WEBSTER DEFINES a wildcat cartridge as "having a bullet of standard caliber but using an expanded case, or a case designed for a bullet of greater caliber necked down for the smaller bullet."

It may have been that simple when gun buffs first started wildcating commercial cases, but today there are as many wildcat cartridges "necked up" by expanding to a larger caliber as are necked down. The case body is often expanded for less taper and greater powder capacity, but in other instances the taper is left the same and the shoulder blown forward to gain more boiler room.

If the parent case capacity is to be greatly increased, the body may be expanded and the shoulder pushed forward simultaneously. Neck length on a short-necked case can be increased by pushing the shoulder back, leaving the overall case length unchanged. With some cases that have heavy body taper — the .300 and .375 H&H cases being prime examples — the shoulder may be pushed back and the neck cut off to form a shorter case, but the body can be blown out resulting in more powder capacity than the original. If less capacity is the wildcatter's goal, the original shoulder is simply pushed back and the neck shortened.

In making any of these changes, the case may be necked up to accept a larger caliber bullet, necked down to hold a smaller bullet, or left in the original caliber. When a wildcatter is working with a mild shoulder angle and thinks a more acute angle will achieve the desired performance, the angle is changed with the other dimensions unchanged. In fact, about anything that is done to change an original case's dimensions can be considered wildcating. Some wildcatters have even gone further and made bullets in diameters unavailable from commercial sources — the .230 caliber being an example.

Although it is not possible for the average wildcatter to extend the overall case length, it can be accomplished by the redrawning process. If an obsolete case is needed and another case of the same head size is available, the longer case can be formed via the redraw method — an example being the use of .30-40 cases to form .35 Winchester. This could certainly be considered a sophisticated form of wildcating.

The question is often asked why good commercial cases are wildcatted and what, if any, improvements emerge from the wildcat cartridge. Today this is a moot question, but it was not always so. We now have many good commercial cartridges in various calibers with cases of different powder capacities, most with shoulders of around 25° — an optimum for most loads and hard to improve upon. I suspect the biggest complaint the knowledgeable handloader has against some modern cases is the excessively short neck. All in all, modern cartridge cases have filled the caliber gaps, but it should be remembered the wildcatter brought this all about.

For those who are not familiar with wildcats vs. commercial cartridges, a few examples may reveal the lack of ingenuity the major arms companies exhibited over the past fifty years or so.

Well-informed gun people knew what great cartridges the .22-250 and the .25-06 were for many, many years before the big arms companies would admit it, although similar cartridges were designed and marketed in the meantime. The .22-250 was developed back in 1934-1937 by various wildcatters, but not loaded commercially until 1964. It immediately became a best seller. And if that sounds like the outcome of a ten-mile turtle race, the .25-06 wildcat was around in the 1920s but not loaded commercially until Remington chambered it in the Model 700 in 1969! Many other commercial cartridges have been the fruit of some wildcatter's efforts, including the 7mm-06 and .285 OKH which became the .280 Remington many years later. The 7mm
Remington Magnum had been made by necking up the .264 Winchester case for years, and fueled by other big 7s like the 7mm Mashburn publicized by Warren Page. There were also various wildcat .333 magnums that evolved into the commercial .338 Winchester and .340 Weatherby.

Wildcatting grows from many reasons and spans the spectrum from hard knowledge of interior ballistics to the outgrowth of a passing whim. Our most efficient cartridges are based on the former, while the latter produces cartridges of little practical value except to the fellow who dreamed them up. Usually, however, the designer has some specific ballistic criteria in mind that no commercial cartridge provides, and has the knowledge to attain them.

Perhaps the foremost reason for wildcatting has been to attain better performance for hunting cartridges. Some situations call for increasing case capacity with the resultant higher velocity for flatter trajectory and greater retained energy. Yet others demand a larger caliber with heavier bullets for use on larger game while not compromising velocity for greater shock and reasonably flat trajectory. Some cartridges are wildcatted by blowing out a long case and then chopping it off to function in a short action, but retaining both the caliber and velocity of the original case.

