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WIND RIVER SHOSHONE ETHNOGEOGRAPHY

BY

D. B. SHIMKIN

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PREFACE

The present paper is part of a series dealing with the culture of the Wind River Shoshone of Wyoming. It is based on researches by the author in 1937 and 1938 which were financed by the Board of Research of the University of California through the Department of Anthropology. I am indebted to Miss Alice Eastwood of the California Academy of Sciences for the botanical identifications, and to Mr. Carlos Garcia for much of the clerical work.

Assistance in the preparation of these materials was furnished by the personnel of Work Projects Administration Official Project No. 665-08-3-30, Unit A-15.

The orthography of native words in this paper follows strictly that recommended by Franz Boas et al. (SI-MC, vol. 66, no. 6), 1916, and modified by George Herzog et al. (AA 36: 629-631), 1934.

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INTRODUCTION

The present essay sketches the habitat of the Wind River Shoshone between 1825 and 1875, approximately. It regionalizes this habitat according to the variations of several geographic factors: topography, physiography and soils, climates, and biota. It studies Shoshone adaptation to this environment in considerable detail, and attempts to establish, in general terms, the nature of economic conditioning within this culture. The technique of ethnogeographic analysis which my paper follows simply exemplifies that set forth by Kroeber in his fundamental work, *Cultural and Natural Areas of Native North America*.¹

The temporal limits of this essay should be noted carefully, for the history of the Wind River Shoshone has been complicated. As I have stated elsewhere,² they began moving on to the Plains from the West at the beginning of the eighteenth century, or shortly before. They were the earliest, in most of the northern Plains, to get the horse. As a result, their power extended, by 1730-50, into Saskatchewan and South Dakota. The acquisition of guns by their enemies and epidemics forced them to retreat west once more. Around 1800 they resided largely west of the Rockies, daring massacre at the hands of eastern enemies only during seasonal bison hunts. The military assistance furnished by friendly white traders reestablished the Shoshones' eastern territories after 1825, however. Reservation life began effectively about 1875; the events transpiring since that date form part of other papers.³

Wind River Shoshone culture has been essentially that of the Plains for a good two hundred years; pioneer ethnographers have vastly overemphasized the Basin affiliations. Consequently, the data contained in the pages which follow will, I believe, be of interest to most specialists on the Plains Indians. They illustrate a phase of life which is very little known for this part of America, despite the fact that many able scholars have concentrated their attention upon study of the area. Lowie, for instance, has given us superlative materials upon the social organization, mythology, and many other aspects of Crow culture. Yet he has nowhere published even a map of Crow territory, or its political or ecological divisions. Furthermore, the data underscore the cyclical abundance and scarcity of Plains subsistence, an observation made by other recent studies for the Plains Cree and Sarsi.⁴ They give some basis for questioning the theory ably expounded by Wissler, on the influence of the horse on Plains culture.⁵ Did the horse raise Plains culture to its zenith? Archaeological materials prove that it did not do so in the southern Plains; it merely intensified some specialties, wiped out many others.⁶ My ethnogeographical materials suggest that this process too took place in the northern Plains. Ultimate decision of the problem must await further ethnogeographical research, particularly among the Arapaho and Western Dakota, as well as extensive digging.

¹ Kroeber, 1939.

² Shimkin, 1941a.

³ Shimkin, MS. a; b.

⁴ Jenness, 1938; Mandelbaum, 1940.

⁵ Wissler, 1914.

⁶ Strong, 1935.

IDENTIFICATION OF THE PEOPLE

Study of Shoshone ethnogeography includes consideration of three main factors: the identification of the people and their area, assessment of the environmental opportunities, and investigation of the degree of utilization of those opportunities, or ecological adaptation.

The identification of the Wind River Shoshone and their territory is not a simple matter. It is complicated by several facts.⁷ These people had no developed national or tribal sense; affiliation was fluid. Nor did they distinguish themselves by a special name. They merely knew that others called them p^o'hⁱnš (Sage-Brushers), p^o'h^oganhⁱt (Sage-Brush Homes),⁸ or ku'č^ondⁱk^anⁱ (Buffalo-Eating People).⁹ Furthermore, they felt no clear-cut distinctions of private or tribal territories. A part of them went each year through admittedly Crow territory to reach the Yellowstone River and Powder River hunting grounds. Virtually all of them crossed du'kurka (Sheep Eater Shoshone)

lands on their summer trip to Green River. The obverse of this may be noted: The Popo Agie (River) and the Seeds-ke-deagie¹⁰ or Green River both in the heart of the Wind River Shoshone range, were known to white travelers by Crow names¹¹--Owl River (po:'pəte owl; a:'šə river) and Prairie-Chicken River (ci:'ega prairie-chicken; a:'šə river), respectively.

In spite of these difficulties, contemporary travelers recognized the basic unity of the Shoshone of Wyoming. Thus Granville Stuart wrote:¹²

"The 'Green-River' Snakes (Shoshones) occupy the country drained by Green River and its branches. They are known also as 'Wash'-a-keeks band,' and their principal hunting ground is in the Wind River mountains and on Wind River (which is a main branch of the Big Horn River) and its tributaries, where they meet and have numerous battles with the Crow Indians, who also claim that country."

⁷ See also Shimkin, 1938.

⁸ Hoebel, 1938.

⁹ Hoebel, 1938; the name ko'hogo'e was unknown to the Wind River themselves. See Steward, 1937, fig. 1.

¹⁰ Frémont, 1853:163.

¹¹ I owe analyses of the Crow names to the kindness of Professor R. H. Lowie.

¹² Stuart, 1865:80.

WIND RIVER SHOSHONE TERRITORY

Wind River Shoshone territory may be defined in terms of three basic zones: the core, in which the tribe and its subdivisions had their regular migrations; territory known and encompassed by individuals once or twice in their lives; the absolute limits of the known world.

The heart of this people's land was approximately the following. Its boundary stretched from the northern slope of the Uintah Mountains to the Red Desert and the Green Mountains, thence across the Sweetwater Divide to the southern tip of the Big Horn Mountains. Then, having cut diagonally to Thermopolis, it went down the Big Horn River as far north as the Shoshone River. It followed this stream over the Absaroka Range, then went to Yellowstone Lake and the Tetons. From here it ran almost due south to its starting point. (The Sheep Eaters occupied a semiautonomous enclave within this area, which included Yellowstone Park, the Absaroka Range, and the upper slopes of the Wind River Mountains.)

The historical evidence gives some weight to the assumption that in 1835-40 the Shoshone were mostly west of the Wind River Mountains.

In 1825 Ashley¹³ noted that:

"The country east and a considerable distance north of these lakes [Great Salt Lake, Bear Lake], including the headwaters of the Rio Colorado of the West and down the same to Mary's river, is claimed by the Shoshone Indians."

Fourteen years later Farnham¹⁴ said:

"The Snakes, or Shoshonies, are a wandering tribe of Indians who inhabit that part of the Rocky Mountains which lies on the Grand and Green River branches of the Colorado of the West, the valley of Great Bear River, the habitable shores of the Great Salt Lake, a considerable portion of country on Snake River above and below Fort Hall, and a tract extending two or three hundred miles to the west of that part."

Almost contemporaneous is Russel's statement:¹⁵

"Their country comprises all the regions drained by the head branches of Green and Bear Rivers and the east and southern head branches of the Snake River."

The same year, however, Hamilton¹⁶ met Washakie and his village camped at Wind River. The latter informed him that the Shoshone

"claimed the country to the Elk River [Yellowstone] and had done so as far back as they and their fathers could recollect. He said the Crows, Flatheads, and Nez Percés hunted upon their land. In fact, it

was held by other tribes as neutral ground, claiming the right to hunt thereon."

Again the outbreak of hostilities between the Shoshone and Crow, after an earlier period of alliance,¹⁷ shifted their movements to the west in the 1850's. The itinerary of Wilson,¹⁸ who traveled with Washakie's band at that time, included Salt Lake City, Bear River, Soda Springs (Idaho), Snake River, Big Hole Basin (Montana), and Deer Lodge Valley (Montana).

Ethnographical materials give a more stable picture. The concentration of known places and place names is thickest within the boundaries described above. Thus, even the minor affluents of the Big Horn and Green rivers were well known to most of my informants.

The internal organization of the Wind River country can be examined from the viewpoint of either the political subdivisions or the economic units. The former, in the period 1842-1875, were organized as follows. All the bands would gather each spring in Wind River Valley under the general leadership of Washakie. They would then cross the Wind River Mountains by following Trout Creek to Mosquito Park, then going to Washakie Pass. From there, they would descend the Big Sandy, crossing it near the Lombard Ferry. After this, they would go across Black's Fork to Fort Bridger. In this neighborhood, more especially near the headwaters of the creeks, they would stay for the summer. Early in the fall, they would return to Wind River, and separate for the buffalo hunt. The band led by Ta'wunasia would go down the Sweetwater to the upper North Platte. That led by Di'kandimp went straight east to the Powder River Valley; that led by No'oki skirted the base of the Big Horn Mountains, passing through Crow territory, then swung south again to the Powder River Valley. Washakie ascended Big Wind River, and then crossed the divide to winter near the headwaters of the Greybull.

Certain modifications took place at times. Ta'wunasia's band occasionally stayed completely by itself, omitting the trip to Wind River.¹⁹ On the other hand, non-Wind River bands, such as Pocatello's,²⁰ might join the main body for the fall hunts. After 1867,²¹ the Wind River Mountains were usually crossed by way of South Pass and the mining settlements.²²

The exact arrangements before 1842 are uncertain; doubtless they were similar, for Russel wrote at that time:²³

¹⁷ Fremont, 1853:189.

¹⁸ Wilson, 1926:68-73.

¹⁹ Rep. Comm. Ind. Aff. for 1877-78:150.

²⁰ Rep. Comm. Ind. Aff. for 1866:122.

²¹ Lindsay, 1930:71-72.

²² Williams, 1928:103-106.

²³ O. Russel, 1921:114-115.

¹³ Dale, 1918:155.

¹⁴ Farnham, 1906:261.

¹⁵ O. Russel, 1921:144-146.

¹⁶ Hamilton, 1905:63, 187.

"One remarked that the Snake chief Pah-da-hawakunda, was becoming very unpopular, and it was the opinion of the Snakes in general that Moh-woom-hah, his brother, would be at the head of affairs before twelve months, as his village already amounted to more than three hundred lodges, and, moreover, he was supported by the bravest men in the nation, among whom were Ink-atosh-a-pop, Fibe-bo-un-to-wat-see and Who-sha-kik, who were the pillars of the nation and at whose names the Blackfeet quaked with fear.

"... In the winter of 1842 the principal chief of the Snakes died in an apoplectic fit and on the following year his brother, but from what disease I could not learn. These being the two principal pillars that upheld the nation, the loss of them was and is to this day deeply deplored. Immediately after the death of the latter the tribe scattered in smaller villages over the country in consequence of having no chief who could control and keep them together."

Functionally, the entire Shoshone territory fell into (A) foci, (B) routes, and (C) hinterlands. The actual exploitation of these will be discussed later. Here we shall enumerate these places.

A. Foci: (1) nda'unawisua, a pocket valley near the head of Owl Creek; (2) Wind River Valley; (3) ya'handai, near Willow Lake; (4) Fort Bridger and ha:'niqtimbangan', a valley in the upper course of Black's Fork.

B. Routes: these were noted in large part by landmarks such as Washakie's Needle (i'sawę, Coyote's penis). They followed rivers (usually named after peaks) and crossed passes (wi'yar). Lakes were of little importance: only Bull Lake, feared for its magical potency, bore a name other than ba:'garir (water seat).

The principal routes were carefully noted by Jones.²⁴

1. From Camp Brown (Fort Washakie) up Wind River Valley nearly to its head, and across the divide to the Gros Ventre Fork of Snake River. (See map 1.) Here it forks, sending one branch (1A) down the stream as far as Jackson's Hole, where it forks in turn, one portion leading down the Snake River to Fort Hall, and the other (1B), bending sharp around to the northeast, follows up Pacific and down Atlantic creeks to the Yellowstone River, down which it follows, passing to the east of Yellowstone Lake, to the Crow country in Montana--a branch of it (1C) following Lewis Fork and the west side of the lake and river; the other branch (1D) leaves the Gros Ventres near its head, and, bending to the south, crosses a low pass in the Wyoming Mountains to the headwaters of the Green River, which it follows down to the open country and thence to Fort Bridger.

2. From Camp Brown to the North Fork of Wind River (Dunoir River?), which is followed up, and two divides--one to the headwaters of Snake River--

crossed to reach the headwaters of Yellowstone River, which is followed down to Yellowstone Lake, where it joins the trail previously described. The divides crossed are extremely difficult.

3. From the "big bend" of Wind River along the left bank to Dry Fork, which is followed up to its head, and a low divide crossed to the headwaters of Owl Creek near Washakie Needles, whence it passes up this stream to its source, passing through a remarkably fine hunting ground for mountain sheep. There is here one of those luxurious mountain parks which nature seems occasionally to throw off in the very midst of her most forbidding works. Its existence would never be suspected from without...

4. From Camp Brown northward over the Owl Creek Mountains and still further north to the buffalo grounds of the Big Horn Valley and the Stinking Water River (Shoshone River), near Heart (Hart) Mountain, thence up the North Fork of the river and over the divide to the trail along Yellowstone Lake.

5. From the "big bend" of Wind River eastward along the northern face of the Sweetwater Valley, by the head of Powder River to the Sioux country east of the Big Horn Mountains.

6. From the "big bend" of Wind River northerly into the Big Horn Valley.

7. From Camp Brown to the head of Wind River, thence through Togwotee Pass, and northerly across the drainage of Snake River, striking at Pacific Creek, a previously described trail from the Tetons to the east side of Yellowstone Lake.

