

cloud base indicates a deeper cloud and, therefore, a higher likelihood of a thermal underneath. Also, several thermals can feed one cloud, and it is often well worth the deviation to those darker areas under the cloud. At times, an otherwise flat cloud base under an individual Cu has wisps or tendrils of cloud hanging down from it, producing a particularly active area. Cloud hanging below the general base of a Cu indicates that the air is more moist, and hence more buoyant. Note the importance of distinguishing features under Cu that indicate potential lift from virga. Virga is precipitation in the form of rain, snow, or ice crystals, descending from the cloud base that is evaporating before it strikes the ground. Virga often signals that the friendly Cu has grown to cumulus congestus or thunderstorms. [Figure 10-2]

Another indicator that one area of Cu may provide better lift is a concave region under an otherwise flat cloud base. This indicates air that is especially warm, and hence more buoyant, which means stronger lift. This can cause problems for the unwary pilot, since the lift near cloud base often dramatically increases, for instance from 400 to 1,000 feet per minute (fpm). When trying to leave the strong lift in the concave area under the cloud, pilots can find themselves climbing rapidly with cloud all around—another good reason to abide by required cloud clearances. See Title 14 of the Code of Federal Regulations (14 CFR) part 91, section 91.155, Basic VFR Weather Minimums.

After a thermal rises from the surface and reaches the convective condensation level (CCL), a cloud begins to form. At first, only a few wisps form. Then, the cloud grows to a cauliflower shape. The initial wisps of Cu in an otherwise blue (cloudless) sky indicate where an active thermal is beginning to build a cloud. When crossing a blue hole (a region anywhere from a few miles to several dozen miles of cloud-free sky in an otherwise Cu-filled sky), diverting to an initial wisp of Cu is often worthwhile. On some days, when only a few thermals are reaching the CCL, the initial wisps may be the only cloud markers around. The trick is to get to the wisp when it first forms, to catch the thermal underneath.

Lack of Cu does not necessarily mean lack of thermals. If the air aloft is cool enough and the surface temperature warms sufficiently, thermals form whether or not enough moisture exists for cumulus formation. These dry, or blue thermals as they are called, can be just as strong as their Cu-topped counterparts. Glider pilots can find blue thermals, without Cu markers, by gliding along until stumbling upon a thermal. With any luck, other blue thermal indicators exist, making the search less random.

### ***Other Indicators of Thermals***

One indicator of a thermal is another circling glider. Often the glint of the sun on wings is all that can be seen, so finding other gliders thermaling requires keeping a good lookout, which glider pilots should be doing anyway. Circling birds are also good indicators of thermal activity. Thermals tend to transport various aerosols, such as dust, upward with them. When a thermal rises to an inversion, it disturbs the stable air above it and spreads out horizontally, thus depositing some of the aerosols at that level. Depending on the sun angle and the pilot's sunglasses, haze domes can indicate dry thermals. If the air contains enough moisture, haze domes often form just before the first wisp of Cu.

On blue, cloudless days, gliders and other airborne indicators are not around to mark thermals. In such cases, pay attention to clues on the ground. First, think about previous flight experiences. It is worth noting where thermals have been found previously since certain areas tend to be consistent thermal sources. Remember that weather is fickle, so there is never a guarantee that a thermal currently exists where one existed before. In addition, if a thermal has recently formed, it takes time for the sun to reheat the area before the next thermal is triggered. Glider pilots new to a soaring location should ask the local pilots about favored spots—doing so might save the cost of a tow. Glider pilots talk about house thermals, which are simply thermals that seem to form over and over in the same spot or in the same area.

Stay alert for other indicators, as well. In drier climates, dust devils mark thermals triggering from the ground. In hilly or



**Figure 10-2.** Photographs of (A) cumulus congestus, (B) cumulonimbus (Cb), and (C) virga.