

# Some of the Beginnings of Range Management

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Sheepmen and cattlemen have been in each others hair—and other folk's hair—since the dawn of history. According to the Good Book even Abram and Lot had “a strife between herdsmen.” Obviously, someone recognized the need for range management, even then, for we read (apropos the “flocks and herds”): “. . . the land was not able to bear them.” But this example goes back a bit too far for the purposes of this paper; so, suppose we skip over a few thousand years and take note of a more recent episode.

## Strife Over Western Grass

A burly sheep owner came blustering into a semi-desert valley in eastern Oregon where another sturdy character had already selected his winter range. The latter was ordered out but stood his ground firmly, and when the intruder advanced with clear intent to commit mayhem, the latter clamly drew his '45' and pumped two bullets into his assailant's chest. The Coroner said, “Self defense.”

This happened in our own West, as recently as 1907. Around the turn of the century there were numerous other cases in which armed men fought for control of the range, as recorded by various historians. In the words of Will C. Barnes (1926) “fierce conflicts occurred in the Blue Mountains of Oregon; in Wyoming there was the ‘Johnson County war,’ followed by what has been called the ‘Upper Green River war,’ and other outbreaks. In Arizona the Tonto Basin ‘war’ inside of a few years cost about 40 lives and terrorized a great range region.” So, for a long

## Editor's Note

*The authors are among the few who have seen and participated in many of the major developments in range management since the turn of the century.*

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time the adjudication of range rights between tribes and indi-

viduals was mostly by sword and pistol.

In this process there was ample stage setting for tension. Cattlemen, who were “there first” over most of the West, resented the coming of sheepmen. Also, sheep outfits were in large part semi-nomadic, moving on and on as the forage was consumed. In many instances the sheep left nothing for the local people who were anchored to their ranches and had no place to go but back to their small fields and pastures, once the surrounding range was “slicked off.” The plague of locusts that the Mormons endured 50 years earlier was less serious. Then in the spring before the snow was hardly off the ground on summer grazing grounds, many forage plants would be trampled into the mud. The necessity to “get there first” was probably as much a factor in range abuse as anything else—including excessive numbers. A terrific hatred for sheep developed among cattlemen, and with much cause.

Still the tensions were not limited to the differences between cattlemen and sheepmen. Trespassing livestock gained ill repute with private land owners. Recreationists saw the lands that belonged to all the people stripped and damaged. Hunters, fishermen and other campers reacted strongly to the lack of horse feed in the mountains. And the few technical foresters could not believe that sheep grazing and growing trees were compatible; they surely had little evidence then to indicate otherwise. Finally, there were conflicts between cattlemen and cattlemen, between sheepmen and sheepmen, and between “nesters” and “nesters.” So range wars became notorious.

These conflicts involving stockmen and other citizens who wished to use the public lands of mountain, plain and desert, started coming to a head about 1890. At that time there was no administration of the public

lands—in fact not the least bit of solid knowledge of how to administer and use them wisely. How thinking started and how it developed into action and fact finding is the aim of this brief historical sketch of a few of the more significant developments.

It was inevitable that management on wild untilled land should come to our West, sooner or later. The play was forced in the latter part of the nineteenth century, over much of the country west of the “wide Missouri.” The squeeze came earlier in Coastal California, in parts of Texas and, locally, elsewhere. Within two decades after the Civil War livestock numbers throughout the West in general had increased tremendously. For example, Nevada probably had 4,000,000 sheep; California over 7,000,000. Between 1880 and 1890 accessible grazing land in Arizona had become “generally well stocked” (Thornber, 1910). Herds from the California grasslands had spread eastward, crowding the forest ranges of the Sierra Nevada. Expanding herds which had their origin in the Spanish settlements in southwestern Texas and along the Rio Grande met herds advancing from the East. The Texas trails of song and story had spewed vast numbers of cattle northward and northwestward; along the Missouri River these herds met others pushing westward from eastern prairies. And, as the combined tide poured across the Rockies it met east-bound herds

from the overstocked Cascade Mountains of Washington and Oregon. The best of the Old West had been over-run!

In the late 1880's, then, came the end of an era. The Indian had been driven to reservation life. The great buffalo herds had been exterminated. “Nesters” and “bob wire” were rapidly changing the open-range picture. By and large, there was no more free abundant grass. Ranges had become overstocked all over the West. Just at that time Nature stepped in and took a hand, in the form of severe droughts and blizzards. The combined result was a heavy blow to the livestock industry and to the western range.

