pend the following correspondence (Supt. Morrison):

Wm. E Clough, Chicago. Dear Sir—I send you to-day by express three tubs of butter. Perhaps you are not aware that the butter I had sent you since the middle of last November (4,000 pounds) was made from the milk of cows that were fed daily from 45 to 50 pounds of corn ensilage, with wheat bran and hay.

As the ensilage is now all fed out, I write to ask how this butter will compare in quality with that I have sent previous winters.

I wish you to give your opinion frankly, so that I may determine whether I had better fill my silo again or not.

Whitewater, Wis., May 1. C. R. BEACH.

C. R. Beach. Dear Sir—Answering yours of May 1st, I would say that your butter during the past winter has given eminent satisfaction to our best trade. It has sold promptly, and been inquired for often by parties desiring fine butter, who often wait from day to day to get the goods rather than take any other. The desire to obtain it has been more marked this winter than ever before. We hand you herewith returns, shipments received to-day. Buyers were waiting for the goods when they arrived. Thanking you for continued favors,

Chicago, May 2. WM. CLOUGH.

I shall plan to fill my silo again.

CHAS. R. BEACH.

THE BUILDING OF SILOS.

By JOHN GOULD, Western Reserve, Ohio.

Disadvantages of Stone.—The apparent abandonment of stone, or concrete, for the building of silos, and the almost universal adoption of wood in its place, has brought out a considerable inventive skill on the part of the builders. The reasons for discarding stone arise from two principal causes. Stone is not always abundant when needed, and the attending cost is often more than the farmer cares to assume. Stone, too, is a poor material with which to build to secure the now desirable ripened or sweet ensilage. Being a remarkable conductor of both heat and cold, it first absorbs the developing heat of the ensilage, and prevents the material along the walls from approaching 125°, now demanded. In cold weather, the reverse becomes true, and the warm ensilage on the one side of the wall condenses the entering frost on the inner surface, and there is a loss of more or less ensilage by mold, decay and kindred wastes. This is not so pronounced with the silo built of lumber, boards and paper. The wood being a good non-conductor of heat and cold, these influences play an unimportant part. The ensilage heats up readily against the walls. The frost has but little influence, and the waste is trivial, the greater part being in the corners, a matter which can be remedied by filling in the angles each day with hot ensilage from the center of the pits.

The Wooden Silo.—How shall the wooden silo be built? There are several variations of the same plan, for the silo must be a box of varying dimensions, usually twice as long as wide, and as deep as wide, though now the silo is often found twenty-five feet in depth, and with apparently corresponding good results, as the deeper it is, the greater its own settling weight. The silo in the
THE BUILDING OF SILOS.

barn, and the one built as an addition or annex to the barn, differ only in this: The latter must be provided with a roof, and, for appearance sake, should have a siding of some description. The silo inside the barn wants neither, as the sides of the barn make its outer cover, and the one roof covers silo and barn alike.

A Strong Building Needed.—The wooden silo needs to be a strong building, and well secured at the sills, to prevent spreading, and at the top to guard against springing out of the building. This is not so much to be guarded against in the barn-silo, as the frame of the building increases the strength of the silo walls.

Building in the Barn.—In building a silo in the barn, it is not economy to try to make the barn answer in part for the other. The silo should be built independent of the barn, i.e., it should have its own frame work, although the studding can be much lighter than the out-door silo. Nor should any attempt be made to join wood and stone in silo building. If there is a stone wall under the barn, let the scantling for the silo go down inside it to the ground, and so leave an air space between the stone wall and the silo lining. The same objections are met with in this case as in the stone silo, and it is hard to join wood and stone so there will be no giving way of the joint, and air will enter. The whole secret of silo building is to make air-tight walls. The floor or cover are not nearly as essential to the securing of No. 1 ensilage.

Plans and Diagrams.—As it is very difficult to give any plans to guide one in building silos inside of barns, the accompanying diagrams are for silo annexes to barns; but this much is common to all. The inside lining and fixtures of one are just as applicable to the other. It is proper to say that the illustrations accompanying this text, were drawn by Mr. A. P. Gould, of Canton, Ohio, expressly for this article.

Fig. I, p. 82.—Shows a good way to make a secure foundation. The soil is all excavated from the floor to the depth of about one foot over an area covering the outside measurement of the walls. A trench is then sunk, just inside this excavation, and built up a little above the outside surface of the soil, as seen at A. A sill, 8x8, is bedded into the inside foot of the wall at B. The studding C, for the frames, is cut with a shoulder,
and set on the sill, the spur going down inside to the earth floor, D. The studding for the building should be 2x10 inches, and set 16 or 18 inches apart on the sill. The inside lining of the silo comes down close to the natural soil of the floor, F. By this plan, the trench affords needed drainage, and the slight excavation gives the wall the back sup-

port of the natural earth, G, and is not only thus made secure, but gives "dry footing" to a building that of necessity must be built with sills close to the ground.

Fig. 2, p. 83.—Shows the same general outline, except that the stone work is dispensed with, the sill P being bedded in the mass of cement depicted. To prevent the building from spreading, cross sills, N, 2x8 inches, are framed into the sill, P, at the lower side, crossing to the opposite sill. The studding, B, is mortised into the sill, and the silo is lined up inside with two thicknesses of inch boards, 8 or 12 inches in width, as shown, breaking joints with a half lap, the tarred paper, S, being between them,

Fig. 1. Foundation of Silo (For Description See Page 81).

the three strongly nailed to the studding, B.