8. From the Wind River Valley across the Wind River Mountains, above Union Peak, to the headwaters of Green River.

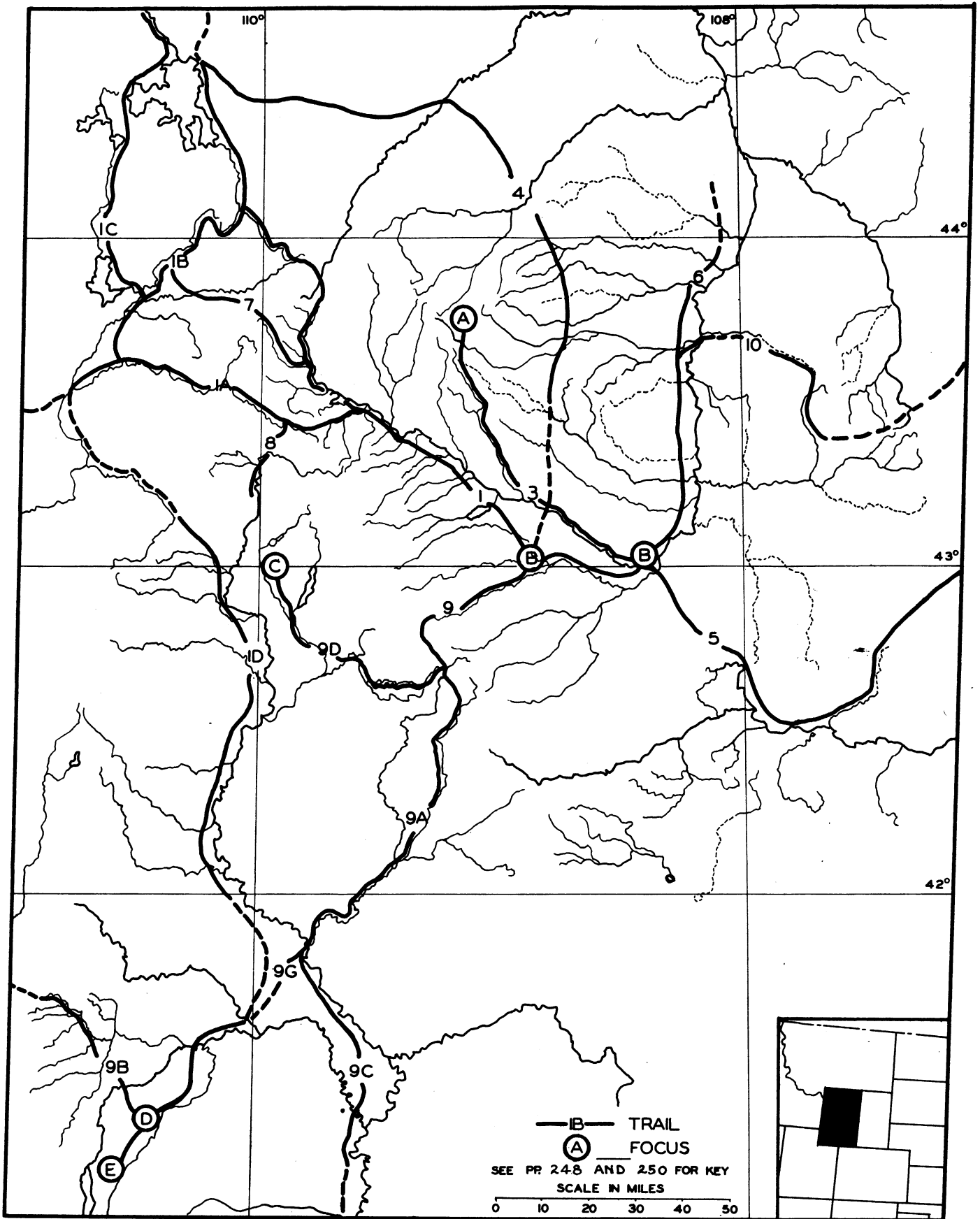
In addition to these trails, my informants told of the following:

9. From Wind River Valley up Trout Creek to Mosquito Park, then by way of Hobb's Peak and Graves Lake to Washakie Pass and the source of Big Sandy Creek. Here it forks, one branch (9A) going south to the head of Little Sandy Creek, which it follows to its junction with Green River at Lombard Ferry. It crosses here and then passes along Black's Fork, where it splits into a route (9B) going to Fort Bridger, then east to the source of the Bear River, Soda Springs and the Snake River; and a route (9C) skirting the west shore at Green River into Utah. The other branch at Big Sandy Creek (9D) crosses over to the East Fork of Green River, and thence to a series of lakes and valleys around present-day Pinedale and Daniel, all loosely called ya'handai¹ (rockchuck hole).

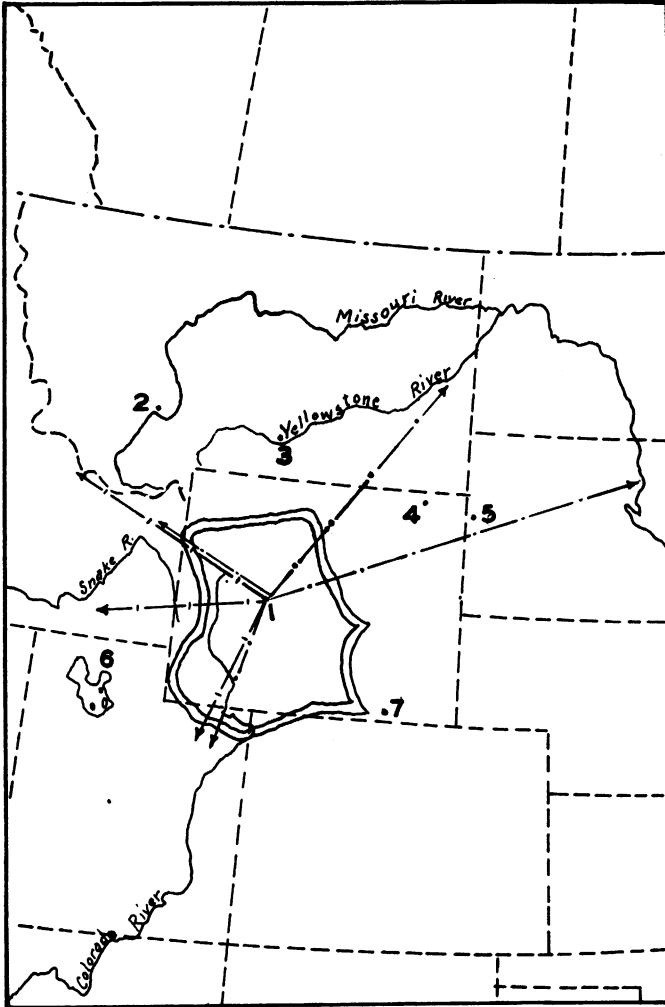
10. From the big bend of Wind River to the vicinity of Thermopolis, then up Kirby (?) Creek to its source; over the pass to the head of Bridger Creek. Thence east and northeast along the edge of the mountains to the headwaters of the Powder River.

C. The main exploited hinterlands were (see map 1) (1) the western half of the Big Horn Basin; (2) the Owl Creek Mountains and adjacent plains; (3) the Powder River Valley (especially south of the state boundary); (4) the lower drainage of the Sweetwater River and the upper North Platte; (5) the Red Desert; (6) the hill country west of Fort Bridger to the Great Salt Lake; (7) Jackson Hole and the surrounding intermontane country.

²⁴ Jones, 1875:54-55.

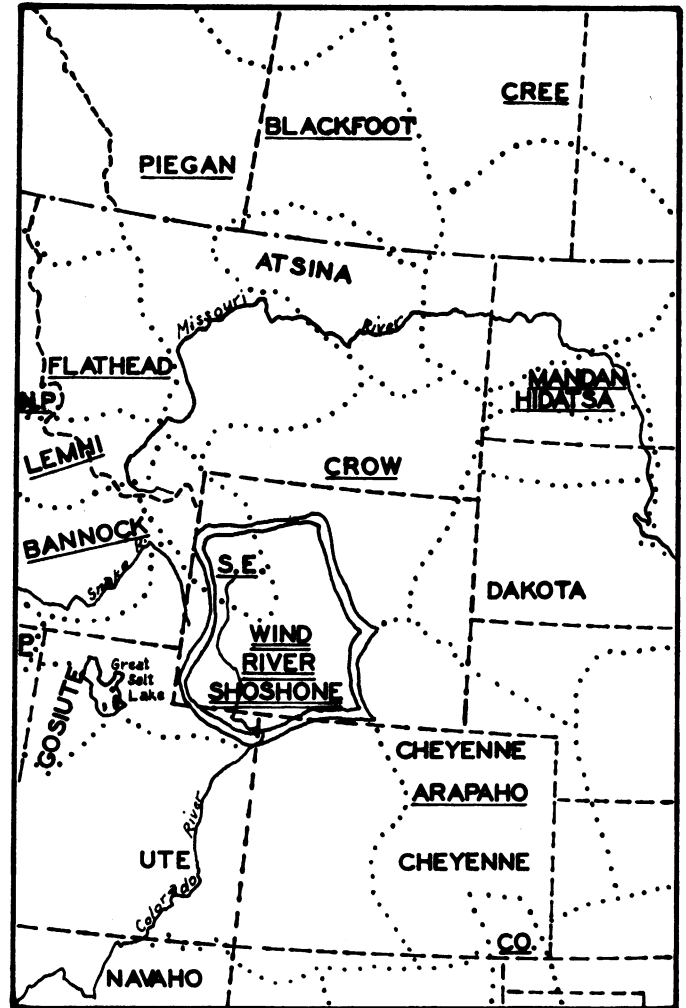


Map 1. Trails and foci.



Map 2. Place names and travels, 1825-1875. —, travels of Panianduk (woman); —, travels of Pivo (man); —, travels of Wind River Valley (yu:warai ṅgē'mēhērt, warm valley); 2, Three Forks of the Missouri (go'nodina o'gwe); 3, Yellowstone River at Billings (gē'tē o'gwe, fast river); 4, Devil's Tower (wē'sōβengar, gourd-its-butte); 5, Black Hills (e'η gakwē'hēṅgarnd'o'yaβi, red-fir?-its-place its-mountain-range); 6, Great Salt Lake (di'čipa:, bad water); 7, Medicine Bow Mountains (w'o'hondza nd'o'yap).

Most of the land within a radius of some 250 miles from Wind River was more or less known by most of these people. Nearly everyone knew of the Black Hills, or of the Three Forks of the Missouri. As a matter of fact, virtually every man and woman would travel sometime during his life. Panianduk's mother with her small children came alone all the way from the Comanche. Pivo, as a member of a small party under Tu:ṅkunt (rope), journeyed east of Standing Rock, South Dakota. In all, even though there was now no evidence



Map 3. The Wind River Shoshone world, 1825-1875. —, tribal boundary (after Kroeber); - - - -, state boundary; N.P., Nez Percé; S.E., Sheep Eaters; P., Pine-Nut Eaters; CO., Comanche (Yampa band). Tribes underlined are well known; Shoshone names in text.

of the extremely long journeys of a previous era (to the Mandan, or to Arizona),²⁵ the average Shoshone still knew personally a sizeable territory. Typical were Pivo's and Panianduk's experiences: the former had been to the confluence of the Powder and Yellowstone rivers, to the Missouri at Standing Rock, to northern Utah; the latter was born in Utah, and had visited the Bannock country and the Lemhi before settling down around Wind River.

²⁵Shimkin, 1941a; MS a.

Finally, the absolute limits of the known Wind River world constituted a much larger area yet. (See map 3.) Roughly, they formed a north-south ellipse with a vertical radius of 450 miles, a horizontal one of 250; an area of 700,000 to 800,000 square miles. I estimated these limits by plotting the locations of people with whom the Shoshone are known historically to have had contact, such as the Navaho,²⁶ or of people whose names my informants recognized. These names may

be divided into those derived from a widespread vocabulary (e.g., the sign language), as shown in the upper part of the following tabulation, and those peculiarly Shoshone, as shown in the lower part.

The heavy concentration of well-known peoples in the far north (Cree, Blackfoot, etc.) gives additional support to the theory of a previous northern residence of the Plains Shoshone elaborated elsewhere.²⁷

Tribe	Name	Analysis	Remarks
Bannocks.....	ba'na'ite	Unanalyzable	
Ute.....	iyuta:'ni	Unanalyzable	
Paiute.....	pa:i'yut	Unanalyzable	
	pai'wik	Unanalyzable	
Cheyenne.....	pa'ganawo:ni	Arrow-many-colored-people	Sign-language name ²⁸
Dakota.....	bambi'zi'mina	(He)-cuts-off-a-head	Sign-language name
Flathead.....	ta'tasiwa:ni	(?) "They're all kind of flat" (folk etymology?)	Sign-language name
Gros Ventre (Atsina).	s:ap	Paunch	Sign-language name
Sheep Eaters ²⁹	du'kurkan'i doya'hi	Sheep-eating-people	
Lemhi Shoshone.....	a'gaidika'	(He)-eats-salmon	
Pine-nut Shoshone (northern Utah) ³⁰ ..	piati'badika	(He)-eats-many-pine-nuts	
Yampah Ute (near White River) ³¹	ya'mpadikani	Yamp-eating-people	
Comanche.....	yampa'hi	Yamp-people	Northern Comanche division ³²
Arapaho.....	sa'idika	(He)-eats-dog	Either assimilated from <sari, dog, or else folk etymology ³³
Crow.....	a:'ni	Horn-people	
Hidatsa.....	du'a:'ni	(Black-horn-people) (Black-Crow-Indians)	
Cree.....	a:'noni	Horn-packing-people	
Blackfoot.....	pa'kiani	Hard-clothes(?armor)-people: ³⁴ Piegan?	
Piegan.....	can'nai'anē	Pretty-girls	
Mandan.....	ha:'nidika	(He)-eats-corn	Also used by Crow ³⁵
Nez Percé.....	co:'wiya	(He)-drags-a-root	

²⁶ Hamilton, 1905:97; for 1826, Pattie, 1906:138-139.

