plines. Four reasons for this include:

1) Range ecosystems are highly complex and have considerable variation.

2) Funding allocation to studying range problems has been low when compared to that for other areas of natural resource management.

3) Government agencies such as the Bureau of Land Management have been forced to allocate much of their monetary and personnel resources towards developing environmental impact statements in the 1970's. This has severely retarded range improvement on public lands.

4) Methods available to study range ecosystems are often crude and many range experiments require several years before any conclusions can be reached.

Looking into the future it appears that rangelands in the western United States will become increasingly important in providing red meat, water, wildlife, energy, and recreation needed by the American public. However, the basic land resource will shrink because of conversion of rangeland to farmland, housing, summer houses, industrial sites, highways, and airports. Livestock grazing will continue on public rangelands because this is the most efficient way to use the range forage resource. In addition, an increased population coupled with higher energy costs will dictate that most of our red meat by produced on land unsuited for cultivation. This is because efficiency is improved if plant foods are fed to man directly. Water will probably become the most important resource derived from rangeland particularly in the Southwest. A sky-rocketing demand for both water and red meat will probably result in more funds for range research directed towards these two products.

How rangelands are used in this country in the future will depend on what happens in other countries as well as at home. As long as the world population grows at an ever accelerating rate, there will be greater pressure to increase production from rangeland in this country. Hopefully in the future the public will become better informed on management principles, and more supportive of range improvement programs. Finally, I am optimistic that range management will progress much faster in the future than in the past.

The Indelible Bull's-eye

Larry C. Eichhorn

What a sight! Giant (for the 1940's) four-engined bombers rumbling in, dropping strings of practice bombs from open bomb-bays, throwing up dust as the bombs hit the ground. Many remember the U.S. Army Air Force B-17 bomber squadrons that trained in northcentral Montana during World War II. The crews and planes are long since gone, of course, but they've left a memorial behind. The one part of the above scene that remains is the target the airmen were trained to hit.

This particular target can been seen on public lands 50 miles east of Lewistown. It was used by the Army Air Force beginning in the fall of 1942 through the fall of 1943. Located in a draw to make it hard to find and hit by the low-flying B-17s, the 1,000-foot target consists of 5 concentric rings. The diameter of the center ring is 200 feet. Apparently made by a 14-inch, one-way molboard plow, the furrows are still 18–24 inches wide and from 6–10 inches deep today even though the target is now 38 years old.

How long will it take for natural processes to erase the target? A good question. Curiosity getting the better of me, I decided to look over the vegetation and soils around the target. I took forty plot measurements on the rings and forty more plot measurements between them as a basis of comparison, using the vegetation measurement method adapted from Daubenmire (1959). Comparisons were given statistical tests according to procedures described by Freese (1967). Plants on the area included western wheatgrass *(Agropyron smithii)*, green needlegrass *(Stipa viridula)*, Sandberg bluegrass *(Poa sandbergii)*, prairie junegrass *(Koeleria cristata)*, fringed sagewort *(Artemesia frigida)*, Nuttall saltbush *(Atriplex nuttallii)*, and big sagebrush *(Artemesia tridentata* spp. *wyomingensis)*.

One significant difference I noted is the canopy cover and height of big sagebrush on the rings compared to the cover and height between the rings. On the rings big sagebrush has 29% canopy cover and an average height of 15 inches. Between the rings, it has 13% canopy cover and measures 5 inches in height. Gerdrum-Tealette soil complex predominates on the plot measurements I took. Plowing the rings increased the clay content of the upper soil because of the mixing of the A and B horizons. This intermixture and furrow area provided more moisture accumulation and infiltration and nutrients for plant growth. Hence the greater canopy cover and height of big sagebrush on the rings. This is the main reason the target is still visible today.

Another significant difference is the presence of green needlegrass only on the rings, not between them. Jorgensen (1979) reported that where clay loam soils were plowed and abandoned, green needlegrass increased in abundance. He felt this may be as a result of the increased clay content of the

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Relic reminders of World War II on the plains of Montana!

upper soil because of the intermixing of the A and B horizon or because of the aggressiveness of the grass in establishing on disturbed areas.

How long will the target remain visible? I really don't know but I could hazard a guess. In 2020, people will still be viewing this memorial from a war 80 years past, this indelible bulls-eye.

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