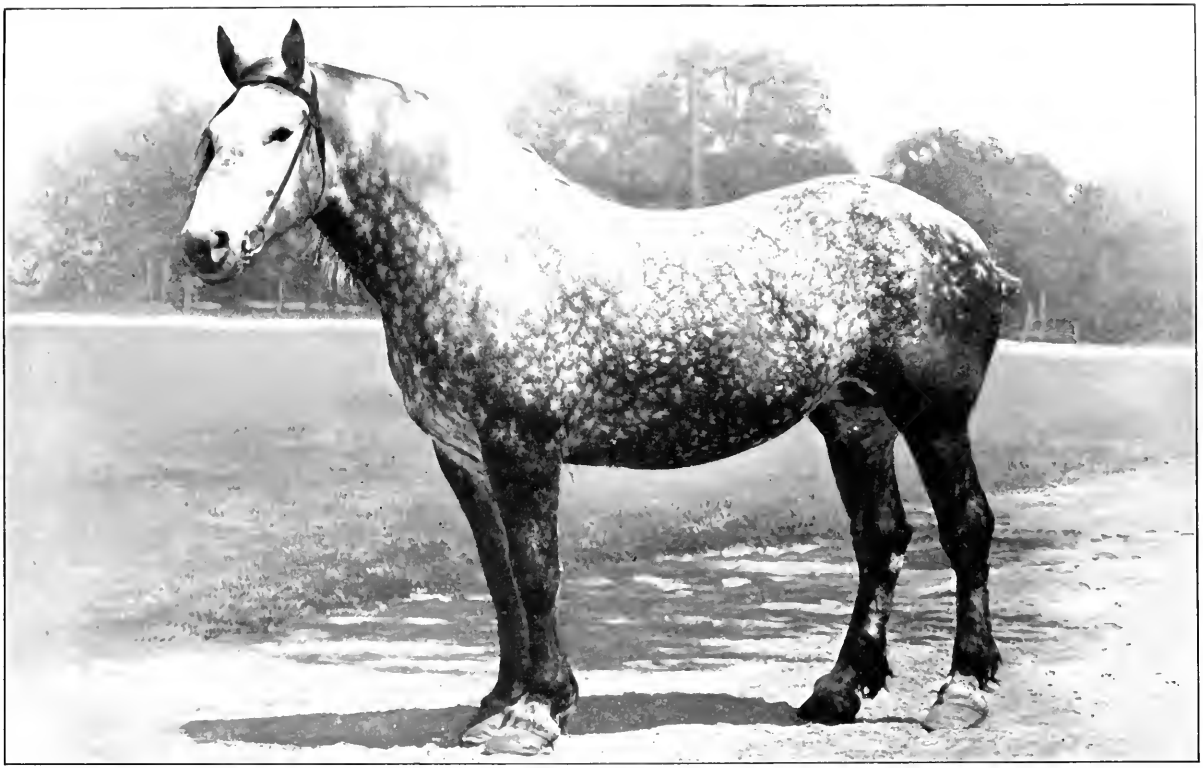

FIG. 2

the back is short and often a little low; and the chest is deep and broad, indicating a hardy constitution. The coupling is not always as short as it should be, and the last ribs are frequently not well sprung. The hips are high and often appear prominent, due to the lack of spring to the last ribs. The croup is of moderate length and frequently more drooping than is desired; it is often rather flat on top. In many Percherons, the tail is set somewhat low and the hind legs are not always set on in the best way. The thighs and quarters are usually heavily muscled, indicating power; and the feet are of the best quality; in the latter respect the Percheron excels all the other draft breeds. The hocks are not always as clean as they should be; they are better than those of the Belgian, but not so good as those of the Clydesdale. The cannons of the Percheron are not so flat as those of the Clydesdale or the Shire, the tendons not standing back from the cannon bones as well as they should.

In action, the Percheron is quick and energetic, exhibiting considerable snap. Percherons are good walkers but have a shorter stride than either the Clydesdales or the Shires. The trot is performed with vim and energy, and the knees and hocks are usually flexed well when carried forwards. Gray and black are the predominating colors, although occasionally bay, brown, and chestnut occur. The Percheron has a sanguine temperament, and an amiable disposition, in these respects being the best of all the draft breeds.

4. Registration.—The registration of Percheron horses in America has been the cause of much controversy. This unfortunate condition of affairs resulted from the fact that in the early history of the breed in America two types of draft horses were imported from France, namely, the Percheron and the Norman. These two types were much alike in every way and at one time animals of both were registered in the same stud book in America. In 1876 the Norman Horse Society was organized. Later the name of this organization was changed to the Percheron Norman Horse Association, and it was under this title that the first stud book was pub-

lished in 1878. This change in name antagonized some of the members of the association, who withdrew and organized the National Register of Norman Horses, which was later changed to the National Register of French Draft Horses. When a Percheron society was organized in France, the word Norman was stricken from the title of the Percheron Norman Horse Association.

The American Percheron Horse Breeders' Association made an attempt to incorporate in 1885, but failed. The career of this organization proved rather unsatisfactory, and in consequence a new association, the American Percheron Horse Breeders and Importers' Association, was organized. In 1905 the name of this organization was changed to the Percheron Society of America. An association known as the Percheron Registry Company was organized in 1902. In 1911 the Percheron Society of America purchased all the records of the Percheron Register Company, so that now the latter association is no longer in existence. In 1905 another association, known as the American Breeders and Importers' Percheron Registry, was incorporated.

A Percheron society was organized in France in 1878. The rules of the French society provide that only horses bred in the Percheron district can be recorded in the French stud book. Should a Percheron mare and a Percheron stallion be taken outside of the Percheron district and mated together, the progeny, according to the rules, would not be eligible for registration. Since 1890 the rules also stipulate that all colts must be registered between 3 and 6 months of age, at which time they are inspected by a veterinarian, and, if accepted, are branded with the society's brand, S P, which is placed on the left side of the neck near the mane, about midway between the head and the shoulder. These rules were adopted with the idea of protecting the purity of the breed; however, it is claimed by American importers that horses outside of the Percheron district are frequently recorded and branded as pure-bred Percherons. Inasmuch as all of the draft horses of France are of much the same blood, the Percheron breed could not have suffered greatly from this alleged mixing.

THE FRENCH DRAFT

5. It is necessary to speak of the so-called **French Draft breed** of horses because of the fact that in America it has been the erroneous custom for many years to refer to all draft horses imported from France as French Draft horses and as of the French Draft breed. This practice has been encouraged by the organization of an association in the United States that registers draft horses from France, irrespective of breed, in a French Draft stud book. Notwithstanding the common use of the term French Draft, there is no recognized breed of this name. In France there are several breeds of draft horses, and when the first importations of animals of these breeds were made to America no differentiation was made between them, all being known as French Draft horses. The name thus applied has clung to all such animals even to this day, in America.

It is probable that all the draft horses that are imported to America from France can properly be listed as belonging to the following breeds: *Percheron*, *Boulonais*, *Breton*, *Nivernais*, *Ardennais*, and *Picardy*.

The **Percheron breed** is the best known and the best developed of the French draft breeds. It has already been discussed.

The **Boulonais breed** is found largely in the district of Boulogne in the northern part of France, not far from Belgium. The animals of this breed are larger and coarser than the Percherons, and very likely possess more Belgian than Percheron blood. Gray is the prevailing color, although some of the horses are bay. It has been claimed by the French breeders that there has been no interchange of horses between the Boulonais and the Percheron districts, but this claim is doubted by many authorities.

The **Breton breed** is found in Brittany, a section of France lying across the English Channel from England. It is not probable that many Breton horses have ever been brought to America, although it is said that many of them are sold in Paris as Normandy and Percheron horses.

The **Nivernais breed** is from the district of Nievre, in the central part of France. Most of the Nivernais are black in color, as a result of using black Percheron stallions on the mares in that region. The horses of this breed are smaller than the Percherons. It is said that not many of them have been imported into the United States; however, this fact is questioned by authorities familiar with the breed. The Nivernais are built much after the Percheron type.

The **Ardennais breed** is native to Ardennes, in the northern part of France, near Belgium. There are two types of Ardennais horses; those of one type are blocky and smaller than those of any of the other French draft horses; those of the other are of a coach type.

The **Picardy breed** is found in the northern part of France and in Belgium. Some authorities claim that the Picardy is a variety of the Boulonais. The horses of this breed are generally bay in color.

The National French Draft Horse Association of America publishes a stud book in which may be registered animals of any of the French draft breeds.

THE CLYDESDALE

6. Origin and Development.—The **Clydesdale breed** of horses originated in Scotland, in the county of Lanark, commonly called the Clydesdale district. Heavy, black Flemish stallions were used in the early development of the breed, authentic records showing that such horses were employed as early as 1715. Ever since that time much attention has been paid to the improvement of the breed and the preservation of purity of blood. So carefully have Clydesdale horses been selected for breeding and so honestly have all matters pertaining to pedigree been conducted, that the purity of blood of recorded animals of the breed is beyond question.

Two noted Clydesdale stallions whose influence on their progeny is noticeable even to the present time were Prince of Wales 673, and Darnley 222. Darnley's three best sons were Macgreggor 1,487, Flashwood 3,604, and Topgallant 1,850.

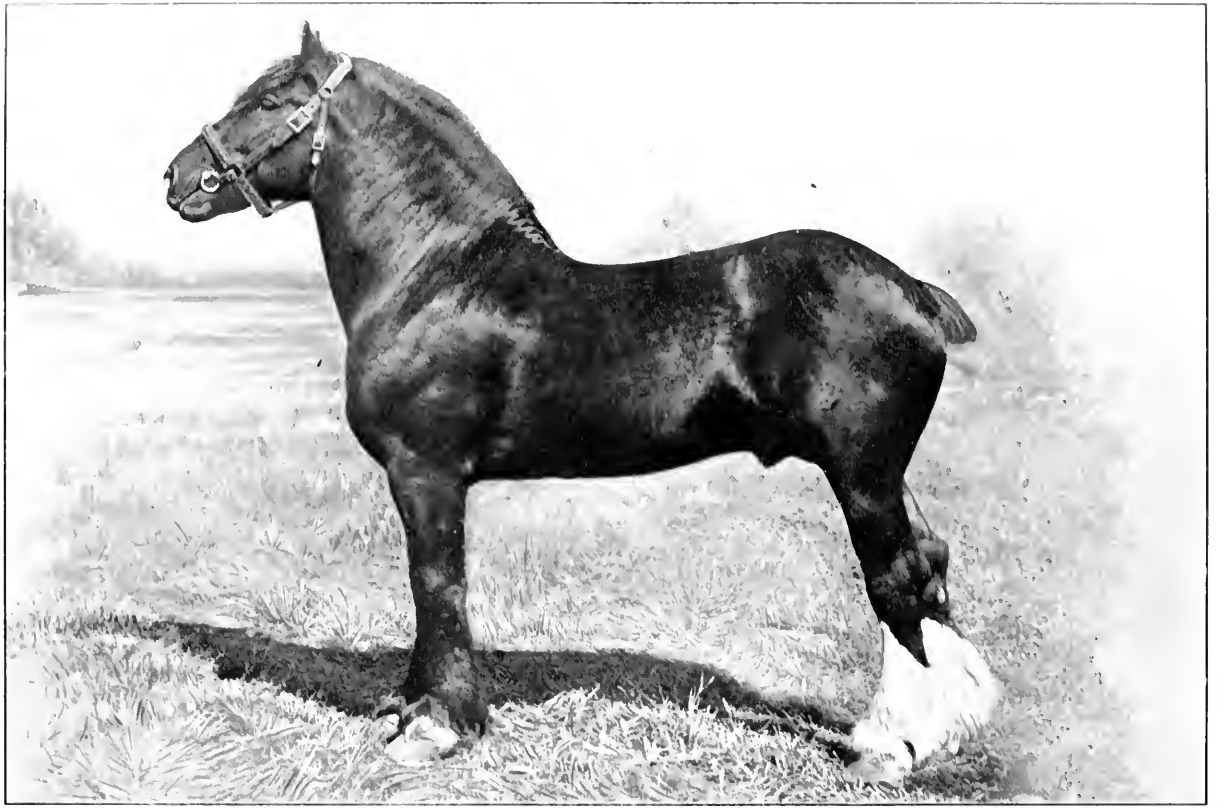

Fig. 3

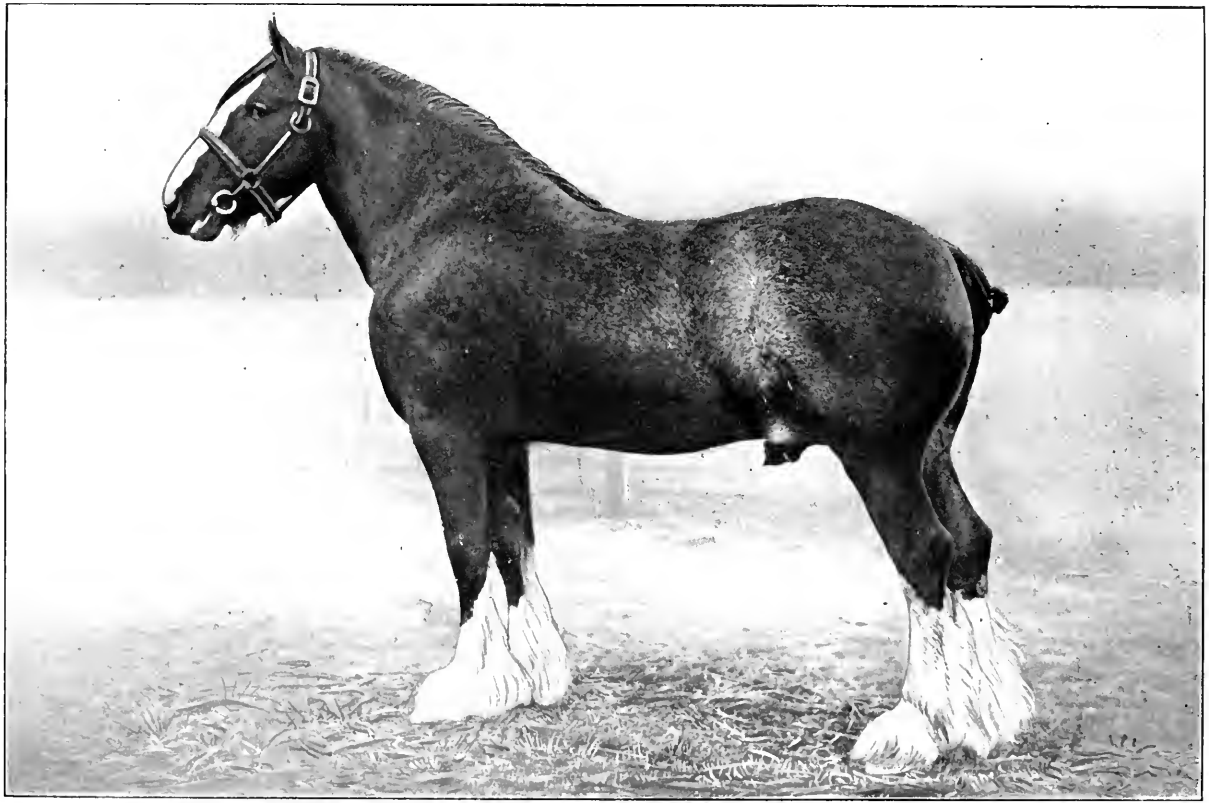

FIG. 4

The most famous Clydesdale stallion of recent times is Baron's Pride 9,122, sired by Sir Everard 5,353, a son of Topgallant 1,850 and a grandson of Darnley 222.

7. The Clydesdale in America.—The first importations of Clydesdales to America were made into Canada, perhaps because this section was settled by Britishers, who naturally preferred horses from their own country. About 1870, the first Clydesdales were brought to the United States, some of them coming from Canada and others from Scotland. The first show in America was held at Toronto in 1846.

In America, the breeding of Clydesdales has not kept pace, in the past few years, with that of horses of other breeds, and it is doubtful whether they will ever become widely popular in this country, unless they are bred more nearly to the type of the American draft horse, less attention being given to action and more to the conformation of body and the securing of weight.

8. Description.—In Fig. 3 is illustrated an American type of Clydesdale stallion and in Fig. 4 a Scotch type.

Clydesdales commonly range in height from 16 to 17 hands, and weigh from about 1,800 to 2,000 pounds. In the best animals the head is of good shape; the shoulders are rather oblique; and the chest is somewhat narrower than in animals of the other draft breeds. The body of the Clydesdale is criticized by many competent judges, who assert that it is lacking in depth and circumference. The feet, bone, and action are cardinal points with Clydesdale breeders, and in these respects animals of the breed are superior. A prominent characteristic of Clydesdale horses is the long, fine, silky hair, commonly termed *feather*, which grows out from the backs of the cannons and from the coronets.

In the early days a few of the Clydesdales were black, a few were gray, and a few were chestnut, but the Highland Agricultural Society, which held its first show at Glasgow in 1827, made it a rule that only bays and browns should be allowed to compete for prizes. This checked the production of blacks and grays, which were rather common in the country at that time.

Gray Clydesdales are still unpopular, and some authorities think that a chestnut color indicates Shire blood.

9. Registration.—The Clydesdale Society of Great Britain was organized about 1877, and the first stud book was published in 1878. The registration in the first volume covers a period of about 50 years, and most of the animals were owned in the Clydesdale district. Up to the present time the Clydesdale Society has published 32 volumes and has registered about 40,000 animals. The American Clydesdale Association was organized in 1879, and the first stud book was published in 1882. Fourteen volumes have been issued, with a total registration of about 14,000 animals.

THE SHIRE

10. Origin and Development.—The **Shire breed** of horses is a product of England, having been developed principally in the counties of Oxford, Leicester, Stafford, Derby, Nottingham, Northampton, Lincoln, and Cambridge. This breed is the result of crossing imported horses from Flanders and Northern Germany on the native stock of England. The breed is very old and has been carefully bred since its origin. Much of the credit for the early improvement of the breed belongs to English tenant farmers, who persevered in breeding and improving the Shire in times of depression. Later, some of the nobility established studs and a number of the more finely bred animals of certain families sold for high prices. Some authorities have questioned whether this was an advantage to the breed, as it took away from the tenant farmer animals that he could not afford to own. One of the most potent factors in the improvement of the Shire horse was the Shire Horse Show, which was established in 1879 as an annual event. This show is held each year at London, and all the horses exhibited are required to undergo a careful veterinary examination.

The aim of Shire breeders in Great Britain has been to maintain or increase the size and substance and improve the quality of their horses as much as possible. In order to do this they

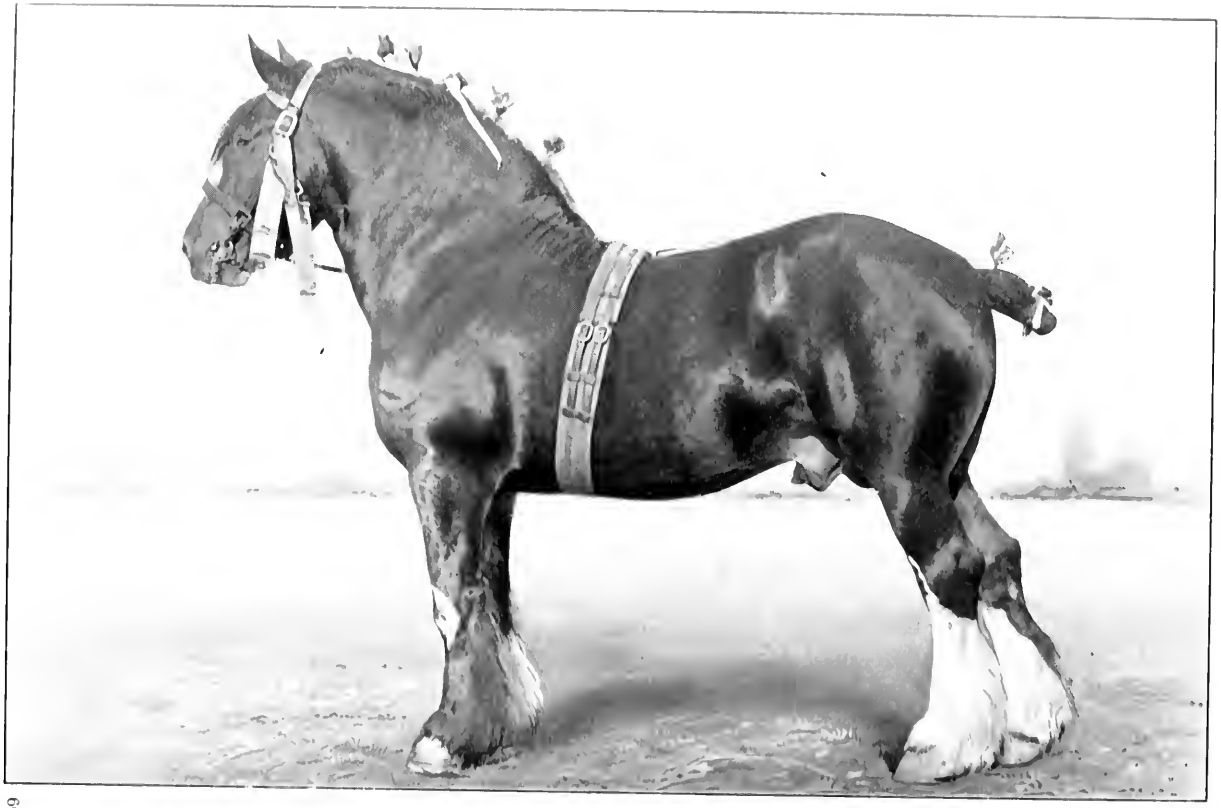

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FIG. 5

FIG. 6

select those with a profuse growth of hair on the limbs, this being considered evidence of quality, substance, and ruggedness. American breeders doubt the wisdom of this practice, and it is regarded as certain that profuse feather will never become popular in America, as it is a frequent source of eruptions and skin disease, as well as of much trouble and annoyance. Although much has been done to improve the quality of the Shire's hocks, some of them still lack width, and are short and not well defined.

11. The Shire in America.—The importation of Shire horses into America began, it is believed, about the middle of the 19th century. In 1853, a Shire named John Bull was imported and taken to Aurora, Illinois, where he became favorably known as a sire. A few years later a second John Bull was imported to Bristol, Illinois. For a time the Shires were spoken of as "John Bulls." George E. Brown, of Aurora, Illinois, an extensive importer, made his first importation in 1874. From this time on importations became more numerous.

One of the most famous early Shire horses imported to the United States was Holland Major 275. He was imported as a 2-year-old by George E. Brown in 1882, and was a champion at the World's Fair held at Chicago in 1893. He lived to be 25 years old and proved to be an exceptionally good breeder of high-class horses.

12. Description.—In Fig. 5 is shown the noted Shire stallion Prem Victor, which is an English horse but of the American type. Fig. 6 shows Glen Royal, an English type of Shire.

Shire stallions range in height from 16 to 17½ hands and weigh from about 1,800 to 2,400 pounds. The head, in many animals of the breed is inclined to be a little plain, not having as much width across the forehead and through the jaws as desired, and there is also a little coarseness in the muzzle. The face is inclined to be a little Roman, which, when only slight, is not objected to by admirers of the breed. The ears are rather long and heavy, more so than in animals of some of the other breeds, and the neck is plain, frequently lacking in crest develop-

ment. The shoulders are massive and powerful. The back is of moderate length and the croup of fair length, although not so level as that of the Clydesdale. The Shire is inclined to be a little plain over the hips and a little too short and straight in the pasterns. The feet are inclined to be small and too flat, lacking height at the heel, and also brittle, especially feet of a white color. As a rule, animals of the breed possess an abundance of bone. A deep chest and heavily muscled shoulders, thighs, and quarters, giving the appearance of strength and power, are characteristic of the breed. Shire horses have a profuse growth of feather coming out from the cannons; often the feather is not as fine and silky as is desired.

Horses of the Shire breed are usually of a bay or brown color, although black, gray, and occasionally chestnut occurs. As a rule, they have white faces, the white extending from the forehead to the muzzle, and one or more white feet and legs, the white extending to the knee or hock, and occasionally higher.

The Shire is usually a good walker, having a long, open stride, and, as a rule, the action is fairly straight. Although the Shire has been much improved in action, he is still a little sluggish, which is especially noticeable in trotting and turning. In the United States the Shire has been used more extensively on the level lands of the Mississippi Valley than elsewhere. Shire stallions make an excellent cross for mares of moderate size with an abundance of quality but lacking in substance.

13. Registration.—The registration of Shire horses in Great Britain is conducted by the Shire Horse Society, formerly the English Cart Horse Society. In America the registration is in charge of the American Shire Horse Breeders' Association.

There have been published six volumes of the American Shire Horse Stud Book and twenty-nine volumes of the English Shire Horse Stud Book, which shows, in a relative way, that the Shires are not extremely popular in the United States.

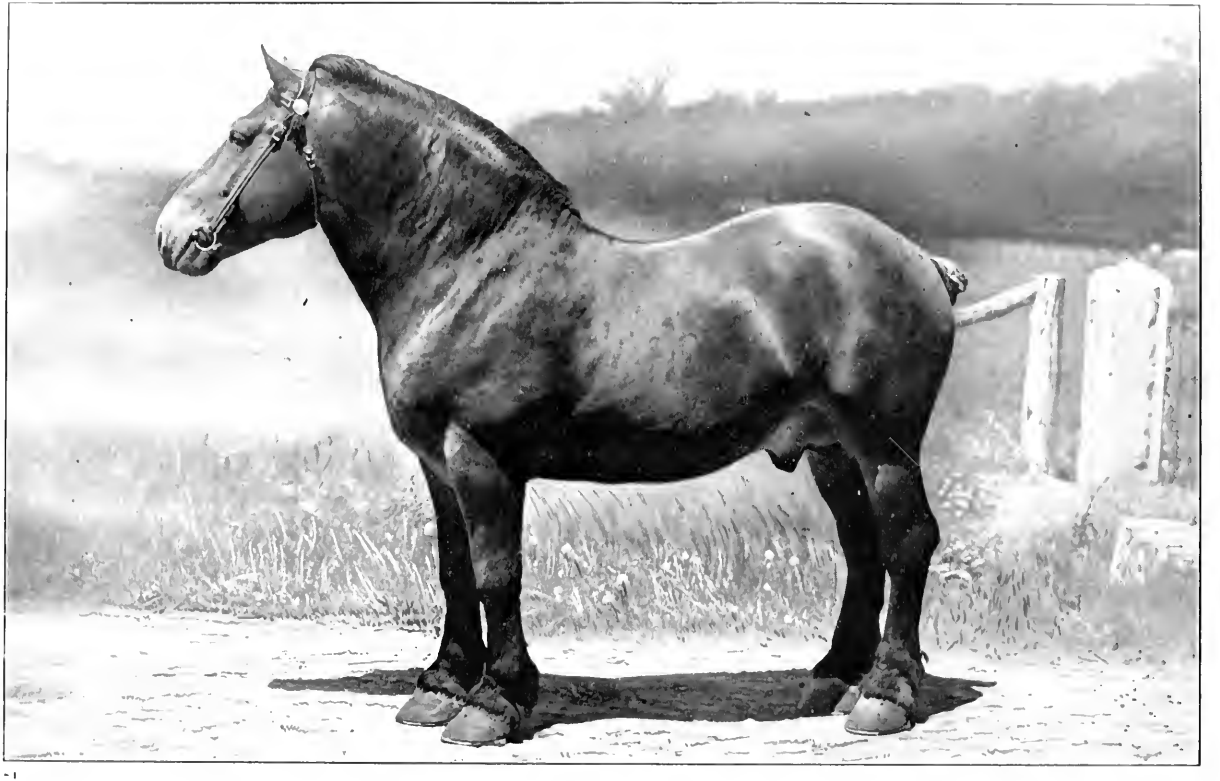

Fig. 7

FIG. 8

THE BELGIAN

14. Origin and Development.—The **Belgian breed** of horses, as the name implies, is a product of Belgium. The modern Belgian horse is a direct descendant of the black Flemish horse, which has been influential in improving all of the draft breeds. Horse breeding has long been an important industry in Belgium, having been practiced at first for the production of war horses and later for the production of horses for agricultural purposes. In 1850 the government established a stud at Tervueren for the improvement of draft horses, and in 1886 the official draft horse society of Belgium, *Le Cheval de trait Belge*, was organized. Since the latter date the Belgian government has promoted horse breeding by making annual grants, or subsidies, to the society. The society organized and holds annual summer shows at Brussels, which attract visitors and buyers from all over the world. It has a membership of about 1,400 breeders and up to the present time has registered more than 58,000 stallions and 72,000 mares. The society registers about 10,000 horses annually, but does not give numbers to the stallions until they are 3 years old; a number is not given to a mare until she has produced a foal. Stallions are given even numbers and mares odd numbers. From the preceding figures it will be seen that the condition in Belgium is altogether different than in the United States, the number of mares registered in Belgium greatly exceeding that of the stallions.

15. The Belgian in America.—Dr. A. G. Van Hoorebeke, of Monmouth, Illinois, made an importation of Belgians to America in 1866; this is said to have been the first. At that time the Belgian horses were designated as Boulonais. Mr. E. Leferbure, of Fairfax, Iowa, began importing Belgians in 1888 and continued until 1905. A number of small importations were made about the same time that Mr. Leferbure began importing, but it was not until about 1900 that any great number were brought to the United States. Only a comparatively few pure-bred Belgian mares have ever been imported

16. Description.—Fig. 7 shows a typical Belgian stallion. Fig. 8 shows a group of prize-winning Belgian stallions owned by Dunham & Fletcher, of Wayne, Illinois.

The Belgian is the heaviest of all draft horses. The stallions range in height from 16 to 17 hands and vary in weight from 1,800 to 2,500 pounds. The mares, of course, are considerably lighter in weight than the stallions, but are heavy in comparison with mares of the other draft breeds.

The characters that distinguish the Belgian draft horse from the horses of other draft breeds are the deep, thick body and short legs, which are free from long hair. The Belgian horse possesses a hardy constitution and is a good feeder on coarse feeds. He lacks the levelness of top that is desired, many animals of the breed being low in the back, rising rather high on top of the hips, and being rather short and drooping in the croup. The neck of the Belgian is short and thick and has a heavy crest that extends to the poll. In many cases the head is short and narrow from the eyes to the top of the poll, and long and coarse from the eye to the end of the muzzle; in some cases the head is badly placed on the neck, and the ears are set wide apart and low, making it difficult for a bridle or halter to be kept on. The legs of the Belgian are short and have moderately heavy bone, but lack the flatness of cannon that is found in the Clydesdale and the Shire. The pasterns, in many instances, are a little short and upright, and the feet are small, having much the shape of the feet of a mule. The under line is not so straight as in animals of the other draft breeds on account of the big, poddy middles. In some cases the hind legs are bent too much at the hocks, forming what is called a *sickle hock*. Perhaps the most severe criticisms that are made of the Belgian horse by unprejudiced and competent judges are: the smallness of the feet, the badly set pasterns, the poor shape of the hock, and the lack of levelness of top line; however, all of these faults are being rapidly improved by modern breeders.

In action, when the Belgian goes true and straight, he is usually good at the trot, but not so good at the walk, being slow and sluggish, and having a short stride.

The prevailing colors of the Belgians are chestnut, bay, brown, and red roan; occasionally black and infrequently gray occurs, the latter color, however, not being popular. The Belgian horse has been described by many admirers of the breed as being docile and intelligent; however, many impartial judges do not believe him to be equal, either in intelligence or disposition, to the Percheron.

The Belgian stands the shipment of importation better than the horses of any of the imported breeds and becomes acclimated readily. In recent years, since the larger and better stallions have been imported, the Belgian has gained much in reputation as the sire of good commercial horses. Being good feeders, such animals mature comparatively early and usually go to the market in better condition than horses of any other draft breed.

17. **Registration.**—In Belgium, the official draft horse society, *Le Cheval de trait Belge*, looks after the registration of Belgian draft horses. In America, the American Association of Importers and Breeders of Belgian Draft Horses has charge of the registration. The latter association was organized in 1877 and has published two volumes of the stud book.

THE SUFFOLK

18. **Origin and Development.**—The **Suffolk breed** of horses, sometimes known as the *Suffolk Punch breed*, is indigenous to Suffolk County, in the eastern part of England. There are also a number of Suffolk horses in Essex and other counties of Eastern England. The true foundation of the breed dates back to a horse foaled in 1768, known as the *Crisp horse*, from the name of its owner, a Mr. Crisp, of Ufford, Sussex. To this horse are traced all pedigrees of Suffolk horses that may be registered in England or America. The Crisp horse was a bright chestnut in color, stood $15\frac{1}{2}$ hands high, and proved to be a remarkable sire. Since the time of the Crisp horse four attempts have been made to introduce foreign blood for the improvement of this breed, but all have proved futile.

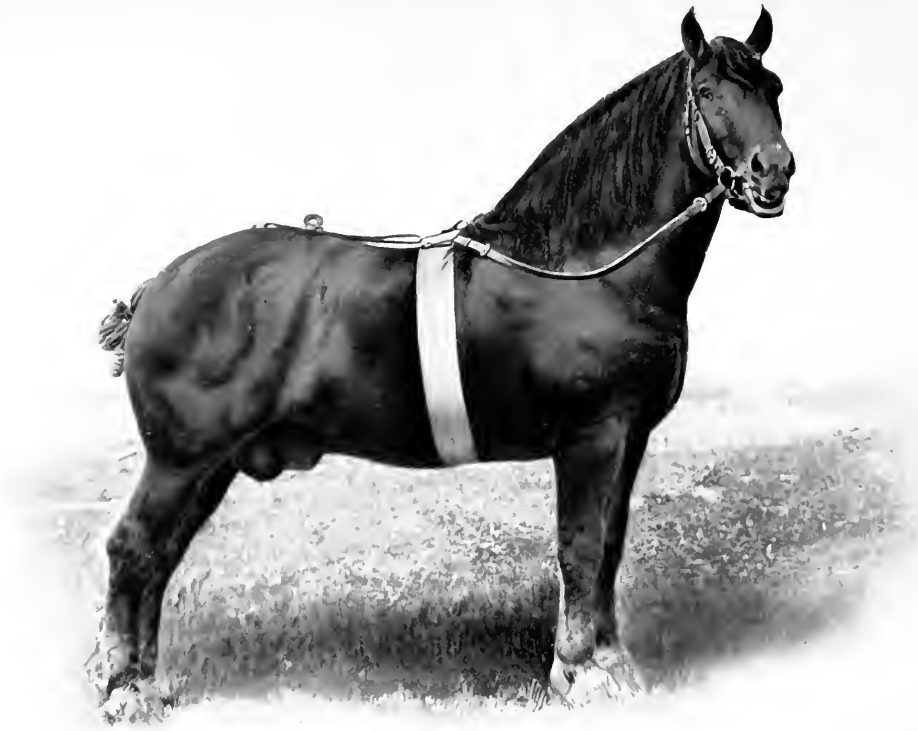

FIG. 9

19. The Suffolk in America.—Suffolk horses were first imported to America about 1880. Since that time importations have been infrequent and the breed has never become well known in this country. This is perhaps due to the comparatively small size of animals of the breed. Perhaps more have been imported into Iowa than into other states; a few have been imported into Wisconsin, and some into Ohio and eastern states. When crossed on the common mares of the country, the Suffolks usually produce good farm horses of quality and finish that are particularly smooth, but with hardly sufficient size, unless the dam is large, to be called drafters.

20. Description.—In Fig. 9 is shown a typical Suffolk stallion, which is owned by O. C. Barber, of Barberton, Ohio. Suffolk horses range in height from $15\frac{1}{2}$ to $16\frac{1}{3}$ hands high and weigh from about 1,700 to 1,800 pounds. The Suffolk is not claimed to be strictly a draft horse, but is suited for agricultural purposes.

The Suffolk differs from the Clydesdale and the Shire in that it is free from all long hair on the limbs. It has a neat head, which is wide in the forehead, and the jaw tapers to the muzzle. The neck is of good length and the crest exceptionally well developed, presenting an arched appearance. The shoulders are long but not extremely straight nor obliquely set. The back and loins are of a moderate length; the ribs are extremely deep and well sprung; the hips are not prominent; and the croup is long and level, in fact, more so than in the case of the horse of any of the other draft breeds. The thighs and quarters are muscular and extremely well developed. The legs, which are rather short, are free from feather, and appear to be a little light in bone; however, breeders disclaim this, stating that it is simply because they are free from feather. The pasterns are of moderate length and the feet are of good texture, although at one time they were criticized for being too flat.

In color, the Suffolk is always some shade of chestnut, either light or dark, the light being preferred. The color of horses of this breed is exceptionally uniform.

In quality and action the Suffolk ranks well. Animals of this breed are seldom coarse, and in action they stand next to the Clydesdale.

21. Registration.—In England, the Suffolk Stud Book Society has charge of registrations. Volume I was published in 1880, and up to the present time about sixteen volumes have been issued. The American Suffolk Horse Association has charge of the registrations in the United States, but no stud books have been issued.

MARKET CLASSES OF HORSES

22. As has been explained in a previous Section, the market classification of horses is based on their size, conformation, height, weight, style, and action. A classification based on such widely variable characters as these must necessarily be somewhat flexible, that is, the lines of division between the classes must be more or less a matter of personal opinion and subject to change according to the market demands for and the supply of any particular class. Many animals go to market and help to supply the demand that are not altogether typical of the market class in which they are sold. In attempting to meet the market demands, if there are not enough horses of a particular type, dealers try to fill the demand as far as possible with animals that are only partly typical of the class. Notwithstanding this indefinite classification, most horsemen recognize an approved type for each market class. It is the purpose to describe, in the following pages, these approved types.

In Table I are given the names of the market classes and subclasses of horses, and the height and weight requirements for each. It will be seen that in most cases the name of the class and subclass is suggestive of the use to which the horses belonging to it are put.

23. Draft-Horse Class.—The draft-horse class is composed of horses that are broad, massive, rugged, and compact, and possess sufficient weight, strength, and endurance to pull

TABLE I

MARKET CLASSES AND SUBCLASSES OF HORSES AND HEIGHT AND WEIGHT REQUIREMENTS OF EACH

Classes	Subclasses	Height Hands	Weight Pounds
Draft horses	Light draft horses	$15\frac{3}{4}$ to $16\frac{1}{2}$	1,600 to 1,750
	Heavy draft horses	16 to $17\frac{1}{2}$	1,750 to 2,200
	Loggers	$16\frac{1}{4}$ to $17\frac{1}{2}$	1,700 to 2,200
Chunks	Eastern and export chunks	15 to 16	1,300 to 1,550
	Farm chunks	15 to $15\frac{3}{4}$	1,200 to 1,400
	Southern chunks	15 to $15\frac{3}{4}$	800 to 1,250
Wagon horses	Express horses	$15\frac{3}{4}$ to $16\frac{1}{2}$	1,350 to 1,500
	Delivery-wagon horses	15 to 16	1,100 to 1,400
	Artillery horses	$15\frac{1}{4}$ to 16	1,050 to 1,200
	Fire horses	15 to $17\frac{1}{2}$	1,200 to 1,700
Carriage horses	Coach horses	$15\frac{1}{4}$ to $16\frac{1}{4}$	1,100 to 1,250
	Cobs	$14\frac{1}{4}$ to $15\frac{1}{4}$	900 to 1,150
	Park horses	15 to $15\frac{3}{4}$	1,000 to 1,150
	Cab horses	$15\frac{1}{2}$ to $16\frac{1}{4}$	1,050 to 1,200
Road horses	Runabout horses	$14\frac{3}{4}$ to $15\frac{1}{2}$	900 to 1,050
	Roadsters	15 to 16	900 to 1,150
Saddle horses	Five-gaited saddlers	15 to 16	900 to 1,200
	Three-gaited saddlers	$14\frac{3}{4}$ to 16	900 to 1,200
	Hunters	$15\frac{1}{2}$ to $16\frac{1}{4}$	1,000 to 1,250
	Cavalry horses	15 to $15\frac{3}{4}$	950 to 1,100
	Polo ponies	14 to $14\frac{1}{2}$	850 to 1,000

heavy loads. The weight should come from size rather than an abundance of fat, although a good covering of fat is desirable on a draft horse intended for market. Strength in a draft horse is usually an attribute of weight, as the heavier the animal the easier it is for it to move heavy loads. Heavy bone of good quality, and muscularity of limbs is the best evidence of endurance. Draft horses range in height from $15\frac{3}{4}$ to $17\frac{1}{2}$ hands, and weigh from 1,600 to 2,200 pounds or more. The action should be energetic and spirited, and the stride at the walk should be long and rapid.

The draft-horse class has been divided into *light draft horses*, *heavy draft horses*, and *loggers*, but the distinction between the light and the heavy subclasses is rarely made on the market, pertaining almost exclusively to the show ring.

24. Light draft horses are from $15\frac{3}{4}$ to $16\frac{1}{2}$ hands high and weigh from 1,600 to 1,750 pounds. Although $15\frac{3}{4}$ hands is accepted as the minimum height for an animal of this subclass, it should be understood that a horse of this height is less desirable than one that is taller, and that it closely approaches the eastern chunk subclass.

25. Heavy draft horses are the heaviest type of horses; they weigh from 1,750 to 2,200 pounds or more, and are from 16 to $17\frac{1}{2}$ hands high. A typical specimen of the heavy draft subclass is shown in Fig. 10. This animal is excellent in compactness of body and smoothness of finish. He is $16\frac{1}{4}$ hands high and weighs 1,950 pounds.

