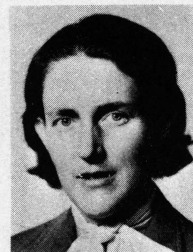


Serpentine cattle chute gives handling advantages



By Temple Grandin

A CURVED chute is more efficient than a straight chute for two reasons. First of all, the cattle can not see the restrainer or stunning pen until they are part way up the chute. Secondly, a curved chute, with the handler working along the inner radius, takes advantage of the natural tendency of cattle to circle around a person. You have probably noticed that, when you walk into a pen of cattle, the animals will turn and face you. A curved chute takes advantage of this natural behavior.

A well-designed system with a curved chute and a well-planned stockyard will often reduce labor requirements. One less man is usually required, compared to a system with a straight chute. When a curved chute is constructed in an area with abundant space the recommended inside radius is 12 ft. or greater. The handler should work from a catwalk which runs alongside the inner radius.

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A serpentine chute system designed by the author provides the advantages of a curved chute but it requires much less space. This is especially beneficial when a plant is being remodelled and space is limited. A serpentine chute system was recently constructed at Moyer Packing Co. in Souderton, Pa. Two persons can drive 150 cattle per hour into a conveyor restrainer. A third person receives the cattle. This system could easily handle larger numbers of cattle.

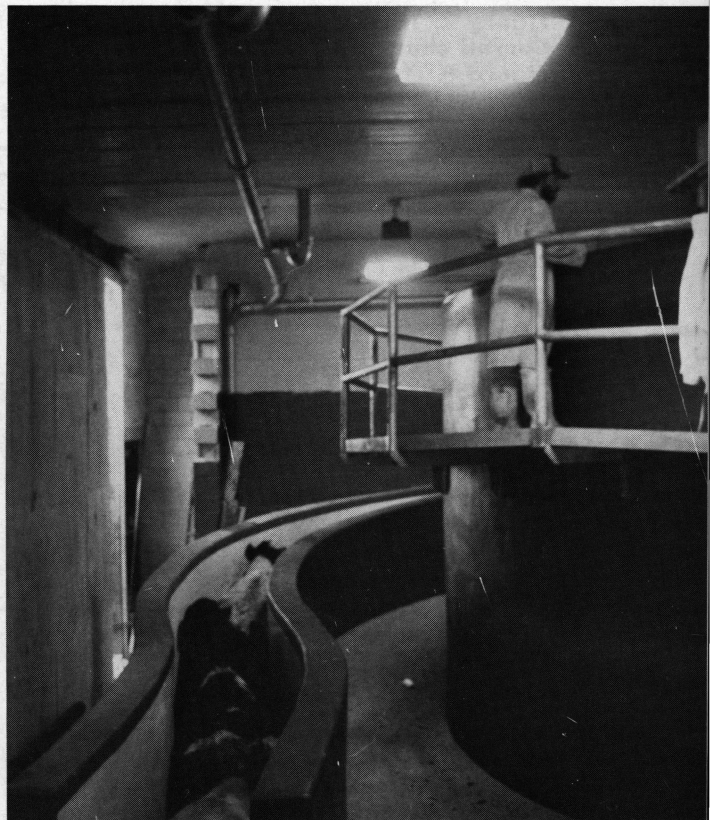
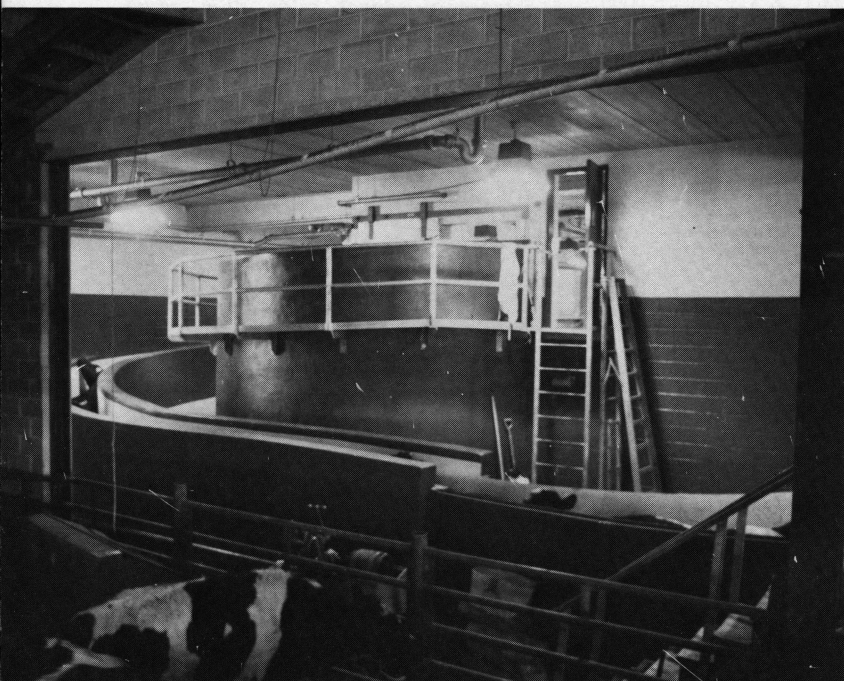
The serpentine system (Figure 1) consists of two curves with a 5-ft. inside radius. The chute must be constructed in a continuous smooth curve to enable the cattle to move easily around the tight bends. The serpentine