²⁷ Shimkin, 1941a.

²⁸ Clark, 1885--see Cheyenne, etc.

²⁹ For their territory see Shimkin, 1938; Hoebel, 1938--also includes his "Elk-Eaters."

³⁰ Hoebel, 1938; Steward, 1937.

³¹ Cooke, 1938.

³² Thomas, 1932:57 ff.

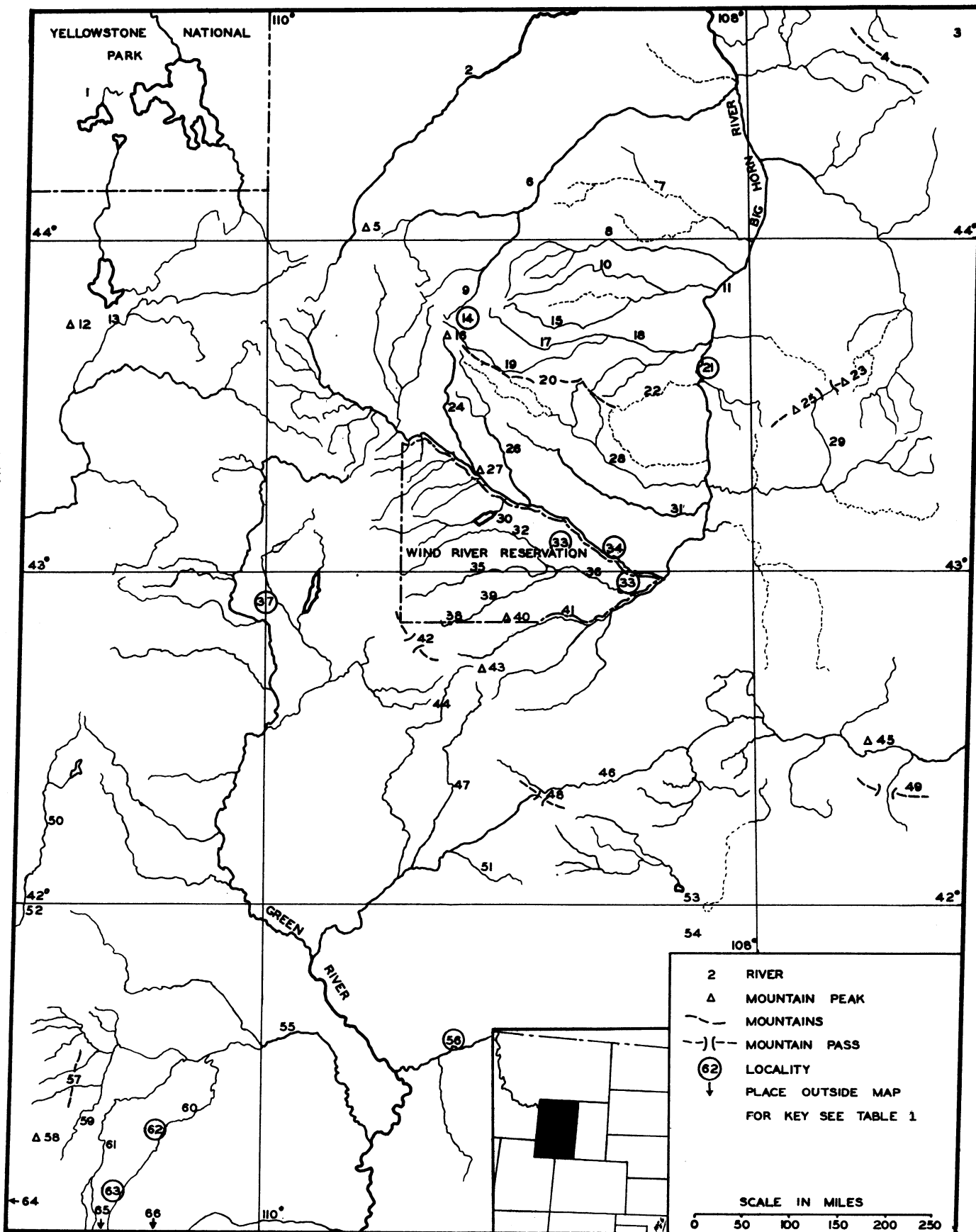
³³ Cf. Steward, 1938:208.

³⁴ Armor of buckskin is known traditionally for the Blackfoot; see Wissler, 1910:163.

³⁵ Lowie, 1922:267.

TABLE 1
Place Names
(Numbered localities are entered on map 4)

English name	Shoshone name	Analysis
1. Yellowstone Geyser basins.....	pa:'ndə'iqunt	Water-keeps-on-coming-out
2. Shoshone River.....	di'čipa:'ə'gwe	Bad-water-river
3. Tongue River.....	e:'k'w'o'gwe	Tongue-river
4. Big Horn Mountains.....	nagatu'sia'ə'gwe ndə'yəβi	Powder-river Its-mountain-range
5. Needle Mountain (?).....	gwe'iajarir	Bird-seat (butte)
6. Greybull River.....	pa:'wakarandə'yapə'gwe	Water-cedar-its-mountain-river
7. Dry Cottonwood Creek.....	pa:'sasoni'ə'gwe	Dry-grass-river
8. Gooseberry Creek.....	e:'βita'ə'gwe	White-clay's river
9. South Fork, Greybull River.....	i'sawə'ə'gwe	Coyote-penis-river
10. Grass Creek.....	pa:'wipə'ə'gwe	Water-bog-river
11. Big Horn River.....	pi'a'ə'gwe	Big-river
12. Grand Teton.....	tī'wənēr; mba'βi	Rock-stand; Elder-brother (when in sight of it)
13. Snake River.....	wə'nērīn ə'gweβi	Standing-one river-course
14. (Valley below Washakie Needles).	nda'wnawisua	(He)-packs-the-dry-meat
15. Cottonwood Creek.....	ci'nara'ə'gwe	"Parsnip"-river
16. Washakie Needles.....	l'sawə	Coyote-penis
17. North Fork, Owl Creek.....	si'hi'ə'gwe; nda'wawisua'ə'gwe	Cottonwood-river; (He)-packs-the-dry-meat-river
18. Owl Creek.....	mumbi'ə'gwe	Owl-river
19. South Fork, Owl Creek.....	tī'amumbi'ə'gwe	Little-owl-river
20. Owl Creek Mountains.....	mumbi'ə'gwe ndə'yəβi	Owl-river Its-mountain-range
21. Thermopolis Hot Springs.....	pa:'gušowənēr	Water-hot-stand
22. Red Canyon.....	eŋgahonoβita'ə'gweβi	Red-gulch's-river-course
23. (Ridge on east of Bridger Mountains).....	pə'həwiyar	Sage-brush-ridge
24. Crow Creek.....	pə'guna'ə'gwe	Currant's-river
25. (Peak on west of Bridger Mountains).....	tu'nangarit	Thunder-sitter (?)
26. Dry Creek.....	ba'kiagə'ə'gwe	Piegian's-peak-river
27. Crowheart Butte.....	hai'mbi	Crow's-heart (This refers to the bird: the popular story of Washakie's eating a Crow Indian's heart here is absolutely false)
28. Muddy Creek.....	sə'hazasagit ə'gwe	?
29. Bridger Creek.....	sə'hə'ə'gwe	Willow-creek
30. Bull Lake.....	pa:'gučina ya'gait	Water-buffalo's-crier
31. Five-Mile Creek.....	siβa'ə'gwe	Brush-river
32. Sage Creek.....	pə'hə'ə'gwe	Sage-river
33. Wind River Valley.....	yu:'warai ŋgə'wahərt	Warm-valley (?)
34. Big Wind River.....	pi'a'ə'gwe	Big-river
35. South Fork.....	tīmbana'ə'gwe	Canyon's-river
36. Little Wind River.....	tī'a'ə'gwe	Little-river
37. Willow Lake Region.....	ya'handai	Woodchuck (or Rockchuck)-hole
38. Mosquito Park.....	so'nidai'int; hu:'capaguxia	Grass-hole; (He)-saws-wood
39. Trout Creek.....	si'hi'ə'gwe	Cottonwood-river
40. Bald Mountain.....	wa:'nzigarir	Buck-antelope-seat
41. Popo Agie River.....	wa:nzigarinə'gweβi	Buck-antelope-seat river-course
42. Washakie Pass.....	də'yawiyap	Mountain-pass
43. Wind River Peak.....	du'kugarir	Mountain-sheep-ram-seat
44. Big Sandy Creek.....	pə'ngana'ə'gwe	?
45. Split Rock.....	ki'nyatiwənēr; tū'iwičapti'wənēr	Hawk-rock-stand; Youth-his-rock-stand
46. Sweetwater River.....	pi'ha ə'gwe; pawundo'iha'ə'gwe	Sweet-river; Crystal-pipe's-river
47. Little Sandy Creek.....	du'kugara'ə'gweβi	Mountain-sheep-ram-place's river-course
48. South Pass.....	mu'za	(Archaic Mountain-sheep-ram? Cf. mu'zambia, Mountain-sheep-ewe)
49. Green Mountains.....	wəŋgə'yigwində'yap	Pines-sitting-mountain
50. Smith's Fork.....	si'hi'ə'gwe	Cottonwood-river
51. Morrow Creek.....	si'narandinə'gwe	?
52. Bear River.....	gu'yə'ə'gwe; hu:'ə'gwe	?; Wood-river
53. Alkali Lakes, Red Desert.....	e'ŋga βagarir	Red-lake
54. Red Desert.....	e'ŋga šogup	Red-land
55. Ham's and Black's forks.....	tu'rə'ə'gwe	Black-paint-river
56. Rock Springs.....	tī'mbipa:razope	Rock-spring
57. (Cliffs near Bear River Divide).	pi'aya'han ŋga'n'	Big-woodchuck (rockchuck) Its-home
58. Medicine Butte (?).....	wa'šipingarit	Mountain-goat (?) -sitter
59. Albert Creek (?).....	co'igara'o'gwe	"Root"-river
60. Black's Fork.....	wo'ŋgo'o'gwe	Pine-river
61. Little Muddy Creek.....	kuš'i'ə'gwe; eŋga'ə'gwe	Gray-river; Red-river
62. Fort Bridger.....		
63. (Valley in upper course of Black's Fork?).....	ha:'ni ŋti'mbingan'	Beaver its-rock-house
64. (Bear River Divide and west to Great Salt Lake).....	za:'šogup	Good-land
65. King's Peaks (?).....	tī'agəi	Small-peak
66. Uintah Mountains.....	wŋgə'ə'gwe ndə'yəβi yu'tani ndə'yəβi	Pine-river its-mountain-range Utes Their-mountain-range



Map 4. Place names.

DEMOGRAPHY

The main demographic materials available for the Shoshone are on the population profile, reproductivity and epidemiology, total numbers, and blood admixtures. All of these data are quite crude--modern census and genealogical records, contemporary estimates--and naturally subject to a high degree of error. Study of the significance of such data and their changes in the Shoshone culture occupies another work;³⁶ here, only the basic figures for 1842-1875 are presented.

The population profile has two main axes, age and sex. At the present time, the extreme age limit is about 90 years; two-thirds of the population, however, is less than 30, one-fourth, less than 10.³⁷ Almost certainly, the population in aboriginal times was at least as greatly skewed toward youthfulness. Although some authentic records of great age--Munhavey, Washakie³⁸--do exist for these days, it must be held in mind that, of the average Shoshone woman's six full-term pregnancies, less than three lived to a marriageable age.³⁹ Counteracting this, and making for a greater relative number of adults, was the great number of childless women: it may have been as high as 20 per cent. All of these, of course, were not truly childless; some had short-lived infants forgotten by others. Yet this assumption cannot explain away the majority of instances. Probable factors for a low birth rate were the impotence of the man (pubescent girls were generally given away to mature, established warriors), venereal diseases,⁴⁰ and organic disorders occasioned by chronic malnutrition (calcium deficiency especially).⁴¹

The most satisfactory data for establishing the proportion between men and women is given by the census of 1874,⁴² taken at a time when both aboriginal economic conditions and war were still active. In all, 369 men, 422 women, and 250 children (certainly too low) were recorded. This would give a proportion of 87 men to 100 women.

³⁶ Shimkin, MS b.

³⁷ Shimkin, MS a.

³⁸ Washakie was prominent by 1842, lived to 1900: a minimum span of 85 years; Munhavey was already mature at that time, yet took part in the Ghost Dance of 1890--indicating a life of 90 years or more. See Hamilton, 1905; Shimkin, MS.a.

³⁹ Case records of informants; genealogies covering 337 persons.

⁴⁰ Syphilis was noted by Lewis and Clark; gonorrhoea is well known, mentioned in mythology. Neither is very prevalent at the present time, according to Dr. D. W. Gunn, the government physician. See also Thwaites, 2:373.

⁴¹ For instance, Humfreville, 1899:207, noted much goiter.

⁴² Rep. Comm. Ind. Aff. for 1874:270; for 1877-78:150.