26. Loggers are heavy draft horses that are used in the lumbering regions for drawing heavy loads of logs. They usually differ from the heavy draft horses in being plain, rough, or slightly unsound in some respect, such as being defective in wind, having sidebones, boggy hocks, etc.; these and other unsoundnesses will be explained in a subsequent Section. Occasionally, good horses are purchased for logging purposes, but as a rule the trade demands rather cheap animals. A logger is shown in Fig. 11. It will be seen that the hindquarters of this animal are very plain, the croup being drooping,

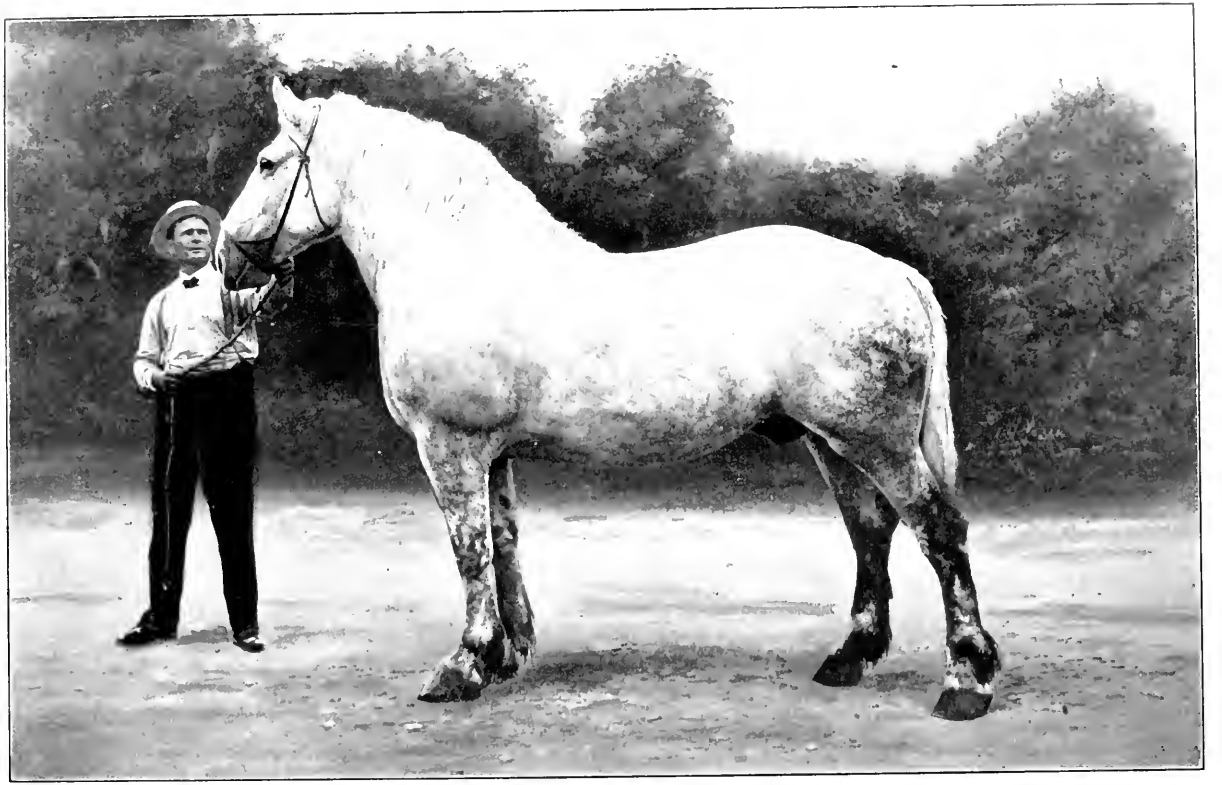

FIG. 10

Fig. 11

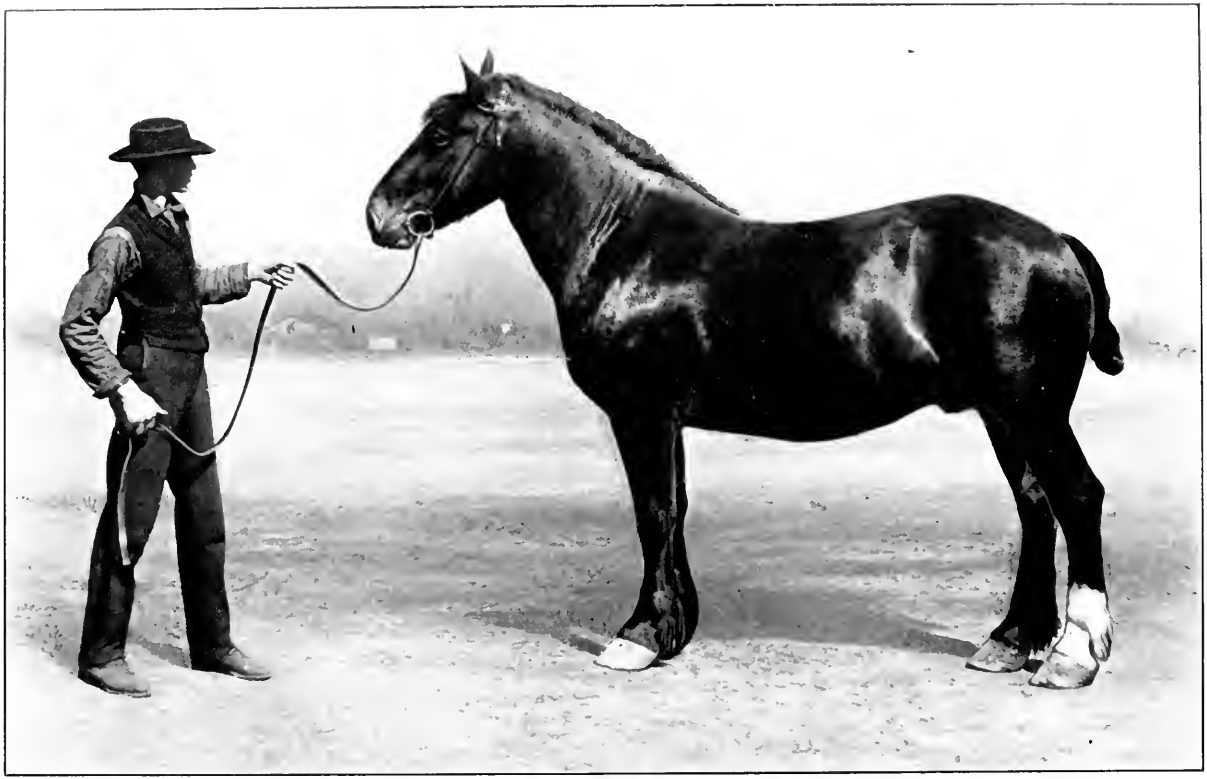

FIG. 12

FIG. 13

the hind flank cut up too high, and the hind legs crooked, or sickle-hocked. This horse is $16\frac{1}{2}$ hands high and weighs 1,950 pounds.

In recent years the demand for draft horses has exceeded the supply, and, as a result, prices for animals of this class are high.

27. Chunk Class.—Horses of the chunk class are short legged, broad, and heavy set. The name of the class is indicative of the conformation of the animals rather than of the use to which they are put. As a class, chunks are less uniform in type than the animals of any other class. They vary in height from 15 to 16 hands and weigh from about 800 to 1,550 pounds. The subclasses of the chunk class are *eastern and export chunks*, *farm chunks*, and *southern chunks*.

28. Eastern and export chunks are of much the same type and conformation as draft horses, but are a little more blocky and compact. They weigh from 1,300 to 1,550 pounds, and range in height from 15 to 16 hands, although, as a rule, they are not more than $15\frac{3}{4}$ hands. At one time a considerable number were exported, but in recent years the price has been too high to permit of a profit in such business. The use for eastern and export chunks is pretty much the same as that for draft horses; they are largely used in pairs and in threes for trucking purposes. Some horses of the eastern-chunk type may be found on the market at all seasons of the year, but not in such great numbers as during the spring. They usually bring good prices, but less than those for draft horses. Fig. 12 shows a choice animal of the chunk subclass. The horse shown is $15\frac{1}{2}$ hands high and weighs 1,530 pounds.

29. Farm chunks are an important item in the horse market, particularly during the spring months. At other seasons they are usually sold to supply demands other than for farming. Farm chunks are lighter in bone and not as uniform in type as eastern chunks. Their lack of uniformity is largely due to the fact that farmers are of varying opinions as to the best type of horse for farm use, and often accept the commoner and inferior grades. Some farmers who do not wish to pay

high prices for farm horses buy animals that are slightly blemished or unsound. The greatest demand is for animals that weigh from 1,200 to 1,400 pounds and are from 15 to $15\frac{3}{4}$ hands high. Mares are usually preferred to geldings, as most farmers want horses for breeding purposes as well as for work. In the case of farm chunks, the walk is the most important gait, but because of the varied work on a farm, it is important that the animals be quick and active, and be able to trot readily, if necessary. Farm chunks sell readily, as a rule, but do not bring as high prices as eastern and export chunks. Fig. 13 shows a choice farm chunk. This animal is $15\frac{5}{8}$ hands high and weighs 1,400 pounds. The bone is a trifle light, but this character is often found in horses of the farm chunk subclass.

30. Southern chunks, or *southern horses*, as they are more generally called, are lighter in bone and more rangy in conformation than farm chunks, being from about 15 to $15\frac{3}{4}$ hands high and weighing from about 800 to 1,250 pounds. They are somewhat of the road-horse type, and usually possess considerable light-horse blood. As in the case of farm chunks, mares are preferred to geldings, and good action is even more desired than in farm chunks. Southern chunks are taken to the southern states where they are largely used for agricultural purposes. The trade in this subclass begins in the autumn and is best during the winter. Southern chunks are in less demand and bring lower prices than farm chunks. A good specimen of the Southern chunk subclass is shown in Fig. 14. This mare has excellent quality and finish, but might be a little lower in the hind flank. She is $15\frac{1}{2}$ hands high and weighs about 1,150 pounds.

31. Wagon-Horse Class.—Animals of the wagon-horse class are used principally for the pulling of light wagons, such as delivery and express wagons, on city streets. Horses of good action are required for this purpose, as they are required to do their work at a fairly rapid gait. In order to stand the work, a wagon horse must have a good constitution, and it is especially important that it have good feet and limbs, and bone

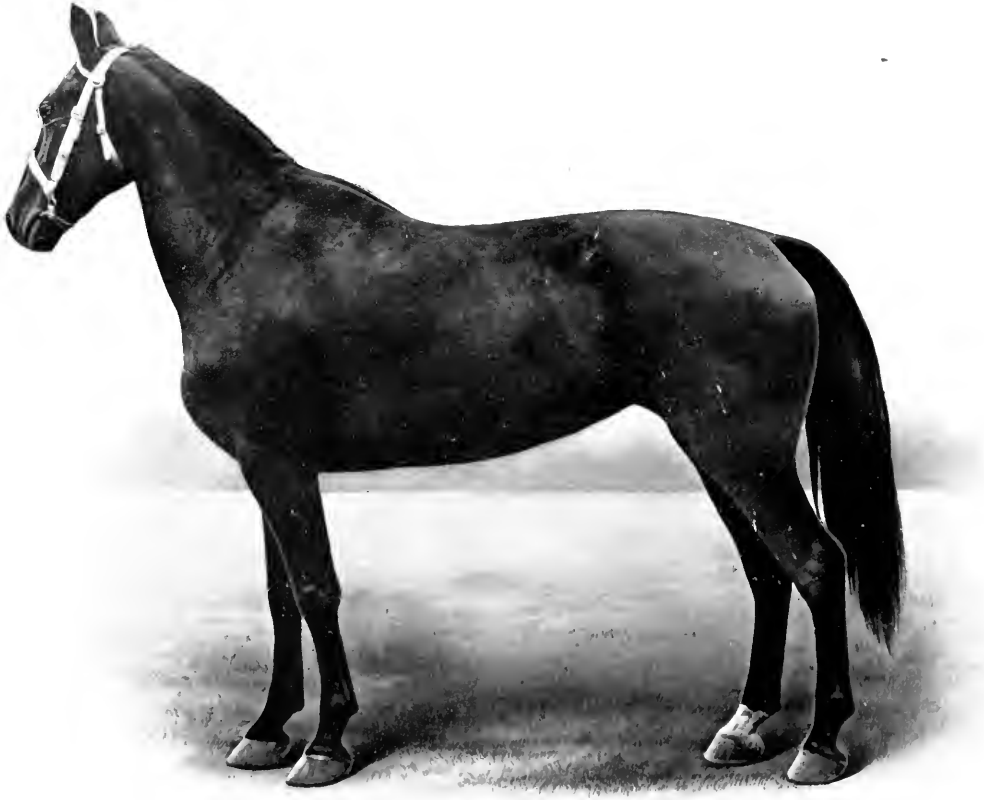

Fig. 14

FIG. 15

of the best quality. Horses of this class are from about 15 to $17\frac{1}{2}$ hands high and weigh from about 1,050 to 1,700 pounds. The subclasses of the wagon-horse class are *express horses*, *delivery-wagon horses*, *artillery horses*, and *fire horses*.

32. **Express horses** are used singly or in pairs by express companies in the collecting and delivering of packages. The size of the horses that are used is determined by the weight of the wagon, whether the horses are worked singly or doubly, and the extent of the territory from which collections and deliveries are made. The lightest grade of express horses, which are hitched to light wagons and used for the delivering of valuable packages, such as money, etc., are known as *money horses;* such horses must be capable of doing fast work. The typical express horse should stand from about $15\frac{3}{4}$ to $16\frac{1}{2}$ hands high and weigh about 1,400 pounds when in working condition. It is important that the shoulders and pasterns of an express horse be obliquely set and that the limbs should be of excellent quality, with large feet and hoofs of a dense, tough horn. The back and loins should be short, broad, and well muscled; and the quarters and thighs deep, broad, and powerful. Express horses should be quick, active, full of energy and spirit, and able to keep their feet well under them when pulling either at the walk or the trot. Fig. 15 shows an excellent animal of the express subclass. This horse is 16 hands high, weighs 1,375 pounds, and is almost faultless in conformation.

33. **Delivery-wagon horses,** or, as they are often termed, *wagon horses*, are similar to express horses, but are not quite so large and generally not as high grade, as most mercantile firms do not care to pay large prices for horses. However, there are exceptions, some large department stores buying nothing but choice animals. Delivery-wagon horses should have clean, hard, flinty legs, and good feet and pasterns. The range in height is from 15 to 16 hands and in weight from 1,100 to 1,400 pounds. There is always a good demand at remunerative prices for the better grades of express and delivery-wagon horses, but the lower grades do not sell so well. The demand for delivery-wagon horses is largely for the drawing of parcel-

delivery wagons, and comes chiefly from retail houses. Some of the coarser, rougher animals are used for heavier work, such as the pulling of huckster wagons, junk wagons, etc. Fig. 16 shows a good animal of this subclass.

34. Artillery horses should be from about $15\frac{1}{4}$ to 16 hands high, weigh from about 1,050 to 1,200 pounds, and be from 5 to 8 years old. Only geldings are used for artillery purposes, and the demand is rather spasmodic. Contracts are let by the government to the lowest responsible bidder to supply them in large numbers by a specified time. Because of the rigid examination the animals must undergo at the hands of official inspectors, many men have lost money in filling contracts for artillery horses. A typical artillery horse is shown in Fig. 17.

35. Fire horses, as the term implies, are animals that are used for the drawing of fire-fighting apparatus. Because of the fact that such horses are required to pull comparatively heavy loads at fast speed, it is necessary that they be more rangy than express horses. There is a wide range in the limits of height and weight from the smallest to the largest of fire horses. For heavy engines and heavy hook-and-ladder trucks they should weigh from about 1,500 to 1,700 pounds and stand from about 16 to $17\frac{1}{2}$ hands high. Hose-cart horses should weigh from about 1,200 to 1,400 pounds, and range in height from 15 to about $16\frac{1}{2}$ hands. Fire horses must be intelligent and otherwise suited for the work. The demands for these horses is from cities maintaining paid fire departments and is quite limited. Enough fire horses are found in the general supply to meet the demand, so that it does not pay farmers to try to produce them, although they sell at remunerative prices. Automobile fire trucks are now replacing many fire horses. Fig. 18 shows a good fire horse, and Fig. 19, a typical fire team hitched to apparatus. These animals belong to the fire department of Chicago, Illinois.

36. Carriage-Horse Class.—Horses of the carriage-horse class are used for drawing heavy vehicles and are frequently spoken of as heavy-harness horses. They range in height from

Fig. 16

Fig. 17

FIG. 18

Fig. 19

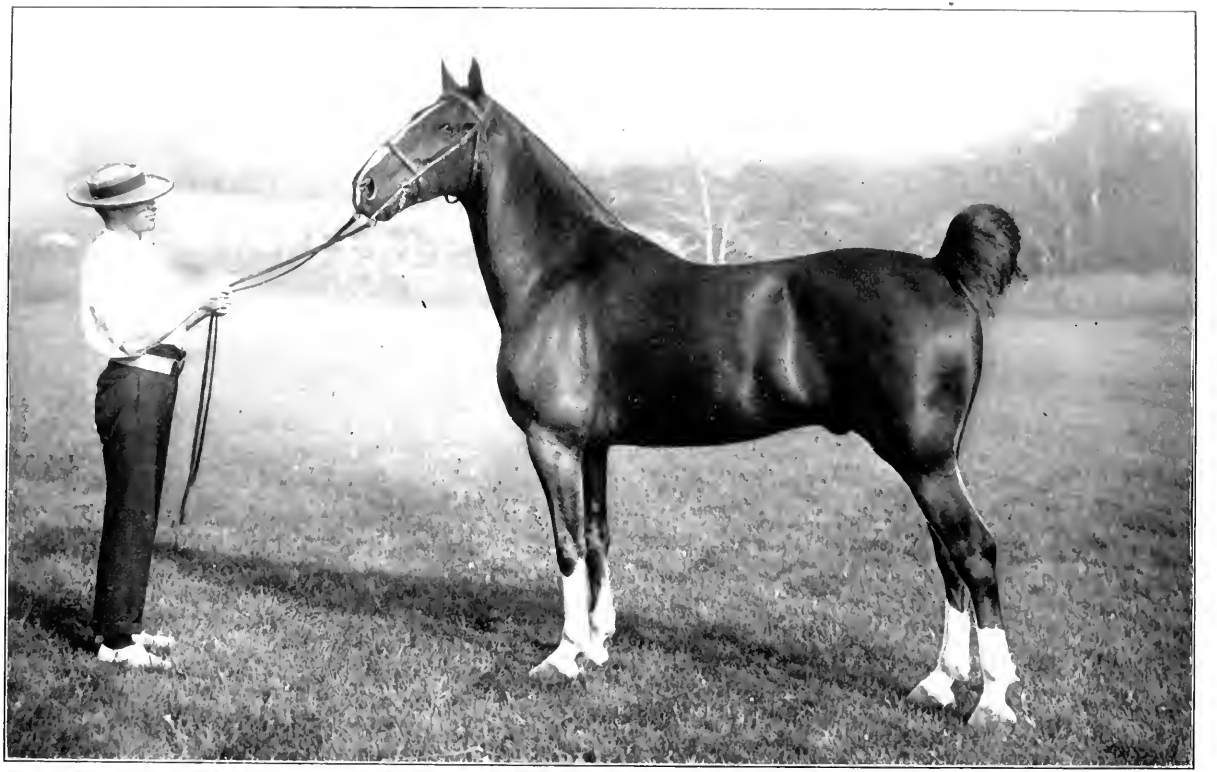

Fig. 20

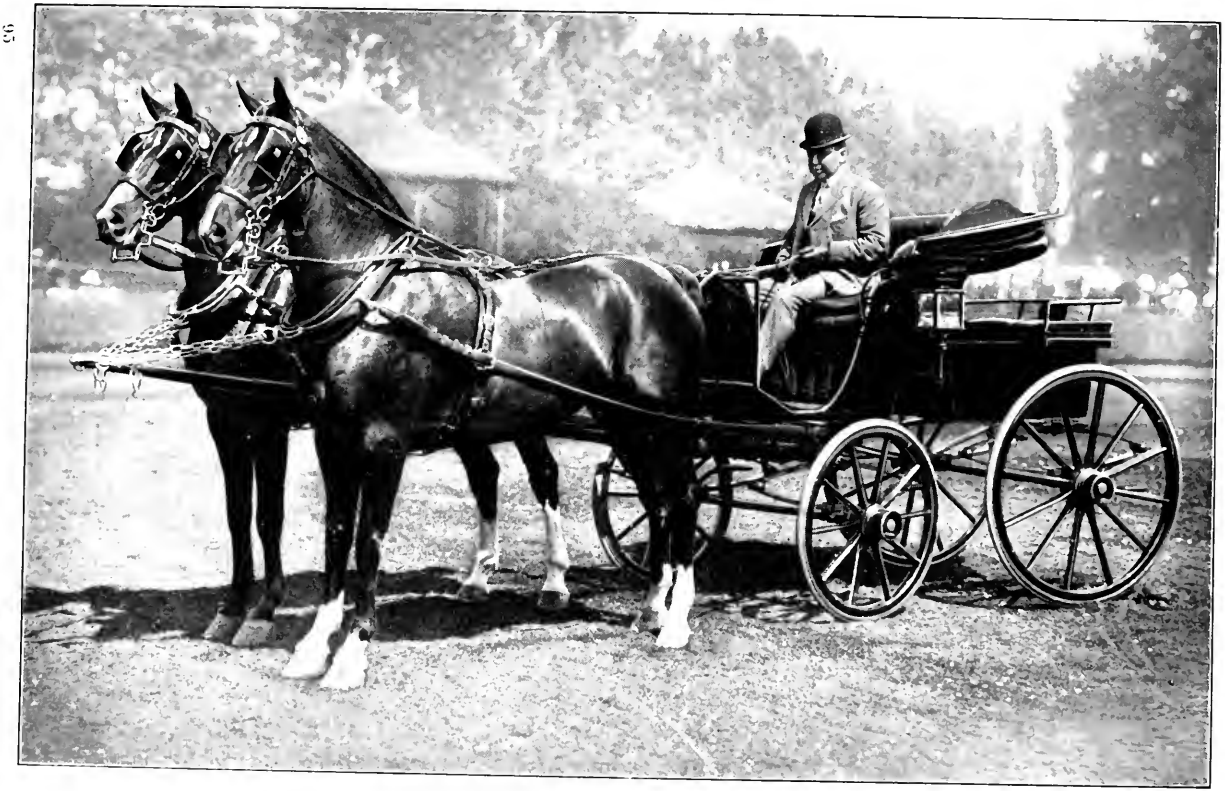

FIG. 21

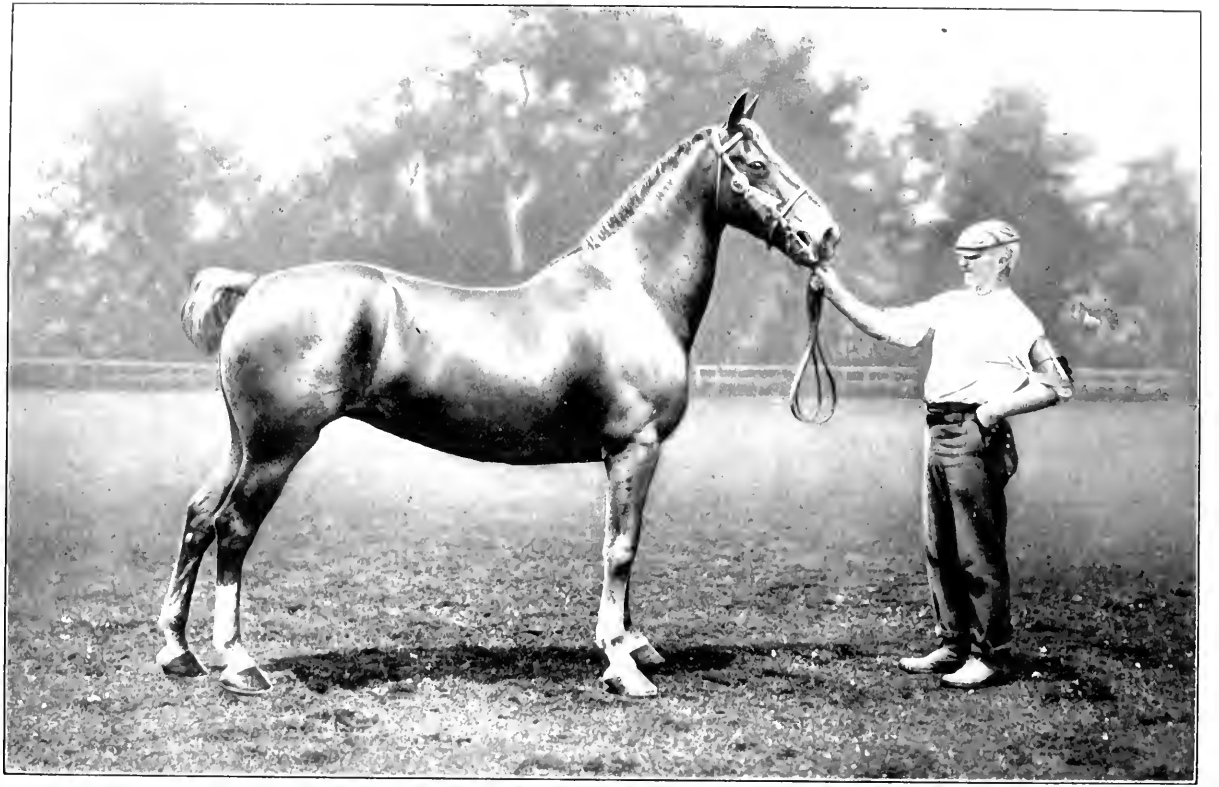

Fig. 22

FIG. 23

$14\frac{1}{4}$ to $16\frac{1}{4}$ hands and weigh from 900 to 1,250 pounds. Carriage horses are smoothly turned and high-headed; they possess an abundance of quality and have high action and fair speed. Everything about a carriage horse should indicate neatness and refinement. The neck should be long and arched, the head small and clean-cut, and the ears neatly set. The shoulders should be oblique in order to enable the horse to carry his knees as high as possible. The back should be short and well muscled; the ribs should spring well from the spine, giving a round barrel; the hips should be rounding, and the croup comparatively level and well muscled; the quarters should be deep, and the tail set high. The limbs should be well set, clean, flinty, and free from blemishes or unsoundness. The subclasses of the carriage-horse class are *coach horses*, *cobs*, *park horses*, and *cab horses*.

37. Coach horses must have high action and beauty of form. They must flex the hocks well under the body and carry the knees high toward the chin. They are a little larger than other horses of the carriage class, and may be said to be a little more stately in action than cobs or park horses. Coach horses with good conformation but deficient in style and action are comparatively low-priced animals. Coarseness is a common fault in this subclass and is very objectionable; flat ribs, staggy necks, and long backs are other faults that are objectionable. Coach horses should be from $15\frac{1}{4}$ to $16\frac{1}{4}$ hands high and weigh from 1,100 to 1,250 pounds. The demand is for trotters only. In Fig. 20 is shown the noted coacher, President, owned by E. D. Jordan, of Boston, Massachusetts. Fig 21 shows a coach team in harness.

38. Cobs are small, stocky coach horses that are from $14\frac{1}{4}$ to $15\frac{1}{4}$ hands high and weigh from 900 to 1,150 pounds. The cob is a popular English type, and in England a horse is never considered a cob that is over 15 hands high. The action of the cob is much the same as that of the coach horse, being, perhaps, a trifle higher at the knees and hocks. Cobs should be somewhat quicker on their feet than coach horses. Owing to the fact that cobs are particularly suitable for lady drivers, they

are often spoken of as ladies' cobs. They are usually hitched to a light brougham, phaeton, or some carriage that is not intended for carrying more than four. As a rule, city purchasers require that the tails of cobs be docked; this operation, however, should be left to the dealer or buyer. Fig. 22 shows the noted cob, Tinker Bell. Fig. 23 shows Alfred Vanderbilt's cob team, Polly Prim and Sweet Marie. These animals are the highest type of the cob subclass.

39. Park horses are used strictly for display purposes, such as for driving in parks or on boulevards, and are usually used by horse fanciers. An abundance of quality and extremely high action at both knees and hocks are essential in horses of this subclass. Because of their high action, a great speed is seldom secured. Park horses should be well broken and have good manners. For a lady's use, a horse of a solid color is more desirable than one with white markings; it is not considered good taste for a lady to drive a strikingly marked horse. The height of a park horse ranges from 15 to $15\frac{3}{4}$ hands, but the most desirable height is about $15\frac{1}{2}$ hands. The weight for this subclass ranges from 1,000 to 1,150 pounds. An excellent park horse is shown in Fig. 24; this animal is Lady Seaton, a noted prize winner. Fig. 25 shows a tandem park team in action.

40. Cab horses range from $15\frac{1}{2}$ to $16\frac{1}{4}$ hands high and weigh from 1,050 to 1,200 pounds. Many of them are either the lower grades of the coach class or worn-out and discarded coach horses. They are used chiefly in cities for the conveyance of vehicles for public service. The requirements of this subclass differ from those of the other carriage subclasses in that high action is not wanted; however, moderate action is desired. The principal qualities sought in cab horses are symmetry of form and endurance, the evidence of the latter being good feet and bone, strong constitution, and a deep barrel with good spring of rib and close coupling. Not as much flesh is required on cab horses as on horses of the other carriage classes, but they should be in good condition and fit for service. Owing to the fact that, as a rule, cab horses are not high-class animals and

Fig. 24

Fig. 25

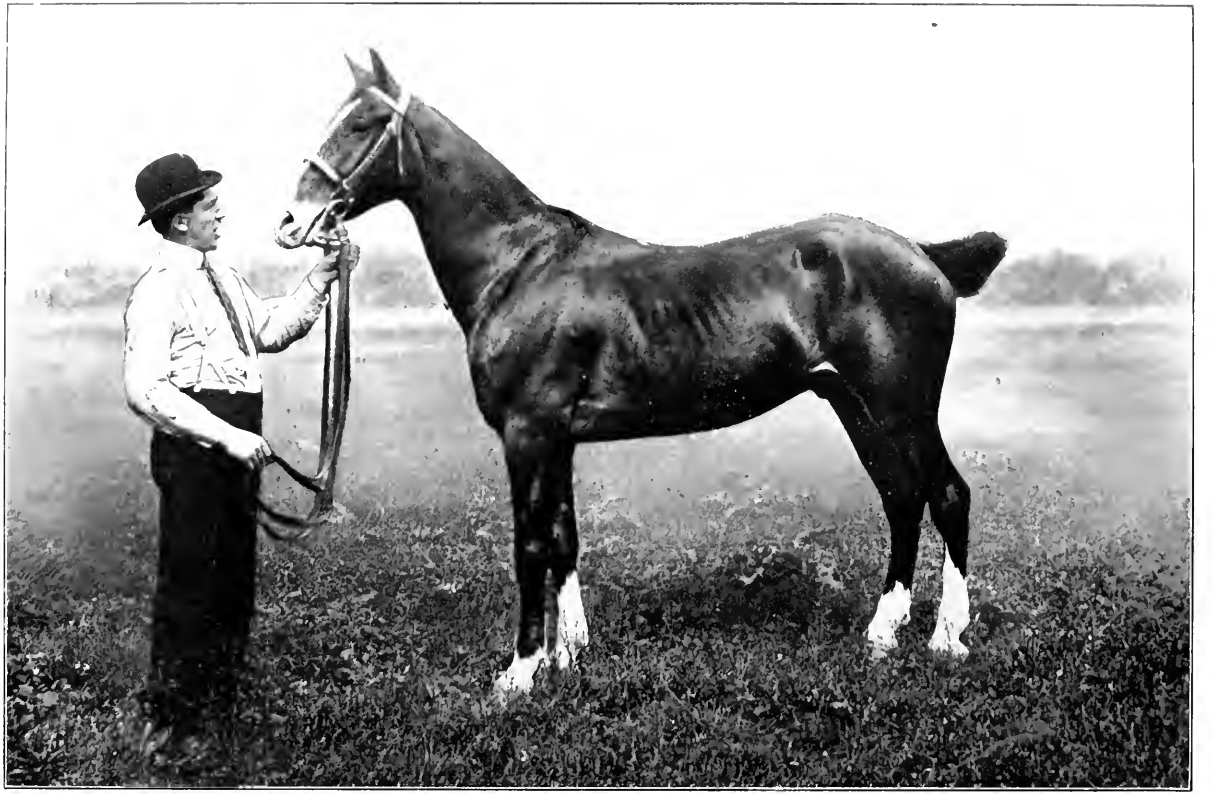

FIG. 26

that the supply is larger than the demand, they do not bring very high prices. Fig. 26 shows a typical cab horse.

41. Road-Horse Class.—Road horses are more lithe in build and angular in form than those of the carriage class. They are frequently spoken of as drivers or as light-harness horses, and should be able to travel rapidly and cover a good distance without undue fatigue. Although performance is the principal quality sought, a good conformation is very desirable. This class is composed of *runabout horses* and *roadsters*.

42. Runabout horses occupy an intermediate place between typical roadsters and carriage horses. They wear harness much like that of carriage horses, but in action and conformation and in the use to which they are put they correspond more to the roadster. They are not so heavy and full as coach horses, and are not so light, thin, and angular as roadsters. They are used on runabouts, driving wagons, phaetons, etc. Runabout horses are rather short legged, are from $14\frac{3}{4}$ to $15\frac{1}{2}$ hands high, and weigh from 900 to 1,050 pounds. A choice runabout horse is shown in Fig. 27. Fig. 28 shows a noted runabout team, Lord Nelson and Grand Duke.

43. Roadsters are less uniform and usually more lithe and angular than runabout horses. The market requires roadsters to be from 15 to 16 hands high and weigh from 900 to 1,150 pounds. In general, a roadster may be described as having the greyhound form, often being a little higher at the hips than at the withers, and powerfully developed in the hind limbs. Speed, style, and stamina are the principal qualities sought for. Roadsters should have a long, free, open stride and quick recovery; they should move the feet in a straight line and have good knee action, although it need not be excessively high. Interfering, forging, cross-firing, and sprawling of the hind legs are common faults in roadsters and are objected to; these faults are explained fully in a subsequent Section.

The more speed roadsters possess the higher prices they bring. For road work the demand is stronger for trotters than for pacers, but for racing purposes there is little difference.

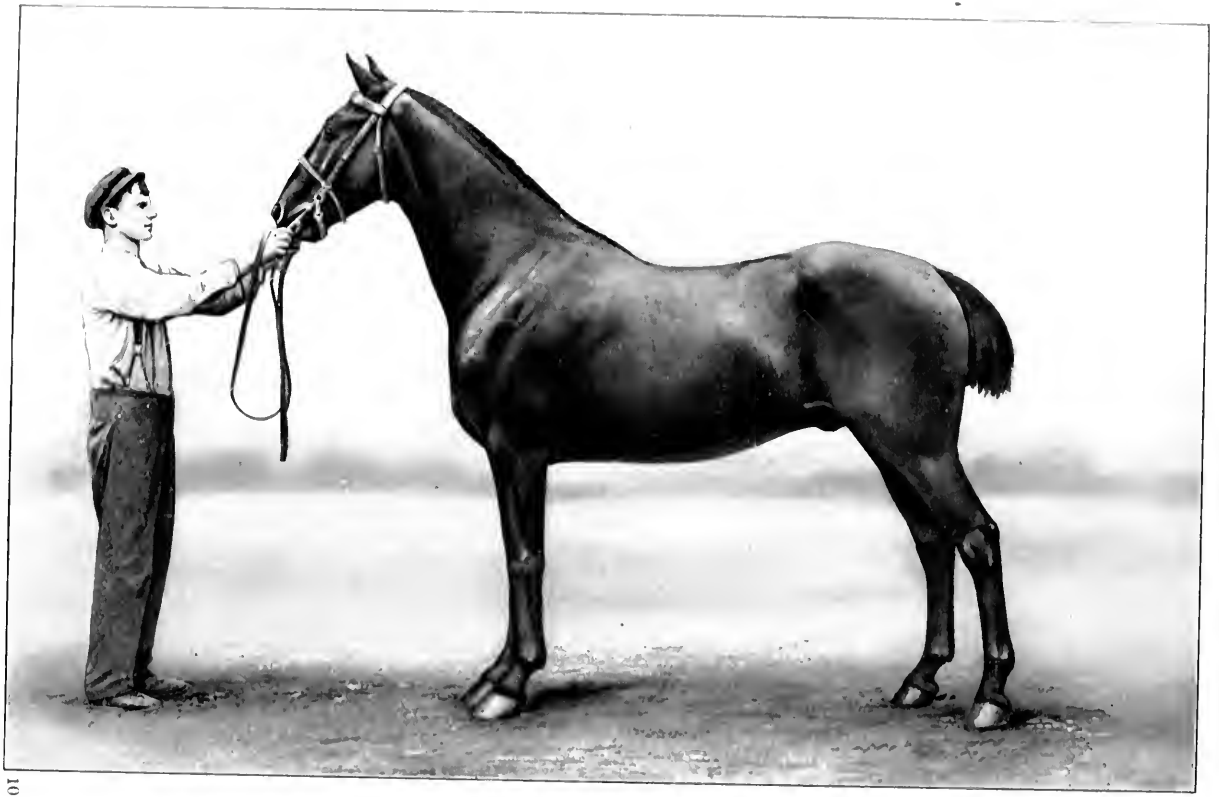

FIG. 27

FIG. 28

FIG. 29

Fig. 30

Fig. 29 shows Lucia G., an excellent roadster owned by the Winoga Stock Farm, of Chestnut Hill, Pennsylvania. Fig. 30 shows a choice roadster team, Lugano and Como.

44. Saddle-Horse Class.—The most important requirement for an animal of the saddle-horse class is to be sure of foot, as no rider cares to mount a stumbler. A saddle horse should also be an easy rider, and be easily controlled. In order to possess these requirements, the animal should have oblique shoulders and pasterns, to give springiness to the gait; high, thin withers, to prevent the saddle from turning and to hold it midway between the front and the hind legs; a short back and short loins, for strength in carrying weight; and a moderately long neck and a good mouth, to give suppleness and ease of control. A horse that lugs at the bit is undesirable as a saddler. The croup should be long, level, and muscular, and the tail neatly attached and smartly carried. In selecting a saddle horse, it is a good plan to choose a conformation that will place the rider well back on the animal, thus lessening the weight on the fore end. The subclasses of the saddle-horse class are: *five-gaited saddlers*, *three-gaited saddlers*, *hunters*, *cavalry horses*, and *polo ponies*.

45. Five-gaited saddlers, often spoken of as *gaited saddle horses* or as *American saddle horses*, are the result of skilful selection and breeding for more than half a century. They should possess the five recognized distinct gaits under the saddle, namely, the walk, the trot, the canter, the single-foot or rack, and a slow gait, which may be either the running walk, the fox trot, or the slow pace. The action should be bold and vigorous, with no inclination to mix gaits. The rack should be smooth, graceful, rapid, and free from side motion, which produces roughness when going fast. The horse should be taught to lead with either leg in cantering, and to go slow or fast according to the pleasure of the rider. The action at the trot should not be high, but should be free and open, and the hind legs kept well under the body. Horses of this subclass should have a long, flowing tail that is gracefully carried. The most desirable height for a five-gaited saddle horse is from $15\frac{1}{2}$ to

$15\frac{3}{4}$ hands, and the most desirable weight is from 1,050 to 1,150 pounds, although the range in height is from 15 to 16 hands and in weight from 900 to 1,200 pounds. Fig. 31 shows Kentucky's Choice, a noted five-gaited saddler.

46. Three-gaited saddlers are much the same in general type and conformation as the five-gaited saddlers, but they are a little more compactly built, having shorter necks and bodies; the tails are usually docked and set; and they have only the three gaits: the walk, the trot, and the canter. This subclass is subdivided into light and heavy horses, the former being expected to carry weights of not over 165 pounds, and the latter weights above this. In general, the heavy weights are about an inch taller and 50 to 100 pounds heavier than the light weights. Fig. 32 shows an excellent three-gaited saddler, Nuff Sed.

47. Hunters are horses used by sportsmen to ride after hounds. They are often required to take daring leaps over fences and gullies, and must be fearless and trained to jump. They should be strongly built and able to stand long, hard rides without becoming unduly jaded. In the show ring, hunters are classified as light, medium, and heavy weights, the division being determined by the weight they are expected to carry. The limits in weight for hunters are from 1,000 to 1,250 pounds. The most desirable height is from $15\frac{1}{2}$ to 16 hands, but may be slightly more. A light-weight hunter is not expected to carry over 165 pounds; a middle weight, is expected to carry from 165 to 190 pounds; and a heavy weight, 190 pounds or over. Fig. 33 shows a noted hunter, Rock Crest, owned by Frederick Bull, of New York City.

48. Cavalry horses, as the name implies, are horses used by the government for cavalry mounts. For this service, the government requires geldings of uniform and lasting color. They must be in good condition, from 4 to 8 years old, weigh from 950 to 1,100 pounds, and be from 15 to $15\frac{3}{4}$ hands high. Like artillery horses, they are purchased by contract, orders being given to the lowest responsible bidder. A typical cavalry horse is shown in Fig. 34.