chute must not be built in a series of straight sections. Cattle move rapidly through the serpentine. Any downers can be easily pulled out after they are stunned. The first 10 ft. of single file chute where it joins onto the crowd pen must be relatively straight prior to the first 5-ft. radius bend. A straight section is essential to facilitate entry of the cattle into the chute from the crowd pen.

Since the chute is laid out in a serpentine design, the handlers sometimes have to work from the outer radius instead of the preferred inner radius. The handlers should station themselves at positions 1, 2 and 3 on Figure 1 and remain along the inner radius as much as possible, moving to the outer radius only to push crowd pen gate or move balky cattle.

Figure 2 illustrates an idea for a spiral ramp to a restrainer that circles over itself like the ramp in a parking garage. The advantage of this layout

BELOW: Serpentine ramp at Moyer's takes up relatively little floor space. Barrel-like structure is a curved ramp leading up to conveyor restrainer. **RIGHT:** Cattle easily enter ramp. First 10 ft. must be relatively straight before cattle encounter the first tight bend.



is that the handler would always be working from the preferred inner radius. The diagonal pen layout in Figure 2 eliminates sharp corners and provides oneway traffic flow. The entire system will fit inside a rectangular building. The serpentine chute in Fig-

ure 1 also can be used with the crowd pen and stockyard layout in Figure 2.

Crowd pen and storage lane

In plants slaughtering over 100 head per hour, a storage lane is essen-

tial. Cattle are often difficult to drive out of the stockyard pens and directly into the crowd pen. The storage lane should hold a minimum of two crowd pen loads of cattle, and preferably more. A storage lane which holds two crowd pen loads of cattle also will make handling more efficient in smaller plants. Cattle can be moved most efficiently into the crowd pen in 15- to 18-head groups.

To reduce bunching at the junction between the single file chute and the crowd pen, one side of the crowd pen should be straight and the other side should be on a 30-degree angle. Never build a crowd pen on a ramp. The cattle will pile up against the crowd gate. The crowd pen floor should be level except for a slight drainage slope. The ramp should be in the single file chute.

Design of chutes

The chute should be 30 in. wide for steers and cows. If bulls are slaughtered the chute can be widened to 32 in. The single file chute, crowd pen and curved holding lane should all have solid fences. Cattle have wide angle panoramic vision and the solid fences prevent them from seeing people and other distractions outside the fence. The crowd gate should also be solid to prevent the cattle from turning back towards the stockyards.

The sides of the chute should be

Figure 1. Serpentine chute system provides all of the advantages of the curved chute but it fits in a much smaller space. The single-file chute has two bends with 5-ft. radii.