Reproductivity was fairly low. On the average, each woman bore somewhat less than three children who reached maturity. But occasional severe epidemics of smallpox, in 1781, around 1805, 1837,⁴³ and 1850, did great damage. According to Clark,⁴⁴ one-half of the Shoshone died in the last epidemic. Native informants give a similar picture. In addition, less noteworthy but equally disastrous epidemics of measles and whooping cough undoubtedly took their toll. In short, it seems probable that the Shoshone population remained stable over the long run, rising slowly at times, dropping suddenly at others.

The total population figures present some difficulties. Most of the sources counted assemblages at rendezvous, when many other tribesmen were present. In addition, some counted by lodges or warriors, not souls. My best estimate on the basis of all such materials is an average of 1500, which might reach 2000 or decline to 1000 at times.

We may assume that there was one warrior (male over 15) to every 4.2 persons; a household included 5 souls, or a few more,⁴⁵ on the average, although in one account 153 persons had but 11 lodges.⁴⁶

Wislizenus⁴⁷ counted "some thousands" at the rendezvous in 1839; these included many tribes.

Russel,⁴⁸ including both Idaho and Wyoming Shoshone, estimated them at 5000-6000, about half of them living in large villages and ranging among the buffalo. As these would be nearly equally divided among the Idaho (mixed Bannock and Shoshone) and Wind River contingents, we arrive at a figure of 1500 for the latter. The same author saw a village of 300 lodges (or 1500 people?), and mentioned another of the same size. In Cache Valley he saw 20 lodges (100 persons?) of Snakes.

DeSmet⁴⁹ at Green River, in 1841, saw "three hundred of their warriors in a military parade." He also encountered a mixed village of Kalispel, Snake, etc., near Livingstone, Montana, which numbered 250 huts (or 1250 persons?).

Hamilton⁵⁰ mentioned three war parties of 25 each in Washakie's village in 1842; this giving a minimum of 105.

Wilson⁵¹ figured that 6000 Indians (not all

⁴³ Tyrell, 1916:327 ff.; Thwaites, 2:373; Farnham, 1906:266, n. 156.

⁴⁴ Clark, 1885:350.

⁴⁵ Based on the analysis of the household arrangements of 160 homes. See also Shimkin, MS a, Appendix I. All the evidence points to a family group of this size as a persistence of aboriginal conditions.

⁴⁶ Rep. Comm. Ind. Aff. for 1877-78:150.

⁴⁷ Wislizenus, 1912:88.

⁴⁸ O. Russel, 1921:17, 113, 114-115, 144-146.

⁴⁹ DeSmet, 1906:163, 392.

⁵⁰ Hamilton, 1905:71.

⁵¹ Wilson, 1926:23, 69.

Shoshone) were camped at Deer Lodge Valley, Montana. When they scattered, only 25 tipis (125 persons?) remained with Washakie.

During the Mormon troubles Moorehead⁵² met Washakie and 2000-3000 Indians.

Wheeler⁵³ relates that 300 Bannock and Shoshone warriors (Wind River people) were defeated at Bear River in 1863; this yields 1300 in the assemblage.

Comstock⁵⁴ described Washakie's band as numbering barely 300 warriors (1300 souls?).

The earlier Reports of the Commissioner of Indian Affairs included Idaho Shoshone in their census. But in 1878 that agent wrote,⁵⁵ "...[1250] is the exact number belonging to Washakie's band of Shoshones, and is all that will be claimed for it hereafter. Their number has heretofore been computed at 1,800, by including some small bands of Western Shoshones, who, however, never really belonged at this agency."

This estimate of population is considerably lower than previous ones. Kroeber⁵⁶ figures 2500. The discrepancy is even greater if density is taken into consideration, as his Wind River area is 55,000 sq. km. against my 96,000 sq. km. Thus he has 4.5 persons per 100 sq. km., I have 1.5 (24 sq. mi. to a person). This is no higher than the figure for the Great Basin arrived at by Kroeber. Yet, as we shall see, Wind River Shoshone economy was definitely much more Plains and Plateau than Basin in type. (These data may have bearing upon theories of the relative efficiencies of the two modes of life, and the impetus given to Plains culture by the horse.)⁵⁷

The sizes of local groups among these people can barely be guessed, for figures are excessively rare. Tawunasia's band was counted as 153

⁵² Connelley, 1907:607.

⁵³ Wheeler, 1924.

⁵⁴ Comstock, "Geological Report," in Jones, 1875.

⁵⁵ Rep. Comm. Ind. Aff. for 1877-78:150.

⁵⁶ Kroeber, 1939, table 18; see also Stewart, 1938:49; Stewart, 1939:146-147.

⁵⁷ See Kroeber, 1939:76-84, and references therein.

souls; Russel met an isolated group of 23 Sheep Eaters, men, women, and children; others cited settlements of from 20-25 tipis. However, the four main groups into which the Shoshone broke annually probably numbered at least 200 persons each.

Population admixture has long been operative among this people. White traders had their influence from the beginning of the nineteenth century; the numerous one-eighth and seven-eighths bloods attest to that. Even more, there has always been much intermarriage with the Bannock, Ute, Flathead, and Crow (virtually none with Arapaho until quite recently). Washakie was half Flathead; one of his wives was Crow; another, Ute. At the present time the composition of blood on the Shoshone reservation is approximately as follows: 43.3 per cent full-blood Indian, 19.9 per cent one-half or more Indian blood, 36.8 per cent less than one-half Indian blood (many of the last not in residence on the reservation).⁵⁸ The Indian admixture cutting across this is about 85 per cent Shoshone, 10 per cent Bannock (including Lemhi Shoshone), 5 per cent others (Navaho, Flathead, Paiute, recent Comanche, Arapaho, Crow). A few are exotic, having Yakima, Klamath, Cherokee, and even Seminole-Wyandotte-white blood.

Very close to this picture is Russel's description for 1837.⁵⁹

"On arriving at the village I found several Frenchmen and half-breed trappers encamped with the Snakes. One Frenchman, having an Indian wife and child, invited me to pass the winter in his lodge, and as he had a small family and large lodge, I accepted the invitation and had my baggage arranged by his wife, who was a Flathead.

"... The inmates of the next lodge were a half-breed Iowa, a Nez Percé wife and two children, his wife's brother and another halfbreed; next lodge was a halfbreed Cree, his wife (a Nez Percé), two children and a Snake Indian. The inmates of the third lodge was [sic] a halfbreed Snake, his wife (a Nez Percé) and two children. The remainder were fifteen lodges of Snake Indians."

⁵⁸ Census data: see Shimkin, MS a, Appendix I.

⁵⁹ O. Russel, 1921:113, 114.

ENVIRONMENT

The most significant aspects of the environment from the viewpoint of a hunting, fishing, and gathering people like the Shoshone are the topography, physiography and soils, climates and biota. The first two serve to direct routes of travel by means of barriers and gateways; the others combine to determine the economic possibilities of any locality. In this section we shall describe the various aspects of geography and their relations to each other. The adaptation of the Shoshone themselves will be dealt with in later pages.

The topography of western Wyoming⁶⁰ is best characterized as a series of basins: the Big Horn, Wind River, Red Desert, Green River, Jackson Hole, and Yellowstone. All of these, except the Red Desert Basin, are broken through by a river. This does not aid exit and ingress, for the channel at this point is always a deep canyon, but prevents the formation of extensive lakes and marshes (Yellowstone Lake is but a remnant of an ancient glacier; the only marshes are found in the Red Desert area). The Sweetwater River alone forms a clear way across this country to the east, a way whose importance was evident in the routing of the pioneer California and Oregon trails.

The boundaries of the basins are barriers of varying difficulty. Those of the Red Desert are insignificant swells. The Owl Creek and Bridger mountains and the Bear River Divide have scarcely more importance. The others increase sharply in difficulty. All except the Absarokas-Sierra Shoshone are anticlines of the Rocky Mountain system which rise, on the whole, to the peneplain level of 10,500 feet. Monadnocks of considerable size, particularly in the Wind River, Teton, and Big Horn mountains, rise above the peneplain to nearly 14,000 feet. Two processes, glaciation and faulting, have modified conditions locally. In general, the first process has greatly increased barriers by sharpening the slopes, leaving intermediate obstacles (lateral and terminal moraines), as well as some residual glaciers and many lakes. The second has caused sharp breaks on the fault-lines, with resultant precipices on one side, gradual slopes on the other. This phenomenon has, for instance, made the climb out of Wind River Valley to the northwest gentle; but, on the other hand, cut off the northern limit of Green River Valley by a steep wall. The Absarokas form the most difficult barrier in western Wyoming. They

⁶⁰ Topographic maps (scale, 1:125,000) have been drawn for about a quarter of western Wyoming; these are based on spirit-leveling, as no accurate surveys exist as yet. For the list of maps and the base data see Marshall, 1914:7. The U. S. Forest Service map of Washakie National Forest, 1926, and the U. S. Bureau of Biological Survey map of Wyoming (scale, 1:500,000) are also useful. Other maps are secondary and often highly inaccurate.

consist of lava and volcanic breccia piled on top of the Rocky Mountains. Glaciation has weathered them into an Alpine country of fantastic shapes, great grandeur, and equally great inaccessibility.

Fortunately, gaps exist in most of the ranges. The Big Horn Mountains break at the head of Shell Canyon; the Wind River Range is passable at Washakie Pass, and separated from its northern neighbor at Togwotee Pass. The northern fork of the Shoshone River leads across the Absarokas. Teton Pass divides the Tetons from the Snake Range.

The drainage within the basins is largely immature, consisting of relatively straight, precipitous streams with shallow channels. They begin in mountain parks as lakes. By and large they are not serious barriers, except where they have cut through lower ranges to form canyons (like the Big Horn and Snake rivers) although their speed of flow makes them dangerous. Intermittent streams exist mainly in the poorly watered area to the east. A partial exception to this picture of immaturity is formed by the Green River and its lower tributaries, which are meandering streams, considerably older than the others.

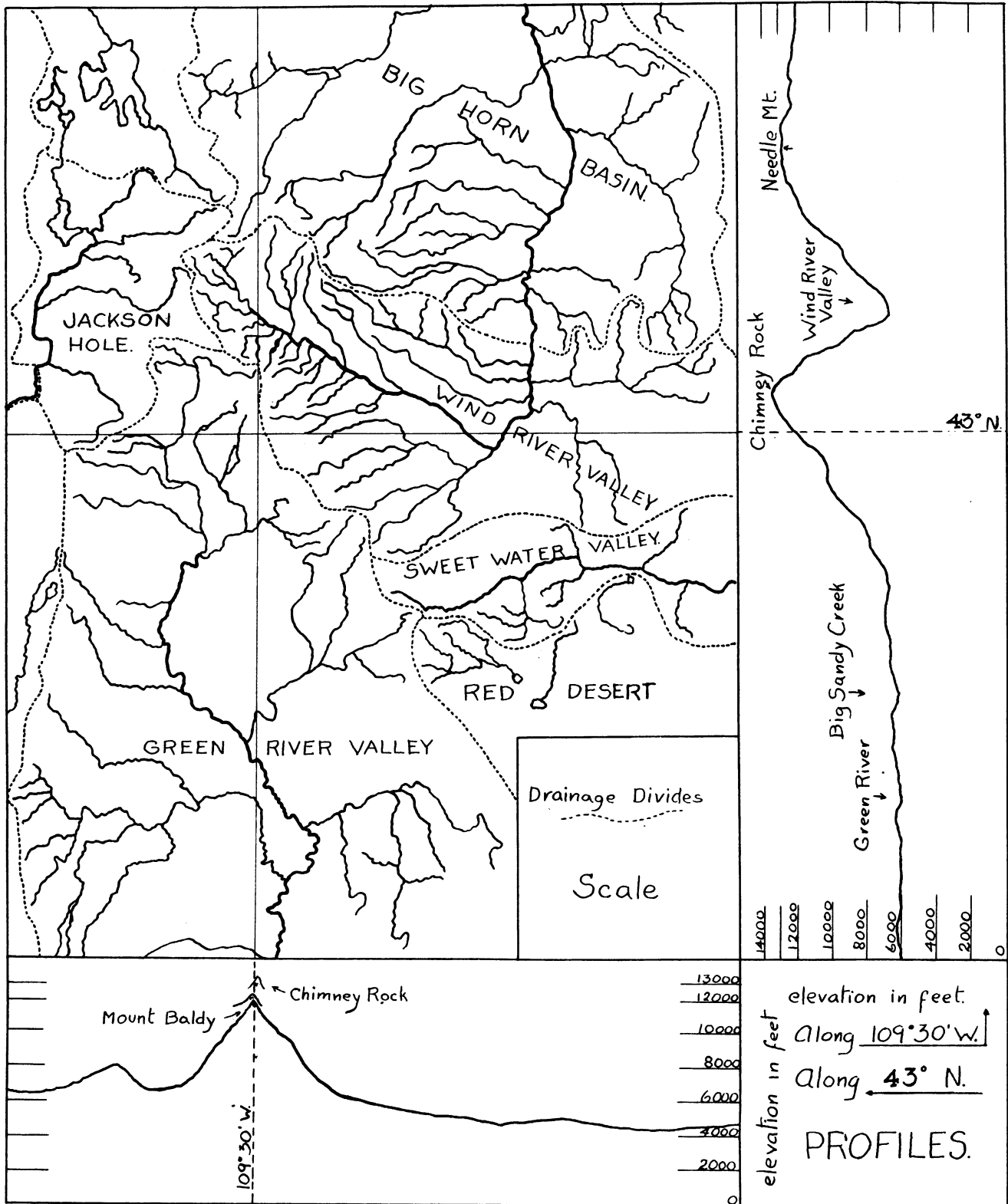
Elevations within the basins are unimportant. They are either rolling hills or, where eroded by the wind, local abrupt bluffs and buttes.