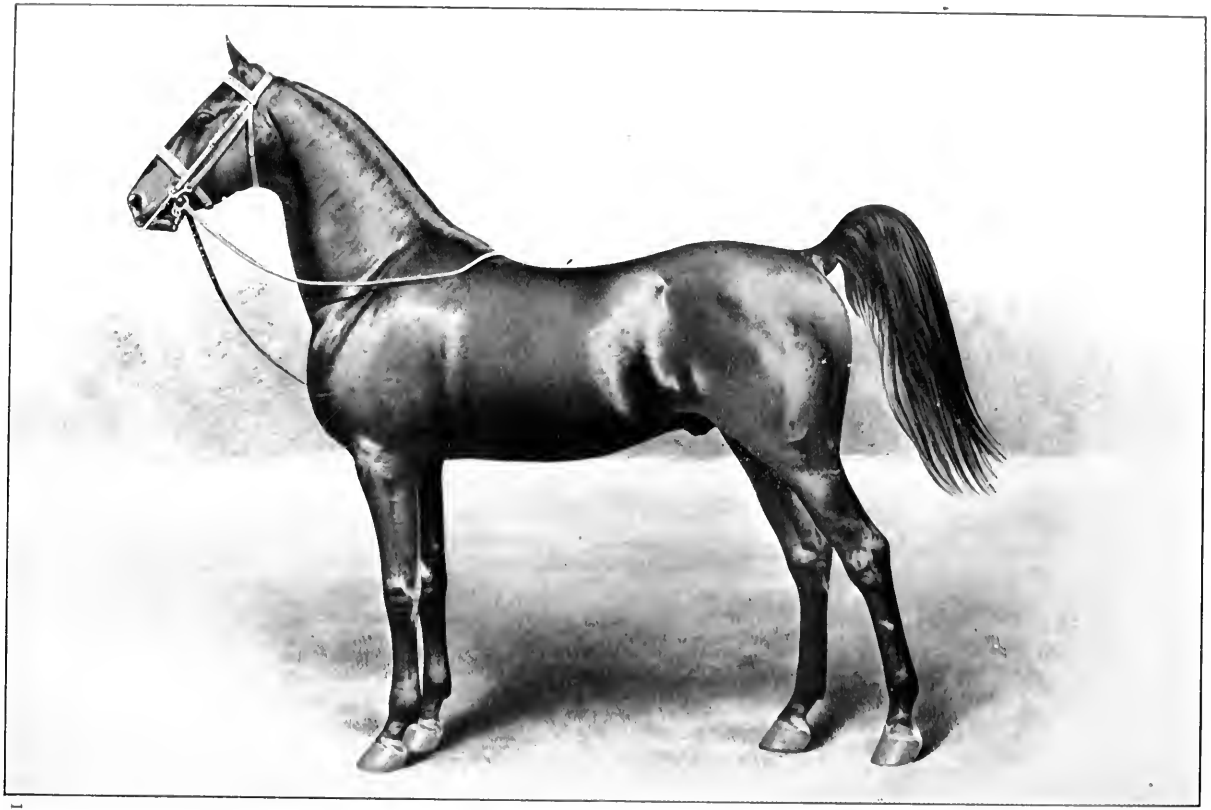

FIG. 31

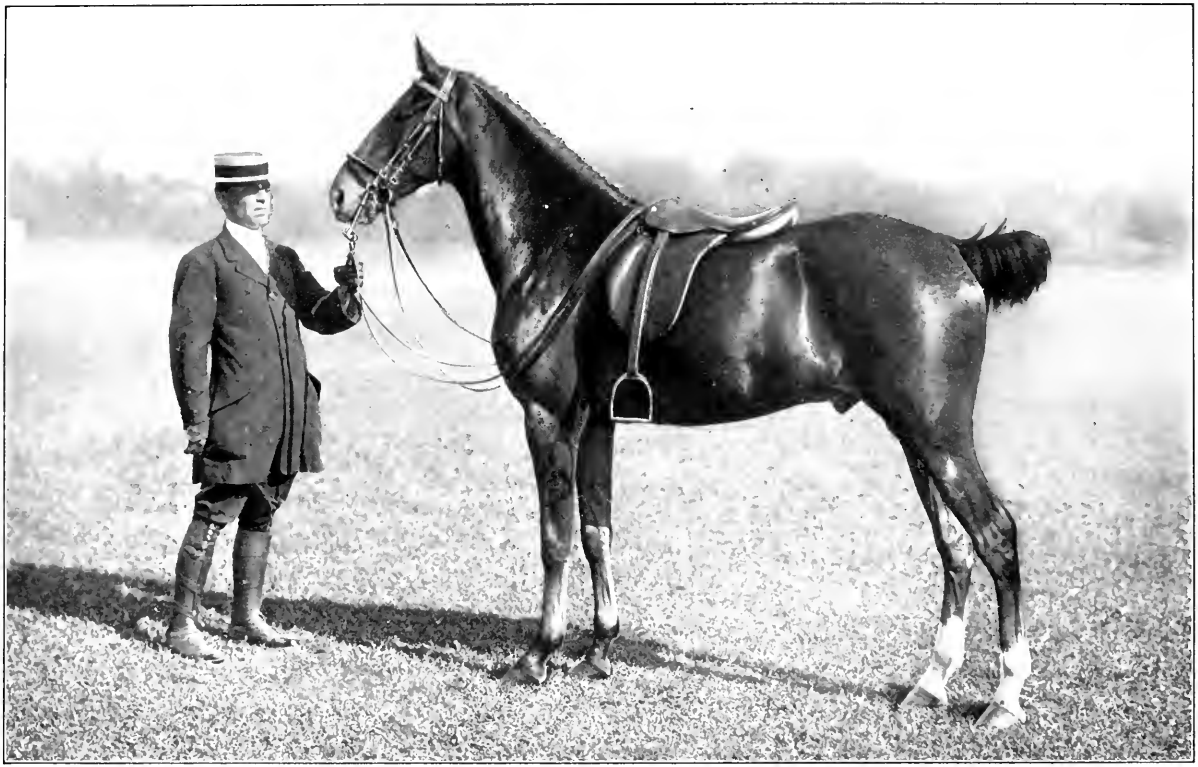

FIG. 32

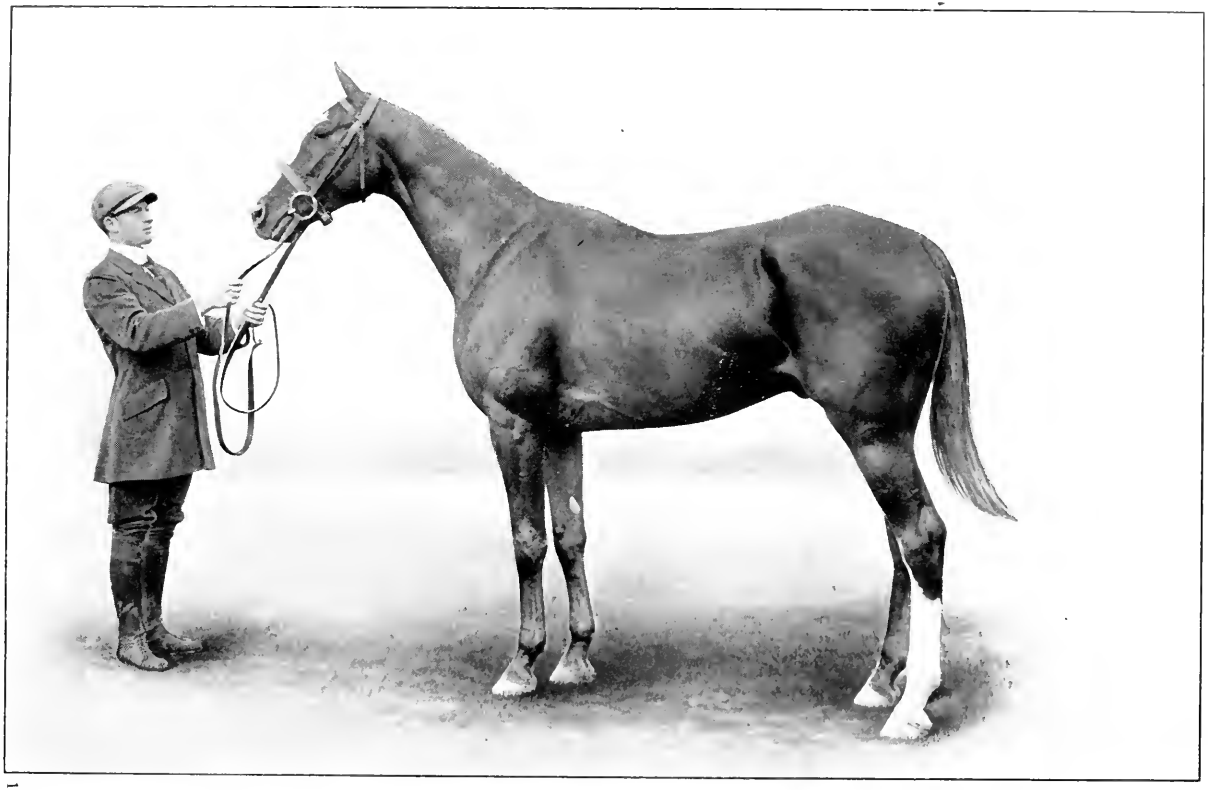

FIG. 33

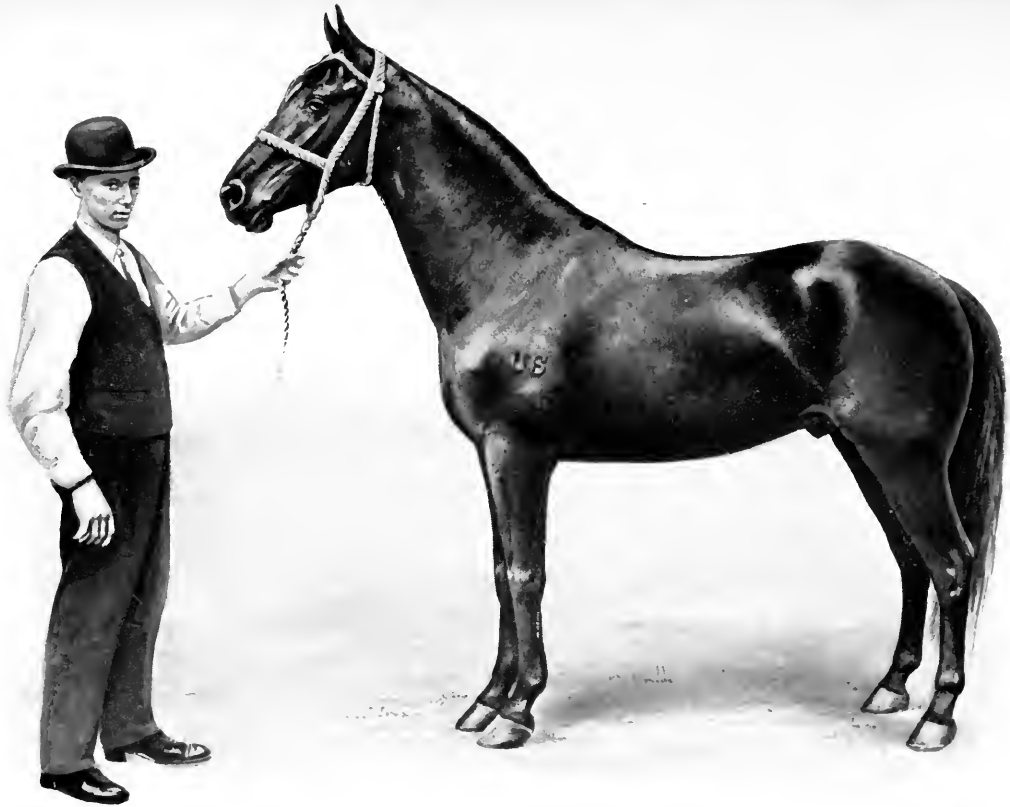

FIG. 34

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FIG. 35

49. Polo ponies are small saddlers that are used in playing polo. The four essentials which they must possess are a specified size, weight-carrying ability, agility, and speed. The rules of the American Polo Association fix the maximum height of Polo ponies at $14\frac{1}{2}$ hands, but the rules are frequently disregarded. The limits in weight are from 850 to 1,000 pounds. Although the larger ponies may have the advantage over the smaller in weight and speed, it is generally conceded that they are not so quick to stop and start, which is a very important requisite. They should possess a conformation indicative of strength and endurance, and also possess a marked degree of intelligence, for if they are not capable of acquiring an education they are worthless for polo. They must be sure footed, quick on foot, and dextrous in starting, stopping, and turning. A polo pony is shown in Fig. 35.

HORSE JUDGING

INTRODUCTORY REMARKS

1. Horse judging is the art of ascertaining the qualities of a horse and of weighing them in comparison with those of other horses or of an ideal horse in the mind of the judge. As the term is commonly used, however, its specific application is somewhat indefinite. It may have reference to the judging of horses competing in a show ring or to more general judging such as any person may do in distinguishing between good and inferior animals. Likewise, the term *a judge of horses* may be applied either to a person that is sufficiently proficient in judging to officiate in the show ring, or to one that is able, through more or less knowledge of horses, to distinguish merits and demerits. Show-ring judging is an art that requires a thorough knowledge of the so-called fancy points of the particular breed or class to be judged, and, further, is of direct interest to comparatively few persons. For this reason, judging will be discussed in this Section from the standpoint of the person who desires merely to select good animals, and reference will not be made to the fancy points of the different breeds and classes.

2. The Anatomy as a Basis of Study in Horse Judging. In learning to judge horses, it is necessary for a person to study the horse as a mechanism. The bones should be considered as levers, the muscles as the source of power, and the nervous system as the stimulator of the muscles. The conformation and quality of the bones, the depth and quality of

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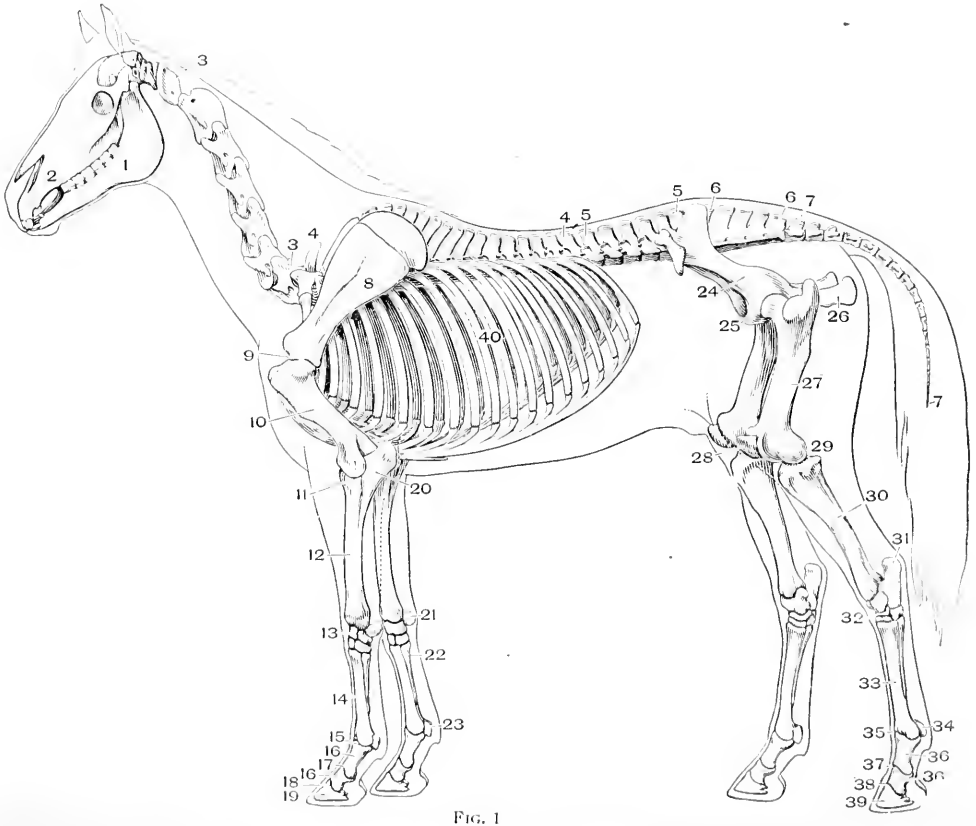
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Fig. 1

the muscular covering, and the nature of the nervous system are extremely important guides to the fitness of a horse for a particular purpose.

To explain the anatomical terms that are necessary in a discussion of horse judging, a view of the skeleton of a horse with a contour view of the body is shown in Fig. 1. The bones, groups of bones, and joints that should be known by a judge of horses are numbered, their names being given below.

BONY ANATOMY OF THE HORSE

1, Lower jaw
2, Upper jaw
3 to *3*, Cervical vertebræ
4 to *4*, Thoracic vertebræ
5 to *5*, Lumbar vertebræ
6 to *6*, Sacrum
7 to *7*, Coccygeal vertebræ
8, Scapula
9, Shoulder joint
10, Humerus
11, Elbow joint
12, Radius
13, Knee joint
14, Front cannon bone
15, Front fetlock joint
16, Front pastern bones
17, Front pastern joint
18, Front coffin joint
19, Front coffin bone
20, Ulna
21, Accessory carpal bone
22, Splint bone
23, Front sesamoid bones
24, Ilium
25, Hip joint
26, Ischium
27, Femur
28, Patella
29, Stifle joint
30, Tibia
31, Os calcis
32, Hock joint
33, Hind cannon bone
34, Hind sesamoid bones
35, Hind fetlock joint
36, Hind pastern bones
37, Hind pastern joint
38, Hind coffin joint
39, Hind coffin bone
40, Ribs

As the front legs of a horse bear the greater part of its weight, they are termed the *weight carriers*. The hind legs are termed the *propellers* because they apply most of the power. The bones of the front legs have no bony connection with the skeleton of the body, but are hung to it by means of strong muscles; for this reason there is less concussion on a horse when in action than if the connection between the legs and frame were solid bone. The bones of the hind legs, by which power is transmitted, are arranged in a series of angles and the femurs are connected to the skeleton by means of strong ball-and-socket

SCORE CARD FOR LIGHT MARKET HORSES

Name or number of animal .....
Age .....
Blemishes .....
Unsoundnesses .....
Estimated market value .....

	Perfect Score	Judge's Score
General Appearance		
Height: score according to class	1	
Weight: score according to class	1	
Form: according to class, symmetrical, smooth, and stylish	5	
Condition: carrying a moderate amount of firm flesh	2	
Quality: bone clean, firm, and indicating sufficient substance; tendons well defined; hair and skin fine	3	
Temperament: spirited, yet docile	2	
Head and Neck		
Head: not too large, features well defined and regular	1	
Muzzle: fine, nostrils large; lips thin, even; teeth sound	1	
Eyes: large, full, bright, and clear	1	
Forehead: broad and full	1	
Ears: medium size, pointed; well carried, and not far apart	1	
Neck: rather long and clean cut, well muscled; crest well developed and nicely arched; throat latch fine; windpipe large; tapering from shoulder to head and head attached at proper angle	2	
Forequarters		
Shoulders: oblique, long, smooth, and covered with muscle extending into back; withers well finished at the top	4	
Arms: short, well muscled, elbows lying close to the body	2	
Fore legs: viewed from in front, a perpendicular line from the point of the shoulder should fall on the center of the knee, cannon, pastern, and foot; from the side, a perpendicular line dropping from the center of the elbow joint should fall on the center of the knee and pastern joint and back of the hoof	3	
Forearms: well muscled, medium length, wide, and tapering from the elbow to the knee	2	
Knees: large, clean, wide, straight, and strongly supported	1	
Cannons: medium, length wide, clean; tendons large, set well back, not tied in below the knees	2	
Fetlocks: wide, straight, strong, free from puffiness	1	
Pasterns: strong, of medium length; angle with the ground 45°	2	
Feet: straight, medium size, even; horn dense; frog large, elastic; bars strong; sole concave; heel wide, high; hoof head large	5	
Body		
Chest: deep, low; girth large; width of breast in proportion to other parts	2	
Ribs: long, well sprung	4	
Back: straight, short, broad, well muscled	3	
Loins: wide, short, thick, and neatly joined to hips	2	
Under line: long; flank low	1	
Hindquarters		
Hips: smooth, level, width in proportion to other parts but not prominent	2	
Croup: long, wide, muscular	2	
Tail: attached high, well carried, well haired, with straight and not too coarse hair	1	
Thighs: long, muscular, thick, and wide, well muscled over stifle	3	
Quarters: heavily muscled	1	
Hind legs: viewed from behind, a perpendicular line from the point of the buttock should fall on the center of the hock, cannon, pastern, and foot. From the side, a perpendicular line from the hip joint should fall on the center of the foot and divide the gaskin in the middle; and a perpendicular line from the point of the buttock should run parallel with the line of the cannon	4	
Gaskins, or lower thighs: wide, well muscled	1	
Hocks: large, strong, clean, and well defined, free from puffiness, coarseness, and curbiness	4	
Cannons: short, broad, flat and clean, tendons large and set back, not too light below the hock	2	
Fetlocks: large, wide, straight, strong, free from puffiness	1	
Pasterns: strong and of medium length; obliquity not so great as fore pasterns	1	
Hind feet: straight, medium size, even; smaller and not so round as fore feet; horn dense; frog large, elastic; bars strong; sole concave; heel wide, high	4	
Action		
Walk: elastic, quick, balanced; step long	4	
Trot: rapid, straight, regular, high; should not forge, wing, or roll in front, or go wide or too close behind	15	
Total	100	

SCORE CARD FOR HEAVY MARKET HORSES

Name or number of animal .....
Age .....
Market class .....
Blemishes .....
Unsoundnesses .....
Estimated market value .....

	Perfect Score	Judge's Score
General Appearance		
Height: score according to class	1	____
Weight: score according to class	6	____
Form: according to class, broad, massive, symmetrical	5	____
Condition: carrying a good amount of firm flesh	4	____
Quality: bone moderately heavy, clean, firm, and indicating sufficient substance; tendons well defined; hair and skin fine	4	____
Temperament: quiet, yet energetic	3	____
Head and Neck		
Head: medium in size, not coarse	1	____
Muzzle: fine; nostrils large; lips thin, even; teeth sound	1	____
Eyes: large, full, bright, clear	1	____
Forehead: broad and full	1	____
Ears: medium size, pointed, well carried, and not far apart	1	____
Neck: medium length, clean cut, well muscled; tapering from shoulder to head, and head attached at proper angle; crest well developed and nicely arched; throat latch fine; windpipe large	2	____
Forequarters		
Shoulders: oblique, long, smooth, and covered with muscle extending into back; withers well finished at the top	3	____
Arms: short, well muscled, elbow lying close to the body	2	____
Fore legs: viewed from in front, a perpendicular line from the point of the shoulder should fall on the center of the knee, cannon, pastern, and foot; from the side, a perpendicular line dropping from the center of the elbow joint should fall on the center of the knee and pastern joint and back of the hoof	3	____
Forearms: heavily muscled, long, wide, and tapering from the elbow to the knee	2	____
Knees: large, clean, wide, straight, and strongly supported	1	____
Cannons: short, wide, clean; tendons large, set well back, not tied in below the knees	2	____
Fetlocks: wide, straight, strong, free from puffiness	1	____
Pasterns: strong, of medium length; angle with the ground 45 degrees	2	____
Feet: straight, medium size, even; horn dense; frog large, elastic; bars strong; sole concave; heel wide, high; hoof head large	5	____
Body		
Chest: deep, low; girth large; width of breast in proportion to other parts	3	____
Ribs: long, well sprung	3	____
Back: straight, short, broad, well muscled	3	____
Loins: wide, short, thick, and neatly joined to hips	2	____
Under line: long, flank low	1	____
Hindquarters		
Hips: smooth, level; width in proportion with other parts, but not prominent	2	____
Croup: long, wide, muscular, not drooping	2	____
Tail: attached high, well carried, well haired, with straight and not too coarse hair	1	____
Thighs: long, muscular, thick, and wide; well muscled over stifle	3	____
Quarters: heavily muscled, deep	2	____
Hind legs: viewed from behind, a perpendicular line from the point of the buttock should fall on the center of the hock, cannon, pastern, and foot; from the side, a perpendicular line from the hip joint should fall on the center of the foot and divide the gaskin in the middle; and a perpendicular line from the point of the buttock should run parallel with the line of the cannon	4	____
Gaskins, or lower thighs: long, wide, well muscled	1	____
Hocks: large, strong, clean, and well defined; free from puffiness, coarseness, and curbiness	4	____
Cannons: medium length, broad, flat, and clean; tendons large and set back, not too light below the hock	2	____
Fetlocks: large, wide, straight, strong, free from puffiness	1	____
Pasterns: strong and of medium length; obliquity not so great as fore pasterns	1	____
Hind feet: straight, medium size, even; smaller and not so round as fore feet; horn dense; frog large, elastic; bars strong; sole concave; heel wide, high	4	____
Action		
Walk: elastic, quick, balanced; step long	6	____
Trot: rapid, straight, regular, high; should not wing or roll in front or go wide or too close behind	4	____
Total	100	

joints; this also aids in preventing concussion and makes locomotion possible. When a leg is extended there is a straightening of the angles; and a horse is able to reach the ground with its foot without materially lowering the body. It can be seen in Fig. 1 that angles occur in the front legs between the scapula and the humerus, the humerus and radius, and the cannon and the pastern; in the hind legs, between the ilium and the femur, the tibia and the cannon, and the cannon and the pastern.

The coupling of a horse is commonly described as the distance from the last rib to the ilium, or hip bone, but in reality it is the connection between the last thoracic vertebra and the beginning of the sacrum. An animal that has an objectionably long coupling is too long in the lumbar vertebræ. The last rib, being attached to the rear thoracic vertebra, furnishes the best means available for determining the forward boundary of the coupling.

Muscles consist of bundles of fibers. When the fibers are long and thin they are more elastic and have greater possibility of contraction than when they are short and heavy. Heavy muscles denote power; long, slender ones denote speed. Short muscles are usually found in association with short bones and in regions where the principal function is the transmission of power; long muscles are usually associated with long bones and in regions where the muscles are the source of speed.

The nervous system varies greatly in different individuals and is no less important as a point of study in the judging of horses than the bones and muscles. Its function is to control all action, both voluntary and involuntary. It is through nervous stimulation that an animal is able to relax, contract, and control its muscles. Thus, it may be seen that the degree of stimulation has much to do with the quickness and strength with which a horse may act.

3. Use of Score Cards in Judging of Horses.—As an aid to beginners in the judging of horses, score cards are often used. Such cards are devised for the purpose of familiarizing

the novice with the different parts of a horse and their relative importance as expressed numerically. As soon as the score card has been mastered it should be laid aside.

For the present purpose it is sufficient to give two forms of score cards, namely, one for light horses and one for heavy horses. The term light horses has reference to animals that are used for riding and driving or other pleasure purposes; the term heavy horses refers to animals that are used for drawing heavy loads, such as in teaming and farm work. The score cards given here are based on the market requirements for these two general groups, and are similar to the score cards used at the several agricultural colleges of the United States and Canada.

4. Market Requirements for Horses.—The market value of a horse is rated largely according to its *soundness, conformation, quality, condition, action, age, color, education and disposition*, and *general appearance*. There are certain minor considerations, also, such as *sex* and *breed*, that may affect the value in some cases, but such factors usually have little weight.

5. Soundness is the most important consideration in determining a horse's value. A horse with any disease or alteration of structure on account of disease or accident, that is enfeebled or deranged, or that has any vice that actually interferes with its usefulness and reduces its capability for work is termed *unsound*. Horses are frequently sold at public auction as being *serviceably sound;* that is, they have no defects that make them unfit for the service for which they are sold. They must be good in wind and eyes and must not be lame or sore in any way, but may have blemishes of a minor nature, such as small splints or a spot or streak in the eye that does not affect the sight. Blemishes that detract from the appearance of an animal and lessen its sale value but that do not interfere with its usefulness are not unsoundnesses, although they may be an indication of unsoundness; for instance, skin scars are only blemishes, but they may indicate the presence of spavin, ringbone, or certain other similar unsoundnesses. Some of the unsoundnesses that dis-

qualify a horse for hard service are: broken wind, unsound eyes, ringbones, side bones, large splints, buck knees, and unsound hocks, such as those having curbs, spavins, and large thoroughpins. These unsoundnesses will be discussed later.

6. The **conformation** of a horse should indicate strength and endurance. Strength is denoted chiefly by well-developed muscles and a general symmetry of parts. Endurance is indicated by a deep, capacious chest, good feet and legs, a short, well-muscled back, a deep barrel and deep flanks, and a short coupling. The extent to which muscles indicate strength is determined not only by their size but also by their quality; they should be elastic and pliable in addition to being well developed. Symmetry of parts is necessary for correct proportions. A deep, capacious chest in which there is plenty of room for the vital organs denotes health and a strong constitution; these qualities are the most instrumental in insuring endurance. Because of the fact that a large percentage of the horses that work on paved streets wear out first in the feet, the conformation and quality of these parts are important considerations in the selection of horses for use in the cities; the feet of horses intended for farm use do not receive so much consideration as those of horses for city use, as the feet of farm horses rarely wear out. Likewise, the legs of horses intended for city work are scrutinized more closely than those of horses for farm work, because the concussion in traveling on pavements is much greater than in traveling on soil and consequently the wear is greater. A short, well-muscled back, a deep barrel and deep flanks, and a short coupling indicate good feeding qualities, which, in turn, denote endurance.

Excessive concussion usually produces soreness and disease and therefore shortens the period of usefulness of an animal, and in order that there may be the least concussion when its feet strike the ground, a horse should have oblique shoulders, rather short cannons, and moderately long pasterns. The front pasterns should set at an angle of about 45 degrees with the ground; the hind pasterns should stand at a slightly wider angle with the ground. Buyers discriminate against horses with long,

low pasterns. In Fig. 2 is illustrated the lower part of a horse's leg with a pastern *a* that illustrates this objectionable conformation. A horse that has pasterns of this kind is said to be *coon-footed*.

FIG. 2

The width of the hips should be in keeping with the other parts of a horse, but the hips should not be prominent. The croup should be long, well muscled, and not too drooping. A drooping croup, although more objectionable in some classes than in others, is unsightly and detracts from the value of a horse. In Fig. 3 (*a*) is shown a drooping croup and in (*b*), a croup of the correct conformation. The tail should be set high, be well haired, and be stylishly carried. The quarters and thighs should be heavily muscled and the hocks large, strong, and clean cut. The head should be of moderate size, the eyes large and mild, and the ears refined, carried erect, and

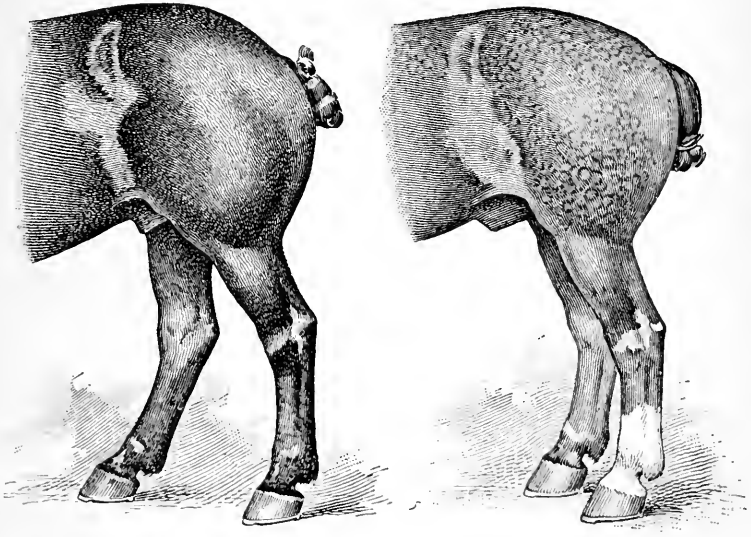


FIG. 3

not set too far apart. A Roman nose, a peculiar conformation of the face that is illustrated in Fig. 4, is not desirable.

7. Quality in a horse is of prime importance. As applied to horses, it has reference to the degree of excellence of the bones, skin, hair, and muscles. Its presence is shown by clean-cut features of the head and legs, clean bones, and well-defined tendons; a soft, glove-like skin with fine, silky hair; well-defined muscles, joints, and tendons; and an absence of coarseness. When an animal of quality is exerted the skin shows clearly an intricate network of veins. Coarseness throughout, especially of hair and skin, is usually associated with soft, spongy bone, which is subject to disease under the strain of hard usage or neglect. The presence or absence of quality is a strong indication of the extent of a horse's endurance.

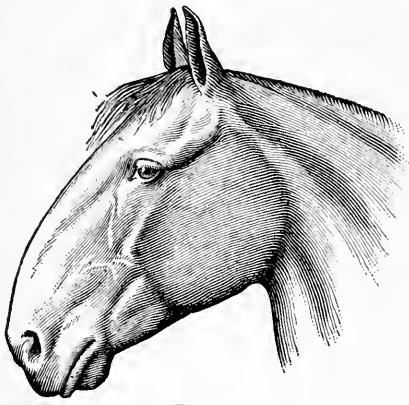


FIG. 4

8. Horses must be in good **condition** in order to bring good prices on the market; that is, they must have enough flesh to round out their bodies, and a glossy coat of hair to give them a sleek appearance; a good coat of hair that fills the market requirements is often estimated to be worth about $10. Condition is a more important consideration in heavy horses than in light horses. Careful estimates based on experiments have been made that give the value per pound of a sufficient amount of flesh to put heavy horses in good market condition at from 20 to 25 cents. As the cost of putting flesh on horses need not exceed from 8 to 12 cents per pound, the producer can well afford to fatten his thin horses before selling them.

9. Excellence of **action** is more effective than any other one point in bringing a high price for a horse of the carriage,

road, or saddle classes, but it is not so important in the case of horses of other classes; however, the market requires that all horses have good action. A horse should move its legs and feet in a straight line, picking the front feet well up and carrying them forwards without winging or interfering. By *winging* is meant throwing the feet out or in when traveling. *Interfering* means striking the fetlock or the cannon of one leg with the foot of the opposite leg as it passes; interfering may be done by the hind legs as well as the front. The hind feet should follow in the line of the front feet without interfering, hitching, cross-firing, or forging. By *hitching* is meant taking a longer stride with one hind leg than with the other. By *cross-firing* is meant the striking of a fore foot in traveling with the hind foot of the opposite side. *Forging* is striking a front shoe with the toe of the hind shoe on the same side. The action required for the various classes has already been described in a previous Section.

10. Age is of great importance in determining the value of a horse. The market demand is for horses that are from 4 to 8 years old, the exact age depending on the market class, the degree of maturity, and the soundness of each animal. All horses sell best when they are from 5 to 7 years old, but in the case of classes for which there is a strong demand, a well-matured animal, if in good condition, will be readily taken at less than 5 years of age. Heavy horses mature earlier than light horses and less time is required for their education, consequently they are acceptable to the market at a younger age, and their value, likewise, begins to decrease sooner than that of light horses.

11. Color, as a rule, is not an important market consideration, and all horses with solid colors except white are in good demand. A good animal of any solid color is rarely objected to unless it is by a purchaser who has a special order to fill. More discrimination in color is made in the case of light horses than of heavy horses, for the reason that the latter are used chiefly for utility purposes, and the former are used principally for pleasure purposes. Choice steel-gray, dapple-

gray, and strawberry-roan horses of the draft, eastern-chunk, and wagon-horse classes are in strong demand by firms that regard their teams as an advertisement and want them to attract as much attention as possible. Bay, brown, and chestnut horses sell better in the light-horse classes than those of any other colors, although a well-matched pair of blacks that are suitable for hearse purposes are usually in strong demand. White horses, also, are sometimes used for hearse purposes, but the principal demand is for black animals with no white markings.

12. The **education and disposition** of horses have considerable influence on their market value. Horses of all classes should have kind dispositions, be willing workers, and be well educated for their work. It is readily apparent, however, that a thorough education is much more necessary in some classes than in others. Horses that are expected to show fancy action or gaits must be thoroughly trained for their work; and all light horses should be indifferent to sights and sounds that commonly frighten horses. Heavy horses should be good pullers and be free from bad habits and vices.

13. The **general appearance** of a horse has much to do with its market value. A horse intended for market should be well groomed so that the hair is close to the body and is sleek and glossy. The foretops and legs of market horses should not be clipped, because this gives the impression that the animals are second-hand or stale, that is, not in their prime, and the presence of foretop and feather leaves little doubt as to the animals being fresh from the country. Docking of the tail should not be practiced by the producer, as that is the business of dealers who cater to a certain class of trade.

14. The **sex** of a horse has little effect, as a rule, on its market value, although for city use, geldings sell better than mares, and the reverse condition is true for country use. Mares are not desirable in the city, because there is a likelihood of them being in foal, and the exhibition of heat is objectionable; but for country use mares are preferred, because in many cases farmers buy horses with the expectation of breeding them.

15. The **breed** to which a horse belongs has little effect on its market value, provided the horse is a good individual. Some buyers discriminate against the animals of certain breeds on the ground that they are more subject to ills and unsoundnesses than those of other breeds. However, in general, the breed to which a horse belongs has little influence in determining its value.

PROCEDURE IN JUDGING OF HORSES

GENERAL EXAMINATION

16. In the judging of horses, it is advisable to have a definite system of procedure. The system followed by most judges is first to make an examination of an animal in a general way and then to make a thorough and detailed examination of each part. In a general examination of an animal the judge should study its conformation, quality, style, action, and temperament.

17. Judging of Conformation.—Usually the first point that is considered in a general examination of a horse is its conformation. By conformation is meant the form, structure, outline, or general arrangement of the parts. The conformation of a horse can best be studied from a point several paces away from the animal; the judge should stand first at one side, then at the front, then at the other side, and finally at the rear. From the side, the judge can observe the top and bottom lines and study the general balance of the horse. The top line—the back from the top of the shoulders to the root of the tail—should be relatively straight and short; the under line—the line of the body from the fore legs to the hind legs—should be long with a low flank. The judge can observe also from the side the length and contour of the neck, the carriage of the head, the slope of the shoulders, the depth of the body, the filling in of the fore flanks, the length of the coupling, the length and levelness of the croup, the set of the legs, and the muscular development of the forearms and gaskins. The

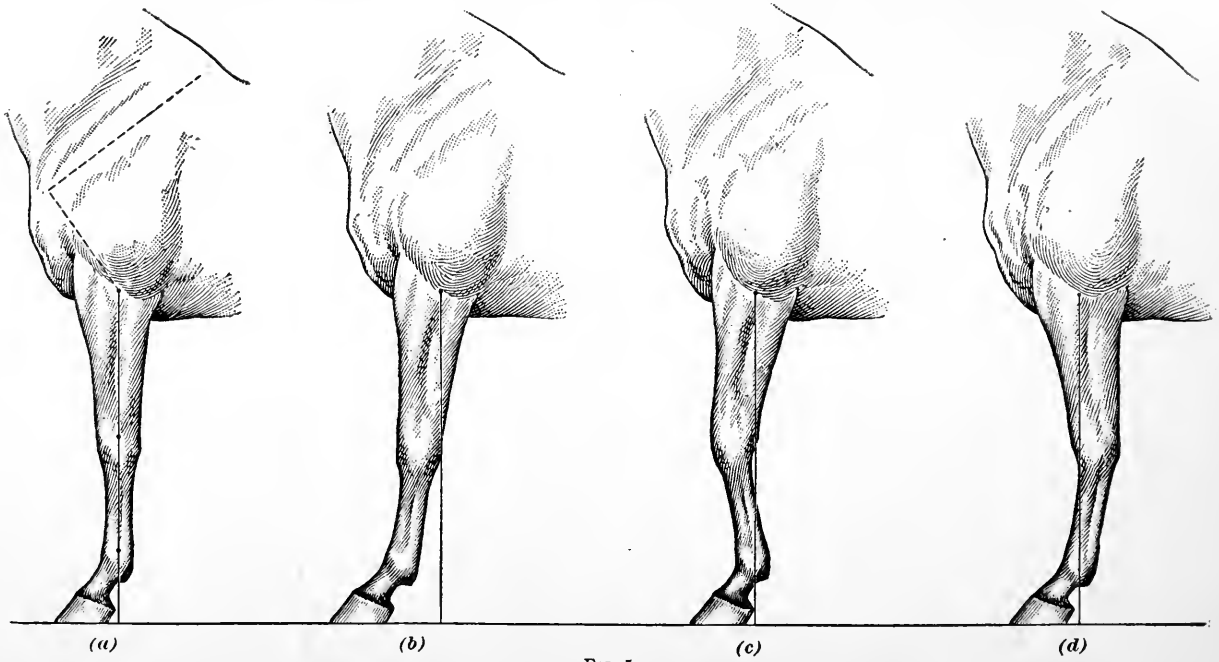


FIG. 5

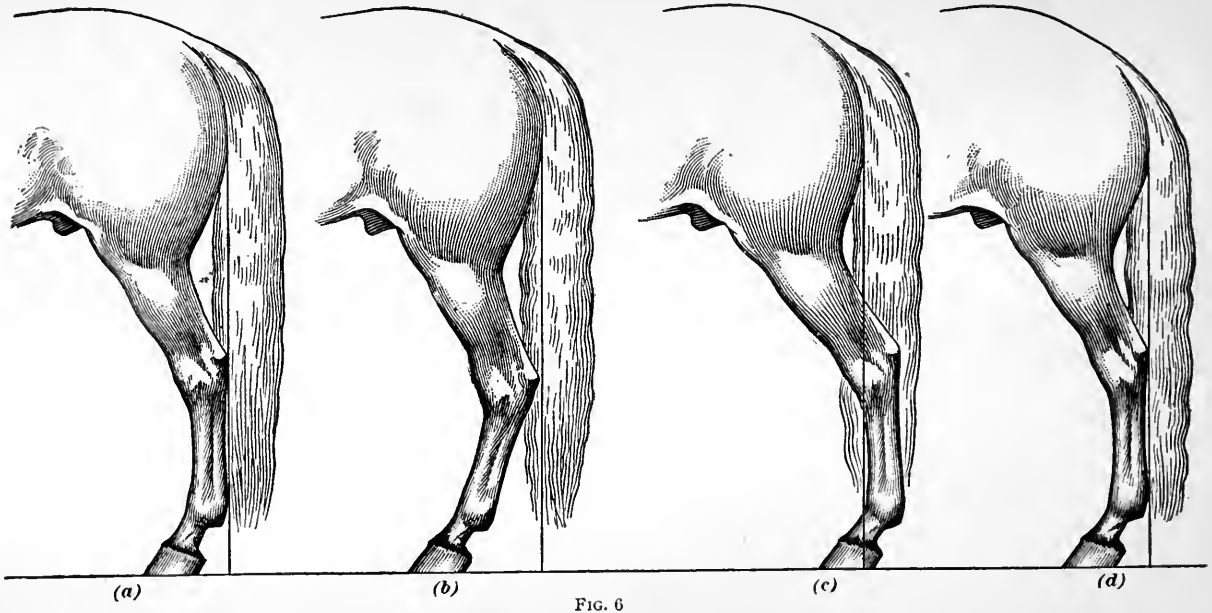


FIG. 6

requirements for these points are given in the score cards for light and heavy horses and are explained later.

18. In Fig. 5 (*a*) is shown a side view of the correct position of the fore legs of a horse when it is standing. A plumb line dropped from the center of the elbow joint bisects the knee, cannon, and fetlock, and strikes the ground at the heel. In (*b*), the foot extends too far forwards; this may be a natural position or it may be due to soreness in the feet. Occasionally, a horse is found that stands with the fore feet too far back, that is, just opposite of the position shown in (*b*). The position shown in (*c*) is common in horses; and an animal that has the legs in this position is said to be *buck-kneed* or *knee sprung*. A horse with the legs in position shown in (*d*) is said to be *calf-kneed*.

19. In Fig. 6 (*a*) is shown a side view of the correct position of the hind legs of a horse when standing. It can be seen that the hind cannons are perpendicular, and if a straightedge were placed at the rear of the cannons, as indicated by the line, it would strike the point of the buttocks. In (*b*), (*c*), and (*d*) are illustrated undesirable conformations of the hind legs. Hocks such as those shown in (*b*) are known as *sickle hocks*, and are predisposed to curbs. In the position shown in (*c*) the legs are set back too far. Although the position shown in (*d*) fills the requirements of having the cannons and the point of the buttock on a perpendicular line, the croup is too short and drooping and hence gives the legs a poor set; a horse with such a conformation would have a very short stride.

20. A horse that is correctly proportioned should be longer from the rear of the loin to the point of the buttock than the total length of back and loin. The hind flank should be well let down and deep; however, the different classes vary somewhat in this respect, draft horses being relatively deeper in the flank than light horses. The head should be attached to the neck in such a way as to give a poise of dignity; the neck should be elevated from the shoulders and have a good crest development, although this varies in different classes.

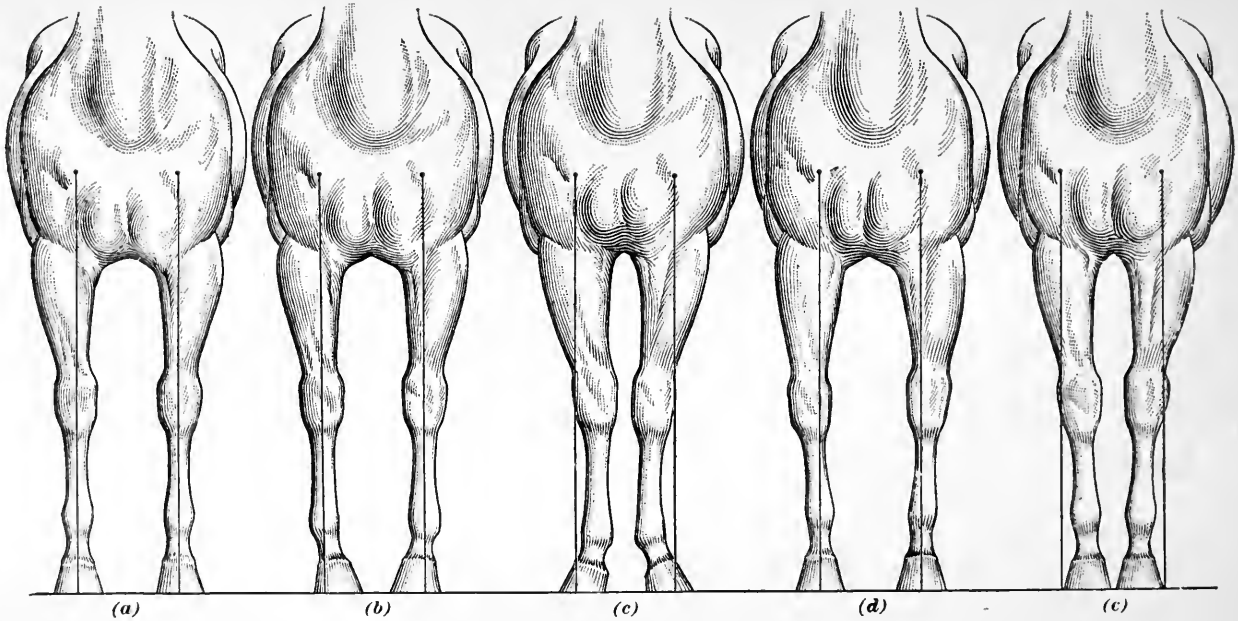


FIG. 7

21. Having completed the inspection from the side, the judge should next step to the front of the animal. From this view he can scrutinize the general bearing, the proportion of parts, the straightness of the fore legs, the width of the chest, and the spring of the ribs.

From the front the fore legs should appear as illustrated in Fig. 7 (*a*). The toes should point straight forwards, turning neither in nor out, and a plumb line dropped from the point of the shoulder should bisect the knee, cannon, fetlock, and toe. In (*b*), (*c*) (*d*), and (*e*) are shown conformations that are frequently found, and all of which are undesirable. A horse with the fore legs in the position shown in (*b*) is almost certain to wing out, or paddle, when moving; one with the fore-legs as shown in (*c*) will likely interfere.

The ribs should be long and well sprung, arching out well from the spinal column and carrying their curvature all the way down. If a cross-section were made at the rear of the

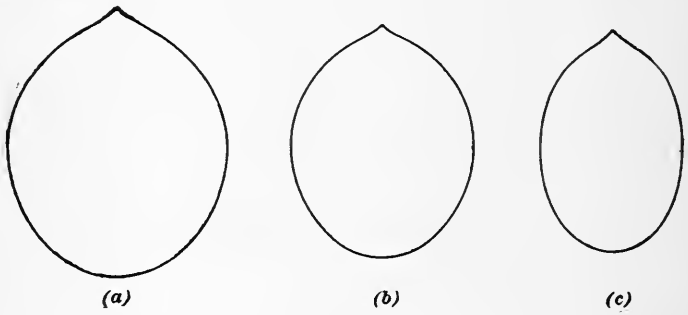


FIG. 8

withers the outline should appear as shown in Fig. 8, (*a*) being that of a typical drafter, (*b*) that of a coach horse, and (*c*) that of a road or a saddle horse.

22. Passing from the front of the animal, the judge should next take his position at the side opposite the one from which the horse was first viewed, and make a similar inspection to that of the first position. He should then proceed to the rear of the horse. From the rear it is possible to observe the spring of the ribs, the width of the barrel, the width and muscular

FIG. 9

development of the croup and thighs, the levelness of the hips, and the position of the hind legs; by raising the tail the judge can observe the muscular development of the quarters and the nature of the hocks. The proper conformation of all of these parts is described in the score cards for light and heavy horses.