The long-range target shooter may wildcat a cartridge in an attempt to gain high velocity with a bullet of great ballistic coefficient. Less bullet drop, less wind deflection, and contained recoil adds up to higher scores over the longer shooting sessions.

The bench rest wildcatter works with cases he hopes will deliver one-hole cases than are formed. Accuracy while attaining wind-bucking velocity with reasonably heavy bullets and low recoil. This normally requires reducing the capacity of some existing case or necking up one of the .222 head size cases to a larger caliber.

After the wildcat case has fully taken shape in the wildcatter's mind and on the drawing board, reamers are made for chambering the rifle and dies and a rifle is actually chambered. The next step is forming cases from existing brass which can be very simple, requiring no tools other than the full-length resizing die, or quite complicated — requiring possibly several form dies, a trim die, a ream die and reamer, plus the full-length resizing die, and finally fireforming to fit the rifle chamber. It takes some knowledge to execute the operations properly without ruining more cases than are formed.

Simply necking an existing case up or down by no more than a couple of calibers (.02-inch as used here) is the easiest route for a wildcat case and needs only a full-length resizing die. If the case is necked down — from .30 to 7mm for example — the neck will be squeezed down to size in a low oxygen environment. This will increase the case mouth diameter, which can be dangerous as it may allow excessive pressure, affecting accuracy. It is best to anneal only a few cases at a time, so that color can be observed and overheating avoided.
single pass. If it is necked up, the expander ball does the chore. One word of caution here: polishing the expander ball, especially on the taper just above the decapping pin, can prevent case neck buckling. And the inside or outside of the neck will need lubrication to avoid sticking.

It is also possible to expand case necks by firing the original cartridge in the wildcat chamber if all other case dimensions are the same and the wildcat's bore the larger of the two — an example being a .30-06 cartridge in an 8mm-06 wildcat chamber. It is a good idea to outside-turn case necks that have been expanded considerably, since they are normally thicker on one side than the other. This is more prone to happen when expanding a neck — either by the expander ball or firing method — than by necking it down. Uneven wall thickness results in a bullet out of line with the bore and a general loss of accuracy.

A case necked down by four or more calibers — .35 to .30 for an example — requires thinning the neck to attain chamber clearance with a bullet seated. If the original case body is reduced to form the new wildcat's neck, thinning is also called for. There are two general methods of thinning — turning the outside of the neck after full-length resizing with the neck expanded to the correct diameter, or inside reaming the neck via a neck reamer. The latter is normally used, but either works well and depends primarily on tools at hand. Inside reaming will require a die for that particular cartridge, but only a pilot of the correct caliber is needed for outside turning, and pilots are cheaper than ream dies and reamers.

Perhaps the next easiest forming job is necking the parent case up or down by one or two calibers, shortening the overall head-to-shoulder length, and increasing the milder shoulder angle to a bit steeper slope. It is sometimes possible to form these cases in full-length resizing dies if they are cut to correct length first. It is much simpler, however, to have a form/trim die made (RCBS has them in stock for most popular wildcat cartridges, and will make them for others). This die will form the new neck and shoulder in a single pass, and is hardened so excess brass may be cut off with a hacksaw and filed smooth without damage to the die. Another pass through the full-length resizing die and the case is ready to load. Examples of such wildcats are various .30 calibers made on .300 H&H brass, and a number of 7mm magnums such as the Mashburn Super Magnum. Most of these cases have sharp shoulders of 25 to 40°, and the bodies are blown out to give greater powder capacity. (Fireforming will be covered later.)

Wildcats like the 7mm Mashburn SM bring up something that is not considered by many handloaders who form and load wildcat cases: there is often more than one factory cartridge case that can be used to form the wildcat. As an example, any case that can be formed from .300 H&H brass can be formed from .375 H&H cases with additional form dies. However, the reverse is not true for the many wildcat cartridges originally made from the longer .375 H&H case. The .300 case will be too short. Wildcats from the .300 and .375 H&H cases can also be made from Weatherby .300, .340 and .375 brass.