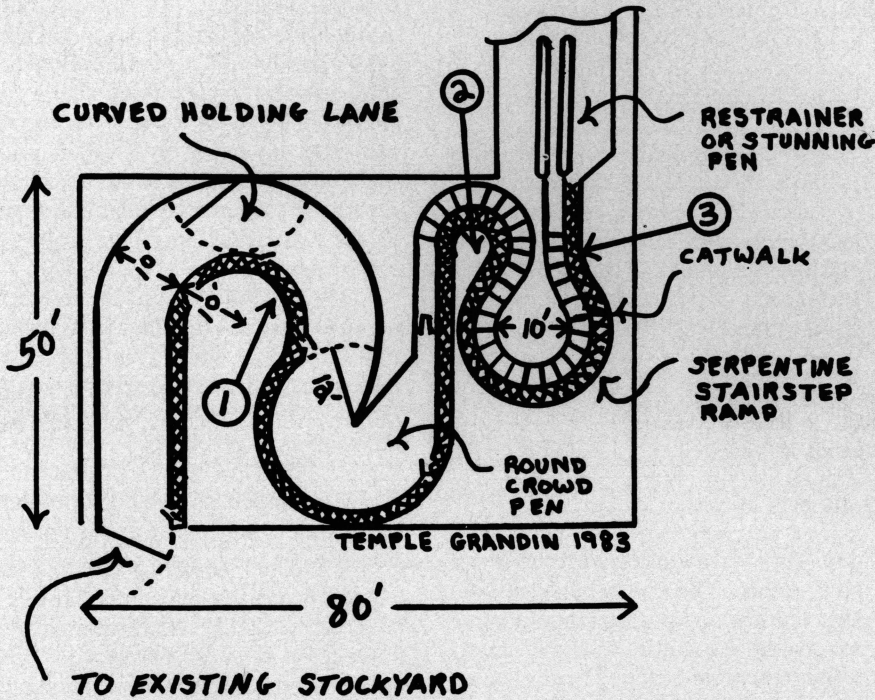
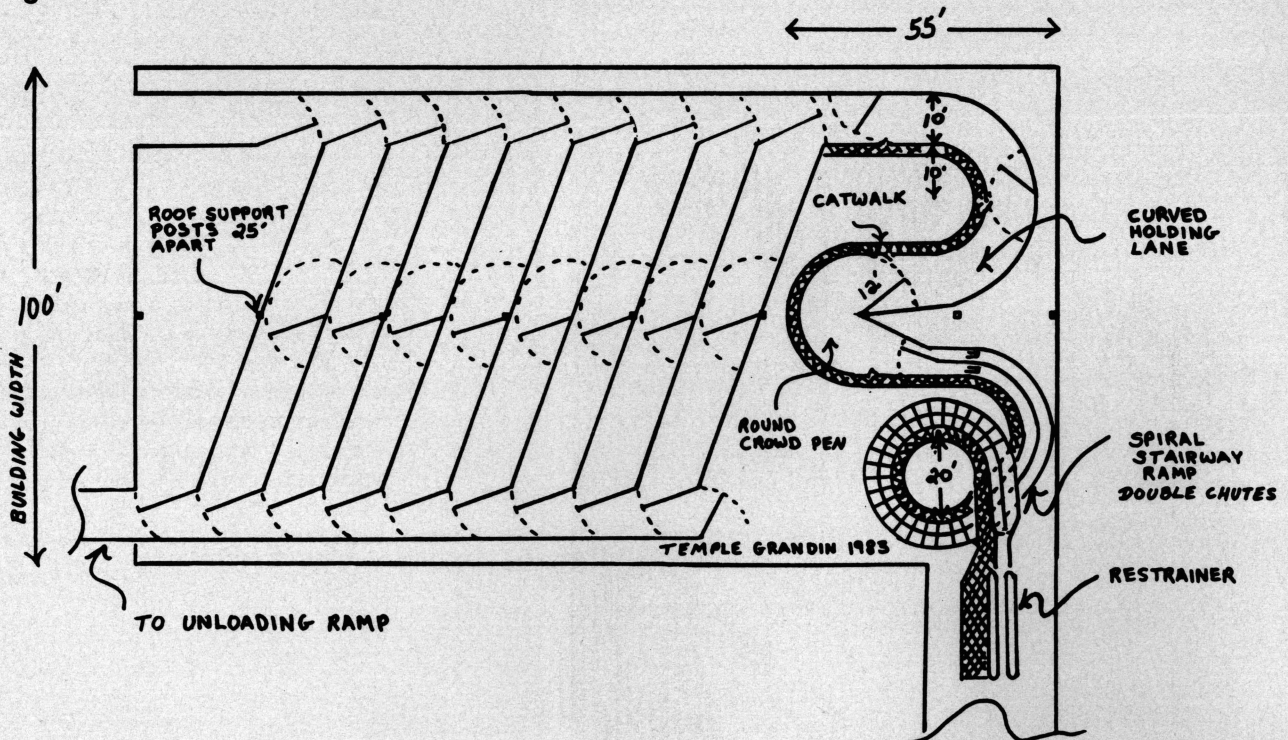


Figure 2: This system, with its curved chutes and diagonal pens, will fit in rectangular building. Curved chute circles like spiral ramp in a parking garage. The pen layout also can be used with Figure 1.





Handler works along one of the 5-ft.-radius bends in chute. Cattle move easily through curved chute with solid sides.

solid, but the animals must always be able to see a pathway of escape. Sliding gates and one-way gates should be constructed so that cattle can see through them. Cattle will balk if the chute appears to be a dead end. To prevent the animals from being "spooked," the tailgate of the stunning pen should be solid.