23. In Fig. 9 (*a*) is shown a rear view of the correct position of the hind legs of a horse when standing. A plumb line dropped from the point of the buttock to the ground bisects the hock, cannon, and foot. The positions shown in (*b*), (*c*), and (*d*) are variations from the correct conformation and are objectionable. In (*b*), the legs are set too wide apart; in (*c*), they are bowed outwards, legs of this conformation being spoken of as too open at the hocks; in (*d*), the legs turn inwards, legs of this conformation being said to be *cow-hocked*.

24. Judging of Quality.—After a judge has studied the conformation of a horse he should next examine it for quality. The degree of quality of a horse may be ascertained by passing the hand over its body, particularly the legs, and noting the fineness of hair and skin, the cleanness and firmness of bone, the definition of the tendons, and the distinctness of the lines showing the divisions of the muscles. Another index to the degree of quality is the conformation of the joints of the legs; in an animal of quality, these should be clearly defined and hard and should not show any fulness.

25. Judging of Style.—An important point to note in a general examination of a horse is its style. Style may be defined as an elegance of form and a symmetry and blending of all parts, both when an animal is standing and when it is in action. All horses should have style, as it enhances their commercial value, but style is not the same in all classes of animals. For instance, style that is considered appropriate for a typical roadster is wholly inappropriate for a park horse. Style is judged by studying the animal at rest and in action. The judge should note the manner in which the head and tail are carried and the grace and balance of the action.

26. Judging of Action.—All horses should have good action with reference to sureness of foot, effectiveness in covering

distance, and lightness; the latter point is important, because horses with light action suffer less from concussion than those with heavy action. The walk should be with a long, firm, quick step, the horse flashing the soles of the feet up to view, and raising its feet high enough to clear any obstacle over which it may be passing.

In judging of action, the judge should observe a horse from the front as it comes toward him, to note whether there is any winging in or out of the front feet, and the manner in which the knees are carried forwards. As the horse approaches, the judge should step to the side and observe the length of the stride, the flexion of the knee and hock, and the levelness of the action. A horse is said not to be level in its action when it is unbalanced, that is, when it lifts the feet relatively higher in front than behind, or vice versa, or is uneven in its stride. Some horses have difficulty in getting their front feet out of the way of their hind ones, and others have a short stride in the hind feet. In observing the levelness of action the judge should not stand too close to the horse, as this point can best be observed at some distance to the side.

As the horse passes, the judge should step behind it and observe the action from the rear. From this position he can see the manner in which the hind feet are carried. The hind feet should be carried forwards in line with the front ones and neither close enough together to cause interfering, or extremely wide apart; the hocks should be well flexed and well directed without any unusual widening, and the soles of the feet made plainly visible at every step.

A horse should strike the ground with the heel slightly before it does with the toe, and there should be no hesitancy in allowing the foot to strike the ground; a hesitancy in this is an indication of soreness. Soreness of feet or of shoulders results in a shortening of the stride and is usually more noticeable at the trot than at the walk. In walking rapidly, a horse should place the hind feet in advance of the tracks of the front ones, although this is not the case at a slow walk. Horses with pigeon toes usually wing out; those with a conformation known as *splay-footed* (toes turned out) usually wing in and

frequently interfere. There should be no hitching, scalping (striking the hind pastern or shin against the front toe as the hind foot is extended), speedy cutting (striking the inside of the hind cannon or pastern against the front foot as the hind foot is brought forward and passes on the outside of the front one), or cross-firing, which occurs only with pacers.

27. Judging of Temperament.—An important point to consider in the judging of horses is **temperament.** A horse that is otherwise valuable may be unsafe and unreliable on account of having an undesirable temperament. The most distinctive temperaments in horses are the nervous, the lymphatic, the sanguine, the bilious, and the erratic; these, with modifications and combinations, make a great variety. Sometimes it is difficult to judge of a horse's temperament in a general examination, but, as a rule, if the horse is thoroughly exercised to show its action a good idea may be had of its temperament.

The term *nervous temperament* is applied to a temperament in which the nervous system is developed in proportion to the muscular system and hence able to stimulate the latter to the performance of work. A horse of nervous temperament exhibits the fact by being a willing worker and is not lacking in nervous control. It should be noted that the term nervous temperament does not apply to temperaments that are excitable or lacking in nervous control although it is sometimes misapplied in this sense. In contrast to the nervous temperament is the *lymphatic temperament*, a condition in which the nervous system is not developed in proportion to the muscular system. A horse of this temperament usually lacks zest and spirit in its work, a condition that is probably due to insufficient nervous stimulation; a horse of lymphatic temperament is said to be lazy. A *sanguine temperament* is one resulting from apparently perfect health, and finds expression in kindness of disposition and a willingness to work. A horse with a sanguine temperament has marked vitality and energy, and shows no irritability or lack of nervous control. In contrast to the sanguine temperament is the *bilious temperament*, which

reflects itself in an ill temper, largely due to a poor nutritive condition of the body, often caused by indigestion. An *erratic temperament* results from irritating a nervous temperament or never teaching the animal to control it. Erratic temperament often exhibits itself in some form of vice or in uncontrollable temper.

DETAILED EXAMINATION

28. A judge usually has two objects in view in making a detailed examination of a horse. He is desirous, first, of ascertaining the merits of the different parts as to conformation and quality, and, second, of determining whether any unsoundness exists. Although one detailed examination is usually sufficient to cover both points, it is desirable, for the sake of clearness, to discuss the subject as if two examinations were made, that is, as if conformation and quality of the parts were judged at one examination and the soundness at another. The examination for unsoundness will be discussed last.

In beginning a detailed study of a horse it is a good plan to adopt a regular system of examination, in order that no points may be overlooked. Most judges start at the head and neck and pass, in turn, to the forequarters, the body, and the hindquarters. The various parts of these regions are examined in detail, and then the regions as a whole are studied.

29. Examination of the Head and Neck.—The head is an important point of study in judging a horse, because its shape gives expression to the countenance, which is usually indicative of the degree of intelligence and the nature of the disposition. The head should be of moderate size, with clean-cut features, and be in proper proportion to the rest of the body. A profile view should show a comparatively heavy jaw that tapers to a refined but not delicate muzzle. The forehead should be broad and high, indicating intelligence, and should not recline or protrude; a reclining forehead indicates timidity and one that protrudes indicates a headstrong and stubborn disposition. The face line from the poll to the end of the nose should be comparatively straight as viewed from the side; however,

horses of different breeds and different sexes vary somewhat in this respect. As a rule, stallions more often have Roman noses and mares are inclined to have dished faces. The face line should incline at an angle of about 45 degrees.

The eyes should be large and set so that they are neither sunken nor protuding, correctly proportioned between the poll and the end of the muzzle; and placid in expression, which is indicative of a sanguine temperament. When the eyes are

FIG. 10

properly placed, a horse is able to see to the front and to the side without turning its head. The face should be clean cut and free of all meatiness, this condition indicating quality; the nostrils should be large, which is indicative of good wind, and when they are distended they should be nearly circular in form; the lips should be broad, which indicates good feeding qualities. The head should be wide between the angle of the jaw bones; this helps to give shape and finish, and allows plenty of room for the windpipe, throat, and larynx. The ears

should be active, refined, pointed, carried erect, and not set too far apart. The ears are expressive of many qualities about the horse. Lop ears indicate laziness or lassitude, and ears that are carried erect but motionless are indicative of defective hearing or total deafness. If one ear is carried forwards and the other one back, with an occasional shifting of these positions, it is a good plan to inspect the eyes; these are likely to be found defective. Extreme soreness of one or both front feet is usually shown by an abnormal carriage of the ears.

The neck should be of good length and in proportion to the body; it should be deep where it joins the shoulders, gradually tapering toward the head, which should be neatly attached. The throat latch should be neatly turned and free from coarseness. The crest should be well developed, with a gradual swell from the withers to the poll and no tendency toward a depression in front of the withers, a conformation known as *ewe neck*. A neck of this conformation is illustrated in Fig. 10.

30. Examination of the Forequarters.—Passing from the head and neck, the judge should next study the forequarters. The shoulders should be long, obliquely set, and neatly finished at the withers. Oblique shoulders usually accompany a short back. The shoulders should be more obliquely set in light horses than in draft horses, as obliquity of the shoulders gives freedom of movement. The arms should be heavily muscled and in draft horses should lie somewhat more horizontal than in light horses. The elbows should lie near the body, but not so close as to interfere with free, easy movement; ordinarily, there should be about room enough to insert the hand. The forearms should be heavily muscled near the body, and the length should be equal to that from the knee to the ground; the knee should be large, well defined, and indicative of strength; and the tendons should stand back well from the bone and not be tied in below the knee, which is indicative of weakness. The cannons should be wide and rather flat as viewed from the side, the width being attained by the distance the tendons stand back from the bones. Horses of different breeds vary greatly in this respect, the cannons of some being nearly round

and those of others somewhat flat. The cannons should be clean, smooth, and free from splints and other blemishes.

The fetlocks should be broad, as viewed from the side, and free from puffiness. The pasterns should be moderately long and obliquely set, about 45 degrees being considered best. The feet should be large, with dense, waxy horn, indicating strength, and there should be no cracks or evidence of weakness or brittleness; the heels should be wide and in height about one-half the length of the toe; the frogs should be large and elastic. Dark-colored horn is preferred to light because it is usually tougher. The pasterns and feet should be neatly joined, blending into each other without any undue prominence at the hoof head or coronet, which should be large. The line of the toe should carry out the same direction as that of the pastern when properly set. The feet should gradually spread from the coronet, increasing in size toward the bottom. The front feet are larger and more circular in shape than the hind ones, which are longer and not so broad. The soles should be convex and the heels high and wide, to give ample room for large frogs. The walls should be heavy and the bars strong; these should not be pared out at the time of shoeing.

31. Examination of the Body.—After judging the forequarters the judge should proceed to the body. The withers should be well muscled and well finished at the top. The chest should be deep and capacious, indicating well-developed vital organs, and should have good length and width—broad from elbow to elbow. The floor of the chest should be well let down between the front legs and extend forwards, thus giving a prominent breast. The ribs should be long, well sprung, and close together. The back should be straight, short, broad, and heavily muscled, and the loins wide, short, and thick. The bottom line should be long, with a flank that is full and well let down but of slightly less depth than the rest of the body.

32. Examination of the Hindquarters.—The last region to be considered in a detailed examination of a horse is the hindquarters. The hindquarters include the hips, croup, tail, thighs, quarters, gaskins, hocks, hind cannons, hind fetlocks,

hind pasterns, and hind feet. The croup should be long, wide, and muscular and carry its width out well to the point of the buttocks; it should not be too drooping, as a drooping croup is unsightly and not conducive to good action. The hips, which are prominences of the pelvis for the attachment of muscles, should be broad but not prominent and in proportion to the rest of the body; broad, high hips give a ragged and unkempt appearance to a horse. The thighs and quarters should be deep, well developed, and heavily muscled; the quarters should not be split too high. The gaskins should be short in draft horses but a little longer in light horses; they should taper in width from above to the hocks. The hocks should be sound, free from puffiness, and long, with more width at the top than at the bottom, as viewed from the side. The hind cannons should be comparatively short, broad, and smooth, and when viewed from the side should have as much width just beneath the hock as near the fetlock. The fetlock should be wide, straight, and strong. The hind pasterns should be strong and sloping; it is not necessary that they be as sloping as the front pasterns, but they should have no tendency toward straightness. The hind feet should be as described for the front feet.

EXAMINATION FOR UNSOUNDNESS

33. In making an examination for unsoundness it should be the purpose of a judge merely to ascertain whether an unsoundness exists; if any unsoundness is found it is not necessary for the judge to determine its cause. As a rule, the common unsoundness can be readily detected after a little practice, although, in some cases, the skill of a competent veterinarian is taxed in determining whether or not a particular condition is an unsoundness or likely to result in an unsoundness. In order for a person to become accurate in detecting unsoundness, however, it is necessary that he have a knowledge of the normal condition of the parts likely to be affected. This knowledge can best be secured by observing the conformation and performance of different animals.

34. Preliminary Examination in the Barn.—Some horse dealers practice trickery and deception to mislead a prospective customer, and for this reason it is a good plan to see a horse in its stall, if possible, when the owner is not present. Unless the horse can be seen unmolested in the stall, some conditions may exist that may never be discovered until too late for the knowledge to be of any value. All appliances and devices used for correcting vices and bad habits, the position of the horse's legs, and the manner in which it stands in the stall should be observed. If most of the weight in front is always borne on one foot and the other foot is extended forwards, it suggests soreness or lameness in the extended foot or leg; if the position of the legs is changed, first one being forwards and then the other, there may be soreness in both. The position of the hind legs is not so indicative of an affection, as it is natural for a horse to rest one of the hind legs by flexing it and bearing the weight on the toe. If it is observed that a horse rests only one of the hind legs and not the other, the indications are that something may be wrong with the hock of the leg that is rested—likely it may have a spavin.

Weaving, that is, continually swaying back and forth in the stall, is a vice and also an unsoundness. The continual exertion fatigues a horse and renders it unfit for hard service. If weaving is not detected in the stall, the chances are against its being discovered in time to protect the purchaser.

The condition of the manger and wall in front of a horse should be noted for signs of *cribbing*. A horse that cribs usually takes hold of some object with its teeth, such as the edge of the manger, and draws in wind; it may crib by simply placing the muzzle against the wall or by taking hold of the halter strap, or even without holding or touching anything. Cribbing may be detected also by the condition of the teeth, particularly the way in which they have been worn; the teeth can be examined after the horse is taken from the stall. To prevent cribbing, a strap is sometimes buckled rather tightly around the horse's neck near the head. The presence of such a strap or its marks on the hair where it has been worn should be readily interpreted as indicating that the horse is a cribber.

The way in which the horse lifts its hind feet as it is made to stand from one side of the stall to the other should be observed, the judge noting evidence of string halt, a convulsive flexing of the hock. When the horse is backed out of the stall it should be noted whether or not the hind feet are picked up or dragged, and the manner of handling the front feet. A horse that is subject to cramps drags the hind feet or may bring one foot up with a jerk; if the horse is sore or lame in the shoulders, the front feet will be dragged instead of being flexed.

The eyes should be examined as the horse is taken from the stall; the best place for doing this is in a doorway facing an open space, but not in direct sunlight. The eyes should be bright and clear, and free from a bluish or milky color, which is indicative of disease. If the vision is tested by moving something back and forth in front of the eyes, an object should be used that will not create a perceptible air current, which would cause blinking. In applying such a test the judge should stand at the horse's shoulder so that no movement save that of the object may be seen by the animal.

The teeth should also be examined at this time, the judge noting the manner in which they are worn and the age of the horse; the estimation of age is explained later. If the outside edges of the incisors are worn round or broken off, it is a good indication that the horse is a cribber. A parrot mouth—one in which the upper jaw is longer than the lower—or an undershot mouth—one in which the lower jaw is longer than the upper—is a malformation and may or may not constitute an unsoundness, depending on the degree of the malformation. If the upper and lower teeth come together close enough that the horse can bite grass and shell corn, he is practically as good for service as if he did not have the malformation, and therefore would be considered sound. The bars of the jaw—the region where the bridle bit rests—and the tongue should also be noted to see whether they are smooth and in perfect condition. If the bars or the tongue are lacerated or the corners of the mouth are worn and calloused, it may indicate that the horse is a hard mouthed or foolish animal, that it is

of erratic temperament, that it is a chronic lugger at the bit, or that the bit is too severe. The lining of the nostrils should be noted; if the horse is in health this will be of a pale pink color. Any variation from this condition such as a mottled, pale, or congested lining or an unusual discharge should be considered with suspicion.

35. General Examination Outside the Barn.—After a preliminary examination of a horse has been made in the barn, the animal should be examined thoroughly outdoors in a good light, the horse being stood on level ground in a normal position. At first the judge should stand a few steps away and take a general survey of the animal from a number of different angles. In this general survey the unsoundness that can usually be easily seen, such as fistulous withers, sweeny, shoe boils, large splints, side bones, curbs, spavins, buck knees, etc., should be noted if present; these are explained later. If the general examination is carefully made the judge should have a good idea of the soundness of the animal before proceeding with the detailed examination.

36. Examination of the Head and Neck.—In making a detailed examination for unsoundness, a judge should follow some definite system. It is a good plan to begin at the head and neck and examine, in turn, the forequarters, the body, and the hindquarters. Starting with the head, the judge should note both sides of the face for scars of trephining for the removal of molar teeth. Although these scars do not necessarily indicate an unsoundness, they do indicate that the teeth have been in bad condition, probably through decay. The breath of the horse should be noted to ascertain whether it has a bad odor, which is often indicative of decaying teeth. The hand should be carefully passed over the poll from behind the ears to ascertain whether there is any enlargement, scars, tenderness, or a fistulous condition called *poll evil*. Poll evil is evidenced by running sores, and always constitutes an unsoundness.

37. Examination of the Forequarters.—In an examination of the forequarters the judge should look for *fistula* at the

withers, *sweeny* of the shoulder muscles, *shoe boils* on the points of the elbows, *faulty conformation* of the knees, *splints* on the cannon bones, *bowed tendons* back of the cannon bones, *wind galls* at the fetlocks, *ringbones* on the pastern bones, *side bones* at the sides of the coffin bones, and *laminitis* or *founder*, *thrush*, *contracted heels*, and *quarter cracks* and *sand cracks* in the feet.

Fistula is manifested by a running sore in the region of the withers; it may be caused by a badly fitting collar, a bruise, a faulty conformation of the withers, or various other causes. Fistula, like poll evil, always constitutes an unsoundness. If fistula has entirely healed and the muscles have assumed their normal size and shape, it is only a blemish; however, because of the tenderness of the parts, the animal is susceptible for a time to a return of the trouble and may again become unsound.

A **shoulder sweeny** is a depression over the shoulder blade due to a wasting away, or atrophy, of the muscles. It usually causes more or less lameness and constitutes an unsoundness. Some horses have heavier muscles over the spine of the shoulder blade than others, consequently it may be necessary to compare the right shoulder with the left in order to determine whether there has been a slight atrophy.

A **shoe boil** is a bruise at the point of the elbow that results in an abscess; it is caused by an animal lying on one of its fore feet in such a way that the heel of the shoe strikes the elbow.

Faulty conformation of the knees may or may not be an unsoundness, and it is necessary to use discretion in deciding this point. Buck knees, which are knees that are bent forwards when the animal is standing, are congenital and should not be confused with sprung knees, which are knees that are bent forwards also but which are acquired after birth, due to a relaxation of the extensor muscles. Sprung knees are much more serious than buck knees and are always an unsoundness.

Splints are tumorous bony growths on the cannon bone, occurring most often on the front legs and usually on the inside of the legs, although they may occur on the outside as well. Fig. 11 shows splints *a* and *b* on the fore legs. Whether or not a splint is an unsoundness depends on its location and

size. If it causes lameness it is clearly an unsoundness, but if not it is usually considered as a blemish. A high splint, such as that shown at *b*, is usually more serious than a low splint, and a large splint is more serious than a small one.

A **bowed tendon** is an enlarged tendon at the back of a cannon bone, due to an injury or sprain, and is an unsoundness. It may occur on either the front or the hind legs. In Fig. 12 is illustrated wind galls *a*, and a bowed tendon *b* on the front legs.

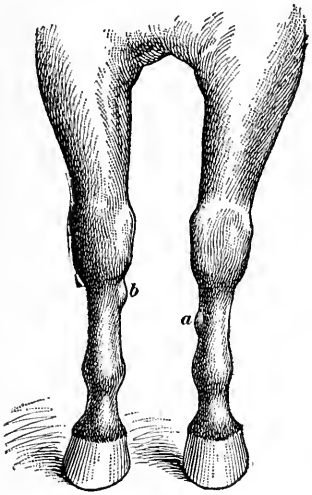


FIG. 11

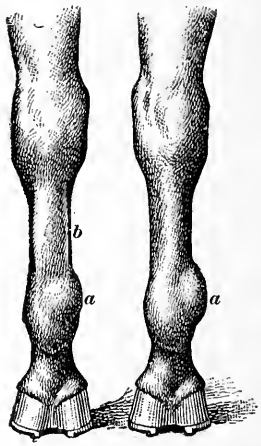


FIG. 12

A **wind gall** is a puffiness about the fetlock joints on either the front or the hind legs. It is considered only a blemish when the enlargement is slight, but when it is large so that it interferes with the usefulness of the animal it is considered an unsoundness.

A **ringbone** is a tumorous bony growth that causes an enlargement on either the upper or the lower pastern bone and is always considered an unsoundness.

Side bones are ossified lateral cartilages that attach themselves to the wings of the coffin bone; they always constitute an unsoundness. They most often occur on the front feet, and more often on heavy horses than on light ones. When the

lateral cartilage ossifies it usually becomes enlarged and if the coronet is free from long hair the outline of the cartilage can usually be seen, although a manipulation of the hand is required to determine the state of its development. Unless it is hard and perfectly rigid so that it cannot be moved laterally, indicating that it is firmly joined to the coffin bone, it has not reached the state of a side bone, but as a matter of fact, if it has become enlarged the market usually considers it an unsoundness. In Fig. 13 is illustrated a ringbone *a* and a side bone *b* on the fore legs.

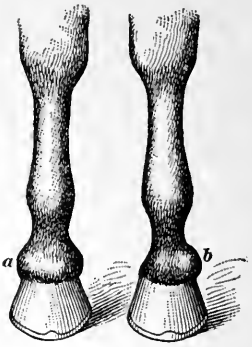


FIG. 13

Laminitis, commonly called *founder,* is an inflammation of the sensitive laminæ of the feet that causes lameness, and always constitutes an unsoundness. It may be due to overfeeding on grain, to giving too much water when the horse is hot, to hard driving, or to paring the sole of the foot too thin and allowing the sole to drop. Opinions may differ as to whether or not slight inflammation and tenderness exists. Founder in an advanced stage is illustrated in Fig. 14 (*a*) and (*b*).

Thrush is a diseased condition of the sole of the foot, occurring either around the margin of the frog or in the cleft, and invariably makes its presence known by a disagreeable odor. It is not usually considered an unsoundness unless it has reached such a state as to cause lameness.

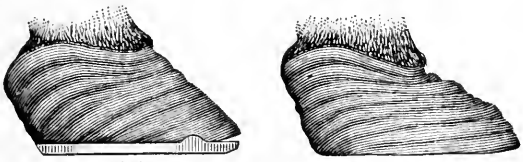


FIG. 14

Contracted heels are not necessarily an unsoundness, although their presence may indicate that unsoundness is likely to occur.

Fig. 15 (*a*) shows contracted heels; (*b*) shows heels that are desirable.

Quarter cracks and **sand cracks,** which are splits in the hoof, are unsoundnesses when they cause lameness. A quarter crack is one that begins at the coronet in the quarter of the hoof and extends downwards. A sand crack is one that begins at the bottom of the hoof, usually in the middle, and extends upwards. Fig. 16 (*a*) shows a quarter crack and (*b*) a sand crack.

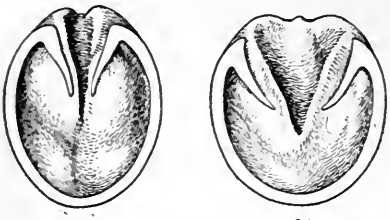


FIG. 15

38. Examination of the Body.—The examination of the body can be briefly made, as there are but few unsoundnesses that manifest themselves in this region. The loins should be examined for soreness or weakness. If no soreness or weakness is present the animal will respond to the touch, but if either of these troubles exist the muscles will be held rigid when they are pinched. A weak loin may be detected also by raising the horse's tail; if the loin is weak, little resistance will be encountered. The movement of the flanks as the horse exhales should be observed for signs of heaves. If the horse has heaves there will be a sort of double action. Heaves always constitutes an unsoundness.

39. Examination of the Hindquarters.—The unsoundnesses that pertain to the hindquarters are: *hipped condition,*

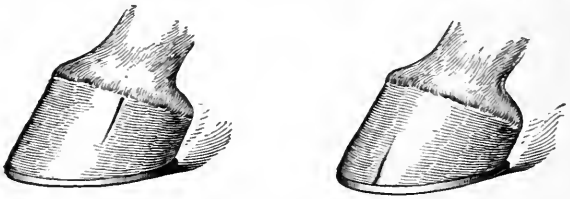


FIG. 16

hip sweeny, dislocated patella, bone spavin, bog spavin, thoroughpin, curb, capped hock, salanders, Michigan pad, and *grease.*

By a **hipped condition** is meant that the point of the ilium has been broken off or injured in such a way that one hip appears lower than the other. Commercially, it is considered an unsoundness; however, if lameness is not present it may not interfere with a horse's service.

Hip sweeny is an atrophy of the hip muscles that causes a depression on one side of the rump.

A **dislocation of the patella** is manifested, of course, in the region of the stifle. As long as the patella is dislocated the horse is unable to carry the leg forwards and when moved will likely go on three legs, dragging the affected leg on the toe; or there may be a dislocation and return of the patella at almost every step. Such a condition is more frequent in young horses than in old ones, and sometimes is brought on by weakness following debilitating ailments.

Bone spavin, bog spavin, thoroughpin, curb, and capped hock are unsoundness that may be found in the hocks. A **bone spavin** is a tumorous, bony growth that usually occurs on the front and angle of the hock at the upper end of the cannon bone, although it may occur on the outside as well. It usually involves the small bones forming the hock joint as well as the cannon bone and causes an enlargement that is readily detected; however, cases occur of *occult*, or *blind spavin*, that is, spavin that is not visible and only the symptoms of spavin are present. The natural conformation of some hocks is coarse, and in this case it is sometimes difficult to determine, if there is no lameness, whether a slight enlargement is natural or is abnormal on account of a diseased condition. Bone spavin always causes more or less lameness during its development, due to the articular surfaces becoming disorganized. It impedes the flexing of the hock, and the step is usually shortened and the weight of the

FIG. 17

body is quickly displaced from the affected limb. A bone spavin *a* is illustrated in Fig. 17.

A **bog spavin** occurs on the front inner side of the hock and is a similar condition to a thoroughpin, the only difference being in the location. A **thoroughpin** is a soft enlargement that occurs in the web of the hock between the point of the hock and the main leg bone. It is an enlarged or distended bursa filled with synovia, or joint fluid, and may be apparent on either the inside or the outside of the hock or extend through the web from the outside to the inside. When pressed on

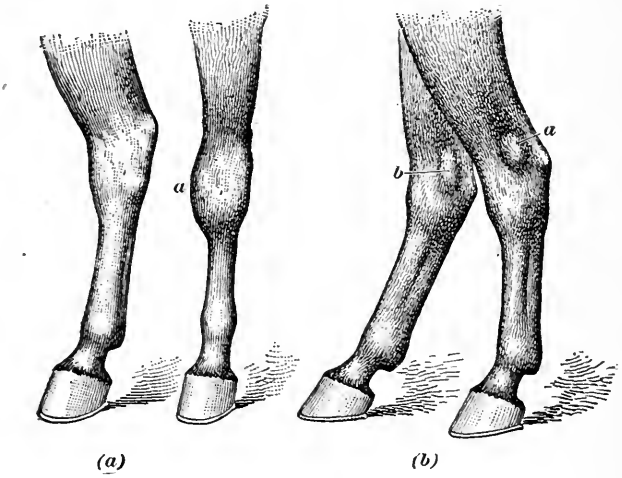


FIG. 18

from either inside or outside it will show on the opposite side. Large thoroughpins and bog spavins constitute unsoundnesses. Heavy horses are more subject to these disorders than are light ones, although the condition is as serious for one as it is for the other. Fig. 18 (*a*) shows a bog spavin *a*; (*b*) shows a thoroughpin *a* as seen from the outside of the leg, and a thoroughpin *b* as seen from the inside.

A **curb** is a hard swelling or bulging at the back side of the hock joint, due to an injury or sprain of a ligament. Legally it always constitutes an unsoundness, though where it is small and on a well-formed hock it may or may not interfere with

the service of the horse. A rounding or sickle hock is more subject to curb than one whose posterior side is perfectly straight. A curb is illustrated at *a* in Fig. 19.

A **capped hock** is the result of an injury bruising the bursa at the point of the hock, and does not ordinarily interfere with the horse's action or ability to work, unless it involves the synovial sac, which intervenes between the tendon and the point of the bone where the one passes over the other. Only in rare cases, such as when there is inflammation and swelling that is painful to the animal, is a capped hock considered an unsoundness. A capped hock is shown in Fig. 20.

FIG. 19

FIG. 20

Salanders is a skin disease that occurs in the front of the hock, due to heavy feeding of nutritious feed with an insufficient amount of exercise, and constitutes an unsoundness. A similar condition, called **malanders,** sometimes occurs on the front legs at the back of the knee in the folds of the skin.

Michigan pad is a puff, or cushion, due to an enlarged bursa; it occurs just below the hock on the outside of the cannon near the forward edge. It does not produce lameness and it is only a blemish.

Grease is a skin disease that may occur either in the hind heels or in the front, and constitutes an unsoundness. The

hind feet are subject to laminitis, thrush, and quarter and sand cracks; these have already been explained.

40. Examination of the Action.—A horse should be examined in action, and by watching every movement, slight defects of conformation that may have been passed unnoticed should be detected. The animal should be walked directly away from the judge so that he may note any differences that may exist in the flexion of the hocks. A horse that has a bad spavin is ordinarily more or less stiff in the affected hock, which will not be flexed so much as the other. The animal need not be moved farther than 50 yards and a shorter distance will suffice where the judge has become familiar in conducting such examinations. As the animal turns the action and flexion of both hind legs should be noted for evidence of string halt and crampiness.

The manner in which the head and ears are carried should be noted. When the horse is sound and under normal conditions there is usually free play of the ears backwards and forwards, but if the horse has defective sight, he exercises more mobility of the ears and uses these organs to help out impaired vision. Where the sight is bad, one ear is usually carried forwards and the other back and the head carried slightly to one side, the eye with the stronger vision being carried to the front. Under normal conditions ears carried erect with no mobility indicate defective hearing or deafness, but where a horse is suffering severe pain or is excited by anger or fear, both ears may be carried rigid and reclining backwards.

A horse that is slightly lame or sore in one of the front feet will nod its head as it places its weight on the sound foot; if it is lame in one of its hind legs, the croup will drop when the weight is thrown on the sound limb. If the horse is lame in both front legs or in both hind legs, there will not likely be any nodding of the head or dropping of the croup. The action should next be observed from the side, the judge noting the length of stride and the manner of extension and flexion of the limbs, both front and back, and any overreaching, forging, or inclination to stumble. A horse that is sore or lame has a

short stride and sets his feet down with great care. The animal should then be trotted and the examiner should note his movements from the same position as at the walk. As a rule, lameness usually shows itself to a more pronounced degree at the trot than at the walk. No whip or other method of exciting the animal should be used or he may not favor the tender parts.

41. Examination of the Wind.—In testing the wind of a horse the method employed should depend on the kind of work for which the animal is used. Saddle horses should be mounted and given a sharp run of from 200 to 300 yards. As soon as the animal is stopped the examiner should place his ear to the nostrils and note any unusual sounds, such as whistling, roaring, etc., and again note the movements of the flank for indications of heaves. Heavy horses may be satisfactorily tested by drawing heavy loads; however, the customary method at the markets and with most dealers is to hitch them in harness and gallop them to a heavy truck until they are winded. As soon as they are checked the examiner should at once place his ear to the nostrils, for the purpose of detecting whistling, etc.

ESTIMATING OF AGE

42. As age is an important factor in determining the present or future value of a horse, a judge of horses should be able to estimate, with a reasonable degree of accuracy, the age of any horse that he may be called on to judge. A number of characters are influential in indicating age, and a knowledge of these is not difficult to secure; but skill in the application of this knowledge depends largely on continued practice.

The best index to the age of a horse is the teeth, yet there are other considerations that may be important, particularly in the case of a young or very old horse. The age of a horse under $2\frac{1}{2}$ or 3 years can usually be closely approximated by the size and general appearance of the animal. In very old horses, white hairs appear around the temples, the eyes, the nostrils, and elsewhere; the poll is more pointed, the sides of

the face are more depressed, and the cavities above the eyes are more hollowed out than in young or middle-aged horses; the backbone is prominent and the back is often **swayed,** that is, curved downwards, and the animal does not stand squarely on its feet. Another general indication of old age is the appearance of knots, or prominences, on the sides of the tail near the root. The first pair of these knots usually appear when a horse is between 13 and 14 years old, and are due to the flesh withering away, leaving the transverse processes of the first coccygeal vertebra prominent. The second pair of knots usually appears when a horse is between 16 and 17 years old, and the third pair when it is about 21 years old; the second and third pairs of knobs are due to the transverse processes of the second and third coccygeal vertebræ becoming prominent.

In estimating the age of a horse by the teeth, only the incisors—the teeth immediately within the lips—are considered. The order in which the incisors appear is an index of the age up to 5 years; between the ages of 5 and 8 years the age is indicated by the configuration and degree of wear of the teeth; after a horse is 8 years old its age is somewhat difficult to estimate by the teeth, but the configuration and degree of wear are still an index. Experts can approximate the age fairly well until a horse is about 16 or 17 years old; after this age it is impossible to estimate the age with any degree of certainty.

Although the teeth are considered the best index of the age of a horse, they are not absolutely accurate in this respect at any age of the animal. Much depends on the condition under which the animal has been kept and its individuality. In the case of horses that have bones of somewhat open structure, the teeth are likely to indicate that the animals are older than they really are; in the case of horses whose bones are of fine, close texture, the teeth may indicate that the animals are younger than they really are. A horse fed on hard, dry feed is likely to have teeth that show more wear than those of a horse fed on soft, succulent feed, and consequently the teeth will indicate greater age. From this it can be seen that the texture of the bones, the kind of feed the horse has eaten, and other conditions have more or less effect on the teeth.

43. Order of Appearance of the Teeth.—When a colt is foaled none of its teeth are in sight, but the first, or middle, pair of incisors in both the upper and lower jaws usually appears in from 2 to 4 days. The second, or intermediate, pair usually appears when the colt is from about 4 to 6 weeks old, and the third, or lateral, pair when it is from about 9 to 12 months old; so that, as a rule, when a colt is 1 year old it has a complete set of incisors. These first teeth are known as temporary, or milk, teeth. In Fig. 21 is illustrated the order of appearance of the milk teeth, only the upper pairs being shown; the lower pairs, of course, appear at practically the same time as the corresponding upper pairs.

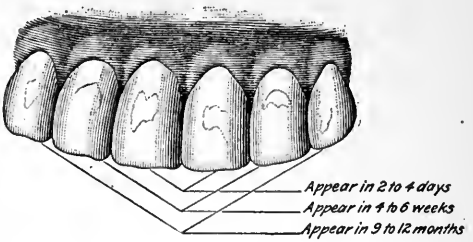


FIG. 21

A colt retains all of its milk teeth until it is from about $2\frac{1}{2}$ to 3 years old; at about that age the first pair of milk teeth above and below are replaced by permanent teeth. The intermediate pair of permanent teeth replace the corresponding pair of milk teeth when the animal is from about $3\frac{1}{2}$ to 4 years old, and the third, or lateral, pair replace the last pair of milk teeth when the animal is from $4\frac{1}{2}$ to 5 years old. Fig. 22 shows the order of appearance of the permanent incisors, only the upper teeth being shown.

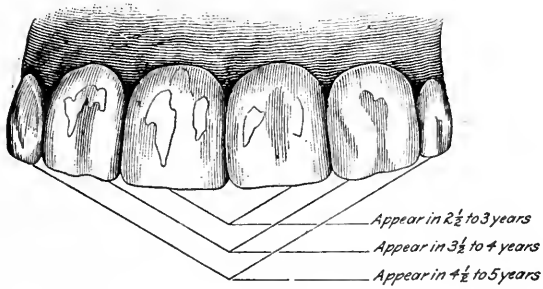


FIG. 22

44. Appearance of the Teeth at Different Ages.—When a colt is about a week old, its first pair of milk teeth appears as illustrated in Fig. 23, which shows only the upper pair.

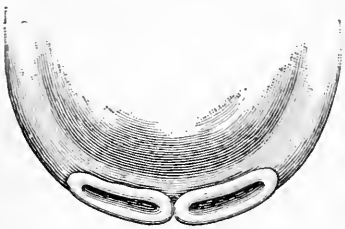


FIG. 23

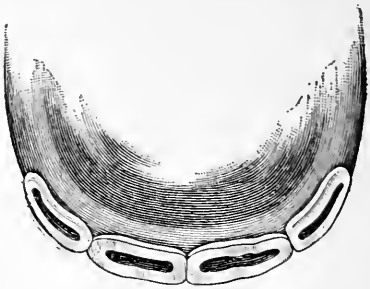


FIG. 24

It can be seen that these teeth are long from left to right, and that they have well-defined cups or depressions in the ends. Fig. 24 shows the appearance of the upper incisors when a colt is from about 4 to 6 weeks old, or after the second pair of milk teeth has appeared. At this time the first, or middle pair shows wear, the cups having become somewhat shallow. When a colt is about 1 year old, or after the third pair of milk teeth has appeared, the upper incisors appear as shown in Fig. 25. At this age the cups of the first and second pairs show considerable wear, the cups of the middle pair being faint in outline. From the time a colt is 1 year old until the first pair of permanent incisors replace the corresponding pair of milk teeth, considerable care is required to estimate the age accurately. This can be done only by taking into account the degree of wear of the different pairs. In Fig. 26 is shown the appearance of the upper incisors when a colt is 2 years old. At this age the cups in the middle pair have almost or entirely disappeared, but a little discoloration usually remains to mark their boundary.

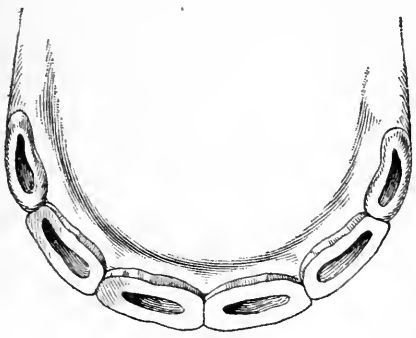
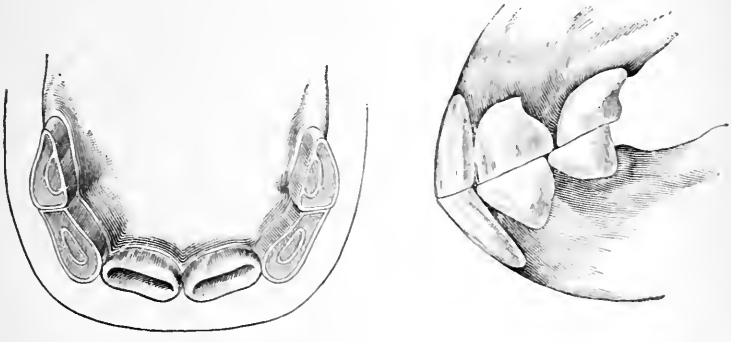


FIG. 25

45. As has already been explained, the middle pair of permanent incisors appears in from about $2\frac{1}{2}$ to 3 years. As a rule, they appear in from about 2 years and 9 months to 2 years and 11 months, and are fully out and in wear in 3 years. Fig. 27 (*a*) shows the appearance of the lower incisors, if normal, at this age; in (*b*) is shown a profile view of the teeth. It can be seen that the middle pair of permanent teeth are larger than the milk teeth. There is also a difference in color, the milk teeth being of a fine white color and the permanent teeth of a slightly yellowish tinge. At this age the intermediate milk teeth have become worn down and have lost all or nearly all of their cups; there is a slight dark indentation that can hardly be called a cup. In the lateral, or corner, teeth the cups are greatly worn. If the colt is a male, small caps called

FIG. 26



(*a*) (*b*)

FIG. 27

tusks may be present or in the process of coming through the jaw just back of the corner teeth.

46. When about $3\frac{1}{2}$ years old, a horse loses the intermediate pair of milk teeth above and below, and these are replaced

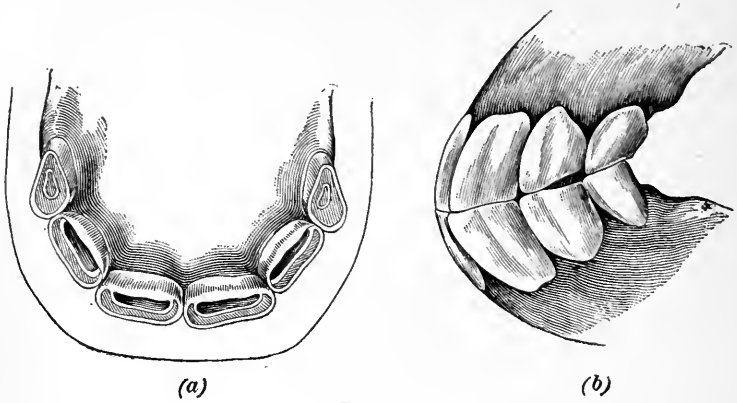


FIG. 28

by permanent teeth; when the animal is 4 years old the teeth will appear as illustrated in Fig. 28. In (*a*) is shown a view of the lower incisors and in (*b*) a profile view of both the upper and lower jaws. The middle incisors show more or less wear, and the last pair of milk teeth have little left of their cups but a shallow indentation. The tusks, if present, are larger than they were at 3 years, but are still sharp at the points.

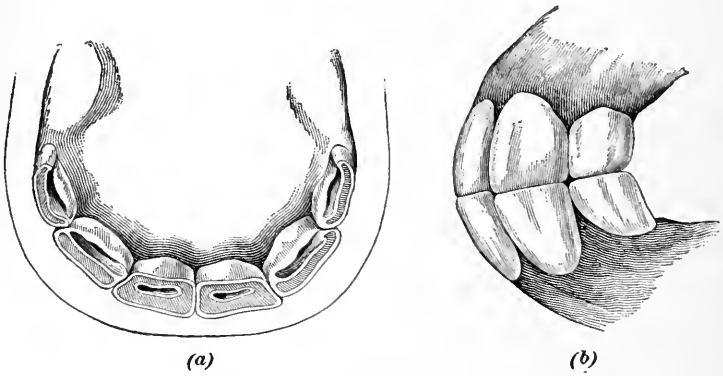


FIG. 29

47. At about $4\frac{1}{2}$ years of age, a horse sheds the last, or corner, pair of milk teeth, and by the time the animal is 5 years

old the last permanent pair are up to wearing, so that the horse has a full complement of permanent teeth. The appearance of the incisors at this age is illustrated in Fig. 29 (*a*) and (*b*). At this age the middle incisors show considerable wear. They have also changed in shape, having become rounder on the inner surface. The intermediate incisors show some wear.

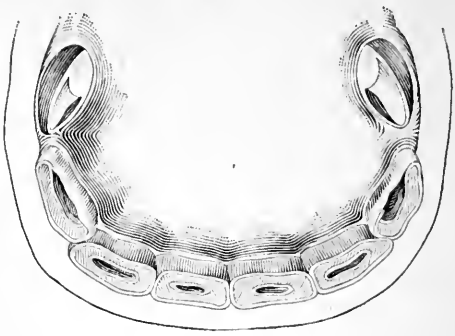


FIG. 30

When the permanent incisors first appear they have cavities or cups called *crowns;* these are similar to the cavities of the milk teeth but are deeper. As a horse becomes older, there is a slight growth of the teeth and a wearing away of the crowns. The incisor teeth become longer and the upper and lower sets form an acute angle with each other. When a horse is 6 years old the middle pair of incisors have been in wear 3 years and in that time have grown out so that the crowns are worn down to such an extent that the cups have disappeared from the lower pair; the cups disappear more rapidly in the lower than

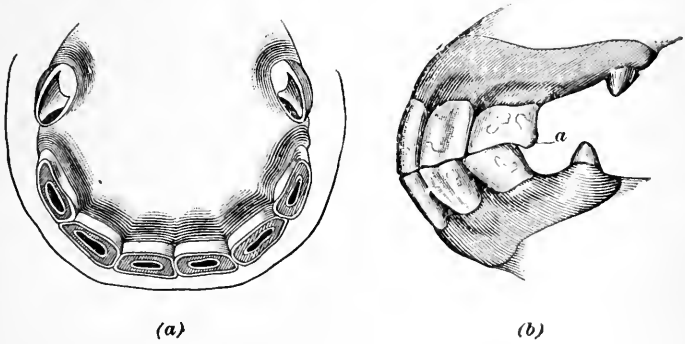


FIG. 31

in the upper teeth. The appearance of the lower incisors when a horse is 6 years old is shown in Fig. 30.