Cases that have been fired two or three
times start to become brittle and thus should be used when the only change is necking up or down by no more than a couple of calibers. The more complicated forming tasks demand new unfired brass. Trying to use old cases that have been fired a number of times, or even old cases that do become brittle with age, leads to complaints about necks and shoulders that wrinkle when forming, or split when fired. Some form jobs can't be performed without wrinkled shoulders when the cases have been fired, and setting back shoulders that have angles of 25° or more is one of them. Even annealing the neck/shoulder area of fired cases with steep shoulder angles will not always cure the problem as annealing may make them too soft.

Lubricants can also be the root of shoulder wrinkles when applied with too much enthusiasm, but the slick stuff is nevertheless essential in case forming. If the case body is not changed, lube only the neck or neck/shoulder area that is to be formed, and do it sparingly with your fingers to form an even, thin coat. Run the case into the form die and if it requires too much pressure, drop it out of the die and give it another thorough but meager shot. This procedure will eliminate many a wrinkled shoulder. Any case lube that works well in full-length resizing will handle the job, but avoid thinner varieties. Wax lubes are particularly at their best due to dense consistency. Even the toughest case forming jobs, however, do not require the pressure that is needed to full-length resize a big case like the .400 Jeffery, .416 Rigby or the .378/.460 Weatherby that has been fired in a large chamber at high pressure. For this work I have never found any lube that works as well as good pad lube like that distributed by RCBS, Hodgdon, etc.

There are wildcat cartridges that have longer bodies and shorter necks than their parent cases with the old Gibbs wildcat line as an example. Gibbs cartridges are formed from .30-06 brass to give more powder capacity than the original case affords. Whereas the .30-06 Ackley improved and other similar "cats" have fireformed bodies with less taper and sharper shoulders than the '06 case, the Gibbs have their shoulders blown forward to give both longer case bodies and less taper. This configuration gives a very short neck and increases powder capacity. When a Gibbs case is destined to be smaller than .30 caliber, a form die with the correct headspace dimensions leaves a small new shoulder forward of the old one, and the case is fireformed in the chamber. But the .30 and 8mm Gibbs cartridges aren't all that easy. While cases can sometimes be formed for the .30 Gibbs by simply firing .30-06 ammunition in the Gibbs chamber, there is a high probability the cartridge will either not fire at all or a partial or complete head separation will occur. Even if a partial separation does not happen, it is almost certain a stretch ring will be formed inside the case. Thus this procedure is not recommended.

Gibbs cases can also be formed by seating the bullets so that in closing the bolt they are jammed solidly into the lands. The bolt should be hard to close on the cartridge. Even this method at times gives problems with an inside stretch ring that forewarns a head separation. I prefer to form a second shoulder to headspace against by first necking the case up to .338 for the .30 Gibbs and .35 for the 8mm by running the case over a .338 or .35 expander plug. It is best to use 8mm and .338 plugs first when going to .35. This can be done by screwing the de-priming stem down out of the die and inserting the larger plug from the bottom in the Gibbs die, or by simply running the case into other dies in those calibers to expand the neck. After expanding the neck, run the case into the Gibbs resizing die to correctly headspace for the Gibbs chamber, making sure the new shoulder gives a crush fit in the rifle chamber. This will hold the case head tight against the bolt face and eliminate the danger of a stretch ring. If the new shoulder looks too small, the bullet may also be seated out to press into the lands for double insurance.

This method will work equally well on cases of similar design. And it does no harm to seat bullets into the lands when shoulders of rimmed and/or belted cases are to be blown forward by fireforming. Remember, however, this should not be done if a near-maximum load is used for fireforming since seating the bullet hard into the lands will kick pressures up.