#### The White Man's First Look at the Western Range

Perhaps it was opportune that Nature did call a halt to rampant herd expansion at about this stage of settlement and development of the West. For the sudden jolts to the industry—region by region over a decade or so—sharpened observation and stimulated some hard thinking about what was happening to the foundation of the industry, the range itself (Figure 1).

What did the western range look like when the white man first saw it? We shall never quite know. At the outset, of course, one must ask “where” and “when”? Interpretation of statements in old diaries and reports is not easy, because range conditions varied, then as now, from

place to place and from year to year. Nevertheless, the old records do contain information of real value.

The beginnings of recording some kind of information on range lands (their vegetation, grazing use, or even availability of feed for an expedition's draft and saddle animals) go back to the occasional explorer, mission chronicler, soldier, emigrant, botanist or stockman who put some of his observations on paper. In scanning the record it is interesting to note that no one group had a monopoly on these early contributions which later led to their analysis, to better organized studies and, gradually, to the “science and art” of range management as we use the terms today. A few scattered examples may serve to illustrate the nature of these early writings which give use a better understanding of original conditions.

Fages, Spanish officer and first white man to see the San Joaquin Valley, California, (Bolton, 1935) found the valley lands well supplied with grass in 1772. Reporting on a portion of the same valley, during the great drought year of 1864, Brewer made this diary entry, “. . . Where there were green pastures when we camped here two years ago, now all is dry, dusty, bare ground. Three hundred cattle have died by the miserable water hole . . . Owing to the drought, there is no feed for cattle” (Farquhar, 1930).

Early plant collections laid the



FIGURE 1. Two-thirds of a century ago “beat out” grazing lands like these signaled the need for range management.

foundation for needed inventories of wildland vegetation. Douglas, in 1824-1827, collected widely from California northward to the Columbia River (Wilks, 1914). Rothrock (1878) reported on "collections made in portions of Nevada, Utah, California, Colorado, New Mexico, and Arizona", from 1871 to 1875 while doubling as surgeon for the so-called 'Wheeler Surveys,' Engineer Department, U. S. Army. Vasey (1886) reported on the grasses of the arid plains of Kansas, Nebraska and Colorado. Merriam (1893) and Coville (1893) made extensive collections on a biological survey of Death Valley, in 1891. These classical examples merely illustrate the contributions of many scientists to knowledge of western range plants. The long list of eminent names in the annals of early western botanical exploration also includes, Sitgreaves, 1851; Ives, 1858; and Cooper, Cones and Palmer, in the 1860s. There were many others, especially during the 1880s.

Noteworthy is the wide diversity of reports on pasturage conditions for expedition animals on various early-day military trips, including those of Abert (under Kearney) in 1846-1847, Pike in 1805-1807, and Wheeler in 1871-1875. Many emigrant parties furnished additional information. In numerous diaries and journals one reads of fertile valleys of luxuriant grass and of heart-breaking stretches with virtually no feed for oxen, horses and mules. Then, as now, the western range country was never covered with a uniform stand of thick luscious grass, nor was every year a good forage year. Still, much enlightening knowledge can be gleaned from the early reports, by one familiar with the travel routes described.

#### **Gradual Recognition of Range Damage**

Even a casual study of the historical material pertaining to the

period of early settlement of the West clearly reveals recognition of a very significant fact. Something more than the effects of recurrent droughts was happening to many range areas. Here and there, late in the nineteenth century, and for a few years thereafter, keen observers saw the beginning of range damage from uncontrolled grazing. They recognized some of the symptoms and pointed out the need to do something about the situation. Some of these were "Government men" or Land Grant College "professors," but neither class at that time was overly popular with the livestock industry, collectively or individually. However, there were others and among these were practical business men, the stockmen themselves. In fact, it was the widespread complaint of stockmen and other users of grazing lands, most all of whom were suffering from competitive use of the open range, that brought the range problem most forceably to the attention of the appropriate public agencies. Suppose we glance at the record of a few random examples of these "voices crying in the wilderness."