The physiography and soils parallel topography. This entire area falls into three major regions:⁶¹ the Central Rocky Mountains, the Wyoming Basin, and the northernmost tips of the Southern Rocky Mountains. The first region is further subdivisible: the Uintah Mountains are an anticline running east-west with the fault lying on the northern edge. Their core is pre-Cambrian quartzite, overlaid (on the southern slopes especially) by later sedimentation. The Wyoming, Salt, and related ranges are a series of sedimentary ridges running north-south, created by extensive lateral shocks from the west. The intervening valleys mark the fault-lines of the weakest rocks.

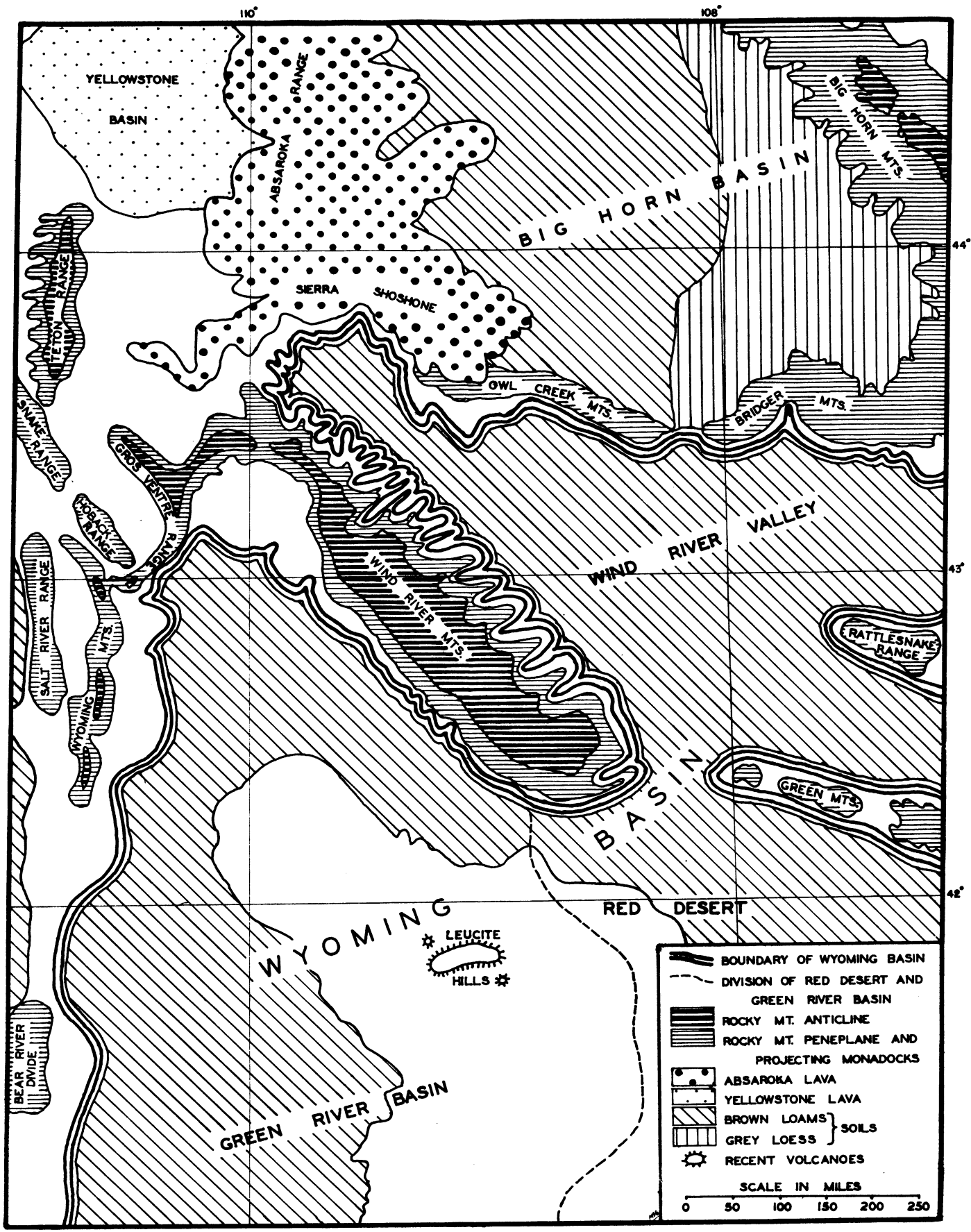
The Wind River, Gros Ventre, and Big Horn systems are elevations created in the fundamental orogenic processes of the Rockies. They all consist of granite or crystalline cores overlaid by ancient sedimentary and metamorphic rocks. The direction of the Owl Creek Mountains-Big Horn rise has caused it to be linked by some with the Southern Rocky Mountains System. The Teton Range is similar in structure to these mountains, but is asymmetrical, with its fault on the east.

The Absaroka-Shoshone Mountains consist of deep layers of volcanic breccia on top of the Rocky Mountains uplift (which reappears in the north as the Beartooth Range). Yellowstone Basin is a structural syncline almost filled by lava (which is 3000 feet deep in places).

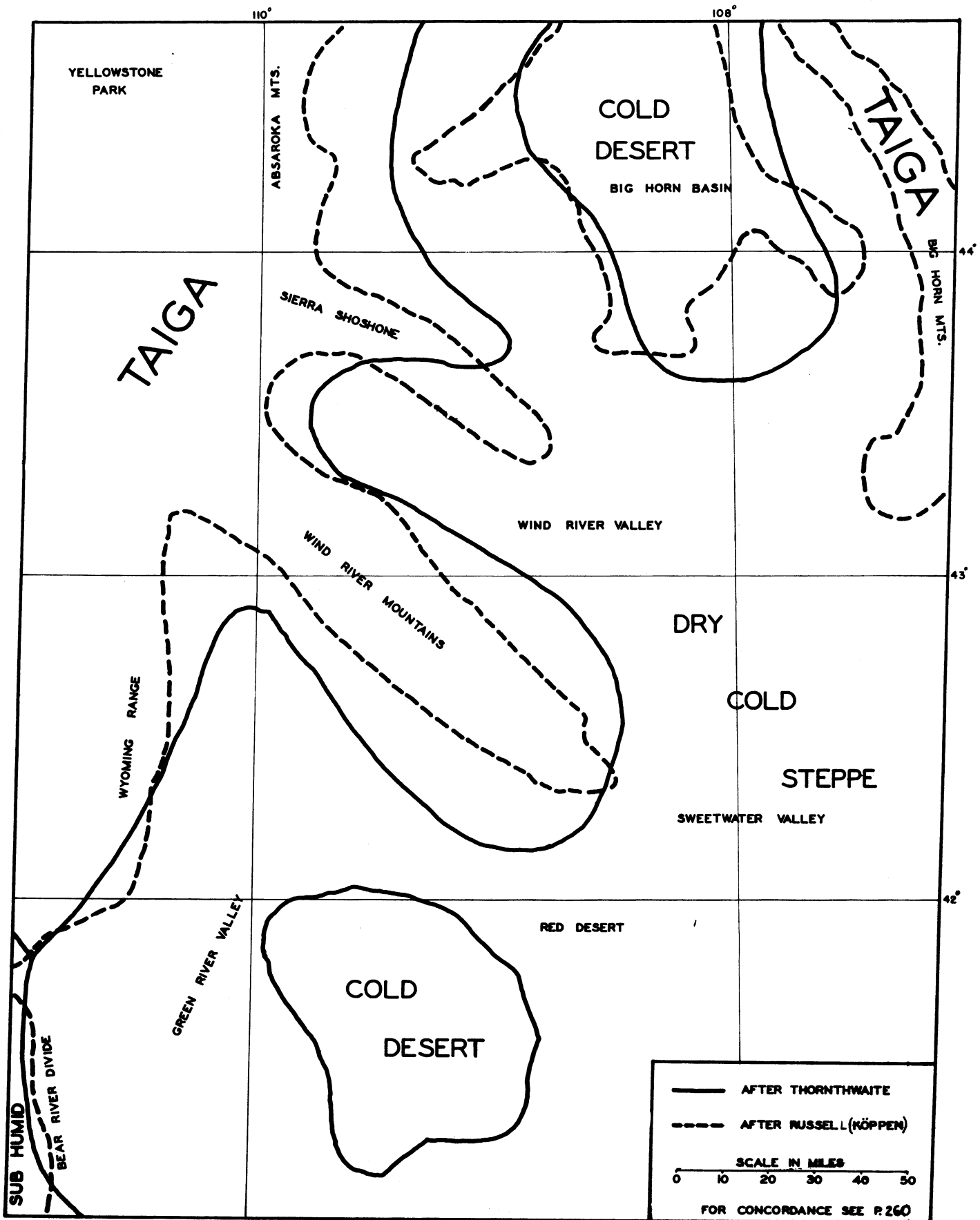
⁶¹ The analysis follows Schmieder, 1933:242-246, and Loomis, 1937:227-240, Fenneman map in rear.



Map 5. Profiles.



Map 6. Physiography and soils.



Map 7. Climates.

The Wyoming Basin is a structural basin originating at the time of the Post-Cretaceous Laramide Revolution (cf. the Wyoming Range). Later it was repeatedly filled and refolded. In its western portion it has been largely excavated and leveled by the Green River. In the east, the low precipitation and interior drainage of the Red Desert have preserved a more primitive condition. Between the two are the Leucite Hills, which are young volcanoes.

The Southern Rocky Mountains are unimportant in this area.

True soils do not exist in most of western Wyoming, as the land is too rough and mountainous.⁶² They occur only in the western part of Green River Valley, the Sweetwater and Wind River valleys, the Big Horn Basin, and south of the Red Desert. Except for the Big Horn Basin east of the Big Horn River, these soils are chiefly brown loams. They are surface soils grading at a depth of from one to two feet into a whitish calcareous horizon. (The profile is developed in a temperate to cool, semiarid climate, under short grasses, bunch grasses, and shrubs, and on unconsolidated sands, silts, and clays.) The exceptional instance is made up of gray and grayish-brown soil of variable texture, closely underlain by calcareous material. (It develops in an arid climate under short-grass and desert plants, and on loess and alluvial fan material.)

The classification of climates presents some difficulties. Representation of all of the factors involved would necessitate numerous, confusing mappings. To avoid this, climatologists have attempted to combine these factors into indices of biological importance. The most widely used of these, the Köppen classification, groups climates according to mean annual temperature, mean annual precipitation, and "precipitation regime" (several maxima and minima of precipitation). The precise definitions (as used by Russell)⁶³ for the pertinent groups in Wyoming are as follows:

"Dry Climate (B): centimeters of precipitation = mean annual temperature, C°, +22 (wet winters) to 44 (wet summers), but a classification recognizing nine types of effective precipitation regimes based on consideration of two out of three months of opposite seasons precedes the application of climatic definitions.

Desert (W); classification as for B, but precipitation values, in centimeters = mean annual temperature, C°, +11 (wet winters) to 22 (wet summers).

Steppe (S), dry climates more humid than desert, as just defined.

Cold type (K), with mean January temperature below 32° F. Taiga is cold and wet."

An important modification of the Köppen system has been developed by Thornthwaite.⁶⁴ He has attempted to compute the "temperature efficiency," that is, the relation between temperature and precipitation utilizable by plants. His formula is rather complicated, so that only the pertinent provinces and their normal correlates will be given here.

Climate	Floral climax (see below)	Soil
Taiga (D')	Picea-Abies formation (Spruce-alpine fir)	Muskeg
Cold Steppe (DC'd)	Atriplex-Artemisia (Salt bush-Sagebrush)	Grayearths (see above) Blackearths
Cold Desert (EC'd)		
Cold Subhumid (CC'd)	Stipa-Bouteloua (Feather grass-Grama grass)	

Russell's and Thornthwaite's maps for Wyoming coincide in large degree. Both recognize three divisions: a cold, wet taiga; a cold steppe, deficient in moisture at all seasons; and a cold desert, deficient in moisture at all seasons. Their taiga and Big Horn Basin desert areas coincide closely; Russell is guided somewhat more by drainage-basin divides, Thornthwaite by altitude. But Russell recognizes a second taiga region in the Big Horn Mountains, which Thornthwaite does not, while himself insisting upon a cold desert in the Red Desert area, a subhumid region west of the Bear River Divide.

A concrete picture of the actual weather in the three major zones of western Wyoming is yielded by hythergraphs (temperature-precipitation charts) for three stations: Moran (in the taiga), Riverton (in the steppe), Basin (in the desert). (See fig. 1.) From them we see that all three have two cycles of precipitation, although at Moran they come in March and May; in the others, in May and October. Moran is consistently wetter and colder than the other two, which differ between themselves chiefly in the heavy rainfall received by Riverton in May.

Even the hythergraphs do not give a complete presentation of all the factors important to man and animal. The means are far from the minima and maxima, which are -66° F in Yellowstone National Park⁶⁵ and above 100° F in the Big Horn Basin. Nor do they show the yearly fluctuation. In Fort Laramie

⁶⁴Thornthwaite, 1931.

⁶⁵At Riverside Ranger Station, February 9, 1933. The average depth of unmelted snow on the ground in the elevated regions of Wyoming by the end of March is 38 inches, with a maximum of 122 inches. See "Climatological Data," Wyoming Section, 42:4 and 45:13 (U. S. Department of Agriculture Weather Bureau, Washington,) 1933 and 1936.

⁶²Baker, 1937:16-18.

⁶³R. J. Russell, 1931:esp. 41.