48. At 7 years of age the cups have disappeared from the lower intermediate pair, although small dark spots can often be seen. The corner teeth still retain their cups, but show considerable wear. The appearance of the incisors of a 7-year-old horse is illustrated in Fig. 31. In (*a*) is shown a view of the lower teeth and in (*b*) a profile view of both jaws. At 7 years notches appear in each of the upper corner teeth, due to uneven meeting with the corresponding lower teeth; one of these notches is shown in the tooth *a* in (*b*). At 8 years of age the notch in the corner incisors is strongly marked, and the cups of the lower incisors are usually entirely worn off, leaving the tables smooth or flat, although irregularities sometimes occur and slight cups may still be present. At this age the teeth assume a somewhat triangular shape. The appearance of the lower incisors at 8 years old is shown in Fig. 32.

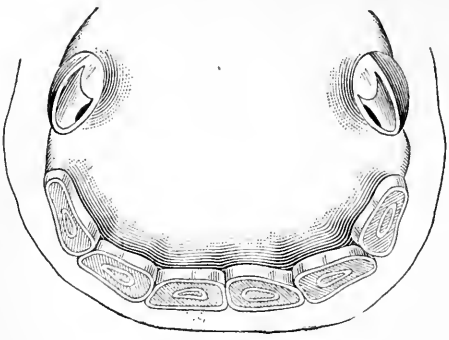


FIG. 32

49. When a horse is 9 years old the cups should have disappeared from the upper central incisors and should be shallow in the intermediate and corner pairs. The appearance of the upper teeth at 9 years of age is shown in Fig. 33. At 10 years of age, the cups will have disappeared from the upper intermediates, but may still be seen in the corner teeth, although shallow. The appearance at 10 years of age is shown in Fig. 34. When a horse is 11 years old all of the cups will have disappeared from the upper incisors. However, in the case of

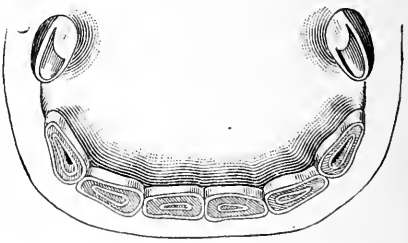


FIG. 33

some horses that have dense bone, it is not uncommon to find cups in the upper corner teeth at 12 and even 15 years of age. The appearance at 11 years is illustrated in Fig. 35.

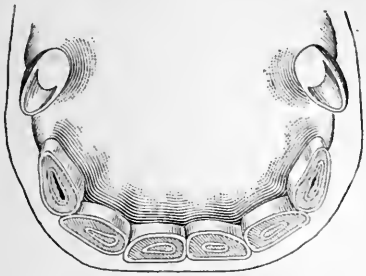


FIG. 34

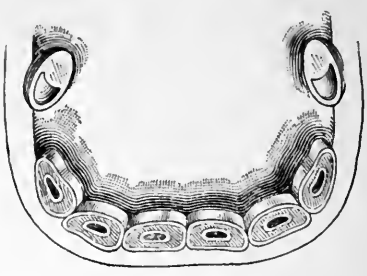


FIG. 35

50. After the eleventh year it is exceedingly difficult to estimate the age of a horse by its teeth. However, the shape and the angle of the incisors usually indicate whether a horse is just past this age or is considerably older. In Fig. 36 is illustrated the shape of a permanent incisor, the solid lines indicating the position of the wearing surface at successive ages, and the cross-sections showing how the surface contour

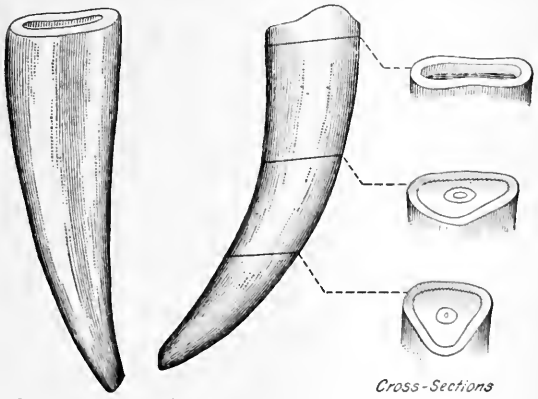
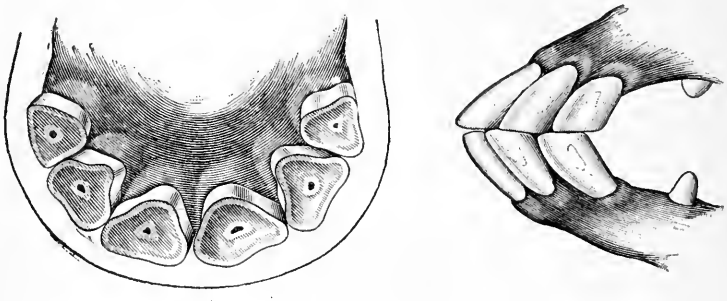


FIG. 36

changes with advancing years. Thus, it can be seen that the degree of triangularity of the teeth is a guide to the age.

When a horse is young the upper and lower incisors meet nearly vertical with each other. As the horse advances in years the angle of the incisors becomes sharper, until in a 20-year-old animal they meet at an angle of about 45 degrees.



(*a*) (*b*)

FIG. 37

The appearance of the incisors at 20 or 21 years is shown in Fig. 37. In (*a*) is shown a view of the lower teeth and in (*b*) a profile view of the jaws.

HORSE MANAGEMENT

(PART 1)

INTRODUCTION

1. The horse is perhaps the most highly organized of all domestic animals. Every horse may be said to have an individuality of its own and to require somewhat different management from every other horse. Because of this fact, the successful management of horses is dependent not only on the application of certain fundamental principles of management that apply to all horses, but also on a careful study of the needs of each animal. In this and the succeeding Section, it is the purpose to give as specific directions as possible for the management of horses, and, at the same time, to emphasize the necessity for studying the requirements of each animal.

The horse differs from all other domestic animals in the relative capacities of the different organs of the alimentary canal. In the horse, the stomach has a capacity of about 3 gallons and the intestines about ten times as much. Compare this with the corresponding organs of the cow, in which the stomach has a capacity of 55 to 60 gallons, or about two and a half times more than the intestines. It will be apparent from this that horses are not as well adapted as cows to the digesting of large quantities of coarse roughages, and must have more concentrated feed, particularly when at work. All the energy that can be gotten out of some feeds is required to digest and assimilate them, and it is needless to say more than that such feeds are worthless for

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horses doing hard work. The harder the work at which a horse is engaged, the more concentrated and digestible the ration should be.

2. The important points to be considered in selecting horse feeds are their nutritive value, their palatability, their influence on health, their economy, and their suitability for the age of the horse and the nature of its work. The quantity of feed given must be sufficient to supply the energy required by the organs of the body in performing their functional activities, that lost through excitement or irritation resulting from such causes as a harassing driver, an unequal mate, ill health, or flies, and that required for the work to be performed. In addition to the producing of energy for immediate needs, the feeding of a horse should be done in such a way that it will be conducive to the future health and vigor of the animal, and, if it is young, to its physical development.

3. As far as possible, horses should be stabled where they will be contented. Some horses fret if they are removed from the company of other horses; on the other hand, some are so irritable when stabled near companions that they lose considerable energy and become unduly fatigued. Also, the personality of the attendants is an important feature of horse management. Too much importance cannot be placed on having horses cared for by competent persons. Nothing worries a horse more than ill treatment; in fact, abuse may be carried to the point that the behavior and disposition of the horse will be affected and hence its market value greatly reduced. To develop a horse to its utmost efficiency, it must be kindly but firmly handled. An observation of these points is extremely important if horses are to be managed successfully.

4. Although the type, breed, and market classifications of horses have been explained in preceding Sections, it is necessary, for the present purpose, to make a broader grouping, based on the work the animals do or the purpose for which they are used. Horses are designated, in this and

the succeeding Section, as *draft horses, driving and saddle horses, breeding horses,* and *horses for show and market.* The term **draft horses** is used here to designate such horses as are used to move heavy wagons or trucks, or to pull cultivating, tillage, and harvesting machinery on farms; by the term **driving and saddle horses** is meant animals of the two general classes of light horses that are used, respectively, for drawing light vehicles and for mounts; by **breeding horses,** as will be clear from the term itself, is meant horses kept for breeding purposes; by **horses for show and market** is meant horses of all classes that are intended for the show ring or for market. It may be seen, however, that there is likely to be an overlapping of these groups. For instance, a horse may be kept primarily as a draft horse or as a breeding horse, and also be occasionally used as a driving horse and as a show animal. In all such cases it is well to consider the needs of the animals for their immediate work.

MANAGEMENT OF VARIOUS CLASSES OF HORSES

DRAFT HORSES

5. Feeding of Draft Horses.—As an average for draft horses at moderate work, a good plan to follow is to feed 1 pound of grain and 1¼ pounds of hay per day per 100 pounds of live weight of the horse. At this rate, a 1,600-pound horse would receive 16 pounds of grain and 20 pounds of hay per day. If the work is severe, the quantity of grain should be increased to 1¼ pounds or more per 100 pounds of live weight of the horse, but should not exceed 1⅓ pounds. When a heavy grain ration is fed it may be necessary to feed a slightly smaller quantity of hay, but this should not be less than 1 pound per 100 pounds of live weight; the exact quantity must be determined largely by the individuality and appetite of each horse. When a heavy grain ration

is being fed it should be slightly reduced as soon as the work slackens.

The grain ration should be divided into three equal feeds and given morning, noon, and night. The greater part of the hay should be fed to the horses in the evening, as they will then have all night in which to consume and digest it; about one-quarter should be fed in the morning and one-sixth or less at noon, the quantity for each feed depending on the time allowed for the horses to eat.

6. In order to prevent *azoturia*, a disease of horses resulting from heavy feeding during periods of idleness, the grain ration should be reduced about one-half on days when the horses are idle. If the period of idleness continues but 1 or 2 days, the reduced ration of grain should be fed until work is resumed; if it continues for several days, the reduced ration should be fed for 4 days, when, if it is desired to improve the condition of the animals, the quantity can be gradually increased until the normal ration is fed. This method of feeding will give time for the systems of the horses to become adjusted to the conditions caused by idleness. A better plan would be to give the horses some exercise each day so that the quantity of grain need be reduced but little; it is advisable to reduce the quantity somewhat unless the horses are in a thin condition and it is desired to build them up, as horses that are merely exercised do not expend nearly the amount of energy that is required when they are at work. When horses remain in the barn on Sundays without exercise, it is a good plan to increase the quantity of hay and reduce the quantity of grain one-fourth.

7. In selecting the kind of grain for the ration of a draft horse, the feeder should be guided by the kind of hay used and the cheapness of the ration; a larger quantity of corn can be economically and satisfactorily used in a ration with clover or alfalfa hay than with prairie or timothy hay. Also, the ration should contain enough digestible protein to meet the requirements of the horse. A ration consisting of $\frac{1}{2}$ part of corn, $\frac{1}{3}$ part of oats, and $\frac{1}{6}$ part of bran, by weight, and

a mixture of timothy and alfalfa or clover hay, or of prairie hay and alfalfa or clover, will give satisfactory results. For a 1,600-pound horse at moderate work, a ration of this proportion would be as follows:

	Pounds
Corn	8
Oats	5⅓
Bran	2⅔
Timothy or prairie hay	10
Clover or alfalfa hay	10

When prairie, timothy, or some other hay low in protein is fed, it may be found economical to add to the ration some cottonseed meal or linseed meal in order to increase the content of digestible protein. A saving of from 8 to 15 per cent. can be made by grinding or crushing the grain and feeding it in some way to insure thorough mastication; this can be accomplished by mixing the grain with from 1 to 2 pounds of chopped hay and dampening the mass to allay the dust. Clover and alfalfa hay are preferable to timothy hay for chopping, as the latter has hard, sharp ends that are objectionable. Bran is a good substitute and also a good supplement for cracked corn. Ear corn is preferable to shelled corn for horses, because it insures a more thorough mastication.

8. Many horse feeders make the mistake of feeding too much hay. It is a bad practice to keep the mangers filled and allow hard-worked horses to gorge themselves just before going to work. As has already been stated, the stomach of the horse is a comparatively small organ and should not be burdened with a lot of coarse feed that is hard to digest and has little nutritive value. Hay contains a large quantity of crude fiber, which requires much more energy and time for its digestion than grain, consequently only a small quantity of hay should be given when the time for consuming the feed is short. The cause of bad wind and heaves is often ascribed solely to the feeding of dusty hay, when, in reality, the trouble is frequently due to a digestive derangement

caused by feeding too much coarse feed and immediately putting horses with full stomachs at hard work.

9. The winter rations for horses that are at work need not differ greatly from those that are fed during the summer. As a rule, however, the work during the winter is not so heavy and continuous as during the summer, consequently the horses do not need so much feed, and often they can be fed on fodders that are less expensive than the roughage required in summer. A good quality of corn stover may be used in place of hay, or good oat straw may be used as a part of the ration. Corn stover that has been properly cared for makes a good feed if fed in the fall or early winter; if shredded, it is more convenient to handle in feeding and makes less litter about the barn. Corn-stalk tops, or the part of the stalks above the ears, make a roughage that is almost equal to timothy hay in feeding value.

Draft horses that are idle during the winter may be given the run of a stalk field or a pasture that has been reserved for winter use. They should have free access to water at all times, and if they can have a straw stack about which to lie and to feed on they will do well in mild weather. If the feed supply gets scant it should be supplemented with some grain or other forage. As a rule, the roughages are cheaper than grains, and horses that are not worked can be maintained on them if they have all they will eat. A month before the horses are expected to go to work in the spring some grain should be fed to them, as horses that have not been having grain are soft and are not able to do as hard work as those that have.

10. Watering of Draft Horses.—It has been proved by experiments that the drinking of copious quantities of water increases the assimilation of food; therefore, draft horses should have free access to salt and be watered frequently. During hot weather, if the horses are at work, water should be given before and after each feed, about the middle of the forenoon, and again about the middle of the afternoon; when this is done there is but little danger of them drinking

too much when hot. If the work is such that water is not available for watering the horses in the middle of the forenoon and the afternoon, it is advisable, where possible, to fill a milk can or a barrel with water and take it to the place of the work. This applies particularly to work on the farm. In the case of road work, it is not always convenient to carry a supply of water, although in certain kinds of road work it may be possible to have the supply of water at some point where it may be had in passing back and forth.

11. Care of Draft Horses.—Draft horses are most efficient if allowed to do their work at a walk. Crowding them to work faster than their natural gait is false economy, because it usually causes fretting and excessive perspiration, which are debilitating and should be avoided as far as possible. Each horse has more or less of an individual gait, and in making up a team this point should be considered and an attempt made to place together animals that are as evenly matched in gait as possible. It is very annoying to a rapid-gaited horse to be compelled to work with one that is slow gaited, and the chances are that the former will pull more than its share of the load.

It is a good plan to clip draft horses as soon as the weather becomes warm in spring. In the case of farm draft horses, the clipping should be done before they are put at hard work. Removing the hair lessens perspiration and the horses dry quickly; colds can be avoided if blankets are used as the weather may require. Clipping also makes possible and probable a more thorough grooming, which adds to the health of horses. Contrary to common belief, if draft horses are worked occasionally during the winter they will not be able to stand cold as well as if not worked. The reason for this is that work is practically certain to cause more or less sweating and this, in turn, will make grooming necessary. Horses that do not sweat and are not groomed have a thin covering of dandruff over the body that protects it from cold. Grooming removes the dandruff from the hair and the surface of the cuticle and also stimulates a circulation of

blood near the surface of the cuticle; this stimulation of circulation retards the growth of cuticle and hair. Horses that are regularly groomed are shorter haired than those that are not; on the other hand, anything that produces an anaemic condition stimulates the growth of cuticle and subjoining parts. This, of course, applies to other classes of horses as well as to draft horses.

It is important to watch carefully the shoulders of draft horses. A collar that fits badly may in a few days cause the shoulders of a horse to become so sore that it will be impossible to work the animal for several days. In the case of farm draft horses, particularly, it is necessary to use extreme care in this respect. As a rule, farm draft horses are more or less idle during winter, and, as a result, their shoulders become well filled out with flesh. After a few days of hard work, the shoulders will perhaps have lost some of their covering, and consequently the collars will be too large. Many farm horses are incapacitated for heavy spring work simply because their attendants fail to keep the collars properly adjusted during the first few weeks. After the shoulders have become toughened to the work, there is not so much danger of injury, but even then they should be examined daily as long as the horses are worked.

When draft horses are used for teaming on hard roads or during icy times they should be kept shod. However, for work on soft earth, such as work on the farm, their feet will last better without shoes. In case it is desired to use farm draft horses for road work, they can be shod and the shoes removed when the work is finished.

DRIVING AND SADDLE HORSES

12. Feeding of Driving and Saddle Horses.—The feeding of driving and saddle horses is not greatly different from the feeding of draft horses, except that the former should be given a smaller quantity of hay and perhaps a little more grain than the latter. An ample ration for a driving or a saddle horse at severe work is 1 pound of good hay and

1½ pounds of grain per 100 pounds of live weight of the animal. At this rate a 1,200-pound horse would receive 12 pounds of hay and 16 pounds of grain per day. Many driving and saddle horses, even though at hard work, can be maintained in good condition on less than the ration just given. Most of the hay should be fed at night and but little given in the morning before the horse is put at work. The grain should be divided into three equal parts and given morning, noon, and night.

In feeding driving and saddle horses when they are doing severe labor, care must be exercised not to give feeds that produce a laxative condition. A large quantity of crude fiber is found in oats; hence this grain is one of the best for horses at hard road work. Corn is not as good as oats for the feeding of light horses at hard work, because it contains slightly less digestible protein, much less crude fiber, and much more of digestible carbohydrates. However, if corn is crushed and fed with chopped alfalfa or clover hay and bran, it can be satisfactorily substituted for oats, and, when fed in this manner, lessens the danger of impaction and other digestive troubles. Because of their laxative properties, clover and alfalfa hay cannot be used as extensively for the feeding of driving and saddle horses as for draft horses; when these hays are fed they should be given with timothy or prairie hay.

For extremely severe work, such as racing, less hay should be given than for common road work; most of the nutrients should be supplied by grain, oats being best. About ⅘ pound of hay per 100 pounds of live weight of the animal should be given, most of it being fed at the evening feed.

During idleness, light horses should not be made to subsist wholly on roughages, as such feeds tend to make the animals somewhat poddy, or large in the abdomen. As a part of the market value of driving and saddle horses is in their appearance, such a condition is very objectionable.

13. Watering of Driving and Saddle Horses.—Driving and saddle horses, like draft horses, should be watered at least

before and after each meal. When possible, they should be watered even more frequently than this, particularly when they are at hard work during hot weather. It should be the practice to water them often enough that they will not drink too much at one time.

14. Care of Driving and Saddle Horses.—As a rule, driving and saddle horses do not work as many hours at one time as draft horses, but their work is more severe while they are at it. A horse of this class, particularly, should not be put at hard work with a full stomach, for the stomach will press against the diaphragm and retard free, easy breathing. The digestion, also, is retarded, because the flow of blood to the stomach and adjacent parts is diverted to other regions of the body.

Owing to the fact that appearance is extremely important in driving and saddle horses, care should be exercised to keep them properly groomed. A sufficient quantity of suitable bedding should be kept in the stalls to prevent the horses from becoming stained by the manure. It is important, also, that they be stabled where it will be impossible for them to rub out their manes and tails and to become scratched by projections. The appearance of a driving or a saddle horse is dependent to a large degree on the coat, which should be kept free from stains, scratches, etc., and maintained in a glossy, luxuriant condition.

As the work of driving and saddle horses is largely performed on hard roads or pavements, it is necessary to pay particular attention to their feet. The work of shoeing such horses should be done by competent horseshoers, who have good judgment as to the kind and weight of shoes to use for a particular animal. This, of course, is extremely important in the case of race horses or those used for fast road work. The limbs of light horses should be watched carefully for sprains or bruises, and if such are found they should be treated. Detailed information concerning the treatment of such injuries is given in a subsequent Section.

BREEDING HORSES

BROOD MARES

15. Selecting of Mares for Breeding Purposes.—As a rule, in horse breeding the general appearance and pedigree of the stallion are given much prominence and in the brood mare they are more or less disregarded. However, so far as is known, the mare has as much influence on the colt as has the stallion. Occasionally, a fine colt may be obtained from an inferior mare, but such is rarely the case, and a horse breeder should not risk breeding such an animal.

A brood mare should be of good size for the breed to which she belongs. Her conformation should be rather open, that is, not too compact; the eyes should be prominent, bright, and well set; the head, fine and feminine in appearance; and the neck, rather thin and not coarse. The shoulders should slope well into the back, and the withers should be high rather than low. The back should be rather short, and the under line should be somewhat longer than the back. The ribs should be well sprung and rather open. The hindquarters should be broad and deep, and the pelvic region broad to insure ease of foaling.

The legs and feet, especially, of the brood mare should be of good quality and conformation. The bones of the limbs should be clean and free from coarseness, so that the legs appear wide and flat. The tendons should be prominent and free from meatiness; the hair should be fine, silky, and glossy. Coarse, kinky, profuse hair that tends to grow from the sides as well as the back of the legs, below the hocks and knees, usually indicates coarseness, spongy bone, and a tendency to diseases of the limbs. The feet should be of medium size, well shaped, dark colored, tough, elastic, and fine of texture. Mares having poor hoofs—too small, too large, too soft and spongy, too weak, brittle, wide and low in the heels, too shallow and flat, too steep and contracted—are not desirable for breeding purposes. The wearing

qualities of a horse depend largely on the character of the legs and hoofs.

The action of a brood mare should be good. The step should be regular, firm, free, and elastic. A fast and snappy walk is essential to all classes of horses, whether for draft or road purposes. The legs and feet should move free of each other and without interfering. In the case of driving horses, good action at the trot or pace is essential; the action of these gaits should be straight and not marred by paddling or sprawling.

It is of great importance that the brood mare be free from all forms of unsoundness and hereditary or other disease that may be communicable to the offspring. Many breeders have fallen into the error of considering any broken-down, halt, maimed, blind, or otherwise unsound mare to be fit for breeding purposes even when she is no longer able to work. It should be said that blemishes that are the result of accident, are not hereditary or transmissible and do not render an animal unfit for breeding. The greatest possible care must be exercised, however, in deciding whether the blemish is the result of accident or an inherent deficiency.

Furthermore, it is desirable that the brood mare should have a good disposition. Infirmities in temper or disposition seem to be readily transmitted to offspring. Pregnant mares are often quarrelsome and many distressing accidents occur when mares in such condition have mean dispositions. Although perfect mares can rarely if ever be found, and few farmer breeders can afford to reject a mare for small and unimportant defects, it would be of great advantage to each horse breeder and a boon to the horse-breeding industry in general if all actually unsound and notably unsuitable mares were rigorously rejected as breeding stock.

16. Productive Period.—As a rule, the most fertile period in the life of a mare is when she is from 4 to 12 years old. During this period she is usually a more reliable breeder and will produce better colts than before or after. Of course, most mares will become pregnant at 2 years of age and will

continue to do so until well advanced in years, but with a less degree of certainty than during the period just given.

The question of the age at which it is safe to breed young mares is one regarding which there is considerable difference of opinion, and one that is dependent on at least three important factors: the breed, the individual animal, and the object sought in breeding. Horses of the draft breeds mature much earlier than those of the lighter breeds, so that a draft filly at 2 years old is often as well matured as a light mare at 3 years of age. Also, there is considerable difference in the way individual mares mature. Usually a smoothly turned filly of fine structure makes her growth more rapidly and hence matures earlier than a rougher, coarser filly. Feed and care have much to do with the early maturity of a filly; one that is kept growing continuously will mature earlier than one that is imperfectly cared for and that has a setback each winter. If the object sought in breeding is to improve the strain of horses, the filly should be permitted to mature more fully than when the purpose is simply to produce as many animals as possible for market. Although opinions differ, it is the belief of a large number of authorities that draft fillies should be bred at 2 years, and driving and saddle fillies at 3 years of age. It is not advisable, however, to breed 2-year-old draft fillies if they are to be fitted for show or put at hard work when 3 years old. If not, breeding at 2 years old will develop the generative organs and the breeding powers, and hence the fillies will make better brood mares than if not bred until they are 3 years old. Too early breeding is detrimental in the case of driving or saddle horses, because, as already explained, such animals are not likely to be as well developed as draft fillies at the same age, and the carrying of a foal is pretty sure to cause the form to become poddy.

The practice in certain draft-horse-producing countries, Great Britain for example, is to breed draft fillies the spring they are 2 years old and not put them at any work whatever that season. After weaning their foals, they are taken as 3-year-olds and put to work, and not bred again until they are 4 years old.

At about 12 years old, the productive powers of many mares will begin to wane, although a large number of mares are reliable breeders to an age of 15 years, especially if they have been bred continuously from their maturity. Above this age, it is rarely profitable to keep them for breeding. Usually it is best to dispose of draft brood mares at 10 or 12 years of age unless they are exceptionally good breeders, in which case they should be kept as long as they will breed.

17. Season of the Year to Breed Mares.—The natural time for colts to arrive is in the spring, and under ordinary conditions, particularly on breeding farms, this is customary. However, it is often the case that a mare must be worked during the summer in addition to raising a colt. This often makes it desirable to breed mares so as to have the foals arrive in the fall. For example, farmers who are compelled to work their draft horses during summer often find it more desirable to have the mares foal in the fall than in the spring, because of the slack work in winter. With good stables, an abundance of feed, and the necessary help, there is no reason why mares should not be bred to foal in the fall if it is more convenient to have them do so. In fact, if there is no chance to favor a mare properly after a foal arrives in the spring, it is best to have the foal arrive in the fall so that it can be suckled when the mare is idle. During winter, however, both mare and foal will require more attention than if the mare had foaled in spring. An advantage of fall foaling is that the colts can be given a good start before they are set back by the short pastures and flies of midsummer. Breeders of race and show horses take every possible advantage of the age limits of racing and show classes and therefore favor early spring foaling. There are, unquestionably, certain benefits, such as life in the open and new grass, to be derived from spring foaling, but the prejudice against fall foaling is not altogether warranted, and circumstances may be such as to make it most advantageous.

18. Period of Heat.—In mares, the natural period of heat recurs about every 21 days and lasts from 3 to 7 days. The

first heat period after foaling occurs in 9 days, or thereabouts, and if the mare is healthy and has received no injuries in giving birth, it is the practice to breed her at this time; some mares will accept the stallion on the seventh day after foaling. The breeder should be cautioned, however, not to breed mares at the first heat period after foaling if they are not in breeding condition.

When a mare has been served she should, as a test of successful impregnation, be returned to the stallion at about the time the next heat period is due. If the first service has been successful the mare will not accept the stallion for a second service. Even if the first service has not been successful, most mares will not accept the stallion for a second service until 27 or 28 days after the first service, but as a precaution against missing a heat period, the mare should be returned to the stallion sooner than this. The exact day after the service that mares should be returned is a much discussed question. Some authorities advise returning mares on the fourteenth day after the first service; others believe that it should be done on the eighteenth day; still others, on the twenty-first day. This divergence of opinion is largely due to the fact that mares differ considerably in the time of the recurrence of the heat period. It is advisable for the breeder to study the individual differences among his mares and be governed, to a large degree, by his observations.

If a mare accepts the stallion for a second service she should be returned as explained for the first service. If she does not accept the stallion when first returned after the first or the second service, she should be taken to the stallion once each week thereafter for about a month as a further test of successful impregnation. Conception usually causes a cessation of the heat period and terminates the discharge of ova from the ovaries, but there are rare exceptions to this rule. Cases are on record where mares have produced a horse colt and a mule colt at one birth; this, in all probability, was due to the two ova being fertilized at different heat periods, the first being fertilized by a stallion and the second by a jack at a later heat period or vice versa.

Some mares are shy about accepting a stallion. If a mare is unwilling and it is desired to breed her, artificial impregnation should be practiced, as explained later. There are other mares, and they are numerous, that will freely accept service when they are in foal, in some cases almost up to the time of foaling.

19. Feeding of Brood Mares Previous to Breeding Season. The chief point to consider in the feeding of brood mares previous to the breeding season is to keep them in good condition without permitting them to become too fat. In the case of mares that are given plenty of work, there is little danger of overfatness, but many mares have a tendency to become excessively fat when idle. Mares that are too fat are usually more difficult to get in foal than those in moderate flesh and they are also more subject to fatty degeneration of the generative organs and to the development of cysts and tumors.

20. Feeding of Brood Mares During Breeding Season. The feeding of brood mares during the breeding season need not differ from that at any other season of the year. It is erroneously claimed by some horse breeders that mares running on clover pasture are more difficult to get in foal than those that are fed on grain. It is possible that a very loose condition of the bowels may have some influence on the breeding condition, but as green forage is the natural food of horses, there should be no difficulty experienced in this respect when mares are allowed to run on clover pasture. In fact, it is desirable to have the bowels of brood mares somewhat loose at breeding time in order to lessen the possibility of a general feverish condition.

21. Breeding Condition of Mares.—If a mare has been well fed and cared for during the winter and early spring, she should be in good condition for breeding, provided she has no organic disorders. Mares are more likely to breed in the spring than in the fall and winter, because they are

usually in better condition. If a mare is to be bred in the fall, after being worked hard all summer, she should be built up by increasing her ration, especially the grain, and by giving her regular and moderate exercise. Her bowels should be kept free from constipation by succulent feeds. Barrenness in mares is often due to poor feeding and hard work, the system being weakened by a lack of sufficient nutrition.

Mares should not be bred when in an excited or a heated condition, but should be allowed to rest and become cool. Before being served, a mare should always be examined to ascertain whether her condition is satisfactory. Her temperature should be taken, both in the rectum and in the neck of the uterus; the temperature of both places should be practically the same under normal conditions, that is, 99.6° F. If the temperature of the uterus neck is found to be 2½ degrees higher than that of the rectum, or above 102 degrees, it is useless to breed the mare, as some condition exists that has caused inflammation of the uterus, and spermatozoa could not live if they were introduced. A self-registering clinical thermometer should be used for taking the temperature. Most clinical thermometers are claimed to register in 30 seconds, but in actual practice it is a good plan to leave them inserted for 2 or 3 minutes to insure a correct reading. Note should be taken of the condition of the vulva and of the eyelids and nostrils; if these are congested, it indicates the presence of inflammation elsewhere.

The attendant should always be on the lookout for any abnormal discharge and for an acid or an alkaline condition of the generative organs. If such are found, the mare should be treated by a competent veterinarian before she is bred.

Great care should be exercised in the matter of cleanliness when making internal examinations or taking temperatures to reduce the danger of an infectious disease being introduced into a healthy mare. The person and clothing of the operator should be clean and the hand and arm carefully washed in some such antiseptic as a dilute solution of bichloride of mercury or of carbolic acid.

22. Serving of Mares.—Before permitting a stallion to attempt to serve a mare, it must be first ascertained whether she is in heat and will accept him. This is determined by leading the mare up to one side of a teasing pole, such as described in *Horse Barns and Paddocks*, and then leading the stallion up to the opposite side and allowing him to bite and otherwise play with her; this is known as *teasing*. If the mare is in heat she will submit to the teasing, but if not in heat she will squeal and attempt to kick the stallion. It is advisable to permit the stallion to tease her for several minutes, because some mares, particularly fillies, are shy about accepting a stallion and will not at first exhibit signs of heat. In addition, if a mare is just going out of heat, she can sometimes be induced to accept the stallion by prolonged teasing. If the mare exhibits signs of heat she should be examined, as already explained, and if found to be in breeding condition and entirely cool and unexcited, she is ready for the service. If she does not exhibit signs of heat the owner of the mare and the stud groom should use their judgment about attempting to breed her. As a rule, if mares do not show signs of heat they should not be served, but some mares are so shy that they will not exhibit signs of heat no matter how long they are teased.

If the mare is willing and everything is ready for the service, she should be led into a breeding chute, such as that illustrated in *Horse Barns and Paddocks*, and the stallion permitted to serve her. It is possible, of course, to breed a mare without the use of a breeding chute, but the service will be much more satisfactory if one is used. The details of a service are explained later in connection with the handling of stallions.

23. Care of Mares Immediately After Service.—After mares have been served they should not be fatigued by a long drive. Experienced horse breeders claim that if mares are allowed to remain quiet for 24 hours after being served, instead of being put to work immediately, a larger percentage will be got in foal. Care should be exercised not to permit

the mare's bowels to become too loose, although a mildly laxative condition is desirable.

24. Artificial Impregnation.—A method of impregnating mares artificially, known as **artificial impregnation,** is now somewhat extensively practiced. As commonly practiced, it consists in collecting a quantity of semen from a mare that has been served in the natural way and introducing it into the uterus of one or more other mares; it is also frequently practiced to further the passage of semen from the vagina into the uterus in the case of a mare just bred, in order to make conception more probable. The act of introducing the semen is spoken of as **artificial insemination.** When a good, natural service is made and the discharge from the stallion is normal, it is possible to breed as many as a dozen or more mares from the one service. During the busiest part of the breeding season, when the stallion is severely taxed, it is a matter of economy to practice artificial impregnation. Also, in the case of mares in which the neck of the uterus is greatly contracted it is often necessary to resort to artificial impregnation if they are ever to be got in foal.

25. To extract the semen from a mare, an instrument known as a *semen extractor* is used. Some forms of these extractors will remove semen from the vagina only, but, since in many cases the semen is deposited directly into the uterus, it is desirable to have an extractor that will work equally well in removing semen from this latter organ. A form of extractor that meets these requirements and that can also be used, if desired, to inject the seminal fluid from the vagina of a mare just bred into the uterus or to remove it and inject it into the uterus of a different mare is shown in Fig. 1 (*a*). This extractor has a flexible metal tube that can be readily bent. When the semen is taken from the uterus, the tube should be bent downwards after inserting it through the neck of the uterus, care being exercised to hold the finger near the end of the tube when the piston is being withdrawn, as shown in Fig. 1 (*b*), to prevent the membranes of the uterus from being sucked in. The extractor should

be warmed to body temperature in sterilized water before it is used. After it is filled, the tube should be straightened before it is withdrawn from the uterus.

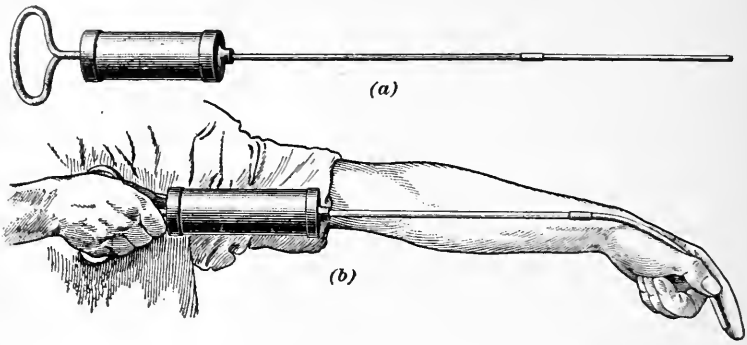

FIG. 1

26. The semen that is withdrawn is deposited in the uterus of a mare by one of two methods. Either an instrument known as an *impregnator* is used, or the semen is placed in an ordinary gelatine capsule of a capacity of about 1 ounce and this is then placed in the uterus of the mare. One form of impregnator is illustrated in Fig. 2 (*a*) and another form in (*b*). By the instrument shown in (*a*), the

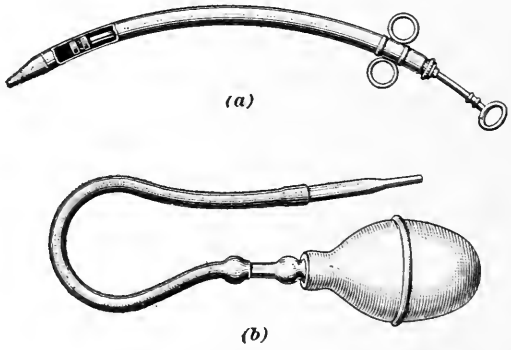

FIG. 2

semen is drawn from the semen extractor by means of the piston in the impregnator and is ejected by a reverse action of the piston. The impregnator shown in (*b*) is filled

from the extractor by compressing and releasing the bulb. The combined semen extractor and impregnator shown in Fig. 1 (*a*) also is commonly used. When capsules are used, they should be filled in a subdued light and the seminal fluid should be maintained at body temperature, which can be done by keeping the extractor partly submerged in warm water. Both sudden chilling and sunlight are destructive to spermatozoa. As each capsule is filled it should be immediately inserted into the uterus of the mare to be bred. The advantage of capsules over an impregnator is that more mares can be bred from one service, because the attendant is able to divide the fluid and know that a certain quantity has been deposited in the uterus.

27. Precautions should be taken in artificial insemination to guard against infection; the instruments used should be sterilized in the same way as surgical instruments and the operator should guard against the introduction of disease from an unhealthy mare. The chances of this happening are much less, if the operator is careful and understands his business, than when a stallion is allowed to cover a mare without an examination being made of her physical condition.

The same method should be used in ascertaining whether a mare is pregnant when she has been bred artificially as when bred by a natural service. If, however, she is artificially bred when not in heat, she should not be returned to the stallion for teasing before about 30 days, after which she should be returned once each week thereafter until it is determined that she is pregnant. If a mare passes over two heat periods after being bred without exhibiting signs of heat, it is generally considered probable that she is pregnant. Occasionally, mares are found, especially among those suckling colts, that do not have a regular recurrence of the heat period, and in this case it sometimes happens that the symptoms of pregnancy are deceptive. If a mare was in heat when artificially inseminated, she should be returned to the stallion for teasing in about 21 days after being bred, and each seventh day thereafter for 7 or 8 weeks. If, during

this time, she does not come into heat, it is almost safe to conclude that she is pregnant.

28. Signs of Pregnancy.—The first signs of pregnancy in mares are the absence of the usual heat period, more quietness, a tendency to take on fat, crossness toward other horses, fullness of the flank, and contraction of the vulva. In advanced stages, the belly becomes more pendulous, the udder fills, and a moving, jerking, and kicking of the fetus is often noticed, especially on the right side just after the mare has taken a drink of cold water. If there is any doubt whether or not the mare is pregnant, an examination may be made through the rectum by a veterinarian.

29. Period of Gestation.—The period of gestation in mares is popularly considered to be 11 months; a period of 336 days is, perhaps, more accurate, but it may vary greatly either way. Table I shows the date after breeding at which a mare is due to foal, assuming that the period of gestation is 336 days. This table will be found helpful in ascertaining the approximate date when foals may be expected.

30. Feeding of Pregnant Mares.—During the first 6 months of the period of gestation, the feeding of a pregnant mare need be little different than that of a mare not pregnant, as there is comparatively little growth of the fetus. At about the beginning of the seventh month, a slight increase should be made in the protein content of the ration, and further increases should be made occasionally up to a short time before the mare foals. The most economical feeds to use in making this increase in protein are such roughages as clover, alfalfa, or cowpea hay. If these are not available, it will be necessary to feed concentrates such as linseed meal, cottonseed meal, and wheat bran. Feeds such as these are rich in protein and ash, and are much better for a mare that is well advanced in pregnancy than a starchy feed such as corn. A good grain ration for a mare that is just past the seventh month of pregnancy and is being worked is as follows: Ground oats, by weight, 4 parts; corn, 2 parts; wheat bran,

TABLE I

GESTATION TABLE FOR MARES

Date Bred	Due to Foal	Date Bred	Due to Foal	Date Bred	Due to Foal
Jan. 1	Dec. 2	Feb. 1	Jan. 2	March 1	Jan. 30
2	3	2	3	2	31
3	4	3	4	3	Feb. 1
4	5	4	5	4	2
5	6	5	6	5	3
6	7	6	7	6	4
7	8	7	8	7	5
8	9	8	9	8	6
9	10	9	10	9	7
10	11	10	11	10	8
11	12	11	12	11	9
12	13	12	13	12	10
13	14	13	14	13	11
14	15	14	15	14	12
15	16	15	16	15	13
16	17	16	17	16	14
17	18	17	18	17	15
18	19	18	19	18	16
19	20	19	20	19	17
20	21	20	21	20	18
21	22	21	22	21	19
22	23	22	23	22	20
23	24	23	24	23	21
24	25	24	25	24	22
25	26	25	26	25	23
26	27	26	27	26	24
27	28	27	28	27	25
28	29	28	29	28	26
29	30			29	27
30	31			30	28
31	Jan. 1			31	March 1

TABLE I—(*Continued*)

Date Bred	Due to Foal	Date Bred	Due to Foal	Date Bred	Due to Foal
Apr. 1	Mar. 2	May 1	Apr. 1	June 1	May 2
2	3	2	2	2	3
3	4	3	3	3	4
4	5	4	4	4	5
5	6	5	5	5	6
6	7	6	6	6	7
7	8	7	7	7	8
8	9	8	8	8	9
9	10	9	9	9	10
10	11	10	10	10	11
11	12	11	11	11	12
12	13	12	12	12	13
13	14	13	13	13	14
14	15	14	14	14	15
15	16	15	15	15	16
16	17	16	16	16	17
17	18	17	17	17	18
18	19	18	18	18	19
19	20	19	19	19	20
20	21	20	20	20	21
21	22	21	21	21	22
22	23	22	22	22	23
23	24	23	23	23	24
24	25	24	24	24	25
25	26	25	25	25	26
26	27	26	26	26	27
27	28	27	27	27	28
28	29	28	28	28	29
29	30	29	29	29	30
30	31	30	30	30	31
		31	May 1		

TABLE I—(*Continued*)

Date Bred	Due to Foal	Date Bred	Due to Foal	Date Bred	Due to Foal
July 1	June 1	Aug. 1	July 2	Sept. 1	Aug. 2
2	2	2	3	2	3
3	3	3	4	3	4
4	4	4	5	4	5
5	5	5	6	5	6
6	6	6	7	6	7
7	7	7	8	7	8
8	8	8	9	8	9
9	9	9	10	9	10
10	10	10	11	10	11
11	11	11	12	11	12
12	12	12	13	12	13
13	13	13	14	13	14
14	14	14	15	14	15
15	15	15	16	15	16
16	16	16	17	16	17
17	17	17	18	17	18
18	18	18	19	18	19
19	19	19	20	19	20
20	20	20	21	20	21
21	21	21	22	21	22
22	22	22	23	22	23
23	23	23	24	23	24
24	24	24	25	24	25
25	25	25	26	25	26
26	26	26	27	26	27
27	27	27	28	27	28
28	28	28	29	28	29
29	29	29	30	29	30
30	30	30	31	30	31
31	July 1	31	Aug. 1		

TABLE I—(*Continued*)

Date Bred	Due to Foal	Date Bred	Due to Foal	Date Bred	Due to Foal
Oct. 1	Sept. 1	Nov. 1	Oct. 2	Dec. 1	Nov. 1
2	2	2	3	2	2
3	3	3	4	3	3
4	4	4	5	4	4
5	5	5	6	5	5
6	6	6	7	6	6
7	7	7	8	7	7
8	8	8	9	8	8
9	9	9	10	9	9
10	10	10	11	10	10
11	11	11	12	11	11
12	12	12	13	12	12
13	13	13	14	13	13
14	14	14	15	14	14
15	15	15	16	15	15
16	16	16	17	16	16
17	17	17	18	17	17
18	18	18	19	18	18
19	19	19	20	19	19
20	20	20	21	20	20
21	21	21	22	21	21
22	22	22	23	22	22
23	23	23	24	23	23
24	24	24	25	24	24
25	25	25	26	25	25
26	26	26	27	26	26
27	27	27	28	27	27
28	28	28	29	28	28
29	29	29	30	29	29
30	30	30	31	30	30
31	Oct. 1			31	Dec. 1

2 parts; alfalfa or clover hay, 1¼ pounds per 100 pounds of live weight.

Feeds that tend to cause constipation, as well as those that are laxative in effect, and all strong drugs, such as purgatives, should not be fed at any stage of pregnancy.