A century ago, Perkins (1863) then Secretary of the California Woolgrowers Association, expressed his concern about range deterioration, in the following words: "Where lands have been so persistently overstocked, the herbage has necessarily become thinner and thinner . . . The question of 'range' has become the most formidable one the sheep raiser has to encounter . . . This system of stocking the grazing lands must ultimately result in their entire depasturage." Further testimony comes from Vasey (1886) who drew attention to the enormous loss through livestock overloading in the Southwest. Alarm over range injury from overgrazing in still another area, central Texas, was reported by Bentley (1898) who said, "The carrying capacity of the range

has steadily decreased" in comparison with forage conditions found 30 years earlier. Another more hard-hitting and concrete bit of evidence was supplied by the manager of one of the big cattle ranches in southern Arizona, in the following words reported by Griffiths (1901): "These regions (the valleys of San Pedro, Sulphur Spring, and Aravipa) have diminished in grazing facility fully 50 percent in 25 years."

Perhaps, however, the most convincing evidence of extensive damage to range, from unrestricted grazing of public lands, came from the livestock industry itself, in response to the invitation of a special Public Lands Commission appointed by President Theodore Roosevelt, October 22, 1903. The Commission consisted of W. A. Richards, Commissioner of the General Land Office; F. H. Newell, Chief Engineer of the Reclamation Service—both of the Department of the Interior; and Gifford Pinchot, Forester of the Department of Agriculture. As reported by Potter (1905) replies from 1,400 stockmen in 16 States showed "very plainly that under present conditions the greater portion of the public grazing lands is not supporting the number of stock they did formerly." There were of course exceptions to this range condition picture. Grazing capacity had not suffered everywhere, but in total the damaged areas were sufficiently large to cause widespread concern among practical men.

At this point it seems advisable to back-track down the historical trail a moment, to clarify the status of the "public grazing lands" for some time before the turn of the century and immediately thereafter.

Disposal of western public lands started with the land grants in the Southwest under the Spanish and Mexican administrations. These grants covered the better valley grasslands and



FIGURE 2. Frederick V. Coville (1867-1937), distinguished scientist whose field work in the Cascade Mountains of Oregon, in 1897, "... started the first sustained national movement toward range management in our West ..."

gave full control to the grantees.

The beginning of general settlement of the West and the build-up of livestock herds followed passage of the Act of 1862, the 160-acre homestead law. Under this Act several million acres of tillable land were patented. Under this and other laws water holes and key tracts were patented with the idea, not always effective, of controlling adjacent grazing grounds.

From the remaining public domain the Act of March 3, 1891 authorized the creation, by executive order, of forest reserves—lands partly or wholly covered with timber. During the next ten years nearly 100,000,000 acres had been set aside under this Act. The lands were in the custody of the General Land Office, Department of the Interior, but congressional prescription for their effective administration was not provided until 1897. The previously established Division of Forestry, in the Department of Agriculture, became the technical advisor to the administrators of the forest reserves. In 1905 the Congress transferred the management of the Forest Re-

serves to the Department of Agriculture, and the Division of Forestry (by that time known as the Bureau of Forestry) became the Forest Service.

### The Controversy of the Cascades

As the nineteenth century neared its close all sorts of pioneer stresses and strains, as sketched in foregoing paragraphs, combined to raise the pressure of the western-range pot to near the boiling point. Presently, the lid blew off!

Perhaps what happened in Oregon, Washington and California, provides as good an example as any, of the trend of events. In 1897, John Muir, one of the colorful actors in this drama of the West, broke the whole thing wide open, and the formation of the Sierra Club supplied the first organized opposition to destructive grazing in the High Sierra wilderness. The background: some forest reserves had been created, but as yet there was practically no administration. Livestock were not to be permitted, but trespass was rampant and widespread and locally, actual use may even have become heavier.

In that year, 1897, the Congress passed a law empowering the Secretary of the Interior to promulgate regulations for the administration of the forest reserves, and to allow grazing to the extent that young tree growth would not be injured. Muir campaigned for elimination of sheep from the the reserves (Anonymous, 1958). The American Forestry Association, meeting in San Francisco, "resoluted" in the same vein, and sold the idea to James Wilson, newly appointed Secretary of Agriculture, who had attended the meeting. Wilson, in turn, apparently sold the idea to the Commissioner of the General Land Office who canceled the grazing permits on the reserves of Washington and Oregon—one month before the end of the customary grazing

season. (Sheep grazing had not yet been allowed in reserves in other western States. Apparently the forest technicians were not yet convinced that there could be sheep grazing without damage to young tree growth.) At any rate, that did it! The pressure was on from the livestock industry, and the Secretary of the Interior, Hermann, a good Oregon politician, reversed the permit-cancelation order. Grazing permits were again issued in 1898.