Cattle often will refuse to approach visible people. Shields for handlers to stand behind will reduce balking. In areas with solid fence, man-gates must be installed to enable handlers to get out of the way of cattle. The

best man-gate design is an 18-in.-wide metal door that opens inward towards the cattle. It is held shut with a spring and there is no latch. Walkways for the handlers should run alongside the chutes and not overhead. The ideal dimension is 42 in. from the top of the fence to the level of the walkway platform.

Prevent bruises and injuries

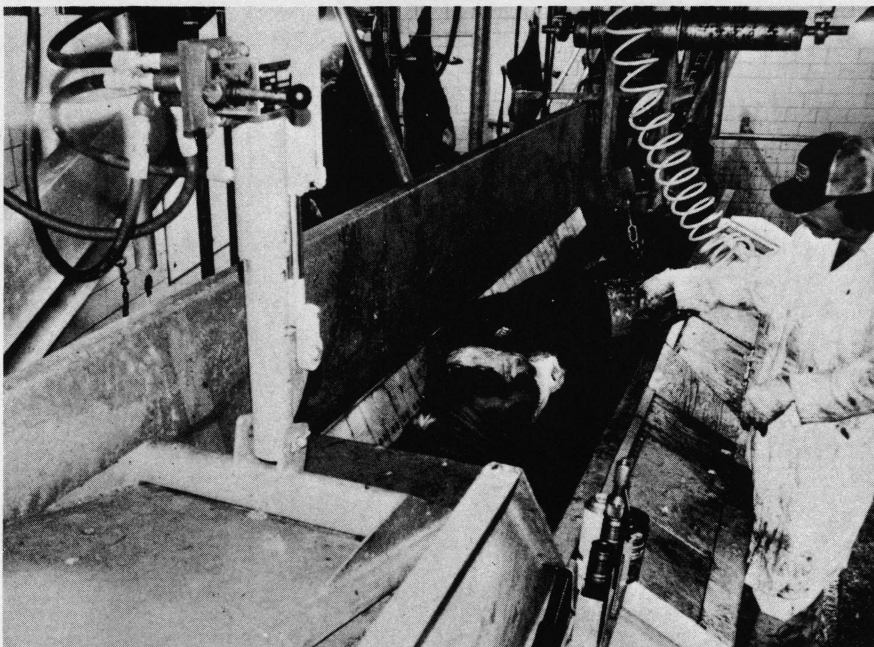
The inside of the chute should be smooth to prevent bruises. An object with a small diameter such as the edge

of an angle iron is most likely to bruise. Many people do not realize that stunned cattle can still be bruised. To prevent slipping, a ramp should be constructed with stair steps. The recommended minimum dimensions are a 3½- to 4-in. rise and a 12-in. tread. At Moyer's, a more gradual ramp was constructed with 3½-in. by 24-in. steps. It is working very well. New flooring should be scored in an 8-in. diamond pattern with 1½-in. by 1½-in. V grooves.