Station	County	ft. elevation	Length of records	Mean temp	Total Precipital.
Basin	Big Horn	3,837	36 yrs.	45.2°F	7.12"
Moran	Teton	6,770	27 yrs.	34.0°F	21.57"
Riverton	Fremont	4,954	18 yrs.	42.2°F	9.49"

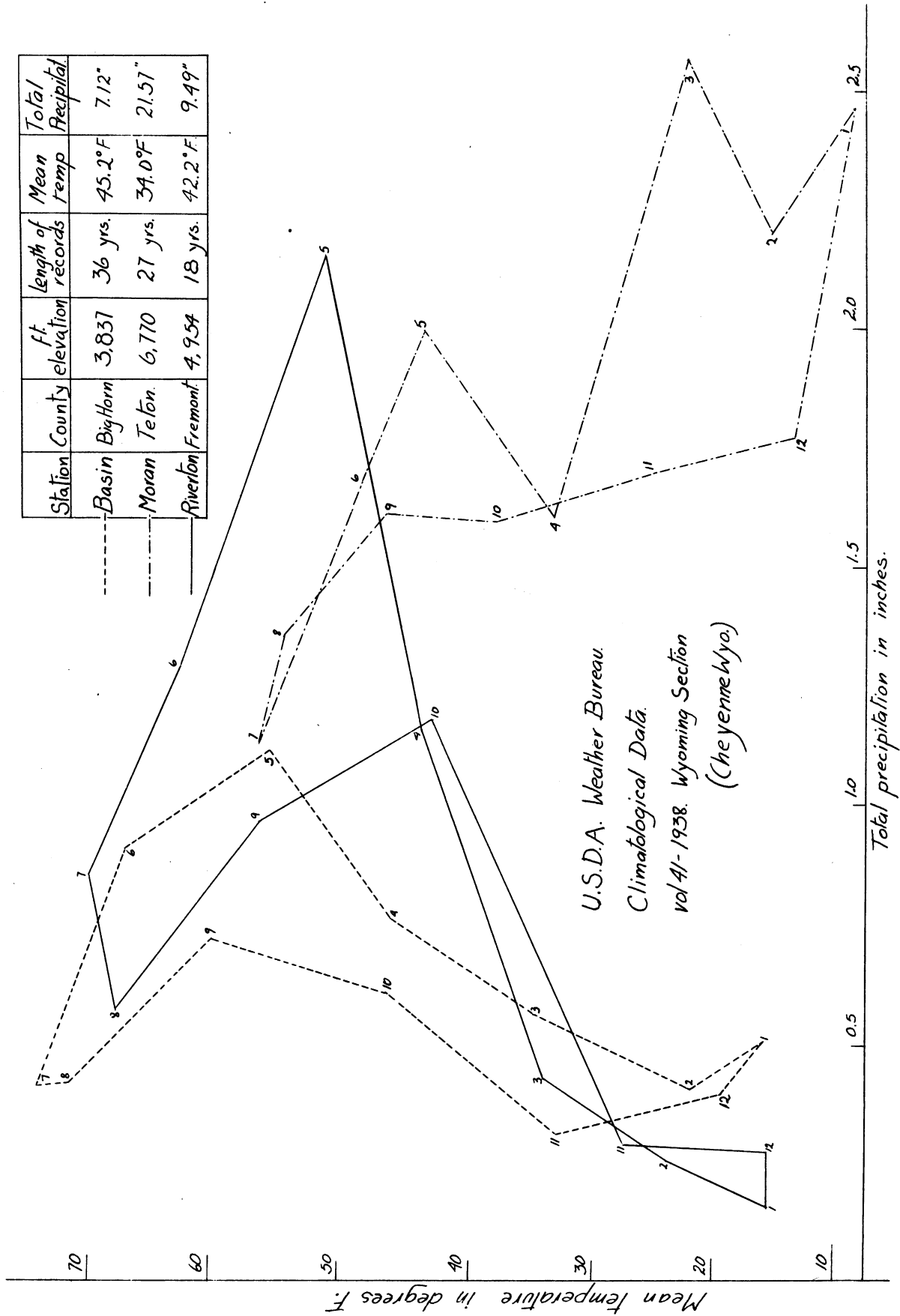


Fig. 1. Temperature and precipitation for type stations in western Wyoming.

(somewhat east of the area under consideration),⁶⁶ the rain in June has varied from 0.0 to 4.8 inches. In addition, such factors as wind (attaining 75 miles per hour on the plains), sunshine, humidity, and evaporation play their roles. Finally, even the nature of precipitation is highly important. Snow protects growing plants from bitter cold, but cannot be directly utilized until it is melted. Showers of less than 0.15 inches actually decrease the moisture of porous soils, in cases of low humidity, by increasing capillarity. Cloudbursts on barren, desert land are not as helpful as their precipitation would indicate because of the heavy run-off, and do actual damage by washing away precious soil. All these factors sharpen the contrast between taiga, steppe, and desert.

The floral and faunal areas of Wyoming have been intensively studied by Merritt Cary.⁶⁷ The divisions which he has set up are those of Merriam, and are based fundamentally upon the type plants and animals associated with the cumulative or effective heat of a given area (cf. Thornthwaite's climatic provinces). Those which he finds in western Wyoming are, in order of increasing altitude, the following (Shelford's approximate synonyms follow in brackets):⁶⁸ Upper Sonoran-Great Basin Division (Semidesert: mixed grass and sagebrush); Transitional (Steppe: grasses in open sod, chaparral, mountain mahogany); Canadian (Rocky Mountains Montane Forest: Western yellow pine, Douglas fir, etc.); Hudsonian (Rocky Mountains Forest: Engelmann's spruce and alpine fir); and Arctic-Alpine (Tundra and Alpine Summits: lichens, herbs, grasses, etc.). An important subclassification runs across these, the "association" or specific physiography, for example, meadow, rock slope, etc.⁶⁹

The characterizations of these zones and their principal associations are briefly as follows:

1. Upper Sonoran zone (up to 5000 feet, roughly). Mammals: antelope, buffalo (formerly), Great Plains muskrat, Wyoming kangaroo rat, black-tailed jack rabbit, Bailey cottontail, plains coyote, kit fox, raccoon, badger, Great Basin spotted skunk, black-footed ferret, northern plains mole; various species of chipmunks, ground squirrels, prairie dogs, mice, gophers, bats. Birds: great blue heron, Virginia rail, mourning dove, burrowing owls, western mockingbird, etc. Snakes: prairie bull snake, plains rattlesnake, etc. Plants: (a) stream association--

broad-leaved cottonwood, willow, skunkbush, flowering currant, buffalo berry, etc.; (b) alkali-flat association--greasewood and glasswort; (c) sandy and adobe plains association--saltbush, Eriogonum, cactus (Opuntia), wheat grass, giant rye grass, rabbit brush, greasewood, yucca; (d) ridges, slopes, and canyons--juniper, piñon, mountain mahogany, shadscale, syringa, cacti, skunkbush.

2. Transitional zone (5000-7500 feet, roughly). Mammals: plains white-tailed deer, Black Hills red squirrel, Wyoming and Uintah ground squirrels, white-tailed prairie dog, bushy-tailed wood rat, Uintah pocket mouse, prairie jumping mouse, white-tailed jack rabbit, Black Hills cottontail, northern plains skunk, long-legged bat; various mice, pocket gophers, etc. Birds: sage hen, sharp-shinned hawk, saw-whet owl, magpie, piñon jay, mountain song sparrow, Rocky Mountain and pygmy nuthatches, willow thrush, etc. Reptiles: western garter snake, a toad, and a frog. Plants: (a) foothill and open plains association--Rocky Mountain and creeping junipers, Bebb-willow, barberry, wild red currant, mountain and large-toothed maples; various berries, sagebrushes, rabbit brushes; many herbaceous plants; (b) stream association--narrow-leaved cottonwood, diamond willow; shrubbery of birch, haws, cornel, wild gooseberry, currant, serviceberry, silverberry.

3. Canadian zone (7500-9500 feet, approximately). Mammals: elk, Shiras moose, Fremont Spruce squirrel, Rocky Mountain flying squirrel, beaver, yellow-haired porcupine, snowshoe rabbit, mountain lion, Canada lynx, mountain red fox, Arizona weasel, Rocky Mountain marten, otter, wolverine, black bear; grizzly bear; various chipmunks, ground squirrels, marmots (rockchucks), shrews, and bats. Birds: white pelican, Canada goose, grouse, various sapsuckers, blackheaded jay, Rocky Mountain jay, water ouzel, western winter wren, mountain chickadee, etc. Plants: (a) upper-hill association--Douglas fir, lodgepole pine, Engelmann's spruce; (b) lower-hill association (in addition)--birch, aspen, willow, various currants, buffalo berry, blueberry, elderberry, etc.; (c) wet-meadow association--willows and grasses, shrubby cinquefoil, larkspur, lupine, geranium, iris, etc.; (d) dry-meadow association--sagebrush, Frasersa, Balsamorhiza.

4. Hudsonian zone (peripheral to the Canadian; 9500-10,500 feet, roughly). Mammals: mountain sheep, timberline chipmunk, several marmots, the pika or coney (also visitors from the Canadian zone). Birds (most species also in the Canadian zone): alpine three-toed woodpecker, Rocky Mountain pine grosbeak, Rocky Mountain creeper, etc. Plants: (a) deep-soiled association--white-barked pine, Engelmann's spruce, alpine fir, low juniper, gray-leaved willow, red raspberry; (b) shallow-soiled association--spring beauty, alpine bitterroot, columbine, larkspur, buttercup, anemone, phlox, painted cup, etc.

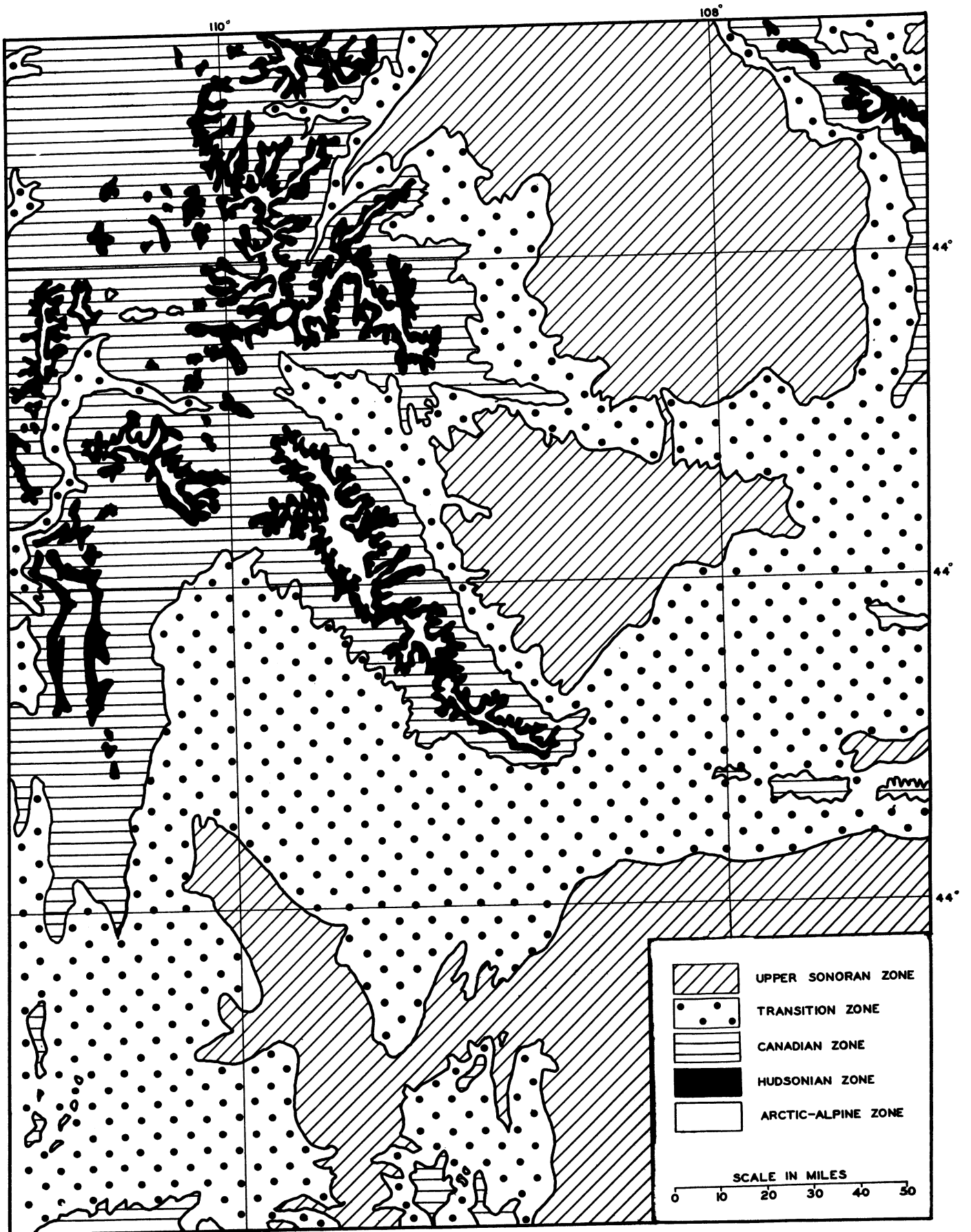
5. Arctic-Alpine zone (above 10,500 feet). Mammals: only visitors from lower zones. Birds: white-tailed ptarmigan, brown-capped rosy finch, black rosy finch, titlark, desert horned lark. Plants: (a) wet gulches and basins--thickets of willow, shrubby cinquefoil; (b) rocky slopes and ridges--mountain heath and alpine avens; (c) slide rock--spring red currant and dwarfed raspberry; (d) high slopes (annuals)--buttercups, alpine meadow rue, locoweed, alpine forget-me-not, golden-rod, fleabane, alpine yarrow, alpine bluegrass, sedges, etc.