Muir again went into action. The mountain resort owners and other recreationists wailed, hunters and fishermen spoke out, and valley water-users became really concerned. Settled cattlemen were wrangling with the nomadic sheepmen and sheepmen were quarreling with sheepmen. Finally, the general public began taking a major interest. The controversy even made the headlines of the powerful Portland Oregonian which took a rather neutral stand but kept the issue alive. 'Twas a beautiful hassle!

### Genesis of a New Science

For some time prior to this critical stage in the situation, it had become clearly apparent to all concerned that some scientific facts were needed to support more clean-cut land policies. Frederick V. Coville, (Figure 2) botanist of the Department of Agriculture, was invited in, by the Interior Department, to help. As a cooperative inter-agency effort in 1897, he started the first sustained national movement toward range management in our West. Coville (1898), who would be called an ecologist today, began with a field appraisal of grazing problems in the Cascade Mountains of Oregon. He concluded that "... sheep grazing without proper restrictions and regulation (to prevent overstocking) is detrimental to the reproduction of forest growth and to soil conditions and waterflow ... (and

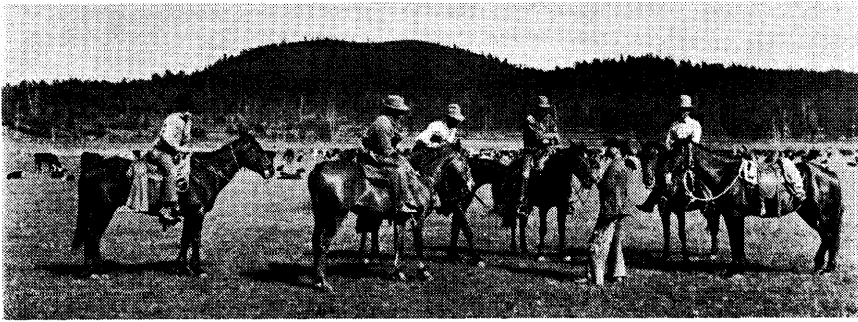


FIGURE 3. Cattle round-up near Flagstaff, Arizona, 1914. Man on foot is Albert F. Potter, a practical stockman who became the first Chief of the Office of Grazing, Forest Service, and who spent 15 years working with the stockmen developing regulations for the use and management of National Forest ranges.

. . . that no range management could be possible without control of these public grazing lands." In other words he pointed out that range improvement and satisfactory management were impossible without control of the livestock. He further believed, however, that with effective control sheep could be grazed on selected areas without damage, and he specified "the steps necessary to a solution of present difficulties by the Interior Department." At the request of the Commission of Public Lands he outlined, in 1904, a proposed system for the regulation of grazing on the public lands, in order to increase their grazing capacity and to provide for their orderly use. Nearly all of Coville's various recommendations were incorporated into the grazing policies pertaining to public lands, and to a large extent are in effect today.

In 1898 Gifford Pinchot became head of the Forestry Division. Two years later Pinchot, Coville, E. C. Bunch of the Salt River Valley Water Users Association, and Albert F. Potter, a representative of a dissatisfied group of stockmen, made a historic joint examination of a considerable stretch of country in northern and central Arizona, to see the effect of grazing on forest land. On this trip Potter apparently made an exceedingly

good case for the stockmen. As Pinchot explained in later years; "I figured the only way to keep even with Potter was to hire him."<sup>1</sup> This he did, to be head of the Branch of Grazing, in 1901. From the standpoint of range management the choice proved to be a good one. Pinchot (1948) always maintained that "the credit for the sound, workable and productive grazing policy of the Forest Service belonged mainly to Albert F. Potter"—a sheepman and cattleman in his own right, fearless and fair, a splendid organizer and respected administrator (Figure 3). His chosen assistant and later his successor as head of the Office of Grazing was the colorful Will C. Barnes, Congressional Medal of Honor holder, cattleman, legislator and writer. The authors might add, here, an observation of their own; without men of the background and stature of Potter, Barnes and Jesse W. Nelson, practical men able to meet stockmen on their own terms, in the touch-and-go days following 1905, one may well speculate as to whether the whole progressive program of range management on public lands might not have been set back many years.