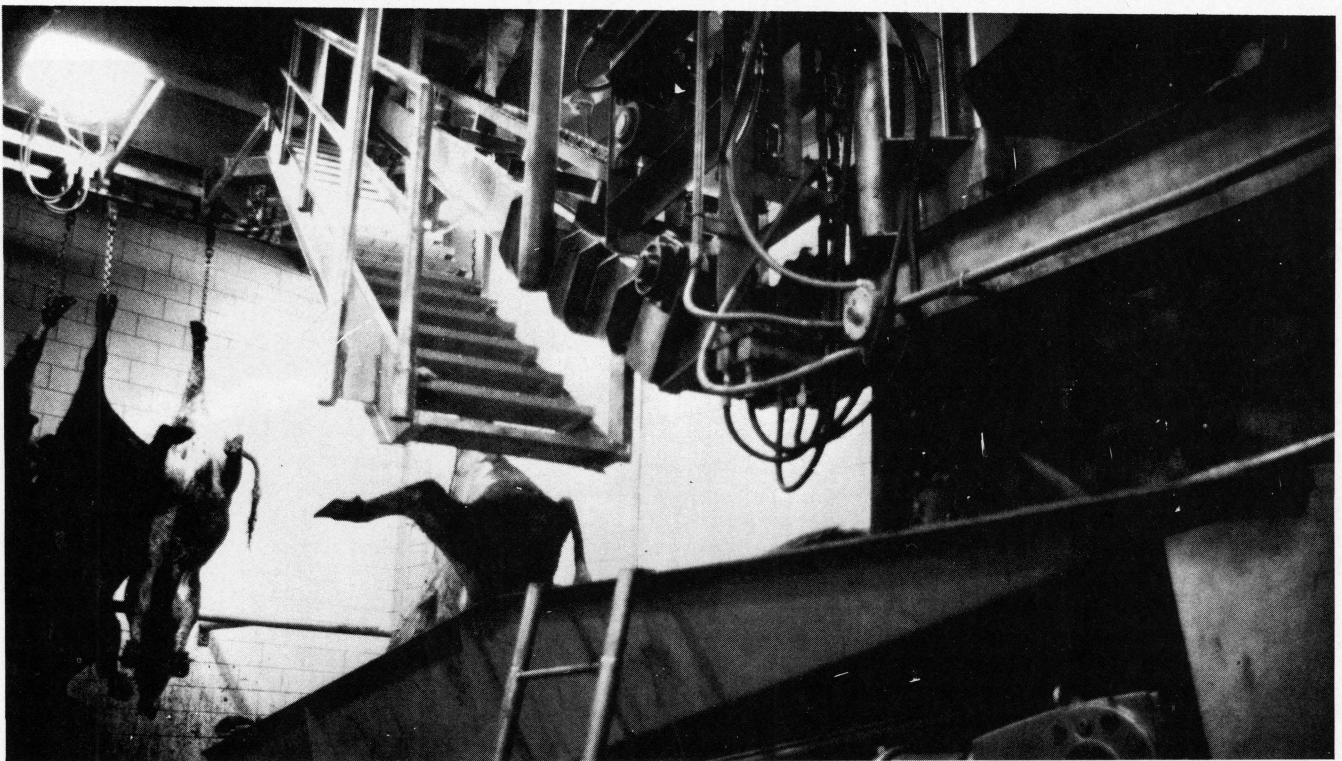
Lighting

Cattle tend to move from a dimly illuminated area to a more brightly illuminated area, provided that the light is not glaring in their eyes. Lamps can be used to attract cattle into chutes and to make them hold their heads up for stunning.

Cattle will often refuse to cross a drain grate or shadow. In new facilities, drains should be placed outside the areas where cattle will walk. It is sometimes difficult to persuade cattle to enter a building from outside. To facilitate the movement of cattle into a building, the building wall must *never* be placed at the junction between the single file chute and the



Hold-down rack at the entrance to the restrainer is equipped with a hydraulic cylinder so that it can be adjusted easily for right height. Such proper adjustment facilitates stunning.



View is of the takeaway conveyor and the incline conveyor. Rail leading to bottom of incline slopes upward slightly from restrainer to maintain tension on shackle chain.

crowd pen. If the crowd pen is outside, the single file chute should extend at least 10 ft. beyond the wall. The cattle will enter more easily if they are lined up in single file before they enter the darker building. The other alternative is to construct a building over both the crowd pen and the chute. Even if the stockyard is totally enclosed an interior wall must *never* be placed at the junction between the crowd pen and the single file chute.

Conveyor restrainer system

The serpentine ramp at Moyer's leads up to a Boss conveyor restrainer. Replacement of a stunning pen with a conveyor reduced bruises. The conveyor restrainer consists of two conveyors which form a V. The animal is held between the two conveyors with its legs protruding through the bottom. While it is held in the restrainer it is stunned and shackled. The stunned animal is discharged from the restrainer onto a take-away conveyor. The shackle trolley travels along a rail beside the restrainer and is picked up by an incline conveyor which transports the stunned animal

After discharge from restrainer, stunned animal is conveyed on slat conveyor. Transfer to incline conveyor is smooth because metal shield prevents animal from becoming tangled on tension rod.

to the bleed area.

The restrainer entrance has an adjustable hold down rack which can be easily adjusted with a hydraulic cylinder. Proper adjustment is essential. If the hold down is too high, the cattle will climb over each other; if it is too low, they will refuse to enter the restrainer.

The system at Moyer's has several new features that make the shackling system operate more smoothly. The takeaway conveyor runs at a high rate of speed to keep the trollies moving. They move quickly past the bottom of the incline conveyor when the feed

switch releases. The takeaway conveyor is on a 10-degree slope. A steeper slope is undesirable because the stunned animal will slide and increase the possibility of joint damage.

The rail between the restrainer and the base of the incline slopes up slightly towards towards the incline. This feature helps to maintain tension on the shackle chain and prevents the shackle from falling off. The configuration of the shackle system was designed by the author. The installation of the restrainer and construction of the shackling system was done by Landis Welding. □