⁶⁶ Given in the excellent discussion by Visher, 1925: esp. 75.

⁶⁷ Cary, 1917.

⁶⁸ Shelford, 1926: 75-76.

⁶⁹ Two detailed studies of associations have been made in this general region, one from the viewpoint of botany, the other from that of zoölogy. See Hanna, 1934, and Davis, 1939: esp. 21-63.



Map 8. Life zones (after Cary).

Geographical concordances.--Comparison of the distributions of topography, physiography and soils, climates, and biota in the pages above reveals a number of concordances which seem to delimit natural areas:

(a) The Central Rocky Mountains Area. It consists of the Yellowstone Basin, the Absaroka Mountains, the Tetons, the Wind River Mountains, the Wyoming Range, and intervening areas. It is uniformly over 7500 feet, belongs to the Rocky Mountains physiographic area, and is heavily glaciated. It has no true soils. It has a taiga climate, Canadian, Hudsonian, and Arctic-Alpine wildlife.

(b) The West-Central Big Horn Basin. This is all less than 5000 feet in elevation, is a structural syncline of the Rocky Mountains System and has brown loam soils. The climate is that of a cold desert; the biota belong to the Upper Sonoran zone.

(c) The Upper Green River-Sweetwater valleys. These are between 5000 and 7500 feet high. They belong to the Wyoming Basin, and have brown loam soils. They have a cold steppe climate, a Transitional flora and fauna.

The other districts, such as the Big Horn Mountains, Wind River Valley, and the Red Desert, present a much more complex picture.

ADAPTATION: MEANS OF LIVELIHOOD

The economy of the Wind River Shoshone was based upon four pursuits: hunting and fishing, plant gathering, trade, and mineral exploitation.

The animals, birds, and fish utilized may be grouped into three categories according to relative importance (a function of the numbers of the animal, its size and its market value in trade). Staples were the bison, fish (especially trout), elk, beaver, and mule deer. Major but occasional supplies were the antelope, jack rabbit, mountain sheep, marmot (woodchuck, rock-chuck), and sage hen. Accessories were the Virginia deer, moose, bear, duck, goose, cotton-tail, badger, snowshoe rabbit, ground squirrel, and wood rat. The bobcat or lynx, mink, otter, and weasel had value as fur, but were not eaten. A few persons (in the Green River country particularly) ate lampreys, ants, locusts, crickets, and owls.

The bison was easily most vital, numbering 40,000,000 on the Plains; and a bull weighed 1800 pounds, a cow 1200.⁷⁰ At best, the animal and its products yielded virtually a complete existence. As Clark elaborates:⁷¹

"... Of the skin they [the Plains Indians] made robes, lodges, lariats, ropes, trunks or par-fleche sacks, saddles, saddle-covers, saddle-blankets, whips, quivers, knife-scabbards, cradles, shirts, decorations for saddles, beds, bridles, boots, a kind of sled for hauling the meat over the snow, and from the thick part of the skin of the neck a glue is made by boiling and skimming.

"Ropes and lariats are made from the scalp-lock, or long tuft on the forehead, and pillows from the hair. From the horns, spoons, cups, dishes, powder-horns, arrow-heads, bows by splitting the longer horns, and the tips are fastened to slender poles which are used in certain games.

"From the fascia (thin tendinous covering which supports the muscles, and called by the interpreters *sinew*), found under the shoulder-blades, the abdominal fascia, the two strips on each side over the hump, and the strip on each side of the back, they made thread, bow-strings, rope for softening robes by rubbing, fasten feather-guides to arrows, and stiffen and make bows more elastic by placing on back. From the thick ligament of the upper portion of the nape of the neck is made a pipe. An instrument used to straighten arrows is fashioned from the center bone of the hump by cutting a hole in it, and from some of the smaller bones, arrow-heads are made, and an instrument for 'flushing', or scraping the meat from hides. From shoulder-blades, axes, knives, arrow-points, instruments for dressing robes and smoothing down porcupine-work.

"The trachea is used as a saw for paints, etc. The rough papillae of the tongue for hair-brushes. The brain, liver, and fat for tanning skins. Instruments for shaping bows and small dog-sleds

⁷⁰ Seton, 3:652 and elsewhere.

⁷¹ Clark, 1885:84-86.

from ribs. From the paunch, water-pipes or sacks, in which meat and blood are sometimes cooked by boiling with heated stones, the latter being dropped into the sacks.

"From the thigh-bones, traps similar to our deadfalls. From the tail, knife-scabbards, handles to war-clubs, and medicine-rattles. The udder, dried, becomes stiff and hard, and is used for dishes, tobacco-bags, medicine-rattles, etc. The pericardium for sacks. The gall is sometimes used as a drink, and produces intoxication; there is also sometimes found in the gall a hard yellow substance, and this is highly valued as a paint for the face.

"The amniotic fluid, in which the foetus floats, is used by them to quench thirst when water cannot be obtained, and is also generally used to cook or boil the foetus in, the latter being specially prized as a dainty and delicate morsel of food. The marrow is eaten both raw and cooked, being roasted in the larger bones by laying them on the coals.

"The teeth are used for necklaces, and are also used in medicine-rattles.

"They consider the contents of the paunch an excellent remedy for skin-diseases, and in case of frost-bite, if the afflicted member is thrust into the paunch of a freshly-killed buffalo, relief obtains without evil after-effects. A very little buffalo-fat is sometimes mixed with the tobacco and red-willow bark for smoking. The liver is often eaten raw and while still warm with animal heat, the gall-juice being sprinkled over it as a sauce. The kidneys are eaten both raw and cooked. The meat, fat, and most of the intestines are staple articles of food, and are kept for months by simply being dried in the sun; the hump is considered particularly fine for drying. The contents of the paunch furnish food for ponies, and the liquid in the same, cleared by the gall, is prized for drinking as cool and tasteless; i.e. devoid of any unpleasant taste.

"The 'buffalo-chips' are used for fuel, and before the days of flint and steel and matches, were particularly good when dry for making a fire by the friction of wood. These 'chips', pounded fine and kept dry, are used to keep the small children warm, they being partially buried in the powdered material. The value of these chips can scarcely be appreciated by those who have not suffered for the want of fuel on our treeless prairies.

"The tanned buffalo skin without the hair furnishes the best material for tepees."

When to this lengthy list is added the fact that the Wind River Shoshone annually killed enough bison to sell at least 2000 skins,⁷² their economic worries seem (at first sight) to have all been solved.

Unfortunately, a series of important limiting circumstances prevented full utilization of this resource. These revolved around three factors: the migratory habits and gregariousness of the buffalo, the food requirements and carrying capacity of the horse, and the military potency needed with constant warfare.

⁷² Rep. Comm. Ind. Aff. for 1884:183; for 1885:211 (extrapolated).

Two main herds of bison wandered in reach of the Shoshone.⁷³ One wintered between the Missouri and Red rivers in North Dakota and Minnesota, the other on the upper Saskatchewan River in Canada. In the spring the animal went in enormous, close-packed droves west and south, respectively, to feed on the luscious plains of the Yellowstone, Powder, and adjacent rivers. By summer, the large herds had split up into small groups that spread widely over plains and mountains, reaching even such inaccessible spots as Jackson Hole.⁷⁴ As fall came, however, the animals reunited for their return journeys.

These migrations consequently restricted effective, large-scale hunting of the buffalo to a short period in the spring, a longer one in the fall. At other times the beasts were too scattered pr tpp far in enemy territory for major exploitation. These habits, combined with the buffalo's wariness and keen hearing, made hunting necessarily collective, organized. It was a case of sudden mass slaughter or virtually none at all. Once the animals were scared--even by a single careless individual--they would flee long distances, possibly completely out of the tribe's range.

In assembling people for large hunts, and in following the migrations of the bison, the horse was a considerable asset. Yet it was also a major liability: it had to have fodder. This fact made long stays in any one locality impossible, as may be seen from a few simple calculations. The Wind River Shoshone had about two horses per person⁷⁵--3000 horses to 1500 people. The virgin range capacity of the Wyoming plains was about 3 acres per cow (or horse) per month⁷⁶ (say, twice that in spring; half, in the winter). In a radius of two miles from camp (about the limit because of the danger of theft, raids, etc.), 2700 cow/months of fodder were available. These would have been appreciably cut down (25 per cent seems a low estimate) by the grazing and trampling of tens of thousands of buffalo. Therefore, six weeks in the spring, three weeks in the winter would have been the absolute limit of a stay for 1500 people.

Two processes were set in motion by the fact above. First, a strong motive was created toward breaking up the camp into smaller units in the fall and winter. This was checked by the military weakness of a small party and the smaller area in which it could guard its horses. (Small parties of Shoshone, 25-50 people, did at times wander by themselves on the Plains for two years

or more in a stretch.) Secondly, nomadism became inescapable.

Once travel started most of the meat had to be left behind, wasted since the Shoshone did not use underground caches of the eastern Plains type.⁷⁷ This is clear: an average family of 5 had 10 horses. Of these, at least one would be a colt, or otherwise incapacitated; one, the precious buffalo horse, reserved exclusively for buffalo hunting, war and racing. Three animals would be needed minimally for saddle purposes; three others, to drag the travois, carry the household goods. This would leave no more than two animals that could carry meat and skins. Their capacity would scarcely exceed 400 pounds, for Indian ponies were small. Half of this would be needed for packing skins for trade. Two hundred pounds of meat--and this is a maximal estimate--would scarcely last 5 persons more than 20 days.⁷⁸

In addition, warfare took its toll. Access to the herds was often endangered, sometimes cut off. Attacks frequently caused flight and precipitate abandonment of supplies. Raids meant lost horses; fear of raids restricted grazing range, but made large encampments the safest. Lastly, credit with white traders could be obtained only by selling many skins. In that way the Shoshone could buy guns for warfare (the bow and lance were far more efficient against the bison).

In all, the efficiency of bison economy was almost incredibly low. With all their slaughter, the Shoshone could scarcely have lived more than six months a year on bison meat. Figuring an average weight per bison of 1500 pounds, and the number slaughtered at 2000, we can see that there was available 3,000,000 pounds gross weight, or possibly 2,500,000 pounds net weight. More than four good kills a year were improbable: if 1500 people could stay at the site of these kills 42 days twice and 21 days twice, gorging on six pounds of meat a day, then could carry away an average of 40 pounds per person, for 20 days' rations each time, an absolutely maximal efficiency of 55 per cent and subsistence for 200 days would be achieved. The norm was unquestionably less than half of this. And it is hard to see how, with their available technical means, they could have increased the efficiency of their economy. More horses would have meant closer pursuit of the buffalo, better defense in war, greater carrying capacity--but also less fodder per head, consequently, more frequent moving; temptation to horse raiders. Fewer

⁷³ Seton, 3:652; Rep. Secy. War (41st Cong., 2nd Sess.), Washington, 1870:64.

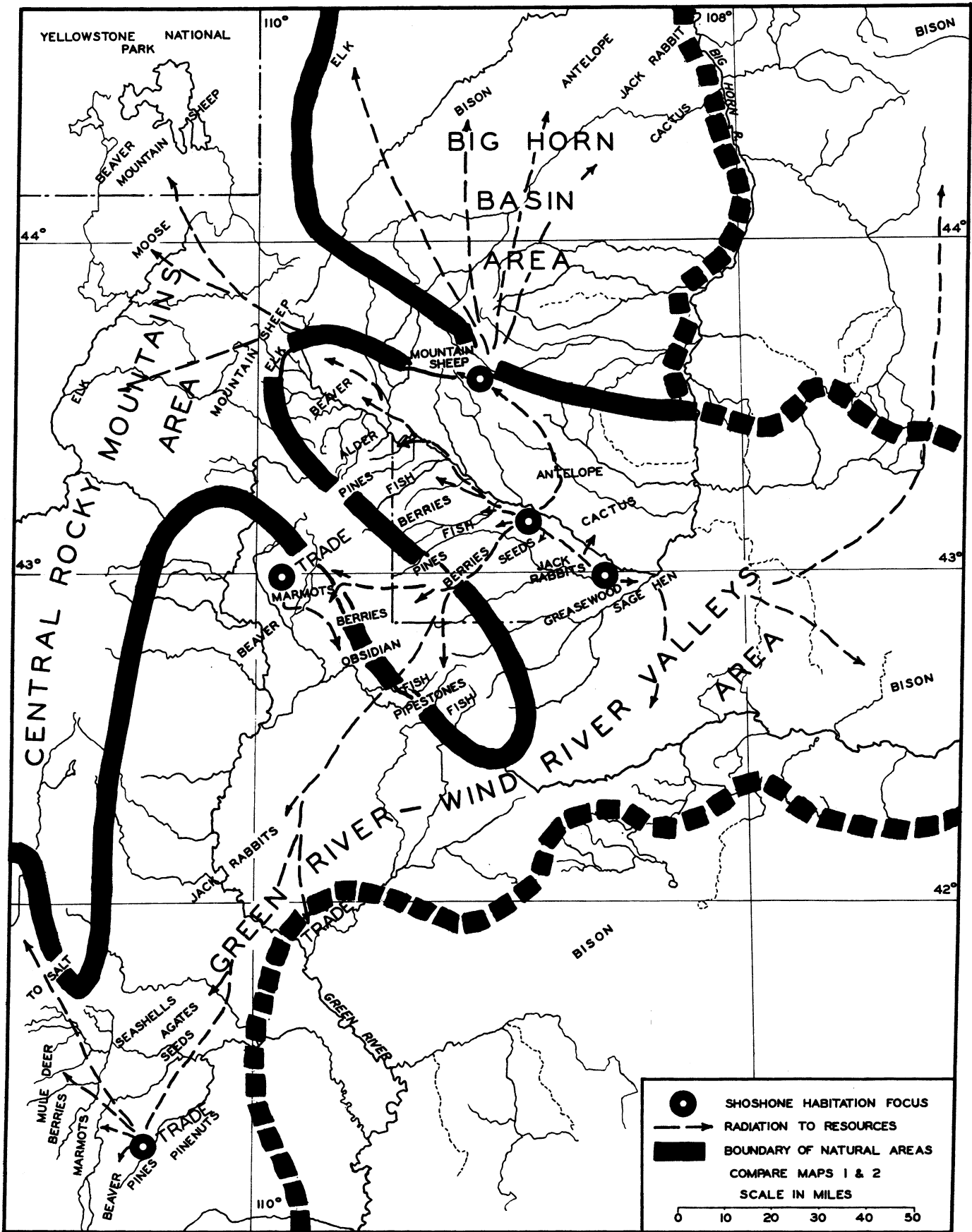
⁷⁴ Fryxell, 1928.