During the decade from 1900 to 1910 widespread stirrings of range management interest were discernable. Specific but scattered studies were started and a series of extensive surveys of

general range conditions was undertaken, chiefly by botanists of the Department of Agriculture, in cooperation in most cases with the State Agricultural Experiment Stations of the Land Grant Colleges. Following are a few examples: Bentley (1898) and Smith (1899) in Texas; Kennedy (1901) in Nevada; Davy (1902) in California; Griffiths (1901-1904) in Arizona, California, Nevada, Oregon and Washington; Cotton (1904) in Washington; Clements (1907) in Nebraska; Wootton (1908) in New Mexico; Thornber (1910) in Arizona; and Shantz (1913) in the Great Plains. Studies of poisonous range plants were also begun by Chestnut, Marsh and Clawson, about 1901.

These observational types of studies yielded many clues to basic principles of management and improved systems of grazing. For example, Davy (1902) stated: "Good management primarily consists in carrying the optimum number of stock and allowing plenty of grass to go to seed"; and he suggested "a complete rest of one or even two years" to start restoration of "worn out ranges." Bentley (1898) pointed out that weakened ranges "must be rested systematically" and he stated that "some of the leading stockmen are now dividing up their holdings into several pastures, one being held exclusively for winter use, another for spring, another for mid-summer or autumn . . ." The idea of deferring and rotating grazing, to repair range damage, through alternating periods of rest and grazing, was advanced by: Kennedy (1901), Davy (1902), Potter (1905), Thornber (1910), and Wilcox (1911). Stockman testimony, reported by Potter (1905) included this further observation: "Another disadvantage (in addition to excessive numbers of animals) in handling stock on the free range is that on the all-year-round range it is all used

<sup>1</sup>Statement to M. W. Talbot in 1937.

at the same time and does not produce as good crops of forage as it would if it could be divided and used a portion at a time."

Two additional milestones are worthy of mention. First, the setting aside, in 1900, by President McKinley, of four sections of land near Tucson, Arizona, for studies of ways and means of improving worn-out ranges of southern Arizona, by the U. S. Department of Agriculture and the Arizona Agricultural Experiment Station. This tract is part of the Santa Rita Range Reserve, known to many readers.

The second milestone was the starting, in 1907, of a series of experiments by the Forest Service, in cooperation with the Bureau of Plant Industry, to find out how the carrying power of the grazing lands within the national forests could be increased. Coville, who had been placed in charge of the cooperative program promptly selected as an assistant, ranch-reared James T. Jardine, whose first assignment, in 1907, was to conduct an experiment in grazing sheep in a coyote-proof pasture in Oregon (Jardine, 1908). Among other things Coville directed him especially to "consider the applicability of the rotation system of grazing which I have already discussed with you" (Coville, 1907). Provision was also made for preliminary work on revegetation of over-grazed areas, and range ecology, projects assigned to another pioneer in range management, A. W. Sampson (1908) (1913).

Jardine's coming into the picture, in 1907, constituted a major third milestone. He made range management a going business, developed the work far beyond the cooperative effort with the Bureau of Plant Industry, and was able with expanded facilities to increase cooperation with the colleges and universities. As the first Chief of the Office of Grazing Studies he organized the work into three projects: sur-