Mares have a tendency to fatten as pregnancy advances. This must be guarded against, as it is possible for a mare to become so fat that the development of the fetus will be interfered with, and abortion may occur or certain troubles such as milk fever may result at parturition. Heavy feeding previous to foaling should be avoided. After foaling, a light feed, mostly bran and oats, should be fed for about a week.

31. Care of Pregnant Mares.—Mares that are in a pregnant condition must have careful treatment. They should not necessarily be allowed to live in idleness; in fact, it is better to work them regularly under proper management and handling. Everything should be done to keep a pregnant mare in the best possible health and physical condition, and this requires regular exercise, wholesome feed, and a good, dry, comfortable bed at night.

Pregnant mares should have particular attention when working in a team and should not be allowed to fret or worry as a result of being unevenly matched or some such cause. Fright, slipping, and straining from overloading should be avoided, and hard blows should never be given to a pregnant mare.

During the winter season, when not at work, mares in foal should have plenty of exercise, but in cold climates should not be allowed to rough it outdoors, as is frequently done. It is not a good practice to turn them out with other farm horses and subject them to injuries from kicks and blows; however, this danger is not great if the number running together is not more than three or four. Pregnant mares should not be turned into a lot or pasture where they will be annoyed by young stallions. Brood mares may be worked at slow work to within a few days of foaling without harm, provided they are handled carefully and the work is not too

heavy; in fact, they are better off if worked than if allowed to stand in a box stall or turned into a small lot where they will not take exercise. Many mares are worked up to the day of foaling without ill results. During the last stages of pregnancy, however, they should not be required to exert themselves in starting up a heavy load or pulling in mud, or, in fact, doing anything that might produce abortion.

32. Signs of Parturition.—Because of the uncertainty of the length of the gestation period, pregnant mares should be closely watched from the tenth month until parturition. There are certain signs of the near approach of parturition that rarely fail. The udder often becomes greatly distended sometime before foaling, but the teats seldom fill out full and plump to the end more than 2 or 3 days before the foal is born. Other signs of the approach of parturition are an enlargement of the vulva and a reddening of the lining of the vagina. About a week before foaling, there is a marked falling away or depression of the rump muscles. About 24 hours before foaling, usually less, a clear wax will form on the ends of the nipples; this wax should not be confused with that formed from milk that escapes from the udder due to its distension.

33. Parturition.—At parturition the mouth of the womb dilates, the vagina and vulva enlarge, and the fetus is preceded by the passing of water bags, which serve as a lubricant, and is followed by the afterbirth. The normal presentation of the fetus is fore feet first, with the head between the front legs, which act as a wedge in dilating the passage. Sometimes a foal is born with a rear presentation, but ordinarily this does not give trouble. If a mare needs assistance in delivering the fetus, because of an abnormal size or presentation, help should be rendered as soon as possible. A mare should not be allowed to labor more than an hour before an investigation is made, as the chances for a successful delivery are increased if assistance is given before the mare is exhausted and the parts become dry and swollen. The fetus should be put in the best possible position for handling

and then pulled gently in a downward direction. Care should be taken to avoid injuring the mare by bruising, tearing, or cutting the tissue; this is liable to cause inflammation and blood poison. If, on investigation, the case is found to be a difficult one, a skilled veterinary surgeon should be called, as it may be necessary to segregate the fetus in order to save the life of the mare.

34. Care of Mares and Foals After Parturition.—At the birth of foals, or very soon thereafter, the umbilical, or navel, cord is usually severed by being broken, which is better than cutting it. As a rule, ligating is not necessary; however, there can be no harm in doing this, provided the ligature is made with a sterilized silk cord and tied about an inch from the body of the foal. When there is undue bleeding, a ligature may be necessary, but such conditions rarely occur. As a precaution against the entrance of germs, which are likely to cause what is commonly known as joint, or navel, disease, the cord should be saturated morning and evening, until dried up, in a solution of 2 drams of corrosive sublimate to 1 pint of boiling water and to which has been added 2 drams of tincture of iron after the solution has cooled. The foal's belly around the cord should be smeared with carbolized vaseline or unsalted lard before the corrosive-sublimate solution is used, in order to keep it from blistering, and the sloughing portions of the cord should be removed each morning until the cord is entirely healed. The stall should be cleaned immediately after the foal has been dropped, and the afterbirth and litter burned. It is desirable that the stall should be located so as to admit as much sunlight as possible, be kept scrupulously clean, and disinfected every day with some good disinfectant. The proper kind of stall for a mare at parturition has already been described in a previous Section.

The condition of the digestive system of the dam should be carefully watched, as anything that affects the mother will likely produce a similar condition in the colt. The mare's bowels should be kept open after foaling, but not too loose.

If a mare has been worked regularly up to the time of foaling, she should have a rest of at least 2 weeks before being put to work again, and for a time the work should be light. As work requires the expenditure of energy, it is impossible for a mare to give as large a flow of milk when being worked as when idle and running on pasture. The colt should not be allowed to follow its dam while she is at work, but should be kept in the barn. Great care must be exercised in starting the mare at work, as the milk from a heated mare frequently causes a colt to scour. For this reason it is best to take the mare to the barn every hour or two the first day that she is worked and allow the colt to nurse; in this way it will not get a large quantity of milk at any one time. This may seem to be a good deal of trouble, but the health of the foal demands it. After a few days there will not be the same danger, and in a week the colt will be able to go 4 or 5 hours without nursing.

35. Feeding of Mares After Parturition.—For about 3 days after foaling, mares should be given a light grain feed of oats and bran, and good clean hay, preferably clover or alfalfa. The ration should be light, as a colt does not need a large supply of milk the first few days of its life. During this time the water given to the mare should be warmed; it is advisable to give it frequently and in small quantities. If, at the end of from 3 to 4 days the mare and foal are in good condition, the ration should be gradually increased, in order to stimulate the flow of milk. If the colt's bowels are properly regulated and its mother is doing well, but little trouble should be experienced from this time on. If the weather is warm, the best place for the dam and foal is on a clean pasture and out in the sun. When the grass is short it should be supplemented with some other green feed, or some grain, in order to stimulate the milk flow for the foal. A succulent feed, especially, is desirable under such conditions.

A mare that is working and suckling a foal requires a little heavier ration than is usually prescribed for work horses, owing to the fact that she is producing milk in addition to

supplying energy for work. The ration should be a highly nutritious one that will produce a good flow of milk; for this purpose good alfalfa or clover hay fed in conjunction with corn and oats is desirable. If good afalfa or clover hay is not available, some linseed meal or cottonseed meal should be added to the ration. Ordinarily, $1\frac{1}{3}$ pounds of grain and $1\frac{1}{4}$ pounds of hay per 100 pounds of live weight will be sufficient, although it may be necessary to increase the grain to $1\frac{1}{2}$ pounds per 100 pounds of live weight if the mare shows signs of getting in poor condition. When such a grain ration is fed it is a good plan to mix the grain with chopped hay in order to prevent any serious digestive disturbances.

HORSE MANAGEMENT
(PART 2)

MANAGEMENT OF VARIOUS CLASSES OF HORSES—(Continued)

BREEDING HORSES—(Continued)

STALLIONS

1. Methods of Purchasing Stallions.—In farming communities the large majority of stallions are owned either by individuals, who offer them for public service at a fixed charge, or by an organization of farmers commonly termed a *company;* in the latter case the stallions may or may not be offered for public service. The cost of a good stallion is high, and comparatively few individual farmers keep a sufficient number of brood mares to justify the expense. On the other hand, if several farmers form a company, they can purchase a good sire at a nominal cost to each. This plan seems to be gaining in favor, as it not only affords the owners a means of breeding their mares to a good stallion, but may also be a source of profit if the stallion is offered for public service.

When an individual is financially able to own a stallion, it is preferable to the company plan, as he can then use his own judgment in selecting a horse suitable for mating with his mares. When the company plan is adopted, the company should not be too large; from three to six members is better for the purpose than a larger number. The company should be originated by the members themselves and not by some

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unknown salesman hired and sent out by a dealer. The members should be men that can agree as to the kind of a stallion needed and the price that should be paid. A company organized by a salesman and in which one or two influential men have been given shares as a consideration for lending their influence, usually results sooner or later in dissatisfaction. A good many stallions have been placed in companies by salesmen at such high prices that it was impossible to realize returns on the investment. If a stallion is to be purchased by a company, the best horseman in the company, or a committee of two or three members, should be given the responsibility of making the selection.

Sometimes it is possible for a company of men to lease a stallion for a season if they do not wish to incur the expense of purchasing one or if they desire the services of a horse that is not for sale. The owner may or may not send a stud groom along with the horse, according to the terms.

2. Stallions are sold at public auction or at private sale. If a person is not a good judge of stallions and is not thoroughly acquainted with their value, it would be best to buy at private sale, provided the purchase can be made from a reputable dealer. On the other hand, if a buyer is experienced, he can occasionally find bargains at public auctions. Many public auctions are merely clearance sales in which a breeder or dealer takes advantage of an opportunity for disposing of undesirable animals.

3. Selecting of Stallions.—There is no better guide in the selection of a stallion than the quality of his offspring. A sire may have an exceptionally good conformation and yet lack prepotency. The best test of any stallion is his performance and not his appearance. Of course, in many cases, such as when the stallion purchased is too young to sire colts or where he is purchased from a dealer at a distance, it is impossible to observe many, if any, of his colts.

The external characters to be sought in a stallion are: a masculine appearance, a deep chest, long and oblique shoulders, a short back, a long croup, smooth hips, heavy thighs and quar-

ters, good feet and bone, and good, straight action. The stallion should be pure bred; a grade stallion, even though an excellent animal, is often deficient in prepotency and is likely to stamp his offspring with scrub characters. Medium-sized stallions are more likely to prove uniform breeders than exceptionally large or small ones.

In purchasing a stallion, it is well to be sure that he is a breeder. Instead of taking a year or two to try him out, all that is necessary is to collect some of his seminal fluid and, by means of a compound microscope, make an examination of the spermatozoa. The general appearance of these has already been described in *Principles of Animal Breeding*. If they are alive and active there should be no question about the stallion being a breeder. The more activity the spermatozoa display the more potent the stallion, and the surer he is in impregnating mares, provided he is a good server.

It is not advisable to purchase a stallion that is too far advanced in years, as in that case his value will depreciate each year, and, too, his powers as a breeder may be on the wane. On the other hand, a stallion that is too young should not be chosen. It is a good plan to use a 2-year-old stallion on a few mares, not more than about six, just to break him in and test his breeding qualities, but a stallion of this age should not be selected for regular breeding. For regular stud service, a stallion not less than 4 or 5 years old should be selected.

4. Feeding of Stallions Out of the Breeding Season.—The feeding of stallions out of the breeding season should be such as to keep them in good condition without permitting them to become excessively fat. If they are worked regularly their feed need not differ from that given to work horses. However, it is not advisable to feed a stallion large quantities of corn or other feeds that are highly fattening. A continued use of a richly carbonaceous ration with but little exercise has a tendency to produce a sterile condition in the stallion, as a result of fatty degeneration of the generative organs. If the stallion is young and immature, he should receive more protein and bone-forming feeds than is needed for a mature horse.

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5. Care of Stallions Out of the Breeding Season.—One of the best ways to condition a stallion for the breeding season is to put him at work. This will insure that he receives plenty of exercise, regular feeding and grooming, and the companionship of other horses. Work will also help to keep him from acquiring bad habits, such as pawing, weaving in the stall, cribbing, lip slapping, tongue sucking, and masturbating.

It is not difficult, as a rule, to break a stallion to work if he is put in the hands of a careful horseman and taught to obey when he is young. When a stallion is worked in a team, it should be with a mare rather than with a gelding, but if the mare is not pregnant, the driver should constantly be on the lookout for an attempt at copulation. If the stallion is inclined to nip, a jockey stick should be attached to his bit and the other end attached to his mate's hame. If treated kindly, he will make a good worker and do as much as any other horse.

Common farm work is suitable for a draft stallion, and the work given to him need be no lighter or heavier than that given to the other farm draft horses. A light stallion should be put at the kind of work to which he is adapted. If he is a high-acting horse or has special gaits, it is not advisable to put him at farm work, as it would stiffen him and render him less able to show the qualities he possesses. Ordinarily, a stallion is not adapted to choring unless it is in a single harness.

As soon as the breeding season is over a stallion should be put at work again, unless it is expected to show him, in which case a heavy grain ration should be fed to him in order to flesh him up. If he is not worked, he should be driven or led to insure that he gets the necessary exercise, which, at first, should be moderate; later, if a draft stallion, he should be driven not less than 5 miles per day, and if a road stallion, not less than 10 miles per day.

6. Feeding of Stallions During the Breeding Season. The sexual tax on a stallion during the breeding season makes it necessary that he be fed a highly nitrogenous ration, as the principal part of the seminal fluid is composed of albuminous

matter. During this time there is nothing better to feed than good clover or alfalfa hay, with oats and bran and a very little corn. A grain ration composed of 2 parts of oats, 1 part of corn, and 1 part of bran, by weight, combined with a roughage ration of 1 part of alfalfa hay and 1 part of timothy or prairie hay will give satisfactory results. Because of the low protein content of corn, a large quantity should not be fed. During the breeding season a stallion requires about the same quantity of feed as horses at hard work.

7. Handling of Service Stallions.—If a stallion has been carefully handled and taught to serve properly when young, he should not be hard to handle in serving mares. It is advisable to teach a young stallion to serve by using an old or a hobbled mare. He should be allowed to start the service before he gets a complete erection of the penis, should be taught to approach quietly and mount at right angles from the left side, and should be allowed to remain with the mare until he voluntarily dismounts; in a good service, the stallion should remain long enough for a complete wilting and retraction of the penis. It too often happens that the stud groom tries to take the stallion away before he has thoroughly completed the service; this, in the case of young stallions, teaches a wrong habit for making a good service.

In serving a mare, a stallion should always be compelled to mount from the left side. This will be found advantageous, because the groom can direct the operations more conveniently than when the stallion is permitted to mount from the right side. The stallion should be allowed to start the service before he gets a complete erection, because the penis can then be easily handled. The groom should direct the penis into the vagina; in the case of old mares the vulva is often sunken and the groom must exercise care in directing the penis to prevent it from injuring the anus or rectum. The stallion should be permitted to complete the service before dismounting, as already explained for young stallions.

Occasionally, a nervous stallion is found that will not discharge if he gets too rigid an erection before being allowed to

mount. This is termed *coming off proud*. Such a stallion should not be used as a teaser, if it can be avoided; when it cannot be avoided, he should be put back in the stall and allowed to cool down, and when taken out again allowed to mount immediately. Where there are a number of service stallions, it may be advisable to keep a cheap stallion to do all of the teasing; this will save the others considerable fretting.

8. Care of Stallions During the Breeding Season.—When the breeding season begins the stallion will not be able to do as much work as before, as stud duties are a tax on his energies. However, he should be able to do a half day's work even during the heaviest part of the breeding season. If he is not worked, he should have about the same amount of regular exercise as recommended for stallions out of the breeding season.

When doing regular stud service, not more than two mares a day should be served, as a rule. On the day immediately following a period of idleness it is possible but not advisable for a stallion to serve four mares, or even more; three services is the maximum number that should ever be permitted in one day, and this only in rare cases when the stallion can be allowed to rest the following day. A larger percentage of mares will be got in foal if only one service a day is made. By adopting the plan of having a definite hour each day for breeding and by using the capsule method of artificial insemination more mares can be bred in a season and with less tax on the stallion and less annoyance to his owner than by the usual plan of permitting the stallion to serve at different times during the day. As a rule, a convenient time for this purpose is 3 or 4 o'clock in the afternoon.

No liquid other than warm water should be used for cleansing a stallion's penis. A better way than washing it is to insert dampened bran into the sheath and allow it to remain there until worked out by the penis.

It is a good plan for a stud groom to have a compound miscroscope that will magnify about 500 times and at each service of a stallion, or frequently, examine a little of his seminal fluid and determine his breeding condition. If no

spermatozoa can be found it is not probable that the service will amount to anything, and it should be repeated the next day; on the other hand, if the owner can show the owner of the mare that the stallion is in perfect breeding condition and that it is the fault of the mare if she does not conceive, it will lessen criticism of the stallion. There may be days when the stallion is in ill health, during which time he will not sire any colts, and it is well for the owner to know when such periods occur.

9. It sometimes happens that a stallion gets to masturbating to such an extent that he will sire but few colts. As a rule, stallions are sensitive about their self-abuse, and many of them will not do it when being watched. When the owner is not sure that a stallion is masturbating, but suspects that he is, in order to get positive evidence all of the bedding should be removed and the stable floor thoroughly cleaned and aired out until dry. When the stallion is put back in the stall, if he has such a habit it can be detected by the presence of seminal fluid on the floor. The masturbating habit is extremely hard to break and usually requires the constant use of a shield, of which there are a number of kinds on the market; the most successful one is an electric shield that gives a slight shock as the stallion attempts to extend his penis.

If a stallion has been worked regularly before the breeding season opened, and his work is reduced to periods of one-half day when he is doing stud service, the bodily processes should gradually build up and he should be in better condition and weigh more at the end of the season than at the beginning. On the other hand, stallions that are fat at the beginning of the breeding season and are not hardened up, will usually finish the season in a much reduced condition, which is altogether detrimental to the animal.

10. Length of Breeding Season.—The length of the breeding season varies in different localities. In some sections most of the mares are bred in the spring and in other sections fall breeding is practiced more or less extensively. The length of the season is usually determined more by the wishes of patrons

than by any arbitrary limitations fixed by the stud keeper. Mares are harder to get in foal in early spring than after the weather gets warmer. For this reason it is likely that most of the spring breeding will be done in April and May. The stallion owner will find that by judicious advertising he will have some mares coming in for service from early in the spring until late in the fall.

11. Advertising of Stallions.—If a stallion can be worked, about the best way to advertise his merits as an individual is to put him in a smart set of harness, hitch him with a mare that mates him well, and show that he can be worked. The fact that he can be worked removes all doubt concerning his disposition. Before the breeding season opens he should be driven to near-by villages on Saturday afternoons and at such other times as he will be seen by most of the people of the community. It is a good plan to give a few exhibitions of his action at different times, doing it in an unostentatious way, and to stop occasionally where he can be seen, for it will not be long before a crowd will gather to look him over and discuss his good and bad qualities. If the weather is cold, a neat pair of blankets to throw on will add to his attractiveness. If he can be safely tied to a hitch rack all the better, but he should not be left alone long at one time.

Liberal advertising should be done in local papers and by attractive posters to call attention to the stallion's merits and the honors that he and his ancestors have won. Small circulars bearing a cut made from a photograph of the stallion and that give his name, pedigree, terms of service, the owner's name and address, etc., will be found useful to hand out or to mail to prospective customers.

12. Breeding Contracts.—The breeding contract should be for the stallion to insure a mare in foal. When a stallion has done that, he has done all that is in his power to do. If the owner of the mare is not willing to take some risk, he had better not breed her. No stallion ever lived that could always sire a living colt, and in most cases where the colts do not live it is due to an accident that has happened to the mare, or to

the fault of the owner in handling her. If the stallion owner is obliged to insure a live colt he must charge a larger service fee in order to cover the loss entailed by those that are not born alive. By insuring colts to stand and suck, the responsibility is not placed on the careless and shiftless man, where it should be placed. However, because of the prevailing practice in a locality, it may be necessary to have terms for several conditions—that is, a price for a single-leap service, a price for the season, another to insure a mare in foal, and still another to insure a living colt or one that will stand and suck.

COLTS

13. Care and Feeding of Colts From Birth to Weaning Time.—It is advisable for an attendant to be near at hand when a mare is undergoing parturition, to see that the foal is safely born, and to care for it, if necessary, after it has been dropped. If strong and vigorous, it should nurse within a few hours after being dropped; however, a refusal to do so need not cause undue alarm, for it can go 12 hours without harm. The first milk of the dam, called colostrum, possesses purgative properties and serves as a physic for the foal. When taken into the stomach it starts peristaltic action and causes the passing of the first feces, which usually occurs within 5 or 6 hours. If the discharge does not take place within 24 hours and the colt seems sick, 2 ounces of castor oil should be given and then an injection of warm water to which a tablespoonful of glycerine has been added; this will usually start peristaltic action and cause the passage of the fecal matter. The water should be near body temperature, or 99.6° F., and should be admitted into the rectum very slowly. It is advisable to lubricate the nozzle of the syringe with vaseline before it is introduced.

As anything that affects the dam will indirectly affect the foal, care should be exercised in the care and feeding of the former. A mare should not receive a heavy grain ration prior to foaling, and for the first few days of the colt's life her feed should be light and loosening. As soon as the colt is well

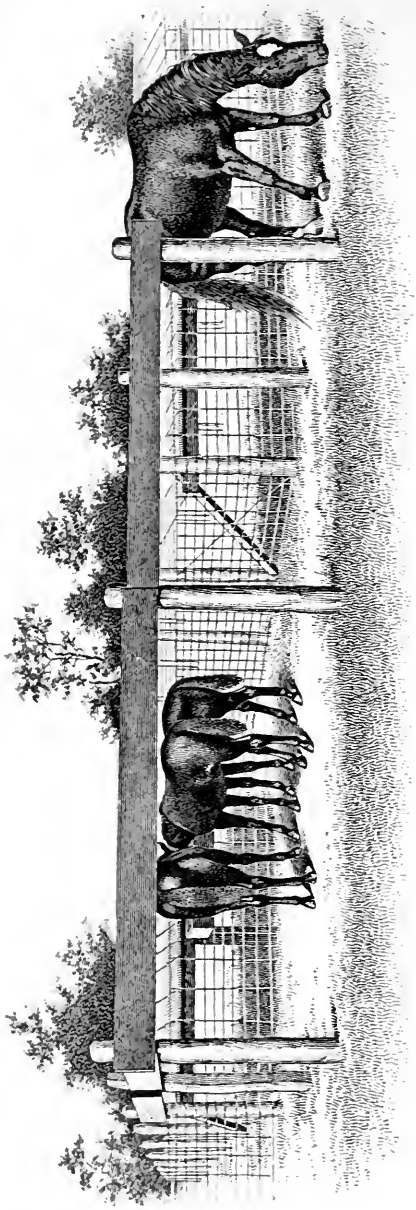


FIG. 1

started, from 7 to 10 days old, and able to take considerable milk, the mare should be fed a larger ration to stimulate her milk flow. Purgatives and like medicines should be avoided.

14. When about 2 months old, a colt should be induced to eat grain; all that it will clean up should be fed in a box at the side of its dam, or, if the dam is running on pasture, the colt can be fed in a pen such as that illustrated in Fig. 1. This pen is made of boards nailed at the tops of posts so that a colt can get under them but a larger horse will be unable to do so. A grain trough should be provided inside of the pen. Several colts can be fed to advantage in the same pen.

A good quality of oats is the best grain to feed to a colt at first; oats are not so hard as corn, and most

colts learn to eat them more quickly. When the colt has become accustomed to eating oats, a little corn can be added to the ration from time to time until it consists of equal parts of oats and corn. Draft colts should never be allowed to go hungry from the time they begin to eat until they are matured, if it is desired to have them grow as large as possible, because size is secured through liberal feeding as well as through breeding.

15. Colts should not be allowed to follow their dams while the latter are at work in the field, as the worry and fatigue is more detrimental than any benefits to be derived from such a practice. The first few days that the mare is worked the colt should be allowed to nurse twice during the forenoon and twice during the afternoon; this is necessary because the mare is pretty sure to be heated, and milk from a heated mare, if taken in large quantities by a colt that is not accustomed to it, is dangerous to the colt, as it is likely to cause scours. After about 4 or 5 days it will be sufficient to take the mare to the colt about the middle of the forenoon and again about the middle of the afternoon. If at any time the mare is kept away for an unusually long time, and is hot when brought to the colt she should be allowed to cool and eat some hay, and should be partly milked out by the attendant before the colt is allowed to nurse.

The colt should have some exercise each day; this it will usually get if it has a companion and is allowed to run in the barn lot mornings and evenings. A little green feed such as grass or rye will be found beneficial for the colt, and it should also be encouraged to eat hay. Colts will not eat hay as early in life as they will eat grain but they can be taught to eat clover and alfalfa hay when but a few months old. The finest and best hay of the farm should be preserved each year for the young foals.

Colts that have done well should be weaned when between 5 and 6 months old, as but little will be gained by allowing them to nurse longer, provided they have been taught to eat grain and hay; if they have never been taught to eat, their

growth is likely to be stunted for a time. At weaning time some succulent feed such as good pasture, silage, or roots will be beneficial. Carrots, if sliced lengthwise to prevent choking, are an excellent feed for colts.

When a large number of colts are raised they should be marked for identification before being weaned. Branding on the front hoof with a hot iron is about the most satisfactory method, but the marking must be renewed occasionally, because the hoofs grow out. If the iron is not set too deeply no harm can come from its use. The next best thing is to use on each colt a halter to which is riveted a name plate or number. The greatest objection to this method is that careless attendants may allow the halters to become changed or lost, and thus the identity of the colt may be lost. Carefulness in these details is abundant proof to the customer or the visitor of the integrity and truthfulness of the breeder as to the authenticity of pedigrees.

16. Care and Feeding of Orphan Colts.—If an attendant is obliged to feed from birth an orphan foal or a foal that is insufficiently nourished by its dam, he should realize that he is undertaking a task requiring a good deal of care and patience. As in the case of all young animals, food must be supplied frequently to young colts. Cow's milk is the best substitute for that of the mare, although the latter has more sugar and less fat than the former. If cow's milk is given to a colt, it should first be modified by the addition of 1 dessert spoonful of milk sugar and 3 tablespoonfuls of lime water to enough new milk to make up a pint. The lime water prevents the milk from forming into large curds in the stomach. A Hygeia nursing bottle with a rubber nipple is about the best means for giving the milk, but if this is not at hand an improvised apparatus can be made by tying to the spout of a teapot the finger of a kid glove in the end of which a hole has been punched so that the milk can flow through it. The glove and teapot should be thoroughly cleaned and sterilized with boiling water each time before they are used and again after each feeding. The milk should be warmed to a temperature of about 100° F.

before feeding it. It is advisable when teaching a colt to take milk, to pour only a part of it into the teapot or bottle at first, as some accident may cause it to be spilled. During the first few days a colt should be fed each hour, but it should not get more than $\frac{1}{2}$ pint of milk at each feeding; at this rate it will get $\frac{3}{4}$ gallon in 12 hours. If it is desired to give a colt extra good care, it may be fed two or three times each night for a few nights, but this would be superfluous after a few nights, because the colt will then be able to consume enough milk during the day to carry it through the night.

If scours should occur, a dose of 2 ounces of castor oil should be given and the milk discontinued for a couple of feeds, the sugar and lime water being given as before but plain warm water being substituted for the milk. As a foal grows older, the quantity of milk may be increased and the number of feeds decreased, until at the end of a month, if it has done nicely, it may be fed only four or five times a day and the milk sugar and lime water omitted. By this time it can be taught to drink out of a pail and the feed gradually increased, although great care must be exercised that too much milk is not given to the colt, because this will likely cause scours. Ordinarily, 3 gallons per day of whole milk will be enough. When a colt is 6 weeks old it should be encouraged to take a little grain in the form of a gruel added to the milk; crushed oats or oatmeal is best for this purpose. It is not a good plan, however, to give the feed in this way very long, as the foal will soon learn to eat it dry, which is more desirable. By the time a foal is 3 months old it should be eating plenty of grain and grass, the same as a foal that has been raised by its dam, and there should be no unusual difficulty in caring for it after this time. An orphan foal usually likes to be coddled and petted, and soon learns to come at feeding time.

17. Care and Feeding of Colts From Weaning Time to Maturity.—From the time colts are weaned until they are matured they should have more protein and mineral matter in their rations than is necessary for mature horses. During this period of growth they are building up a framework of

bones and muscles, for which a plentiful supply of the materials mentioned is necessary. Grass, good alfalfa hay, and good corn silage fed with a little bran and oats are the most desirable feeds. Next to these feeds in desirability are clover hay, cowpea hay, old-process linseed or cottonseed meal, and the succulent roots that are used for feeding purposes. Of the latter, carrots are best, but if they cannot be had mangels will be found satisfactory. A limited quantity of corn may be used, but it should not be the only grain fed. If timothy or prairie hay is used, it should be supplemented with oats, bran, and linseed or cottonseed meal.

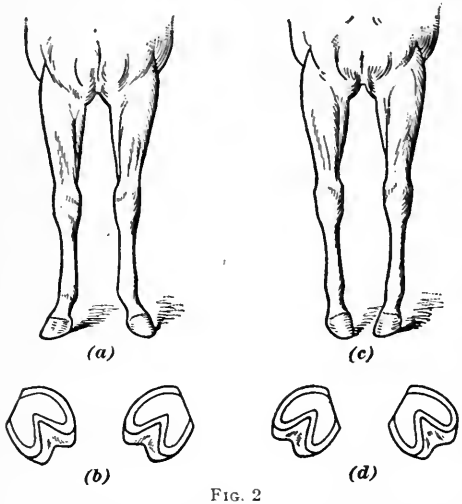


FIG. 2

During the first winter from two to three colts, not more, may be fed together in a box stall, if the colts are selected according to their temperaments. When more than this number are fed together, the big and strong ones will likely take advantage of the weaker ones and force them away from the feed trough. As long as grass remains they should be turned out each day on a good pasture. For winter feeding, a rye field will prove useful in furnishing a little succulent feed.

They should receive grain twice daily during the winter and about all the clover or alfalfa hay they will eat, which should bring them out in the spring in good condition. In the spring when they are turned on grass the grain should be continued for 2 or 3 weeks, the quantity being gradually reduced. A few pounds of grain fed once daily during the entire summer will help to promote a good growth and increase size. At no time should a colt be allowed to lose the natural flesh lying along its back and with which it was born, as it will be practically

impossible for it to regain its original form even though the flesh is put back again by liberal feeding.

18. Stallion and filly colts should not be allowed to run together after they are yearlings. On breeding farms where stallions are raised the young males are usually divided into groups of not more than five or six animals at the end of the second summer; it is best to have only two or three animals in one group. On farms where the male colts are castrated they can be turned in with the fillies as soon as the operation is performed. Young horses will spend most of their time in the open, if given an opportunity, and this is the best thing for them.

The owner should constantly be on the lookout for lice on colts, and their feet should have attention and be kept pared down level so as not to break up and cause crooked limbs. A young colt is very pliable, and if it naturally possesses slight deformities in feet or limbs, these can often be materially improved by proper care of the feet.

When the toes naturally point out, as shown in Fig. 2 (*a*), the feet should be leveled up, and the toes trimmed on the outer forward edge, as shown in (*b*). If the toes turn in, as shown in (*c*), the bottom should be leveled and the toes trimmed on the inner forward edge, as shown in (*d*). It is more difficult to improve the hind than the front feet. In Fig. 3 is illustrated a patented tool for keeping the toes short; *a* is the handle; *b*, the handhold; *c*, the hammer; *d*, the head; and *e*, the chisel. The chisel is placed against the hoof and, by means of the handle, the hammer is driven down against the head with one hand while the other hand grasps the handhold. A criticism of this tool is that its use does not require the colt to pick up its feet, which it should be taught to do; another criticism is that it is impossible to tell how short to trim a hoof without first looking at the bottom. Fig. 4 shows a useful pair of hoof nippers, the advantage of which is that the operator is able to see

FIG. 3

just where he is cutting. A rasp should be used to smooth up the edges.

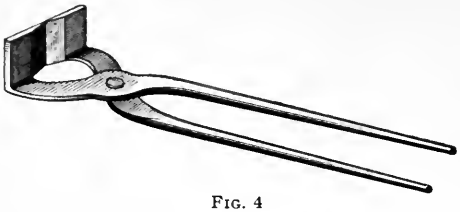


FIG. 4

19. Castration of Colts. — Colts should be castrated when they are about 1 year old. As a rule, spring colts are castrated before fly time in the spring, and fall colts late in the fall, after fly time. A competent veterinarian should be employed and his instructions regarding the care of the colt should be followed.

HORSES FOR SHOW AND MARKET

20. Fitting of Horses for Show.—The most important requisites for show horses are that they be sound and have plenty of flesh to round out and smooth up the body. To meet the first of these requirements, it is necessary that good, sound animals be selected. It is impossible to make a good show horse out of an unsound animal, no matter how much flesh and finish is put on. To meet the second requirement, plenty of time should be allowed for getting the animals into condition. Allowing ample time is much better than crowding the animals to their full capacity, unless the feeder is experienced in feeding show horses. The time required for putting flesh and finish on horses for show purposes ordinarily is from 60 days to 6 or 8 months, depending on the age of the animals and their condition at the beginning of the feeding period. An aged horse will fleshen more rapidly than a young one, because the latter uses a part of his feed for growth.

In fitting horses for show, they should be put on full feed gradually; usually, from 20 to 40 days is required, depending on whether or not they are accustomed to receiving grain. A safe rule to follow for the first 30 days is to feed not more than 1 pound of grain per 100 pounds of live weight, and to give all the hay the horses will eat. As the feeding period advances, more grain can be fed and, consequently, less hay will be con-

sumed. The hay fed should be of good quality, free from dust or mold, and should be given in two equal feeds, care being exercised to see that none of the horses are overfed. Horses are gluttonous animals and, after they have had all the feed they require, will continue to nibble at and spoil and waste what is left. For this reason no more feed than they will readily clean up should be fed. If some should be left at any time it should be removed before the next feeding and the next ration reduced to a quantity that they will readily consume. It is possible to ascertain when horses are getting more or less feed than they require by observing the avidity with which they eat.

21. A mixed grain ration of corn and oats, when fed with clover hay, has been found by experiments conducted by the Illinois Experiment Station to be more efficient for producing large gains than a single grain ration of corn. In one of these experiments a ration of corn, oats, and clover hay fed to one lot of horses was more expensive than one of corn and clover hay, but the gains were enough more to make the former ration more economical than the latter. A ration of corn and oats fed with clover hay produced 58 per cent. more gain than a ration of the same grains fed with timothy hay. A ration of corn, oats, and timothy hay was not satisfactory for producing finish, but was materially improved by the addition of linseed meal. These tests also indicated that there was but little difference in the efficiency of rations consisting of corn and oats fed in conjunction with clover hay when the grain part of the ration consisted of 1 part of oats and 3 parts of corn and when the corn and oats were fed in equal quantities, by weight, although the ration containing 1 part of oats and 3 parts of corn proved more economical. The same tests indicated that, for producing gains, a ration of corn and bran in the proportion of 1 part of bran and 4 parts of corn, by weight, and supplemented by clover hay, was superior to an all-corn ration. The tests also indicated that there is a possibility of feeding too much bran for the best results when clover hay is fed as the roughage part of the ration; this is likely to produce an overlaxative condition. In these experiments the narrower

the nutritive ratio the larger were the gains; the best results were obtained by a nutritive ratio of 1 to 8.

About 6 weeks or 2 months before the show, old-process linseed or cottonseed meal should be added to the ration to put the hair of the animals in good condition; about ½ pound should be fed daily at the beginning, and the quantity gradually increased until at the close of the feeding period each horse is receiving 3 pounds daily. Sorghum molasses may be substituted for the linseed or cottonseed meal if the former is more economical. The molasses should be fed at the rate of 1 pint per day for each horse.

It is not good policy to feed breeding animals a heavy grain ration, crowding them to the limit, as may be done with market horses that are soon to be disposed of. As the time approaches for putting on the finishing flesh, if it is noticed that some of the animals are putting their flesh on in rolls, the corn part of the ration should be replaced with oats and one feed per day of clover hay replaced with a feed of timothy or prairie hay; if a little succulent feed, such as steamed barley and roots, is added, it will help to overcome the tendency to put on the flesh in rolls.

22. Show horses should be exercised daily and put through the paces they are expected to show in the ring. Draft horses should be taught to stand in the manner expected of them in the show ring, and to move in a spirited way when led by an attendant. When brought back to the place of starting they should be stood up just as if they were being looked over by a judge, the attendant always selecting for this purpose a spot where the front feet will be a little higher than the hind feet. Light horses should have practice in displaying action and in turning each way, and should always be kept on the alert so that they will never appear sluggish. The training of show horses should be kept up daily, but the horses should not be worked until they get tired.

It is advisable to water the horses out of a pail for several days before leaving home, in order that they may become accustomed to it. If possible, feed should be taken along, so

that there will be no change from what the horses have been accustomed to. It is best to arrive at the show grounds in plenty of time to accustom the horses to the grounds and to give them a little time to fill up after the trip and to get acquainted with the arena in which they are to be shown.

It usually takes at least one resetting of the shoes to put the feet in the best of shape; consequently, the first set of shoes should be put on from 4 to 6 weeks before the show, and then the shoes should be reset 3 or 4 days before the show, in order that the horses may become accustomed to the new shoes and learn to handle their feet gracefully.

On the day of the show, it is best to water and feed the horses early enough that they will not go into the show ring with full stomachs. Draft horses should be decorated in a tasty manner by putting some ribbons or yarn in the mane and a few artificial flowers in the tail, which should be done up neatly and tied with ribbon. Light horses should not have decorations in their manes or tails, but the hair should be clean and brushed out straight; a little coal oil will remove the dust and give the hair a gloss. Any stable stains on the legs of an animal of either class should be washed out and the hair rubbed dry. The hoofs should be cleaned and polished by rubbing them down with emery paper and then applying neat's foot oil that has been colored with lampblack. A little aluminum paint placed on the edge of the shoes will help to make the latter attractive. A neat, plain bridle should be used.

23. Handling of Horses in the Show Ring.—For the handling of horses in the show ring, attendants with whom the animals are familiar and who are capable of making them display their merits and training should be chosen. It sometimes happens that a slightly inferior animal is awarded the premium solely because of superior handling. The attendants will be expected to put the horses through such paces as the judge may require. When the premiums are awarded, the owners of each animal should accept victory or defeat as gentlemen, and strive afterwards to improve such inferiorities of their animals as were disclosed by the competition.

24. Fitting of Horses for Market.—The feeding of horses for market is similar to the feeding of horses for show, about the same kind and quantity of feed being fed and the same time required for putting on flesh. However, in order to secure the best results in the feeding of horses for market, if it is largely for the purpose of putting on flesh, the animals should not be exercised more than is necessary for good health; in fact, it is the common practice of feeders of market horses not to give them any exercise at all. Experiments conducted by the Illinois Agricultural Experiment Station in fleshing horses for market, showed that exercise has a retarding effect on the taking on of flesh. One lot of horses that received no exercise made 24 per cent. more gain in 84 days than those having a daily walk of $2\frac{4}{5}$ miles. This same test indicated that although box stalls are safer than single stalls for stabling, they are more expensive and, so far as they affect the taking on of flesh, have no advantage over single stalls; in fact, the horses stabled in single stalls for 84 days made gains of 16 pounds, or 84 per cent. over those kept in box stalls.

For the feeding of horses for market, there is probably nothing more economical than corn, oats, bran, and clover or alfalfa hay; silage is an economical feed in some localities. A grain ration of 2 parts of corn and 1 part of oats, by weight, will prove satisfactory. Another good ration may be made by mixing corn and oats in equal parts, by weight, and to this adding $\frac{1}{6}$ part of bran. The grain is usually fed three times daily, although some horsemen prefer to feed five times daily. When the feeding is done five times a day, less is given at one time, of course, and often the grain is not mixed, the corn being fed in the morning, at noon, and at night, and the oats and bran at 9 o'clock in the forenoon and at 3 o'clock in the afternoon. Sometimes a soft feed such as steamed barley, bran mash, roots, or corn silage is fed at 9 o'clock and at 3 o'clock instead of the oats and bran. When bran is cheaper per pound than oats, some of the former may be substituted for oats in the ration. When fed in conjunction with clover hay, it is best to feed bran dry, for when it is fed as a mash it has a very laxative effect.

When horses are to be fed from 60 to 120 days to prepare them for market, good results will be obtained by substituting for the bran 2 or 3 pounds of cottonseed meal per day per horse.

25. Marketing of Horses.—The two common methods of marketing horses are public auction and private sale. Public auction is the plan generally adopted by breeders who have a large number of animals to dispose of, as it eliminates the trouble of entertaining buyers every few days that is experienced when the animals are sold at private sale. However, public auctions place the owner at the mercy of the public as far as prices are concerned.

The cost of selling horses at public auction is usually from $10 to $50 a head, depending on the number of animals in the sale, the number of auctioneers employed, the extent of advertising, and the cost of cataloging. It is usually advisable to secure the best auctioneers that can be obtained, because an inefficient auctioneer may allow the sale to go to pieces and more money will be lost, even on a few animals, than would be expended in employing a good auctioneer. The character of a sale is often judged by the prominence and number of the auctioneers employed, the number of animals cataloged, and the extent of the advertising, although this should not be the case.

The safest method of selling horses is by private sale. If this method is followed, liberal advertising should be done to let the public know what is being offered, but unwarranted claims should not be made for animals if a breeder expects to stay in the breeding business and wishes to make a reputation. If advertising is done in agricultural publications or in those devoted to horses, it is likely that a number of sales will be made by correspondence. At least, many inquiries will be received and these will have to be answered by mail. For this reason, the horseman that is attempting to sell animals at private sale should pay strict attention to his correspondence and attempt to make his letters businesslike and convincing. It is advisable to have mimeographed or printed circulars containing a description and photograph of each animal offered

for sale, so that these can be enclosed with replies to prospective customers. The descriptions should be as accurate as possible and not too extended. It is better to underrate animals a little than to overrate them, especially if the sale is to be made through correspondence.

26. The best mediums for the advertisement of market horses are public shows, agricultural and livestock journals, and local newspapers. Besides these mediums, it is possible to advertise horses by using posters, signs, catalogs, and an appropriate letterhead. The value of a newspaper or livestock journal for the advertising of horses should be rated according to the number of people it reaches who are interested in the particular breed of horses advertised and the reputation of the paper for reliability. The best agricultural journals have field men who solicit livestock advertising. If a breeder expects only local buyers, there is but little use to advertise in a journal that has a wide circulation; on the other hand, if he thinks people in other states would be interested in his offering, then he should select a medium that will reach the people he hopes to interest.

A neat and attractive letterhead describing the kind of horses bred, and which shows a small picture of the leading stallion of the stud and the name of the farm and proprietor, helps to give publicity. A sale catalog should be gotten up in a neat, attractive way, and should contain pedigrees of the horses to be sold and such other information as purchasers would wish to know. It should also state the show-ring winnings of not only the horses to be sold, but any winnings or records that their sires and dams or grandsires and granddams have made. Great care should be exercised in the matter of accuracy, and if the catalog is to be illustrated with engravings they should be made from photographs of the animals rather than from crude drawings. On the inside of the cover page should be given the location of the farm and the nearest railroad station and the schedule of the train service on all railroads entering and leaving. The leading hotels and their rates should also be mentioned unless free entertainment is to be

provided. On the first printed page should be given the terms of the sale and the guarantee that goes with each animal. Every effort should be put forth to make the catalog so neat and attractive that it will be preserved and create a desire on the part of the recipients to attend the sale. The animals should be cataloged in the order in which they are to be sold; the more valuable ones should be sold first.

It is a good plan to have the name of the farm displayed in a conspicuous place. It may be found desirable, also, to have a bulletin board located where it can be seen by the public and on which announcement can be made that certain stock is for sale.

27. Guaranteeing of Breeding Horses.—All horses that are sold as breeding animals should be guaranteed to be such, and should be taken back by the seller in case they do not prove to be breeders. However, it should be stipulated that they must receive proper care and feeding, and must be returned in good condition, if the guarantee is to be operative. An animal may be a breeding animal at the time of sale, but not be one 3 months later, due to improper care and feeding. Under such conditions the seller should not be held responsible.

A breeding animal is usually considered to be one that is capable of producing offspring. If a mare is sold under a guarantee, she may be considered to be a proved breeder either when she shows unmistakable evidence of being in foal or when she has a foal at her side, according to the terms of the guarantee. Many breeders do not give guarantees with fillies that have never been pregnant. Some guarantees merely permit the purchaser of a mare, if she does not prove to be in foal, to return her for a second stud service. A fair and equitable agreement is to allow the purchaser of a mare of breeding age 9 months in which to make a test of her breeding qualities, and if it is found impossible to get her in foal in that time the purchaser is to notify the seller, who shall have a like time for trying, or, at his discretion, the right to return the purchase price. If the seller also fails to get the mare in foal in 9 months he should substitute another animal equally as good or refund the

purchase price. If the seller succeeds in getting the mare in foal, the purchaser should bear the expense of the transportation both ways. If, however, the seller does not succeed in getting the mare in foal, the expense of the transaction should be equally shared with the purchaser.