After a case has been run through the first or second die, the brass becomes work hardened and case wrinkling might be noted. Annealing the area down to slightly below the new shoulder can alleviate the problem and prolong case life. A few forming operations that require the annealing operation include forming cases from large caliber cartridges in big belted cases, from basic cases that are the unnecked originals of those cases, or even necking and

Necking large cases to small calibers, or forming necks from original body portion of original cases, requires that necks be thinned. This can be done by outside turning with a Marquard or Foster case trimer (left) or by inside reaming in a die, such as the RCBS at right.
shortening the standard '06 case to a much smaller caliber.

Of the several annealing methods, the simplest is setting the cases in a pan of cold water that covers them to about a half-inch below the new shoulder, and moving a propane torch around and over the cases until they turn color. They can be left sitting in the water, or even for rapid cooling. Don't try to anneal too many at a time or some will not be properly heated.

Some reloaders plunge the case neck-first into melted bullet metal to the desired depth and then dunk them in water to prevent the heat running back toward the head. If this method is chosen, movement into the water must be quick, and time spent in the molten metal kept to a minimum to prevent metal clinging to the brass. I do not recommend this method because there is a very real chance of heating the case too far toward the head.

Fireforming the wildcat case in the rifle chamber is the next topic, and there is certainly a difference of opinion here, according to my mail. If the shoulder remains the same or is set back, there should be no problem with headspace and consequent partial or complete head separation. Blowing out the body does not require as much pressure from the fireform load as when the new shoulder is pushed forward and the body expanded at the same time. If the fireform load does not develop enough pressure to form the case body to a perfect fit in the chamber, no harm is done and a full-power load will finish forming the case. But if the new shoulder does not form to fill the chamber tightly, especially on a rimless cartridge, a stretch ring with partial or complete head separation is inevitable.

Many reloaders seem reluctant to use bullets in fireform loads, apparently feeling bullets are too expensive or they are unwilling to subject the barrel to extra wear. Instead, they use fast burning powders and some substance inside the case to build up pressure. I have tried most of these methods and found that bodies will expand fairly well but the new shoulder often does not fill out to snugly fit the chamber shoulder. This is particularly true with heavy walled modern cases with hard brass.

A few bullet substitutes I have used include wax plugs, rolled paper plugs, and fine-grained cereal or flour to fill the case; all of these ahead of a fast powder like 2400, Unique or a shotgun or pistol powder of similar quickness. The wax or paper plugs will handle fireforming on fairly thin cases that do not require too much expansion, and do not develop high pressures.

Flour or fine-grained cereal like Cream-of-Wheat and corn meal will do a much better job. Charge the case with powder and sift in enough flour or cereal to fill the case to about the base of the neck, then insert a plug of paper to hold it in place. I can't tell you the exact powder charge that will work best with your particular wildcat or filler medium, but as an example, the belted magnum cases will be expanded with about 25 grains of 2400 behind a flour filler. But even with this method they will not fit the chamber perfectly.

My own experience has indicated a perfectly formed case requires pressure over 40,000 psi, and some of the tougher jobs require nearer 50,000 psi. In some instances, a reasonably mild full-power load can be used both to form and hunt with. In many wildcat cases, however, the unformed case will not take enough powder to develop the pressure required for a full-throttle load. Where this condition exists, the case will have to be fireformed before loading for hunting or target use.

For the heavy fireforming jobs, a medium-burning powder like 4895, 4064 or 4320 will work well in cases from .30-06 and up. Start with a conservative test charge and work up until the case is perfectly formed and continue using that load.

Economically, a lighter weight bullet should be chosen when that method is mandated, such as with the Gibbs line. When the case body is to be radically changed or the shoulder shape changed or pushed forward, a few bucks spent on bullets is prudent insurance against case failures and a ruined hunting trip.

Hydraulic pressure can also be utilized in forming cases but the necessary equipment is beyond the average handloader's pocketbook. I may have overlooked a few other points on wildcatting and case forming that others have found successful, but hope this information may start a green wildcatter in the right direction—or discourage such a venture if its problems are too high a price for the improved performance.