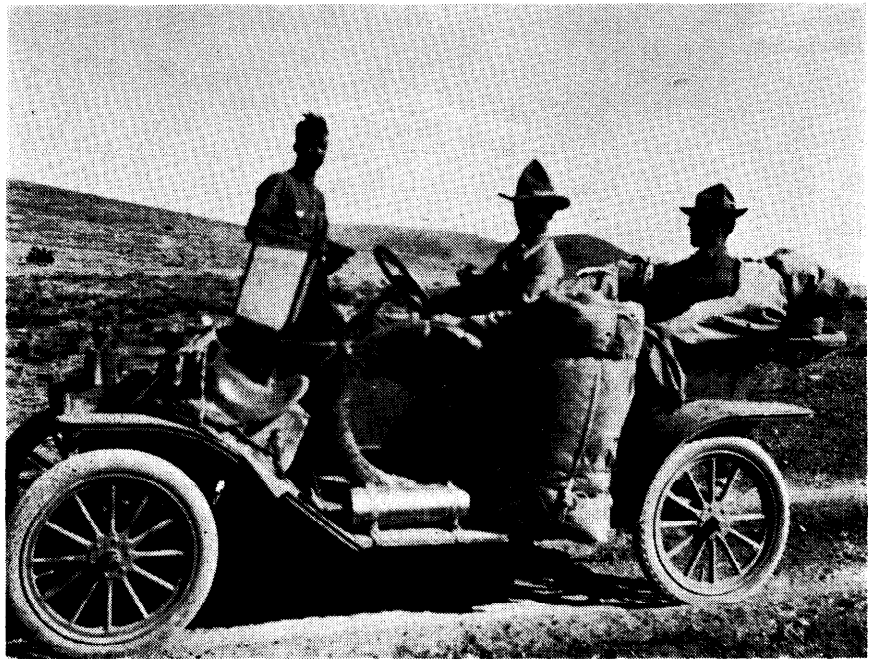


FIGURE 4. Heading for grazing reconnaissance camp, San Augustine Plains, New Mexico, 1915, to apply the range-inventory method devised by James T. Jardine. L. to R.—Juan Correjo, cook and packer; Bert Goddard, Forest Supervisor; R. R. Hill, Chief of Party.

veys, technical advice to administrators, and range studies. Under his capable leadership a coordinated series of field stations was started. One of these, the Great Basin Experiment Station, was the base for much of Sampson's early work on plant succession in relation to range management (1919). Jardine also initiated the systematic collection and analysis of needed facts about western range plants, handled as a lifelong project by W. A. Dayton.

Jardine devised the "grazing reconnaissance" method of making inventories of range lands (Figure 4). This method was first used on a party basis on the Coconino National Forest, Arizona, in 1911, by the following crew: Jardine, chief; R. R. Hill (later, inspector of grazing, Washington); L. H. Douglas (later, assistant regional forester); A. E. Aldous (later, professor of pasture management, Kansas State Agricultural College); C. E. Fleming (later, veteran director of the Nevada Agricultural Experiment Station);

and three summer students: R. E. Bodley (later, Agricultural Extension Service); A. D. Read and W. R. Chapline (who succeeded Jardine and was Chief of Range Research for 32 years).

With Jardine's comprehensive series of lectures delivered at Yale University, beginning in 1910, the whole subject of range management began to take definite form. While there was considerable work on a variety of subjects being inaugurated by the schools, it naturally did not constitute a coordinated program. The pursuit of all the important phases of the problem was what Jardine set out to do. Excerpts from the annual reports of the Forester (later called the Chief of the Forest Service) reflect the scope of activity in this little-explored field.

In 1908 studies were reported under way on livestock handling to prevent range damage, on proper grazing periods, on the life history of forage species and on reseeding methods. In 1911 livestock handling studies were expanded since "existing prac-



tices are wasteful and destructive," investigations of poisonous plants were started and plans made to determine the role of rodents on rangelands.

By 1912 the scope of the studies program, handled mostly in cooperation with practical stockmen, was reflected by several additional topics; a method to determine grazing capacity more accurately, classification of ranges for most suitable class of livestock, wastage in forage utilization, livestock water development methods, character of grazing damage to forests and watersheds and how to avoid this, and control of erosion and rehabilitation of mountain meadows. The next year the erosion and streamflow study was started at the Great Basin Station. By 1917 work had been started on improved methods of handling goats, on the question of how salt could be used in range management, and on such problems as the effect of grazing on pine and aspen reproduction.

Finally, Jardine rounded up, with the assistance of Mark Anderson, what was known on the subject and by a superb piece of writing condensed its essence into the famous "Bulletin 790" Range Management on the National Forests—the "Bible" of range management. It summarized the basic principles of management in terms of a simple guide-line; the proper number of livestock, of the proper kind, grazed at the proper season, under adequate handling methods. This classic has long been out of print but, in so far as information was available at the time of issuance in 1919, it is virtually as sound today as it was when written forty years ago. With its issuance the new science—and art—of range management was safely launched.

With this milestone we have arbitrarily chosen to end our tale. In the selection of episodes, names and dates to illustrate how range management evolved,

stage by stage, we are acutely conscious of the unavoidable omission of merited credit to many workers who have played important parts in the complete story. The literature is vast. We were limited to a few examples and in several cases the choice was a blind one.

Although we have laid down our pencils at the year 1919, we wish to allude to the substantial advances that have been made since that date on many fronts—the steady flow of new basic data, the expansion in public interest, the improvement in practices, and the betterment of facilities for gathering and disseminating facts still needed for sound efficient management of a big land resource. Credit for this fine progress may justly be shared by numerous Federal, State and local agencies, as well as by the livestock industry. This recent history is relatively well known. It has been the wish of the writers to tell of the earlier and less-known lines of thinking and action that formed the foundation for the new science of range management.

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