Fig. 3, p. 84.—Gives the general form of construction of the silo, with the corner "cut away" so as to show the framing. P is the sill; B B B the studding; A the corner post, showing the crossed corner; T the door; E E the inside lining, the same as Fig. 1; H
is the siding lumber of any sort; R is the inside plank partition, fitting into the grooves, S S S. This partition is made of two-inch plank with jointed edges, not matched. As the filling of the silo progresses, the planks are added as required, until the top is reached. When feeding out the ensilage, the pit is better than jointed plank. To prevent the planks from springing by each other, two or three pins can be put in each one, fitting into corresponding holes in the plank above. The rest of the cut is self-explanatory, and aside from the siding wall, represents a silo in a barn interior.

**Fig 2. Foundation Showing Sills Bedded in Cement (See Page 82).**

K is first fed. Then the cover is removed from the next pit, and as the feeding progresses, the planks are removed one by one. They should be numbered so as to be replaced in order when refilling the silo. If a solid partition is thought best, 2x4 scantling will be set up across the silo in placing the planks, and ceiled up, both shown in Fig. 7, but it does not appear wherein it

**Fig. 4. p. 85.**—Shows an enlarged view of the corner in fig. 3, and will be readily comprehended by any carpenter. The inside lining boards, D C, are cut in at the ends, and crossed; the 4x4 scantling, A, being set in the angle. The studs, B B, are set in the two outer angles. The boards are first nailed to A. When the first lining boards, J J, are all in place, the studs, B B, are put up, and
nailed to from the inside. The second lining boards, E E, are simply cut with a square end, and nailed tight to B B. This gives a corner of great strength, that it is impossible to pull apart or burst through. F G are false studding walls from springing out at the top. By the plan it is seen that no plate is used, and the rafters, K K, 2x8 inch, are spiked to the top of the studding, B. The under cross ties, L L, are 1x8, and at the heel, are nailed strongly to the

**Fig. 3. General Form of Construction of Silo. (See Page 82.)**

to build out the corner to nail H H to, so as to give the corners a finished appearance.

Fig. 5, p. 86.—Shows the plan of truss roof, to not only strengthen the building, but also keep the opposite side of the stud from K. The three can then be clinched by using wire 20d. nails

Fig. 6, p. 87.—Is an enlarged plan of fig. 5 at K, and is, with fig. 5½, p. 87, clearly depicted.
Fig. 7, p. 88.—Shows the two forms of partitions, plank, double, B, and ceiled on scantling A. The planks are held in place by cleats fastened to the walls, and the other partition is tied into the walls at A, and secured by the scantling C.

Fig. 8, p. 89.—Shows the silo complete. The Dormer window is placed over the center of the partition, so that when

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**Fig. 4. Enlarged View of Corner (See Fig. 3).**
SECTION OF TRUSS:

Fig. 5. Plan of Truss Roof (For Description See Page xx).
Fig. 6. Showing How Rafter are Spiked (See Page 84)
the carrier of the cutter is run in through this window, the ensilage can be distributed at will in either pit. If preferred an aperture can be cut in under the eaves, and one need not be at the expense of the roof window.

If only one thickness of lumber is used the paper will add no value, as it will spring away from the boards between the studding and allow the free admission of air between paper and board. Taking cost of No. 1 flooring, and two

**FIG. 7. PARTITIONS OF SILO (For Description see Page 85).**

**Inside Facing.**—A few words about the inside facing of the silo. While there is no absolute rule about silo building, the air-tight wall cannot be lost sight of, and some contend that, for the inside face, paper first put upon the studding, and then covered with one thickness of matched flooring, is all that is required. Thicknesses of common inch boards, the difference is but little, and then if the paper is put between the two, a solid air-proof wall is secured. Matched lumber is liable to have the grooving broken by swelling, and a defect is at once made in the walls, which cannot happen with the other method, as shown
in Figs. 1 and 2. The last, a finishing lining, E, in Fig. 2, had best be surfaced on one side to prevent, as much as possible, dragging in the settling ensilage.

Painting—Floor.—The wooden silo needs a cheap, water-proof paint to secure it from decay. So far, coal tar, made and applied boiling hot, and reinforced with some rosin, to give solidity to the tar after application, is probably as cheap and durable as any substance, although pitch, and other roofing paints that harden well, are each and all good. The floor may be thinly covered with
cement plaster, but it has very little superiority over clay well pounded down, and allowed to come up a few inches on the inside of the silo walls, as seen at D in Fig 1.

Cost.—The cost of a silo is impossible to tell without all the incidentals and conditions of building, but it may be safely said that it varies from about 50 cents per ton for the cheapest, to $1.50 for the most expensive. Its cheapness, however, is apparent for the outlay for storage for 2½ tons of ensilage is reckoned as against the storage for hay. The former occupies less than 125 cubic feet, and the ton of hay over 500. So silos cost far less than hay barns. What silo building may develop into in the future no one can tell, but it would appear that the changes in the future will be far less than in the past, and silo building has now reached somewhere near definite rules.