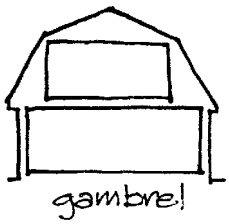
Roof Pitch and Building Form

Part II

by Gordon F. Tully

A quick look through any 19th Century suburb will convince you that many other roof forms are possible in addition to those discussed last month in Part I.

The gambrel roof, which involves setting a shallow-pitched gable on a steeply pitched lower roof, can be used to solve second-floor space problems. It is an ingenious solution, since it alleviates the thrust problems noted in



last month's column. The thrust from the upper roof is taken out at the break in the roof by horizontal ties, and the lower roof adds little thrust of its own.

Properly done, a gambrel can be quite handsome—but it all hinges on proper dimensions and details. Most gambrels are improperly constructed, however.

Because the side roof is nearly a wall, gambrels look best on small houses in which the roof and walls are constructed of the same material. Personally, I like the big, hulking gambrels you sometimes see on turn-of-the-century houses.

The Mansard roof (named after 17th Century French architect Francois Mansard) is a very specific form with strong historic associations. It is practically synonymous with the Second Empire style, which prevailed from the 1860s through the 1890s, and is very similar to a gambrel. Whereas gambrel roofs have only two sides, Mansards always have four. (Gambrel is to gable as Mansard is to hip, so to speak.)

Like gambrel roofs, Mansards are difficult to construct. The upper roof should have a low pitch and the lower one should sweep to a wide overhang, with the top of the lower roof well inboard of the wall below.

It goes without saying that neither the Mansard nor the gambrel can be "glued" successfully to an otherwise rectangular two-story building. This fact has never deterred the economy-minded builders who scar the landscape with this "Neo-Burger-King" style, however.

Shed roofs are indispensible in small doses—over a porch or as an appendage, for example. Larger sheds evoke a form of modernism known in real-estate circles as "contemporary." They were celebrated by an excellent architect, Charles Moore, who wrote a highly recommended book called *The Place of Houses*. My view is that shed roofs are very hard to use and a real plague at their worst.

Solar architecture relies highly upon sheds. In the extensive solar work done by our office, we struggled mightily to remove the "shed curse." One trick is to combine sheds and hips.

Mix and Match

In fact, all of the basic roof forms can be combined and mixed in endless variety. For example, adding a small gable at the end of a hip roof creates something vaguely Polynesian, but handsome nonetheless.

Adding a hip to the end of a gable can enhance an otherwise plain building, as in a few 18th Century Virginia churches. Queen Anne style houses from the late Victorian period are based on this mixture of hip and gable roofs.

Complex plans usually require that several roof forms intersect. The simplest intersections are hips or gables set into larger ones—dormers, if you will. When intersecting two roofs of different widths, ridge and eave can be held level by varying the roof pitches; if the pitch remains constant, the ridge or eave or both can change height.

Each decision has to detail consequences that need to be considered early on. Both hips and gables can intersect at angles. When complex forms interesect at angles in the plan, it's almost inevitable that small sections of flat roof will develop. These normally do not create visual problems, but they must be carefully detailed.

One very useful roof combination is a perpendicular gable set flush with the side wall (a big dormer, if you will) that has the same eaves, ridge and pitch as the parent roof. The details where the gable-dormer meet the main roof eaves are hard to work out, because the eave of the main roof suddenly becomes the rake of the gable at that point.

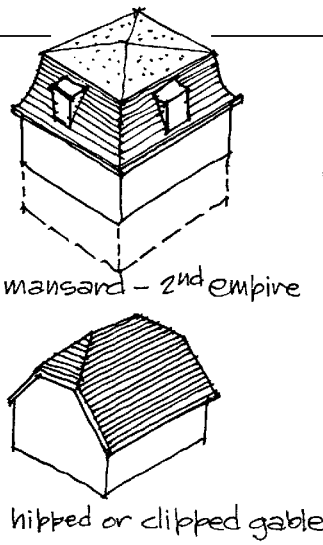
Look at examples from the late 19th Century for ingenious solutions to this problem: A generous overhang helps a lot.

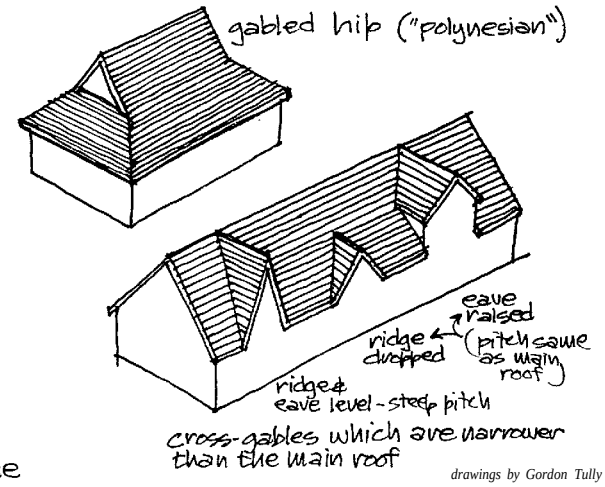
I offer one rule for deciding which roof to use in a house design: Consider the roof form from the beginning as part of the design problem. Plans should be worked out with a roof form in mind, and the overall massing should be checked frequently as the plans develop—particularly in multi-story houses. (Small study models, made of brown cardboard at the scale of 1/8" to a foot with stuck-on windows of "Zipatone" are indispensible.)

Once a satisfactory roof is worked out on one principle, it is easy to change the pitch, overhangs and other details—or even switch from hip to gable or shed—as the design develops. But you can seldom come up with a good house by doing a plan with no thought of the roof.

We will return to the design of roofs in a future article and cover some of the special forms not discussed here, including turrets, clerestories, butterfly dormers, roof pockets that allow dormers to be set further into the roof and roof decks. And since careful detailing at the eaves can make a huge difference in design, I hope to spend time trying to generate some excitement about the seemingly mundane subject of eaves. •

Gordon F. Tully is president of Tully & Ingersoll/Massdesign Architects in Cambridge, Mass.





drawings by Gordon Tully

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