Stallions are usually guaranteed to get in foal from 50 to 60 per cent. of all breeding mares that they cover. Such a guarantee is almost valueless, however, because a purchaser would have a difficult task to establish that all the mares covered were breeding mares or that they were returned to the stallion at the proper time. A better way of testing the breeding qualities of a stallion is to examine his seminal fluid with a compound microscope in the manner already described. If living spermatozoa are present there can be no question as to the animal being a breeder, provided there is nothing to prevent him from serving mares.

28. Shipping of Horses.—When horses are to be shipped by rail they can be sent either by express or freight. If shipped by express in carload lots, they are usually loaded into a special type of car, known as the Arms palace express car, which is provided with individual stalls, and usually has room for twenty-seven horses. Shipment of horses by express is preferable to shipment by freight, because they reach their destination sooner; the express rates, however, are higher than the freight rates. Horses shipped in carload lots by express should be accompanied by an attendant to see that the car is properly ventilated and that the horses are fed and watered. If horses are to be shipped in carload lots by freight, it is usually the practice to use either an Arms palace stock car—a car divided into three compartments, with open, slatted sides—or a common stock car. In the case of highly fitted horses that are purchased in carload lots and shipped to distributing points, an Arms palace stock car is best, because the horses are not so likely to become bruised as in a common stock car. The car should be well bedded with straw, or, better, with moist sand. All hind shoes, and all front shoes that have sharpened calks, should be removed.

In shipping colts, each animal can be crated singly, if desired; mature horses cannot be shipped in crates. Because of the expense incurred by an express shipment, most single animals are shipped by freight.

When shipping one or two horses alone in a car, those who have had experience consider it best to turn them loose and give them the whole run of the car, because they are not so likely to be thrown off their feet as when tied and therefore are safer. When it is necessary to tie them, they should be stood crosswise of the car rather than lengthwise, as is frequently done. If it is necessary to stand them lengthwise of the car they should be placed with their buttocks against one end and a heavy timber placed across the car in front of their breasts. The end of the car should first be heavily padded with burlap nailed over straw or excelsior, in order to prevent the hocks from being bruised and the tails being rubbed out; the piece in front of the breast should be padded in a like manner and should not be lighter than 4 inches by 4 inches, because heavy weight will be thrown against it.

MISCELLANEOUS INFORMATION

TRAINING OF HORSES

29. Early Training of Colts.—The training of a colt should begin when it is but a few months old, or even sooner. It should first be taught that man is its friend and master. The first step in teaching this lesson is to coddle and pet the colt while it is at the side of its dam. After a colt has been fondled a few times it will have lost much of its fear, and no difficulty should be encountered in passing the hand down over its legs. It is a good plan to slip a small halter on a colt and let him wear it continuously; this will be an aid in handling the colt and will familiarize it with having something on its head. It requires but little time to give a colt a few strokes with a brush every time its dam is groomed, and this does much to familiarize it with the attendant. The best place to begin brushing it is on

the back, just behind the withers; after a short time it will permit being brushed on the croup, neck, and legs.

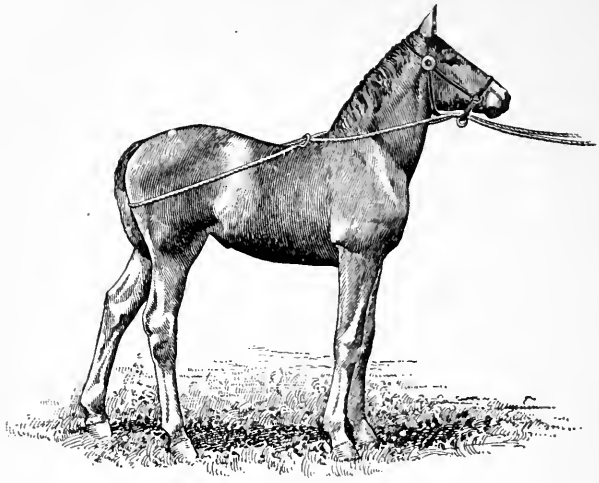


FIG. 5

There is nothing more effective in teaching a colt submission than to lift it from its feet and lay it on the ground. A colt can be easily held in this position if its neck is held firmly to the ground and the muzzle is held up. While the colt is thus held down, the legs and body should be stroked. As soon as the colt is permitted to arise it should again be stroked from head to foot.

30. If a colt wears a halter regularly, it can easily be taught to be led by occasionally tying it to its dam when she is in harness. After this has been done a few times use should be made of the device illustrated in Fig. 5. A small rope is doubled and a knot tied in it about $3\frac{1}{2}$ feet from the loop end. The loop is dropped around the colt's buttocks below the tail, the knot in the loop coming on the colt's back, and a strand of

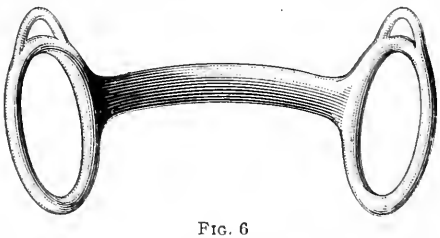


FIG. 6

the rope is passed forwards on each side of the colt's neck. Both strands are then run through the chin strap of the halter so that the two ends extend outwards in front of the animal. If the ends of the rope are pulled lightly pressure is applied behind and the colt will usually follow the attendant without much difficulty being experienced. Young colts should be handled enough to make them tame and gentle, which will save much trouble later.

A good way to teach a colt to stand tied is to slip a halter on it when it is in the stall, and allow the halter strap to drag. The colt will frequently step on the strap and in doing so will apply pressure at the top of its head and thus become accustomed to the use of the halter.

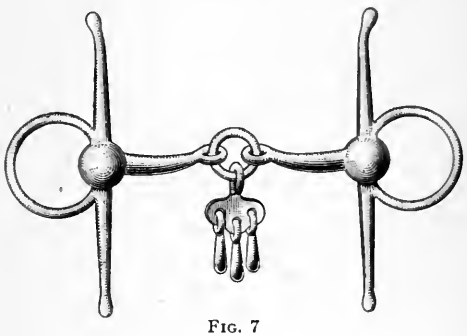


FIG. 7

Time spent in giving colts a preliminary training is never wasted. They never forget it entirely, even if they are not handled from the time they are weaned until they are old enough to be put at work. As a rule, they are more easily trained and make more trusty horses if they are handled from time to time than if not handled.

31. Training of Colts to the Bit.—Before attempting to work a colt it should first be trained to the bit. The bit rests on the bars of a horse's mouth, and to a slight degree on the lips. At first these parts are tender and sensitive and should not be injured by rough handling. A good way to harden the bars and lips and accustom a colt to wearing a bit is to put a bridle with a thick bit on the colt and to let him wear it for an hour or two a day for a few days or a week. A good form of bit to use for this purpose is shown in Fig. 6. The bar of this bit is broad and rigid and hence is not so likely to injure

the mouth as a thinner, more flexible bit. Some horsemen prefer the form of bit shown in Fig. 7. The claim for this bit is that the links attached to the middle of the bit will cause a colt to champ it and the bars of the mouth thus become hardened.

The training to the wearing of a bridle should be followed by the training to the wearing of a device known as a *bitting harness*, one form of which is illustrated in Fig. 8. This con-

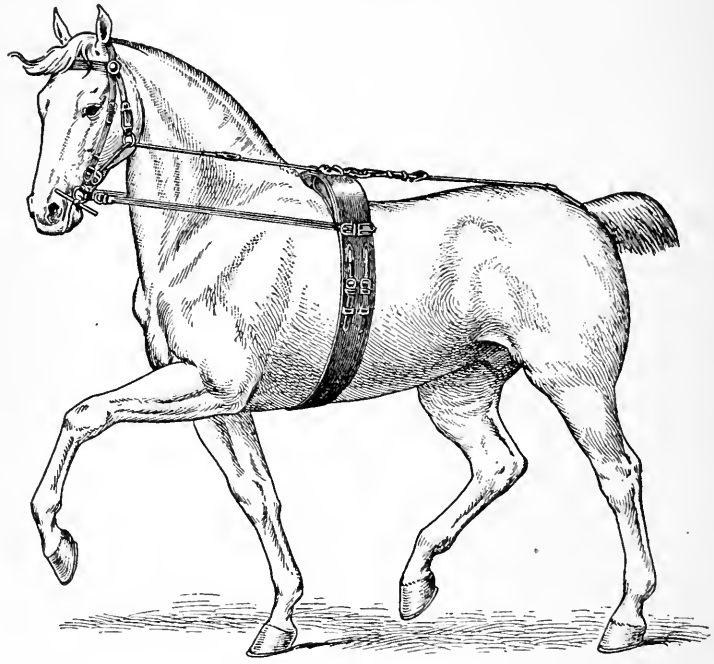


FIG. 8

sists of a bridle with a suitable bit, a surcingle that is buckled around the body, a side rein and a check rein on each side, a back strap, and a crupper. The reins are adjustable as to length at the surcingle. At first these should be adjusted loosely and then gradually tightened up as the colt becomes accustomed to the bit. It is advisable to give a colt that is wearing such harness the run of a lot or paddock. No rule can be given as to the length of time to use bitting harness.

This must be learned by experience, for there is a great difference in colts, some requiring the harness much longer than others. As a rule, it should be used for 2 weeks or more before an attempt is made to put the colt at work. Even after the colt has been started at work, the bitting harness can sometimes be used to advantage. If a bitting harness is not at hand, it is an easy matter to improvise one.

After a colt has worn a bitting harness for about 2 weeks or thereabouts, the side reins should be removed and long lines substituted, the attendant following behind the colt and driving it. The lines should be passed through rings placed not too high on the surcingle; midway of the colt's side is about right. By this arrangement a colt can be accustomed to being driven single. Each command should be given clearly and distinctly, and its meaning impressed on the colt's mind by the aid of the reins.

32. Too many lessons should not be attempted in one day, because the colt is likely to become confused and consequently nothing will be gained. Fatigue, either mental or physical, retards the power to grasp and to hold new ideas. For this reason, the lessons should be short and clear-cut rather than prolonged. While driving the colt thus it is a good plan to accustom him to such unfamiliar sights and sounds as he is likely to encounter later on, and which would likely frighten him. The attendant should not endeavor to frighten the colt but rather to show him that he has nothing to fear. In adjusting the harness, care should be exercised to see that every part fits properly, because the skin of a colt is tender and easily injured. Great care should be exercised, also, in the manipulation of the reins to avoid, if possible, the mouth becoming sore, which will cause a colt to become more or less erratic.

33. Training of Colts to Single Hitching.—The advisability of training a colt to single hitching depends on the class of the colt and the work it is to do. Colts that are to be used for road or city work should be trained to single hitching, but those that are to become farm or draft horses and work in teams may be trained after the bitting harness stage by hitch-

ing them with old reliable horses. If a colt is to be trained to work single the first step is to hitch it to a cart. A long breaking cart made especially for this purpose is desirable, its special advantage being that it is made heavier than an ordinary cart and with long shafts so that a colt could not strike the body of the cart if it should kick. Of course, if a breaking cart is not available a common cart, if strong, may be used.

In hitching a colt single for the first time, care should be taken that it does not become frightened at the cart and get loose before it is securely fastened between the shafts. An assistant can be used at this time to advantage. Every part of the harness should be properly adjusted and the lines kept within reach. While the colt is being held by the bit the attendant should carefully run the cart up just as if the colt were to be hitched. It should then be taken away again and brought around to the front for the colt to examine with his nose; this will help to reassure him that it is nothing to fear. This may be repeated a few times, if it seems advisable. When the colt has finally been fastened between the shafts, it should be in a place where there is plenty of room, for the turning between shafts is a new experience and it may not be possible to keep him under control until this lesson has been learned.

A colt should be started off slowly at first by having the assistant lead it and should be permitted to see what is going on around it. An open bridle should be used; if blinders are necessary they can be substituted later on when the colt's education is farther advanced. A colt will learn faster and give less trouble if kept at a walk rather than at a trot during the first lesson between the shafts. It will take some time for it to learn to turn, but patience and perseverance will win.

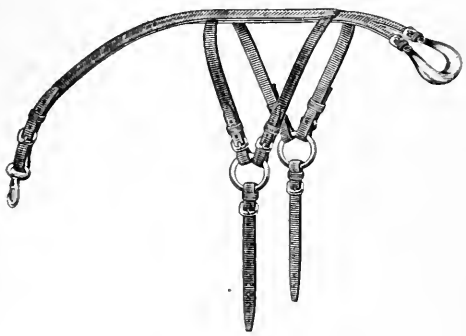


FIG. 9

It is a good plan to use a kicking strap for the first few times a colt is hitched single, in order to prevent it from forming the habit of kicking. A *kicking strap* is a strap that can be passed over the croup of a horse and attached to each shaft so that it is impossible for the animal to raise its hindquarters and hence to kick. Fig. 9 shows a form of kicking strap that is convenient. This device is thrown over the colt after the backstrap and crupper of the harness have been removed, the snap being fastened to the back pad, and the lower straps buckled around the shafts. Such straps can be purchased from harness dealers, or they can be improvised.

34. Training of Colts to Double Hitching.—If it is desired to train a horse to double hitching, the best plan is to hitch it to a light load with a steady, reliable horse that is not easily frightened and which is accustomed to being hitched with colts. The horse should be a good puller and should be hitched so that he will pull most of the load at first. It is a good plan, during the first few lessons, to put a halter on the colt and tie the strap to the hame of the older horse; this will prevent a runaway, should the colt become frightened. Draft colts are less spirited than light colts and many of them will work almost like an experienced horse from the start.

35. Training of Colts to Submit to Being Mounted.—If colts are handled from the time they are very young until old enough to be ridden, little difficulty should be experienced in training them to submit to being mounted. After a colt has been wearing bitting harness for some time, the attendant should slip quietly onto its back without a saddle, sit quietly for a few moments, and then urge the colt to walk. If the colt is timid and nervous, it is a good plan to put a dummy on it until the colt becomes accustomed to having an object on its back; the dummy should be strapped on securely, because it would have a bad effect on the colt if it should attempt to unseat the object and be successful.

Some horsemen prefer to use a large double-cinch horn saddle when a colt is mounted for the first time. A saddle may make the rider's seat more secure than without it, but

the saddle is likely to cause the colt to pitch and buck, especially if the hind cinch is drawn up tightly.

36. Training of Vicious Horses.—The secret of success in training or in correcting vicious horses is to get their attention and respect. The best way to accomplish this will depend somewhat on the nature of the vice. For kickers and runaways, there is nothing better than a trip line with which to throw them down. Taking a horse's legs from under him and tumbling him on the ground humiliates him and causes him to respect his master more than almost anything else that can be done. The trip line must be adjusted so that it can be used when an offense is committed. For cowing a man-eating horse, a revolver loaded with blank cartridges to fire into the animal's face is usually effective.

37. Training of Balky Horses.—Most balky horses are made so by incompetent drivers and by ill-fitting harness. Kindness, patience, and the diverting of attention are the most successful remedies. The driver should endeavor to obtain the confidence of the horse by treating it kindly and never making unreasonable demands on it.

38. Training of Halter-Pulling Horses.—A good method for reforming a halter-pulling horse—one that pulls back on the halter when tied—is to use a device similar to that shown in Fig. 5. A strong rope should be used and the ends secured to some substantial object. When the device is in place and the ends tied the attendant should encourage the animal to pull back. A few such trials will be likely to break it of the habit. Another device that works satisfactorily is to tie a rope around the body of the horse just back of the forelegs, pass the ends between the forelegs, through the halter, to the manger, and back to the halter again. Still another method is to loop a rope around under the tail in the manner of a crupper, and pass the ends forward on both sides of the horse's body and through the halter to the manger. Perhaps the commonest method is to tie a rope around the horse's neck and then to the manger.

OVERHEATING IN HORSES

39. Horses, if exposed to the direct rays of the sun in extremely hot weather, or if worked at protracted severe labor in an intensely hot, humid atmosphere, are susceptible to sunstroke or to overheating. Exhaustion produced by a long-continued heat is often the essential factor in overheating, and is called heat exhaustion. In overheating, there is a congestion of the brain and it may be sufficient to cause immediate death, hence it is important that any person working horses should have some knowledge of the cause, treatment, and prevention of this condition.

Horses are especially susceptible to sunstroke when the temperature in the sun is about 110° F. or more but the danger is not so great if the atmosphere is dry. Anything that will protect the top of the head from the direct rays of the sun is beneficial. Such devices as straw hats and wet sponges are desirable for this purpose. Also, during hot periods, horses should be watered frequently and allowed to rest in the shade when they show signs of being tired or of becoming too hot.

Sunstroke occurs rather suddenly. The animal stops, begins to stagger, soon falls to the ground unconscious, and may die in a few minutes without regaining consciousness. There are certain symptoms of an oncoming attack, however, that may be noticed and the attack possibly averted. If during extremely hot weather a horse becomes suddenly tired, or shows evidence of lacking its usual spirit and willingness to keep going, sweating ceases entirely and the hair dries up, or the animal sweats only in spots, it should be stopped at once, unhitched, and no time lost in cooling it off by dashing water over it.

The treatment for sunstroke is to apply freely ice or ice-cold water to the animal's head and along its spine, and to dash cold water over its body with a bucket or a hose for 10 or 15 minutes, until the animal is cooled off and its fever reduced. The limbs should be rubbed freely with spirits of camphor and to the horse should be given internally 2 ounces of aromatic spirits of ammonia in $\frac{1}{2}$ pint of water, or $\frac{1}{2}$ ounce of ammonia

carbonate dissolved in 1 pint of water. A few swallows of cool water should be given to the horse, but it should not be allowed to have a large quantity, as this might cause founder. A good plan is to give a swallow or so every 5 or 10 minutes until the animal's thirst is quenched. If the horse does not die, and after the fever has been reduced as just described, a competent veterinarian should be called, as more active stimulants may be required when the reaction sets in, and other treatment will be necessary during convalescence, which will extend over a long period of time, during which the animal will be unfit for work.

REGISTRATION AND RECORDING OF HORSES

40. Registration of Horses.—The registration of horses is conducted on much the same plan that is followed in the case of other classes of domestic animals. Each breed has one or more record associations that maintain stud books in which elegible animals can be registered for a nominal fee. If an owner desires to have a certain horse registered, the first step necessary is to file a standard application with the secretary of one of the record associations for the animals of its breed. In Fig. 10 is shown the form of application used by the National French Draft Horse Association. Other associations use somewhat similar forms of applications.

If the secretary finds that the horse is eligible for registration, its name is entered in the stud book and a certificate of registry is issued to the owner. In Fig. 11 is illustrated the form of certificate used by the National French Draft Horse Association, the American Morgan Register, the American Hackney Society, and the American Clydesdale Association. Other record associations, of course, use certificates similar to these.

41. Recording of Pedigrees.—If it is desired to record the pedigree of a horse, there are a large number of different forms of blanks that can be used. Most of the record associations have their own form of pedigree blank for this purpose, although it is not necessary to use any particular kind. In Fig. 12 is shown

This Blank to be used only for Imported and Native Bred Full Blood Animals. Read carefully the Rules Governing the Entry of Animals on back of Blank.

APPLICATION FOR REGISTRY

National Register French Draft Horses

Entered by John Cox *of* London, Iowa *Date* July 4 1910

Name of Animal Baron *Imported or Native Bred*

Foreign Number 999765 *Name of Book in which Registered*

Sex Stallion *When foaled* May 5, 1875

Color and Distinguishing Marks Black, star, white hind feet

Name and Address of Breeder M. Lineau, Dept. of Sarthe, France

Name and Address of Owner John Cox, London, Iowa

Name and Address of Importer John Cox, London, Iowa

Date of Importation. Aug., 1876

(Write all proper names plainly; if there is not room in line, commence above it.)

PEDIGREE OF

Baron
No. (999765)

(Write name of animal to be recorded, and number if imported, on above lines.)

Write Name of Sire here ☞ Sire Joyeux No. (42976)

Sire
No.
Dam
No.

Sire
No.
Dam
No.

Write Name of Dam here ☞ Dam Margot No. (42983)

Sire
No.
Dam
No.

Sire
No.
Dam
No.

REMARKS

I hereby certify that the above pedigree is correct and in full compliance with the Rules of Entry of the National French Draft Horse Association, to the best of my knowledge and belief.

John Cox *Applicant.*

Have Certificate Acknowledged before Justice or Notary. See back of this blank.

FIG. 10

243—40

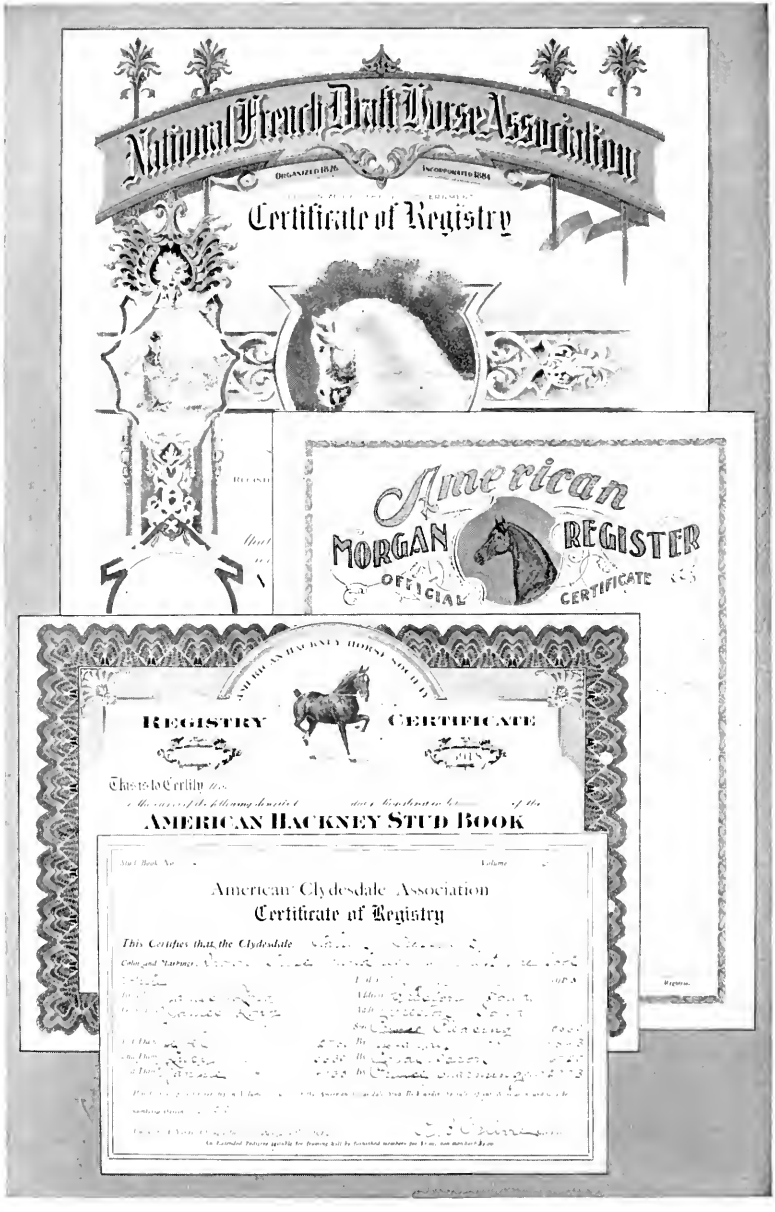

National French Draft Horse Association
Certificate of Registry
American
MORGAN REGISTER
OFFICIAL CERTIFICATE
REGISTRY CERTIFICATE
AMERICAN HACKNEY STUD BOOK
American Clydesdale Association
Certificate of Registry

FIG. 11

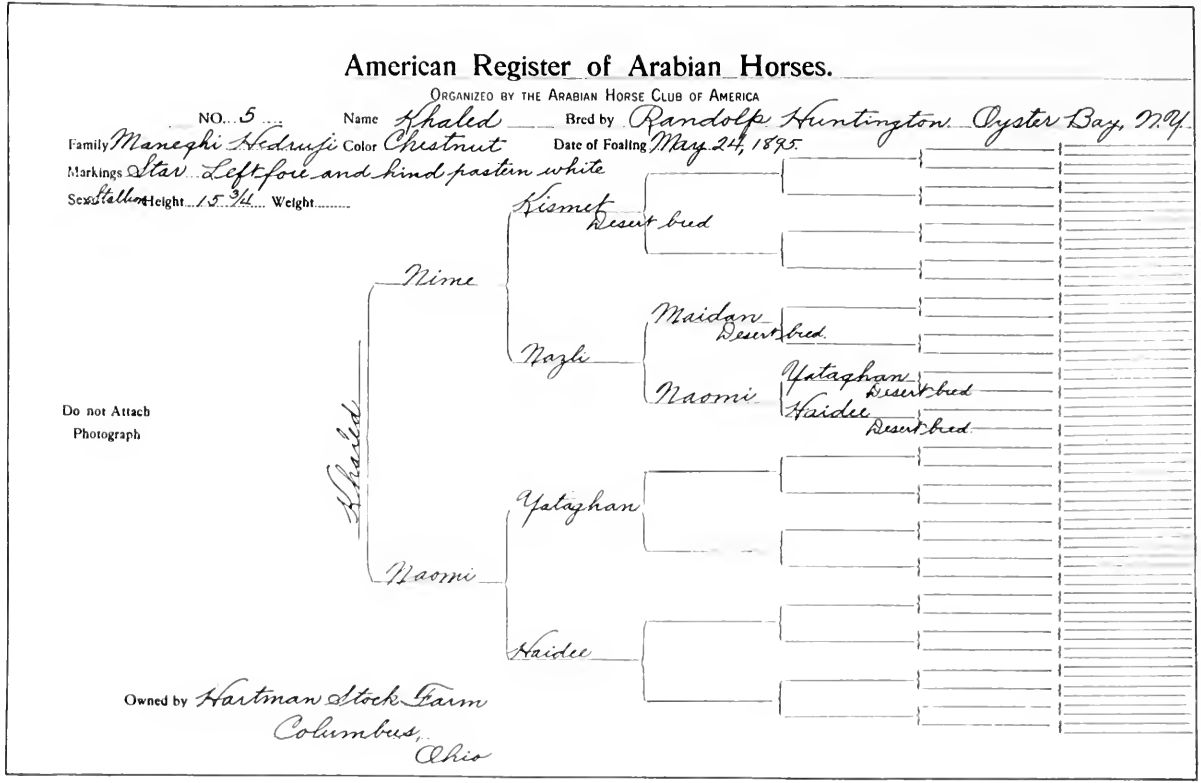
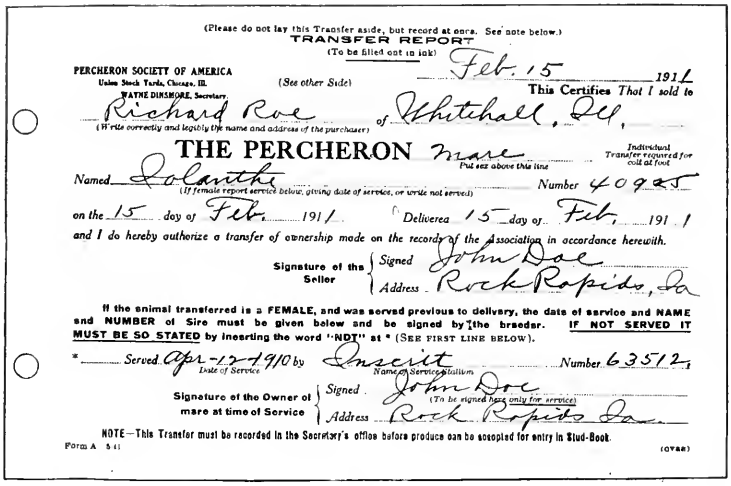

American Register of Arabian Horses.
Organized by the Arabian Horse Club of America
NO. 5 Name Khaled Bred by Randolph Huntington Oyster Bay, N.Y.
Family Maneghi Hedruj Color Chestnut Date of Foaling May 24, 1895
Markings Star Left fore and hind pastern white
Sex Stallion Height 15 3/4 Weight
Do not Attach Photograph
Khaled
Nimr
Kismet
Desert bred
Nazli
Maidan
Desert bred
Naomi
Yataghan
Desert bred
Haidee
Desert bred
Yataghan
Naomi
Haidee
Owned by Hartman Stock Farm
Columbus, Ohio

Fig. 12

the form of pedigree blank in use by the Arabian Horse Club of America.



(Please do not lay this Transfer aside, but record at once. See note below.)

TRANSFER REPORT

(To be filled out in ink)

Feb. 15 1911

PERCHERON SOCIETY OF AMERICA
Union Stock Yards, Chicago, Ill.
WAYNE DINSMORE, Secretary.

(See other Side)

This Certifies That I sold to

Richard Roe of Whitehall, Ill.

(Write correctly and legibly the name and address of the purchaser)

THE PERCHERON mare

Individual Transfer required for colt at foot

Put x or above this line

Named Dolantite Number 40985

(If female report service below, giving date of service, or write not served)

on the 15 day of Feb. 1911. Delivered 15 day of Feb. 1911

and I do hereby authorize a transfer of ownership made on the records of the Association in accordance herewith.

Signature of the Seller { Signed John Doe
Address Rock Rapids, Ia

If the animal transferred is a FEMALE, and was served previous to delivery, the date of service and NAME and NUMBER of Sire must be given below and be signed by the breeder. IF NOT SERVED IT MUST BE SO STATED by inserting the word "NOT" at * (SEE FIRST LINE BELOW).

* Served Apr-12-1910 by Onscrit Number 63512

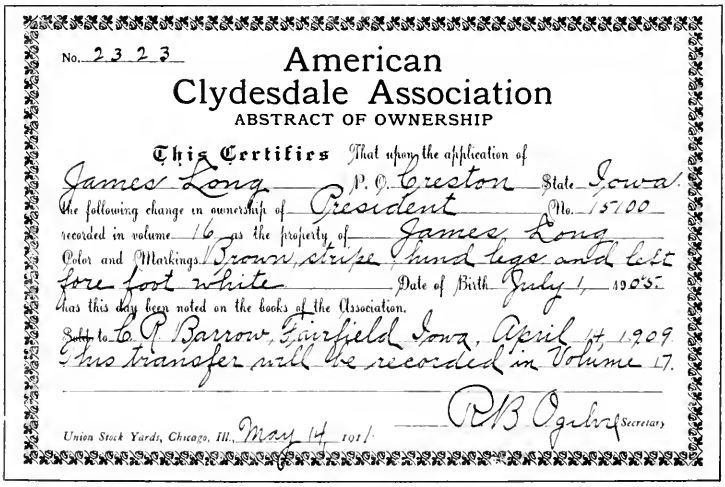
Date of Service Name of Service Stallion

Signature of the Owner of mare at time of Service { Signed John Doe (To be signed here only for service)
Address Rock Rapids Ia.

NOTE—This Transfer must be recorded in the Secretary's office before produce can be accepted for entry in Stud-Book.

Form A 541 (over)

FIG. 13



No. 2323

American Clydesdale Association

ABSTRACT OF OWNERSHIP

This Certifies That upon the application of

James Long P. O. Creston State Iowa

the following change in ownership of President No. 15700

recorded in volume 16 as the property of James Long

Color and Markings Brown, stripe, hind legs and left fore foot white Date of Birth July 1, 1905

has this day been noted on the books of the Association.

Subj. to C. P. Barrow, Fairfield, Iowa, April 1, 1909

This transfer will be recorded in Volume 17.

R B Ogilvie Secretary

Union Stock Yards, Chicago, Ill. May 14, 1911

FIG. 14

42. Recording of Transfer of Ownership.—When a registered animal is sold it is necessary to have the change in owner-

ship recorded by the secretary of the record association. To have this done the former owner must file with the secretary a standard form of request for the recording of a transfer of ownership. The form used by the Percheron Society of America is shown in Fig. 13.

On receipt of such a request, the secretary will issue to the new owner an abstract of ownership. The form of abstract used by the American Clydesdale Association is illustrated in Fig. 14.

PONIES, ASSES, AND MULES

PONIES

GENERAL REMARKS

1. The distinction between ponies and horses is made almost entirely on a basis of size of the animals. In general, all horses, regardless of type or breed, that are less than $14\frac{1}{4}$ hands high are classed as ponies. The small size of ponies may be attributed largely to the adverse climatic conditions, the scanty supply of feed, and the inbreeding to which the animals were subjected for many generations. Distinct types of diminutive horses, or ponies, are found in almost all countries. Thus, in the western part of Asia, there are the Arab and its near allies, the Turk, the Barb, and the Persian ponies; in the eastern part of Asia, the Mongolian, the Japanese, the Korean, the Burma, and the Manipura ponies; in the northern part of Europe, the Russian and the Scandinavian, or Norwegian, ponies; in the British Isles, the Shetland, the Welsh, the Exmoor, the Dartmoor, the New Forest, the Scotland, the Galloway, and the Connemara ponies; in Iceland, the Celtic pony; and in America, the broncos that were originally found in the southwestern part of the United States and the northern part of Mexico, the Indian ponies, found originally in the northwestern part of the United States and the western part of Canada, the Creole ponies of Louisiana, the Sable Island ponies, and the ponies of the South Atlantic States. Besides these regional breeds, or types, of ponies, there is a general class of ponies being developed for use in playing polo that are known as polo ponies. Only those ponies that are of most importance in America, namely, the Shetland pony, the Welsh pony, the bronco, and the Indian pony, will be discussed in this Section.

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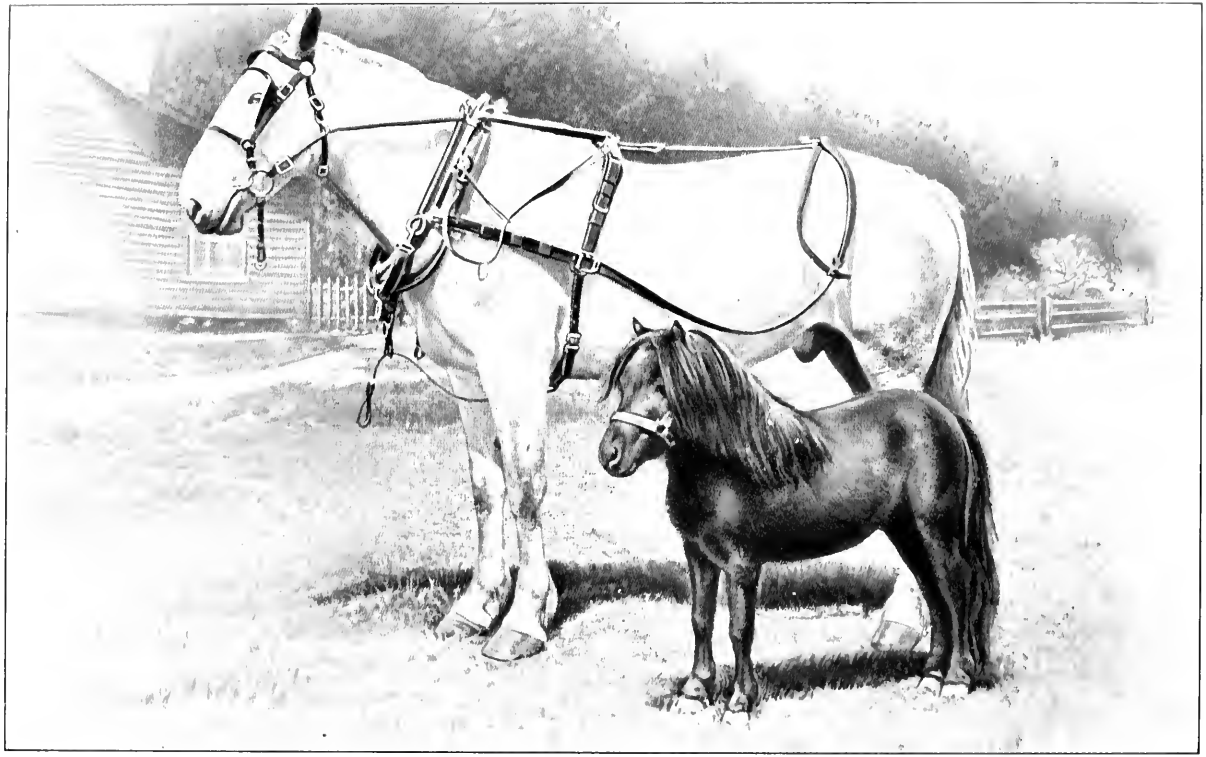

FIG. 1

BRITISH ISLE PONIES

SHETLAND PONIES

2. Nativity of the Shetland Pony.—The native home of the **Shetland pony** is a group of about one hundred and twenty islands known as the Shetland Islands, which are located from 150 to 200 miles north of Scotland. Although these islands are rather far to the north, the climate is tempered by the Gulf Stream, in the course of which the islands are located. However, the winters are long and severe, the wind blows almost constantly, and dense fogs, mists, and cold rains are much in evidence. Some of the islands are uninhabited and offer only scant pasturage for the few sheep or ponies that are pastured on them and that, from the earliest history of the islands, have been known to exist there. The severe weather, the scarcity of feed, which consists only of hay and pasture, and the fact that but little if any shelter is ever given to the ponies may account largely for the small size, the enduring qualities, and the heavy coat of fine hair of the Shetland ponies.

3. Description of the Shetland Pony.—The average size of pure-bred Shetland ponies, which are the smallest of ponies, ranges from 9 to 10 hands; although the minimum and maximum heights may be placed at $7\frac{1}{2}$ and $11\frac{1}{2}$ hands. The relative size of a Shetland pony and that of a large work horse is shown in Fig. 1. The limit of the height of ponies that may be registered by the Shetland Pony Stud Book Society of Scotland is 42 inches; the American Shetland Pony Club will register pure-bred Shetland ponies that are 46 inches in height at the withers. The height and weight of a Shetland pony may be increased by giving it better care and more feed than it had formerly received. Thus, a pony brought from the severe climate and scanty supply of feed of the Shetland Islands to the more temperate climate, luxurious pastures, and abundance of feed of the corn-belt region of the United States will, if not too old, increase in size. Also, the offspring of such ponies

FIG. 2

FIG. 3

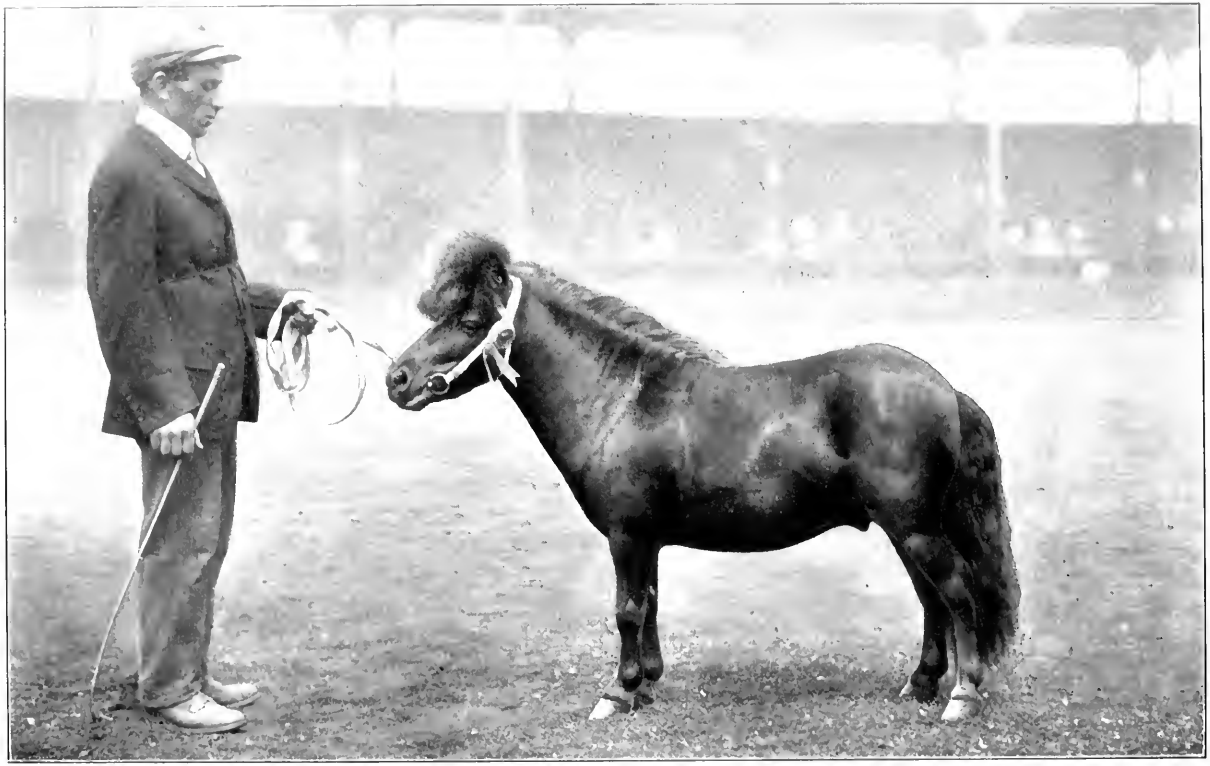

FIG. 4

have a tendency to become much larger than their parents. The weight for a Shetland of average height will vary from 325 to 375 pounds.

The general appearance of the best specimens of Shetland ponies is that of a diminutive draft horse. The body is deep; the legs are short; the back is short and broad; the chest is deep and full; the bone is fine, smooth, and strong; the neck is short, muscular, and slightly arched; the head and ears are small; and the eyes are prominent. In color, they are usually brown, black, or bay; although dun, chestnut, gray, piebald, and some with white markings are not uncommon. Those with white markings, such as the mare illustrated in Fig. 2, are very popular.

The coat of the Shetland is long and shaggy, especially on an animal under 2 years of age. A striking example of two ponies with long, shaggy coats is illustrated in Fig. 3. During early spring, the coat loses its luster and usually sheds in patches, making a very forlorn looking pony, but after the shedding is completed the pony is covered with a coat of fine, silky, lustrous hair. A fine specimen of a mature Shetland pony stallion is shown in Fig. 4.

4. Uses of Shetland Ponies.—Shetland ponies are very docile, and in their native islands are used as beasts of burden, to carry large packs of dried peat that is used for fuel. These packs often weigh as much as 120 or 140 pounds. A common fall scene in the Shetland Islands of the ponies carrying peat is shown in Fig. 5. The photographs from which Figs. 3 and 5 were made were furnished by Dr. S. B. Elliot, of Markham, Virginia. The women often have charge of this work and make companions of the ponies, allowing them to go into their little huts or dwellings much the same as some people do with dogs.

A large number of Shetland ponies are raised in England and Scotland, where they are used extensively for drawing cars of coal in the mines to the main hoisting shaft. It is claimed that in the mines a pony weighing 350 pounds will travel 30 miles a day and draw, on rails, a car weighing from 1,200 to 1,400 pounds.

FIG. 5

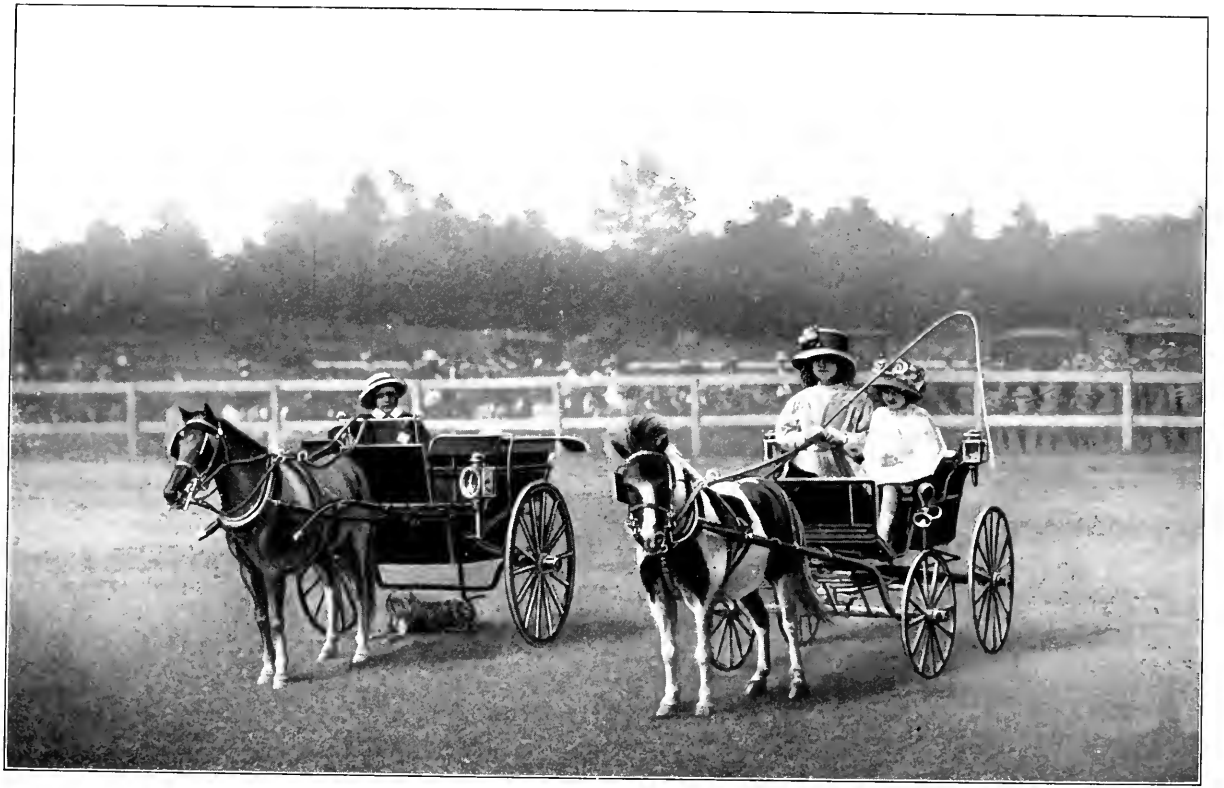

FIG. 6

In America, the Shetland pony is used chiefly by children and for light driving, that is, in such outfits as is shown in Fig. 6. The ponies are easily trained for riding and driving, and are noted for their intelligence, their gentle disposition, and their freedom from the trickiness of some ponies and horses.

For delicate children, whose health would be improved by living out of doors, the companionship of a Shetland pony is an excellent means of inducing them to remain out of doors much of the time; and the exercise that the children take in riding and driving a pony is generally considered to have a most exhilarating and health-giving effect. On account of the gentle disposition of the Shetland, and the fact that it can be easily managed by a child from 9 to 15 years of age, it is conceded to be the animal best adapted for the use of children.

5. Breeding of Shetland Ponies.—Imported Shetland ponies should not be bred until they have become thoroughly acclimated, and, like all breeds of domestic animals, they should not be too fat when bred. A Shetland mare should not be bred until she is 3 years old; but thereafter she may be bred for from 20 to 25 years, or so long as she will produce strong, vigorous colts. The best time of the year to breed the mares is from the first of May to the middle of July, during which time they get an abundance of succulent grass and plenty of exercise. The latter is just as essential, or even more so, for the best condition of breeding stallions as it is for breeding mares.

A pregnant mare should be driven with care up to within 3 weeks of the time for foaling; she should have light driving up to within a few days of the time for her to foal, at which time, unless the weather is stormy, she should be placed in a pasture lot or paddock by herself. If it should be raining, cold, or stormy, she should be placed in a rather large box stall.

6. Care of a Shetland Colt and Its Dam.—For a few days after a mare foals, especially if she foals in the spring or during cold or rainy weather, the colt and the dam should be kept where they can be watched closely, so that assistance may be given them if necessary. If the mare foals during the spring, it is advisable that she and the colt be given shelter at night

at least; but when the weather becomes warm they should be turned on pasture for the following summer and fall.

Ordinarily, there should be no concentrate feed given to them during the time they are on pasture; but, if the pasturage becomes very scanty during the summer and both the mare and her colt begin to lose flesh, extra forage, such as oats, rye, or green corn, should be given to them. And, if the mare becomes very thin from suckling the colt, about 1 quart of oats and an equal quantity of wheat bran should be given to her twice a day. If foaled in early summer, as should be the case, the colt will increase in size rapidly and by fall will be a vigorous, rugged, little fellow more than twice its size at birth.

7. Weaning a Shetland Pony Colt.—In the Shetland Islands, as a rule, the colts are allowed to run with their dams the first winter; but some of the most successful breeders of Shetland ponies outside of the Shetland Islands make a practice of weaning the colts when they are from 5 to 7 months old and supplying them with a liberal ration through the winter. In order that a mare may experience no bad effects, such as caked udder, from weaning her colt, the colt should be allowed to go to its dam once a day for 5 or 6 days to nurse out the milk that may accumulate in her udder. The colt and the dam should then be separated permanently and the udder should be emptied thoroughly every 2 or 3 days for a week.

8. Care and Feeding of Shetland Ponies.—In general, the feeding and care of Shetland ponies after they are weaned is much the same as that of horses; but, since the ponies are very much smaller than horses, they require a much smaller quantity of feed. In fact, the quantity of feed required for Shetland ponies is about the same, per 1,000 pounds of live weight, as for draft horses; that is, about the same quantity of feed that is required by a 1,100-pound draft horse will be sufficient for at least three 350-pound ponies. But the quantity of feed required at any time will, of course, vary according to the energy expended by horse or pony.

Colts, until they are 2 years old, should not be worked, and should be allowed all the fine, bright, well-cured hay that they

will eat or have the run of a good pasture. For mature ponies that are under the saddle or in harness for only a few hours each day, and are used by rather small children, 1 pint of wheat bran or of oats or an ear of corn given to each pony once a day will be sufficient. But a pony 10 to 10½ hands high and used several hours a day by adults as well as by children should have from 1 to 1½ quarts of oats three times a day.

Care should be exercised not to drive or ride a pony so long that it becomes very hot and sweats profusely; but in case it does become very much warmed up from exercise, grain feed or more than from six to ten swallows of water should not be given to it until it has cooled off. Under ordinary conditions a pony should be watered before and after eating and in the middle of the forenoon and the afternoon.

9. **Registration of Pure-Bred Shetland Ponies.**—The interests of pure-bred Shetland ponies in regard to the improvement of the breed, the keeping of records of pedigrees, the transfer of ownership, etc., are looked after in America by the American Shetland Pony Club, which was organized in 1888. This club furnishes the blank forms that, when correctly filled out and accompanied by the proper fee, are necessary for the registration of a pure-bred Shetland pony.

10. **Scale of Points for Shetland Ponies.**—As an aid to judges, the American Shetland Pony Club has adopted the following scale of points for the Shetland pony:

Scale of Points	Points
Constitution.—Indicated by general healthy appearance, perfect respiration, and brightness of eye	10
Size.—Ponies over 4 years old 42 inches and under in height, two points to be deducted for every inch over 42 inches up to 46 inches, fractional portions to count as full inches	25
Head.—Symmetrical, rather small and fine, wide between the eyes; ears short and erect	10
Body.—Barrel well rounded, back short and level, deep chest, good breast, compact "pony build"	10
Legs.—Muscular, flat boned, hind leg not cowhocked or too crooked	25
Mane and Tail.—Foretop, mane and tail heavy	10
Feet.—Good	10
	100

FIG. 7

WELSH PONIES

11. The **Welsh pony,** as the name implies, is a native of Wales; or at least, this pony has been known to exist in Wales since the earliest history of that country. In general conformation, the Welsh pony, as shown in Fig. 7, resembles the roadster type of horses, instead of the draft type, as does the Shetland pony. The Welsh pony is a sturdy, stockily built animal, has a beautiful head, sloping shoulders, clean, smooth legs, and is heavily muscled. It is larger than the Shetland, ranging in height from 11 to 13 hands. The size varies somewhat according to parentage, the care and the quantity of feed given to them; etc. Ponies from the mountainous regions of Wales are smaller than those from the lowlands, where the natural feed conditions are more favorable than those in the mountainous sections.

The Welsh pony is generally conceded to be more alert and quicker in action than is the Shetland pony. These qualities are due, perhaps, to a cross of Arabian blood at some early time on the native Welsh ponies. On account of the more lively action and the larger size of the Welsh ponies, they are not usually considered to be so well adapted for the use of small children as are Shetland ponies. But where larger ponies than Shetlands are desired, for driving and riding by adults or by children from 12 to 18 years old, Welsh ponies are admirably adapted for the purpose. Also, Welsh ponies are used extensively in playing polo.

The breeding, care, and management of Welsh ponies is practically the same as that for light horses.

AMERICAN PONIES

12. The ponies of America are the descendants of horses that were brought to America by early Spanish explorers. It is supposed that some of these horses either escaped or were turned loose and that their offspring formed the herds of wild horses that roamed over the plains of the western portion of the United States, Canada, and the northern portion of Mex-

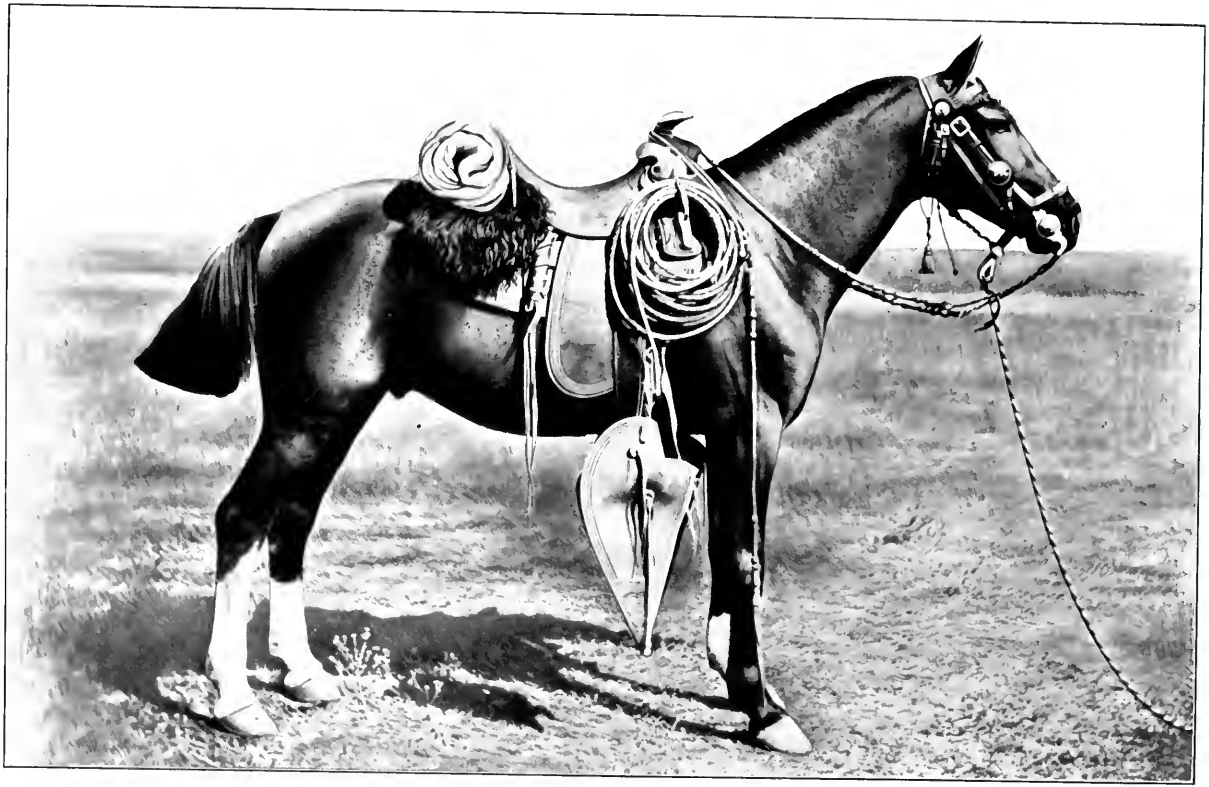

FIG. 8

ico. These horses, or ponies, were tough, wiry, hardy, and variously colored; some of them were beautiful animals with fine heads showing much character, and they had high-class limbs and feet. A few were domesticated by the Indians, but it remained for the pioneer settlers and cowboys of the plains to catch, subdue, and break these bucking, courageous little animals. There existed two rather distinct types of the wild horses of western America, namely, the **broncos,** which are found in the southwestern part of the United States and in Mexico, and the **Indian ponies,** which were found in the northwestern part of the United States and in the western part of Canada.

BRONCO PONIES

13. Bronco ponies are not often more than 14 hands high and weigh about 800 pounds. They are exceedingly hardy, have good, strong constitutions, excellent feet, strong legs, and usually can endure much hardship. In the best types of the broncos, such as the one shown in Fig. 8, the head is small and clean-cut; the eyes are bright and piercing; the ears are small and attractively set; the neck is of medium length, well crested, and very well carried; and the body is short, deep, and muscular. The bronco is not a particularly swift animal, as ranchmen, astride a good domestic horse, could ride down and capture the bronco in its wild state. However, the bronco has great endurance, as may be judged from the fact that it frequently has been ridden by a heavy man in a 50-pound saddle for several days in succession over rough, rocky trails.

During the pioneering period of the western part of the United States, the broncos were extensively used by the ranchmen as saddle horses; but as the country became more and more developed, there was a decreasing demand for broncos and an increasing demand for larger and swifter horses. Large numbers of grade bronco ponies, that is, the offspring of native bronco mares and domestic stallions, have been shipped to the cities, where they are used for drawing light delivery wagons, for light driving, and as saddle ponies; and a few of the better ones have been used for polo playing.

The breeding of bronco ponies takes place almost entirely on the large ranches in the western part of the United States; but even there they are rapidly being replaced by better, larger horses.

INDIAN PONIES

14. Indian ponies were found in a wild state in the northwestern part of the United States and in the western part of Canada; they are slightly smaller, but are more compact of body, have stronger bone, and are more tractable, more intelligent, and display more courage than the broncos. The Indian ponies often have considerable hair on their legs, and heavy manes and tails. This hairiness is not a common character of the broncos, and indicates that the Indian pony and the bronco pony are probably not descendants of the same foundation stock.

Indian ponies are used for much the same purpose as broncos, and, like broncos, they are rapidly being replaced by superior horses.

ASSES

15. General Description.—The **ass,** or as it is often called, the *donkey*, or *burro*, belongs to the same genus of animals as the horse, although it differs from the horse in several details. The ears are very large and long; the body is short, very compact, nearly round, and is often covered with very long hair, especially during the winter months. The foretop and mane are very scanty and stand nearly upright; the tail bears no long hair except near its end, which is covered with a brush of rather long hair; the quarters lack the deep muscling of draft horses; the bones of the legs are large and strong, the joints are sometimes rather large, and the feet are small and narrow.

In size, asses vary from the small ass, or burro, which is often not more than 9 hands high, to asses 16 hands in height. In America, the prevailing color of asses for mule breeding is very dark brown or black with light points, that is, with a light

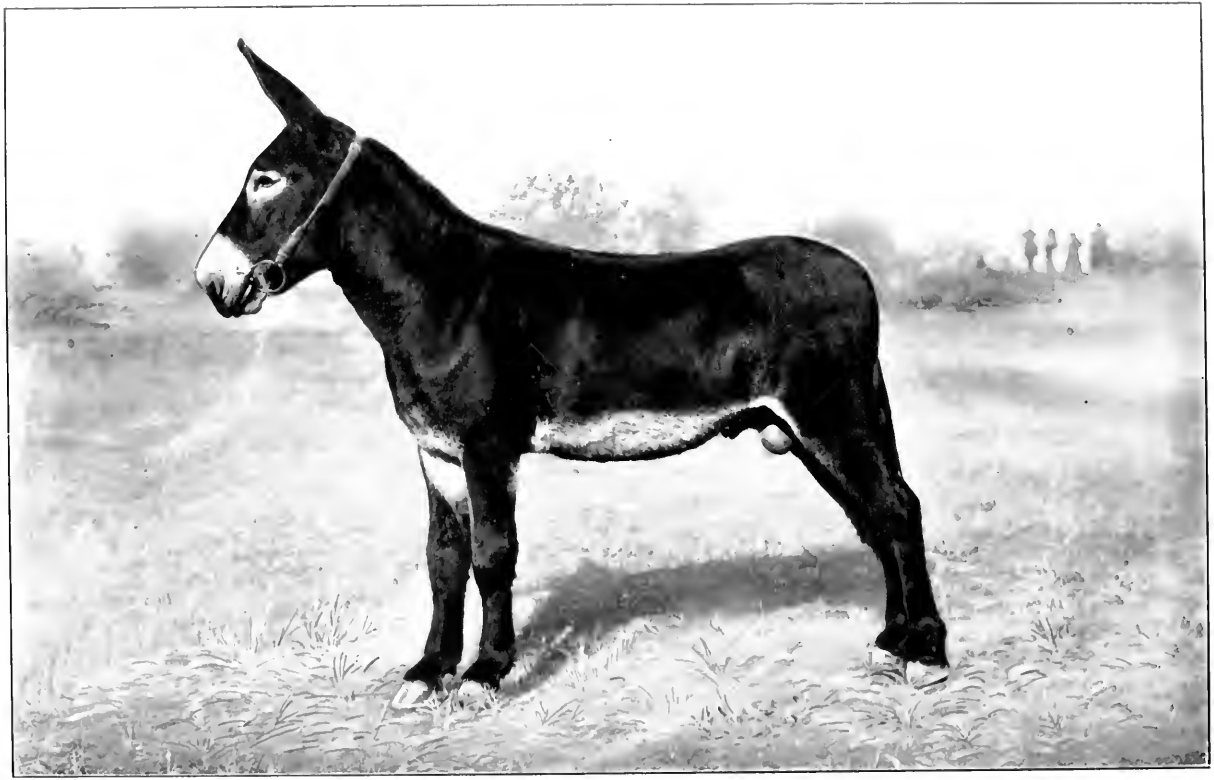

Fig. 9

creamy color around the eyes, covering the muzzle, and on the belly. A good specimen of a mule-breeding jack is illustrated in Fig. 9. Gray or blue gray is a common color of the small asses.

16. Uses of Asses.—The chief use of asses in America is that of using the jacks for breeding with mares for the production of mules. The small asses are used extensively as pack animals over rough, mountainous trails. For this purpose the small animals are especially adapted, as they are particularly sure footed, are extremely docile, and bear with much endurance and stability heavy and sometimes bulky packs. In some localities the burro is used for drawing loads of coal and ore in mines from the workings to the hoisting shaft.

17. Breeding of Jacks to Mares.—The breeding of a mare to a jack does not differ in many respects from that of breeding her to a stallion. Jacks, however, are very timid animals and often refuse to serve under strange surroundings or to serve a mare if they have previously been used in serving jennies. Jacks that are to be used for mule breeding should be raised with horses, for many jacks, if they are raised with asses, absolutely refuse to serve mares; and sometimes a jack that has been trained to serve mares will refuse to continue to do so if it is once allowed to serve a jenny.

A stallion should be used to tease the mares, and when a mare is found to be in heat, the stallion should be removed and all preparations made so that the jack may mount as soon as he is led from the stall. If he refuses to mount, he should not be abused but coaxed and petted. Sometimes a jack may be induced to serve a mare by blindfolding him, and by dampening the tail of the mare with the urine of a jenny. If a large mare is to be bred to a jack, some arrangement, such as a breeding chute or a pit, should be provided so that the mare may be lowered to about the height of the jack.

18. Breeds of Asses.—On account of the fact that the ass has been raised in widely different sections of the world and under varying conditions of climate, care, and feed, there have been developed several rather distinct strains, or breeds. The

jacks that are used most extensively in the United States for mule raising are of the *Catalonian*, *Andalusian*, *Majorca*, *Poitou*, and *Maltese* breeds.

The **Catalonian jacks** come from the northeastern part of Spain. They are black or dark brown with light points, and are from 14½ to 15 hands high. For jacks, they possess unusual style, beauty, and action. Their heads are said to show character; and their ears are rarely droopy. These jacks are wiry and tough, mature at an early age, and are used freely in Missouri, Tennessee, and Kentucky for the production of breeding jacks and large, high-grade mules.

The **Andalusian jacks** come from the southern part of Spain, are usually gray but sometimes black, stand 14½ to 15½ hands high, and have a good quality of bone. Although these jacks are found in various parts of the United States, they are not popular, perhaps on account of their light color.

The **Majorca jacks** come from the island of Majorca, which is off the coast of Spain in the Mediterranean Sea. They stand on an average 15½ hands high. They lack style and action, and, in fact, have a tendency to be sluggish. Their heads and ears are very large; the ears are claimed to be longer than those of any other breed of asses. In appearance the Majorca jacks are large, approaching the draft type of animal.

Although the **Poitou ass** is claimed to be the strongest of any breed of asses, the jacks have not been used by American mule breeders as extensively as the Catalonian jacks. The best specimens of the Poitou jack are black with light points and vary in height from 13½ to 15 hands. The head and ears are very large; the mouth and nostrils are small; the neck is short, thick, and broad; the body is long and deep; the legs are short, straight, and flat, and the bone is large and hard; the hocks are very large; and the feet are large and more spreading than are those of any other breed of asses.

The **Maltese jacks** come from the island of Malta in the Mediterranean Sea; they are black or brown in color; usually stand about 14½ hands; are very lively and active; the head is of good form, with sharp, upright ears; and the bone is finer than that most desired.

19. Care and Management of Asses.—The same care and management that is recommended for draft horses is equally applicable for asses. The latter respond as readily as horses to good care and an abundance of feed; but horses cannot subsist and maintain their strength on so coarse, rough, scanty feed as asses can.

MULES

20. General Description.—A **mule** is a hybrid resulting from the crossing of a jack and a mare. If the cross is reversed and a stallion is bred to a jenny, the resulting offspring is called a *hinny*. The conformation of the mule resembles, in most respects, that of its sire, but in the best specimen of draft mules the influence of the dam is shown in the size of the mule, in the shape of its body, and in its strength and courage. The head of the mule is large, with a somewhat Roman nose; the ears are large and long; the mane is rather scant and stands upright; and the body is somewhat smaller and more round than that of the dam, although the more nearly it approaches the shape of the draft horse the more desirable is the mule. In the best specimens, the legs are well muscled, the tendons are easily distinguished and sometimes are quite prominent, and the bone is large, fine, smooth, and hard; and the feet are narrower and longer than those of the mare, but are larger and more spreading than those of the jack.

In size, mules vary from 600 to 1,800 pounds, according to the size of the jacks and mares used in producing them and according to the care and feed used in raising them. Also, the color of mules varies according to the color of their parents. The common colors are black, brown, bay, sorrel, chestnut, gray, and white; brown and bay are the colors most often seen.

21. Temperament of Mules.—Mules are quiet, patient animals, and for steady, hard pulling they are superior to any class of animals in the horse family. Mules are not nearly so much given to kicking as is generally believed; in fact, persons in position to speak authoritatively on the subject claim that when mules are properly treated they are no worse in this

respect than are horses. But, if mules are abused they kick in self-defense and if kicking proves effective in stopping the abuse, they resort to this method of defense very readily.

22. **Endurance of Mules.**—It is generally conceded that mules can endure hard work for a longer period and subsist on a smaller quantity and poorer quality of feed than can horses. Also, mules are hardier and more able to endure the hot sun than horses, and for this reason are more commonly used than draft horses in southern climates. In spite of the hard work that they usually perform and the indifferent care that they sometimes receive, mules, as a rule, live much longer than horses. It is not uncommon for them to be in working condition at 30 years of age and there are records of mules having lived until they were 40 years old.

23. **Influence of Sex on the Salability of Mules.**—The sexual organs of mules are incomplete to the extent that these animals do not breed. A few cases have been reported where a female mule has become impregnated and produced young; if authentic, such cases are exceedingly rare. As a rule, female mules are more popular with dealers and feeders and usually sell more readily than do male mules. This is due to the fact that female mules mature at a slightly earlier age, are not inclined to be so angular, and can be fattened more easily when young than the male mules. Although, for certain kinds of work, male mules are preferred.

24. **Resistance of Mules to Diseases.**—It is often claimed by mule dealers that mules are immune from the diseases and ailments with which horses are commonly afflicted. This claim, however, is only partly true, as careful investigations have shown that, although mules are apparently exempt from certain diseases, they are very susceptible to other diseases. Thus, in certain sections of the United States infested with buffalo gnats, mules succumb to the attacks of these insects more than do any other class of domestic animals. On the other hand, mules are not so subject to disease and unsoundness of the legs and feet as are horses, and the cases of spavin, ringbone, or

sidebone that do occur on mules do not as greatly reduce their commercial value as such unsoundnesses do on horses.

25. Use of Mules.—The chief use of mules is for draft purposes. In the southern and central portions of the United States mules are used extensively on farms and plantations for agricultural purposes; they are also used much more generally than horses by contractors in the United States in the construction of levees and railroad grades; and in coal mines mules are practically the only animals used for drawing cars of coal from the workings in the mines to the hoisting shafts. In fact, almost everywhere that draft animals are required, mules are extensively used. In some portions of the southern part of the United States mules are used as saddle animals, especially by negroes; and, in some sections they are driven, singly and in pairs, as carriage animals and have drawn forth favorable comment on account of their action and speed.

26. Market Requirements for Mules.—The mule market requires sound, shapely, mature young mules, with size and action suitable for the use to which they are to be put; and their market value is rated on soundness, conformation, size, general appearance, condition, quality, age, color, and action.

Soundness is more important than everything else. Mules, like horses, to be useful must be serviceably sound. There is no objection to slight blemishes that do not interfere with the serviceability of the animals; but there is always objection to an unsoundness or blemish that is likely to interfere with the usefulness of a mule in any way. Thus, serious objection is made to wire marks about the feet of mules that are to be worked in the mines, since these marks are easily affected by sulphur or other minerals with which the feet constantly come in contact in mines. However, such a blemish might not be objectionable on mules that are to be worked on farms. The most common unsoundnesses that are objected to and looked for are large spavins, puffs, sidebones, ringbones, bad eyes, and broken wind.

The conformation of mules should be indicative of strength and endurance, and their size should be suitable for the work

that they are expected to do. Mules that work on city streets usually wear out first in the feet, and because of this fact good, large, feet are an important consideration of the buyer when he is purchasing a mule for city use. For farm use the size of the feet does not command so much attention.

The general appearance of mules is an important market requirement, and is greatly affected by the quantity of flesh that is carried and the quality of the coat. The market demands that choice mules be in good condition and have enough flesh to round out their bodies. Many mule dealers make a business of buying mules that are in thin flesh, or poor, and fattening and then reselling them. The estimated value of the flesh thus put on the mules is 25 cents per pound. The market requires that the mules should show quality, which is indicated by a sleek, glossy coat of short hair, a coat of this description often being estimated to be worth about $10, and by firm, clean, strong bone.

The most desirable age for mules is determined somewhat by the market class in which a mule is placed; but in most cases the most salable age is from 4 to 8 years.

Color is of secondary consideration as a market requirement; dapple-gray mules are very popular in the draft class; but as a general rule bays, browns, and chestnuts are most desirable; and matched pairs usually sell for more than double the price of single mules. Action, also, is a minor consideration in mules so long as they are not sore in limbs and show vigor and energy in their movements.

27. **Market Classes of Mules.**—On account of the various purposes for which mules are used, there exists in the leading mule markets an active demand for large numbers of mules of distinctly different description as regards size and general conformation. In the East St. Louis mule market, which is the largest mule market in the world, all mules are sold in one of the five following market classes: *Mining mules*, *cotton mules*, *sugar mules*, *farm mules*, and *draft mules*.

28. **Mining mules** are such mules as are purchased for use in and about mines. Mules for this purpose must be compact

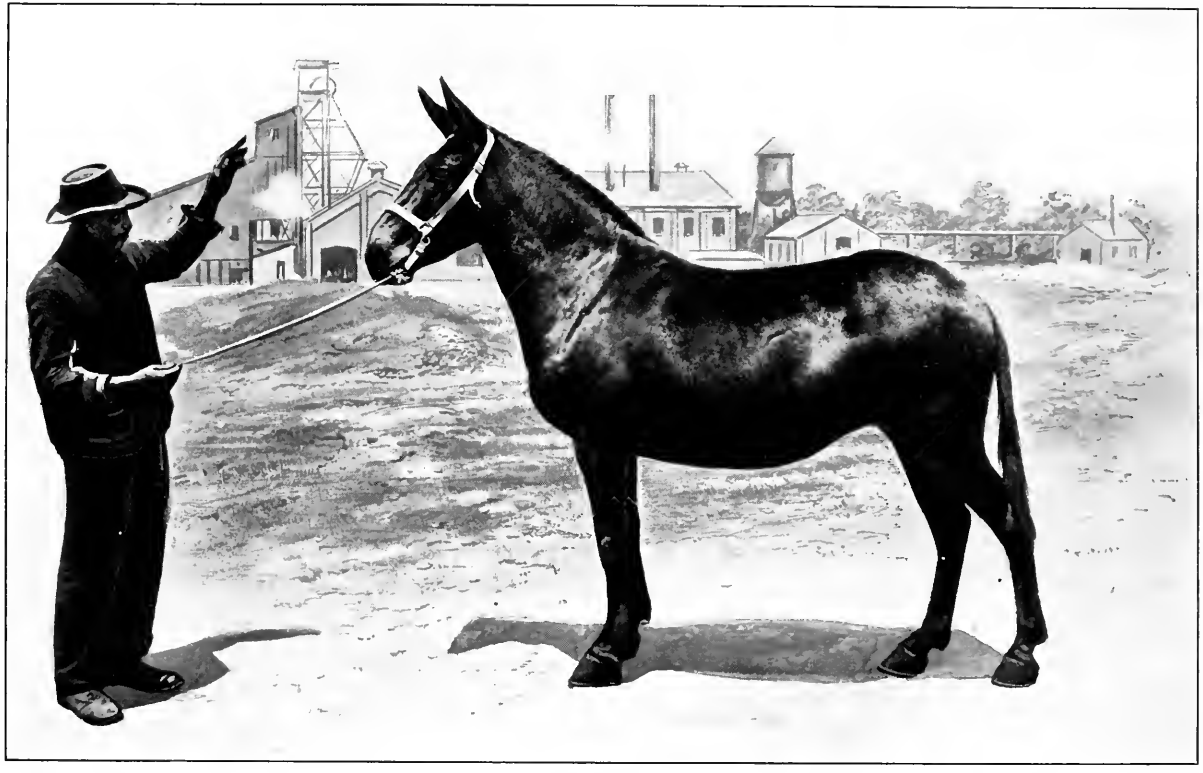

FIG. 10

Fig. 11

in conformation, have a short and deep body, short legs, strong and heavy bone, large feet, and be rugged throughout. Small mules used in mines where a thin vein of coal or ore is worked are called *pit mules;* their height will depend on the depth of the vein in which they are used. For this reason mining mules range in height from 12 to 16 hands and vary in weight from 600 to 1,350 pounds. The colors most sought in mining mules are dark bay and black. The mule shown in Fig. 10 is $14\frac{1}{2}$ hands high, weighs about 1,100 pounds, is a choice animal, and is typical of the market class of mining mules.

The demand for this class of mules in the large mule markets is strong and constant throughout the entire year and for this reason mining mules usually command very satisfactory prices. Male mules from 5 to 8 years old are more in demand than are female or younger mules, although well-preserved mules up to 12 years of age are readily salable.

29. Cotton mules are such mules as are used on cotton plantations for planting, cultivating, and harvesting the cotton crop. However, many mules that are sold as cotton mules never see a cotton field, but are used for many other purposes, chief among which may be mentioned the drawing of delivery wagons in the cities of certain sections of the United States. These mules show much quality in their general conformation. They have small, neat heads and compact bodies; and, as a rule, they have longer legs, smaller feet, are lighter in weight, and higher in proportion to their weight than are mining mules. In height, they vary from $13\frac{1}{2}$ to $15\frac{1}{2}$ hands; in weight, they vary from 750 to 1,100 pounds. A choice cotton mule $15\frac{1}{4}$ hands high, weighing about 1,050 pounds, and showing a high degree of quality and finish is illustrated in Fig. 11.

The demand for cotton mules is strongest throughout the fall and winter months, young mare mules from 3 to 7 years old being preferred.

30. Sugar mules are such mules as are sold in the mule markets to be taken to the sugar plantations of Georgia, Louisiana, and other Southern States for agricultural purposes.

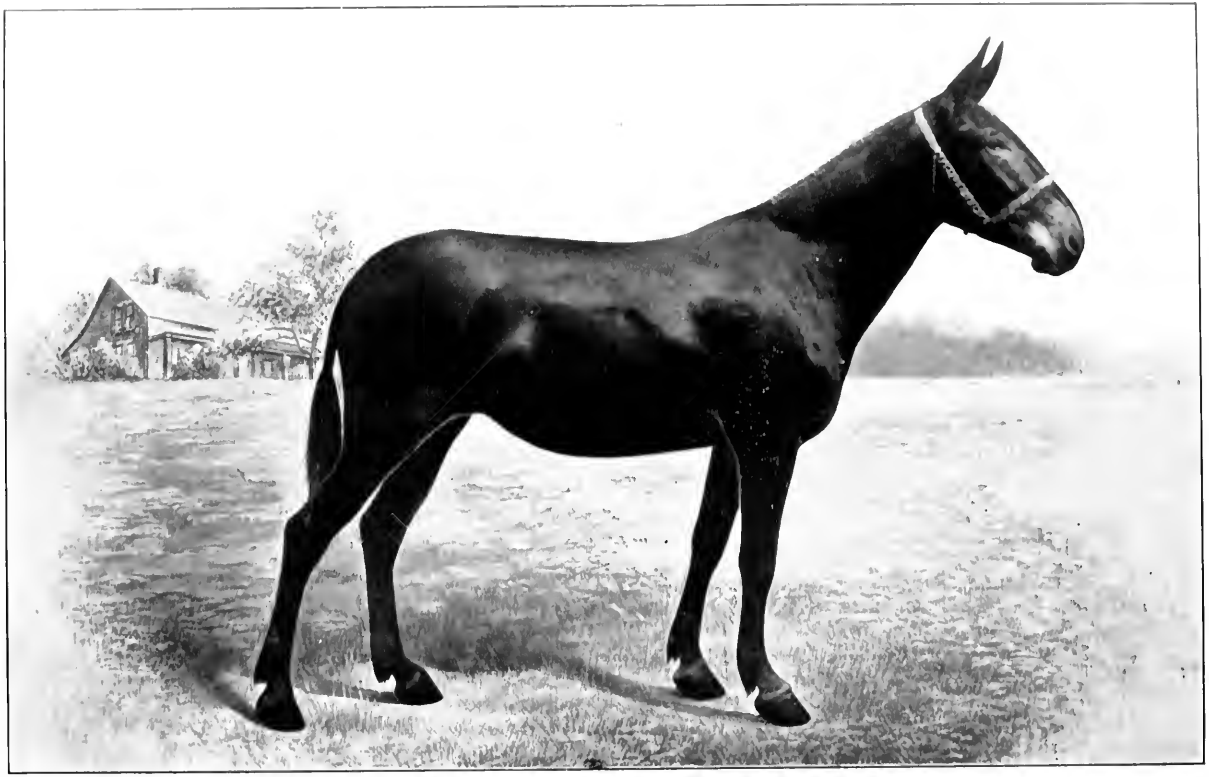

FIG. 12

They are larger, taller, have heavier bone, and usually have more quality and finish than cotton mules. For this reason the former usually commands a somewhat higher price than do cotton mules. The market—which for sugar mules is strongest during the months of September, October, and November—shows a preference for mares that are from 3 to 6 years of age. Sugar mules stand from 16 to 17 hands high and weigh from 1,150 to 1,300 pounds. A choice sugar mule $16\frac{1}{4}$ hands high, weighing about 1,200 pounds, and possessing much quality and finish is shown in Fig. 12.

31. Farm mules are such mules as are sold to be used for general farm work. Mules of this class lack uniformity in conformation, and do not have the style and finish that are required in all other market classes of mules. The lack of uniformity is due to the facts that farmers differ very widely as to the kind of mules that are best suited for farm work, and that many farmers desire to purchase young, thin mules then after working them for a year or more to fatten and resell them as mining, sugar, or cotton mules. Although farm mules, as they leave the markets, are likely to be rather plain looking and thin in flesh, they usually possess good constitutions, strong, clean bone, and fairly large feet. They usually stand from $15\frac{1}{2}$ to 16 hands high and weigh from 900 to 1,250 pounds. The mule shown in Fig. 13 stands $15\frac{3}{4}$ hands high, weighs about 1,150 pounds, and shows such quality and finish as is found in choice farm mules.

The demand for farm mules is not so great and they usually sell for less than mules of the other market classes. Sex and age do not have as much bearing on the prices of farm mules as these factors have on the prices of other classes of mules.

32. Draft mules, like draft horses, are large, strong, low-set animals with all the weight that can be secured with a draft-horse type of conformation. They are very rugged and well-muscled; the body of a draft mule is short, deep, and broad; the back is broad and short; the legs are large and clean; and the feet are large. They are extensively used for teaming, especially where heavy loads are to be moved; they are like-

Fig. 13

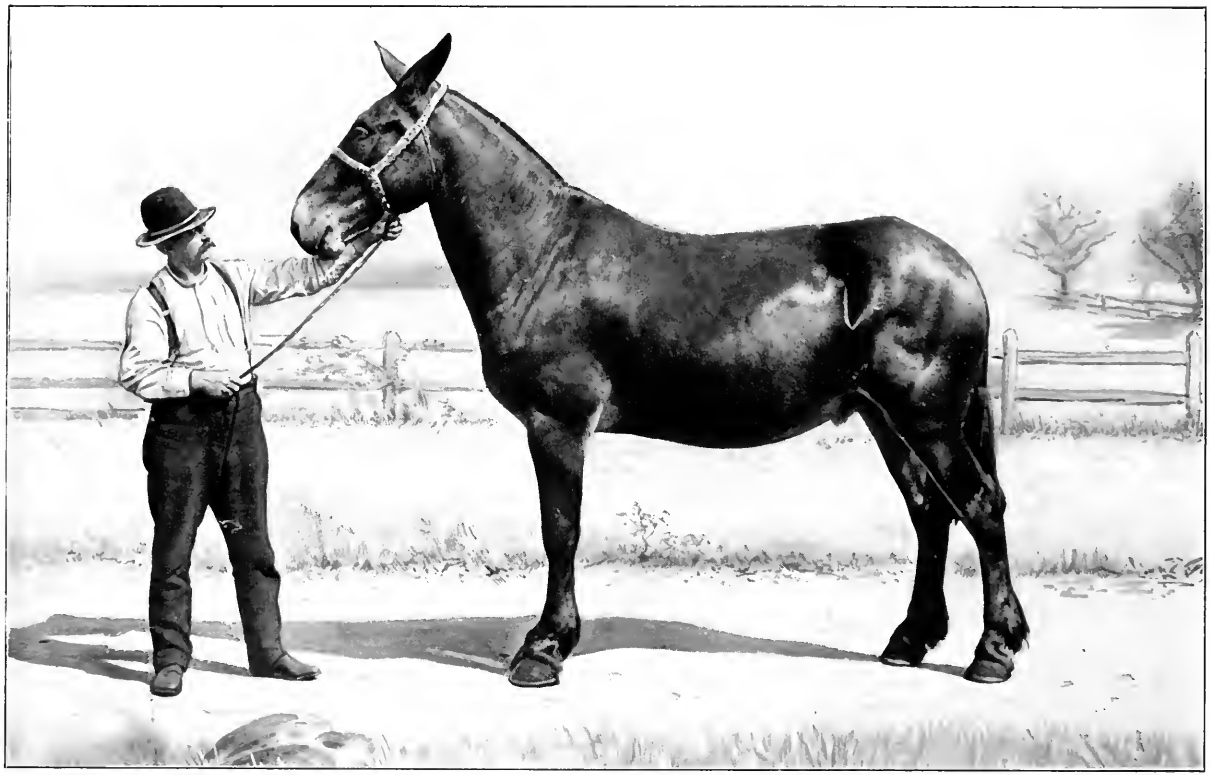

FIG. 14

wise used extensively by contractors for railroad grading, and because of this fact they are sometimes called *railroad mules*. The usual range in height is from 16 to 17½ hands, and the range in weight is from 1,200 to 1,600 pounds; although the latter weight is often exceeded. A large, rugged, choice, draft mule that measures 17 hands high and weighs about 1,500 pounds is shown in Fig. 14.

The demand for draft mules is strong and constant. Mules from 5 to 8 years of age are in greatest demand and there is little difference in preference in respect to sex.

33. Mule Raising.—The first essential to the raising of first-class mules is the selection of a good, sound mare with a deep, capacious chest, well-sprung ribs, close coupling, long and nicely turned croup, deep muscular quarters, broad thighs, smooth heavy bone, and large sound feet. If it is intended to raise mining or draft mules, a low-set mare should be used; if sugar and cotton mules are to be raised, a rather tall mare should be used. The more quality, style, and action that is possessed by the mare, the more pronounced these qualities will be in the mules. The theory is advanced by some mule breeders that an unsound mare, when bred to a jack, is more likely to produce a sound mule than to produce a sound colt when bred to a stallion, and, on account of this fact, there is a common custom of breeding unsound mares to jacks rather than to stallions. It must not be understood from this, however, that as good a mule can be raised from an unsound mare as from a sound one, for such is not usually the case. But the unsoundness, if it is reproduced in the mule, is not perpetuated, as might be the case in horse colts.

The second essential in raising choice mules is the selection of a jack that gets good, strong mules. A jack should not stand less than 15 hands high. He should have a large head, a rather heavy jaw, a tapering muzzle, and long ears that are heavy at their base and taper to a point; long shoulders; a deep chest; long, well-sprung ribs; a rather short, straight back; close coupling; a long croup; deep quarters; thick thighs; strong, heavy bones; and large feet.

A young mule taxes the energy of a mare more than does a colt, because the former is always pulling at the dug, or teat. The young mules should be halter broken and handled the same as colts, and as soon as the mules are weaned they should be placed in a pasture by themselves, because they are very mischievous and if placed in the same pasture with calves, sheep, or pigs will worry and perhaps injure them. Mules seem to thrive best if they are not tied up in stalls, but are allowed to run on pasture, and, during the winter months, especially in those sections where the winters are cold, have access to a warm shed or large box stall in a barn and are supplied with grain and hay.

34. Feeding of Mules.—Although the same general principles governing the feeding of draft horses will apply to the feeding of mules, the latter differ from horses somewhat in their habits of eating and drinking. Mules seem to know enough not to eat a large quantity of feed nor to drink too much water at one time or when they are heated by exercise. If a mule has his liberty after working hard all day and has access to feed and water, he will drink a few swallows of water, eat a few mouthfuls of feed, lie down and roll, and, upon getting up will repeat this routine for a dozen times or more during an evening. In this way he will consume a larger quantity of feed and water during the night and will keep in better condition than if tied in a stall at night. As mules consume their grain feed slowly, they should not be hurried at feeding time, and should receive a larger quantity of feed at night than at the morning or noon feed. They should be watered frequently, and as they drink very slowly they should not be rushed when they are drinking. As a rule, mules will not consume more than 1 pound of concentrates and $1\frac{1}{3}$ pounds of roughage per 100 pounds of live weight in a day. In general, the same kinds of rations that are adapted for the feeding of draft horses are suitable for the feeding of mules. A satisfactory ration for mules is 3 parts of corn, 2 parts of oats, and 1 part of wheat bran, if fed in connection with grass, clover, or alfalfa hay. Mules are very fond of corn fodder, and, if they are not worked,

can winter on it alone. Young, growing mules, mules that are being fattened for market, and mules that are being worked should receive concentrates in addition to all the roughage that they will eat. Some mule raisers, while fattening their mules, feed blackstrap molasses extensively to secure a fine coat of hair.

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NOTE.—All items in this index refer to the section (see the preface) and then to the page of the section; thus, in "Action in horses, §37, p10," means that matter relating to action in horses will be found on page 10, of section 37.

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