⁷⁵ Rep. Comm. Ind. Aff. for 1872:101, 407 (1037 persons; 1800 horses); for 1874:52 (1800 persons); for 1874-75:133 (3300 horses); for 1876-77:208, 304 (1800 people, 3800 horses).

⁷⁶ McArdle, 1936:96.

⁷⁷How much such caches might add to the total food supply is open to doubt, for return to the spot would often be infeasible in wintertime, say; and the caches might be robbed by beasts or men; or their locations forgotten. Only semisedentary people could use caches effectively.

⁷⁸The concentrated reserve ration, at least as efficient as pemmican, used by modern armies, weighs three pounds; the normal field ration, five. Thus my estimate of dietary requirement is absolutely minimal.



Map 9. Utilization of natural areas.

horses would have meant longer stays, but poorer defense, less close pursuit of the buffalo, smaller carrying capacity. Wheeled vehicles would have been an incredible boon.

An account of endless slaughter merely for skins and tongues is much closer to the norm than Clark's effusion.

The principal food fishes of western Wyoming are cutthroat trout, mountain grayling, and Rocky Mountains whitefish.⁷⁹ They are largely residents of cold mountain streams. Unfortunately, no quantitative data exist concerning them.

Fish played, and continue to play, an important role in Wind River economy. Methods of taking fish were relatively efficient: weirs, dams, and fishtraps were the major devices. The fish were dried or smoked on a large scale. However, no private ownership of good fishing places existed, and dams and weirs were not maintained from year to year. Furthermore, the lack of boats other than the bullboat in historic times prevented exploitation of such rich lakes as Yellowstone Lake.

In general, fish were taken principally in the spring, when the stores of bison meat were running low. At other times, they were regarded as an auxiliary food, eaten when other supplies were lacking. In such instances less efficient techniques came into play, such as fishing through a hole in the ice, angling, spearing, etc. The yield then could not have been very great.

Elk are animals of limited migratory habits. Their range--from the high mountains in summer to the low valleys in winter--varies considerably with climatic conditions. A severe winter of deep snow may bring many thousands into a restricted valley, while a mild one might leave them scattered throughout the higher valleys and slopes. They are, furthermore, gregarious, although not to the same degree as the bison. Their original numbers are a little difficult to estimate. In 1912⁸⁰ the authorities estimated that 50,000 elk lived in the vicinity of Yellowstone Park. Consequently, 150,000 does not seem excessive as an original figure for all of western Wyoming. (It, however, scarcely could have exceeded this very greatly, because of the competition of beavers and elk in food, and the early great number of beavers.)⁸¹

Elk hunting seems to have been an important auxiliary to Shoshone economy at all seasons of the year. It involved merely tracking and shooting by a single man; snowshoes aided in overtaking herds in the deep winter snows. Inasmuch as the elk weighs about 600 pounds and bands together in groups of from 3 to 75 animals, it must be hunted continuously. No reserve to be transported or cached, especially for any sizeable number of

people, can be built up: the smaller the hunting group, the better. Consequently, elk hunting was most common in the winter and summer when the Shoshone had divided into minimal groups.

Seemingly, the elk could be used as a substitute for all the functions of the buffalo (making allowance, of course, for his smaller weight and thinner skin). Thus, in the 1880's, elk hides replaced the vanishing buffalo hides as a marketable product.⁸² Also, because of the greater steadiness of supply, use could be fuller, less wasteful, than in the case of the bison. In all, the elk was exceeded only by bison and fish in its contribution to Shoshone life.

The mule deer and the Virginia deer⁸³ resembled the elk in the use made of them by the Shoshone. Their smaller size, fewer numbers, and greater wariness made them much less important, however. Mule deer were most common in the Bear River country, and seem to have been hunted most there.

As a sedentary, sizeable (often over 50 pounds), and well-nourished animal, the beaver furnished an important food and fur supply for isolated, small groups.⁸⁴ Originally, he could not be killed off at will, but the introduction of steel traps and tough axes made his defenses of water, mud house, and ice quite vain. The value of his fur was so great that trappers, both white and Shoshone, virtually decimated the beast in the 1830's. Thereafter, the beaver declined in significance.

Use of the antelope, jack rabbit, mountain sheep, marmot, sage hen, and waxwings⁸⁵ was characterized by irregular peaks and long periods of nonoccurrence. All of these are gregarious and somewhat migratory; none are large enough or numerous enough to allow any considerable reserve to be built up from a mass slaughter. Thus the antelope could be caught effectively only in surrounds, as it was too fast even for horses. But a single killing would cut down the population for years. The jack rabbit waxed and waned in numbers, increasing a dozen-fold one year over the other. This undependability, plus the difficulty of preserving rabbit meat, made the animal only casually valuable. Mountain sheep necessitated arduous and dangerous climbs in summer; in winter, however, snowshoed hunters could trap them in the deep snow (this was the Sheep Eater specialty). Marmots were a prized tidbit in the summer and early fall. Hibernation in inaccessible rock shelters made year-round use impossible. Finally, the value of the sage hen and waxwings came about through the ease with which these birds could be killed, either by sticks or bird-arrows; they served for occasional feasts, particularly in winter.

⁸² Rep. Comm. Ind. Aff. for 1884:183.

⁸³ Bailey, 1930:16 ff., 1918:26 ff.; Steward, 1938:33-41; Davis, 1939.

⁸⁴ Bailey, 1930:11-115.

⁸⁵ Davis, 1939; Bailey, 1930:188 ff.

⁷⁹ Evermann, 1892; Locke, 1929.

⁸⁰ Bailey, 1930:43 and elsewhere.

⁸¹ Bailey, 1930:114.

The casual use of the other animals may readily be explained on the basis of danger (bears), scarcity and inaccessibility (moose), small size and lack of detailed knowledge by the Shoshone of the habits of different species and even races (ground squirrels, wood rats, etc.). Two exceptions exist, ducks and geese. Here the reason was twofold. Although their flyways cross western Wyoming, the major breeding grounds of these birds, in the Bear River marshes,⁸⁶ are somewhat west of Wind River territory. Secondly, bird-arrows were simply futile against high-flying ducks and geese; shotguns were not, so far as I know, in common use.

The useful plants of the Wind River Shoshone may be grouped as foods, manufacturing materials and medicines.⁸⁷ In the first category four subdivisions existed, depending upon the use of the root, berry, pistil and leaf, or seeds. The first and second were gathered by individual women, or parties of them, in the late summer and fall. Wild roots, camass, and wild onions, especially, were dug with digging sticks; and women picked currants, rose berries, hawthorns, and gooseberries. The returns were dried and boiled in soup, or mixed with pemmican. Greens, in the forms of pistils and leaves, came as welcome spring changes from a monotonous winter diet. The sugary content of honey plants, gilia, cinquefoil, and others was highly prized by children, above all. Thistles and some kinds of sunflowers served as the only sources of seeds. Even they were gathered amateurishly. The gathering baskets of the Basin were unknown; ordinary sticks were inefficient beaters. In all, while plants balanced diet, they were quantitatively of no great value.

Materials for manufacture included such plants as Indian hemp for rope, prickly pear for glue, alder for weaving baskets, etc. In addition, all sorts of larger trees and bushes were used for firewood and lodge construction. Here, especially in earlier times, an abundance of easily broken branches was much appreciated, for the women, with poor axes, or none at all, could not cope with larger timber. A limitation in regard to the size of timber that could be easily cut down or dragged left useless most of the larger trees.

Concerning medicinal plants, my identifications are poorest. Sagebrush infusions relieved fever, rye grass scraped trachomatous eyes. Tragopyron had a treasured fragrance. But I have no clue to the nature of many pain killers, perfumes, magical plants, etc.

The establishment of regular rendezvous and permanent exploitation by trappers in western Wyoming after 1825 quickly modified the habits of all the neighboring tribes. Previously, white man's goods could be obtained only by long and dangerous trips to the Mandan villages or the

Comanche country.⁸⁸ Those they could get, served only to whet appetites. Now, with easy accessibility and large volume possible, an active trade arose, changing much of the aboriginal economy, as an excess of buffalo, deer, and beaver skins had to be gathered every year to achieve credits in buying guns and ammunition, cloth, flour, coffee, etc.

The historical accounts speak for themselves. Pattie, in 1826, met a company of Shoshone in Arizona.⁸⁹

"They were warmly clad with buffalo robes, and they had muskets...they had recently destroyed a company of French hunters on the headwaters of the Platte... We took from them all the beaver skins which they had taken from the slain French, and five of their mules..."

In 1832 Wyeth wrote,⁹⁰

"We were surprised to find the Indians in the vicinity, of the mountains, and all around Pierre's Valley, and the Blackfoot tribe, and the Shoshones, or Snake-tribe, so well provided with muskets, powder and ball, woollen cloth, and many other articles, until we were informed that Mr. MacKenzie, an established and wealthy Indian trader, had long supplied them with every article they desired."

Farnham gives a less rosy picture.⁹¹

"Beaver, otter, bear and buffalo skins, and horses are exchanged by them with the Arrapahoes, and the Americans, and British traders, for some few articles of wearing apparel; such as woollen blankets and hats. But as their stock of skins is always very limited, they find it necessary to husband it with much care, to obtain therewith a supply of tobacco, arms and ammunition."

Wislizenus' long account deserves full quotation because of its liveliness and the wealth of incidental facts brought in concerning customs, attitudes, and games.⁹²

"From the agents we learned that this year's [1839] meeting place had been fixed on the right bank of the Green River at the angle formed by its junction with Horse Creek... It was the Fourth of July... The next morning we started early, and reached toward noon the Green River, so long desired..."

"We reached the camping place. What first struck our eye was several long rows of Indian tents (lodges), extending along the Green River for at least a mile. Indians and white were mingled here in varied groups. Of the Indians there had come chiefly Snakes, Flatheads and Nezperces, peaceful tribes, living beyond the Rocky Mountains..."

"A pint of meal, for instance, costs from half a dollar to a dollar; a pint of coffee-beans, cocoa beans or sugar, two dollars each; a pint of dilute alcohol (the only spirituous liquor to be

⁸⁶ Lincoln, 1935.

⁸⁷ See table 2.

⁸⁸ See Shimkin, 1941a; MS a.

⁸⁹ Pattie, 1905.

⁹⁰ Wyeth, 1905:83.

⁹¹ Farnham, 1906:261.

⁹² Wislizenus, 1912:84, 86-88.

had), four dollars; a piece of chewing tobacco of the commonest sort, which is usually smoked, Indian fashion, mixed with herbs, one to two dollars. Guns and ammunition, bear traps, blankets, kerchiefs and gaudy finery for the squaws, are also sold at enormous profit...

"The Indians who had come to the meeting were no less interesting than the trappers. There must have been some thousands of them. Their tents are made of buffalo hides, tanned on both sides and sewed together, stretched in cone shape over a dozen poles, that are leaned against each other, their tops crossing. In front and on top this leather can be thrown back, to form door and chimney. The tents are about twelve feet high and twenty feet in circumference at the ground, and give sufficient protection in any kind of weather. I visited many tents, partly out of curiosity, partly to barter for trifles, and sought to make myself intelligible in the language of signs as far as possible. An army of Indian dogs very much resembling the wolf, usually beset the entrance. From some tents comes the sound of music. A virtuoso beats a sort of kettle drum with bells around with all his might, and the chorus accompanies him with strange monotone untrained sounds that showed strong tendency to the minor chords. A similar heart rending song drew me to a troop of squaws that were engrossed in the game of "the hand," so popular with the Indians. Some small object, a bit of wood, for instance, is passed from hand to hand among the players seated in a circle; and it is some one's part to guess in whose hands the object is. During the game the chorus steadily sings some song as monotonous as those to which bears dance. But the real object is to gamble in this way for some designated prize. It is a game of hazard. In this case, for example, a pile of beads and corals [sic], which lay in the midst of the circle, was the object in question. Men and women are so carried away by the game, that they often spend a whole day and night at it. Other groups of whites and Indians were engaged in barter. The Indians had for the trade chiefly tanned skins, moccasins, thongs of buffalo leather or braided buffalo hair, and fresh or dried buffalo meat. They have no beaver skins. The articles that attracted them most in exchange were powder and lead, knives, tobacco, cinnabar, gaily colored kerchiefs, pocket mirrors and all sorts of ornaments. Before the Indian begins to trade he demands sight of everything that may be offered by the other party to the trade. If there is something there that attracts him, he, too, will produce his wares, but discovers very quickly how much or how little they are coveted. If he himself is not willed to dispose of some particular thing, he obstinately adheres to his refusal, though ten times the value be offered him. The peltry bought from the Indians must be carefully beaten and aired, at peril of having objectionable troops billeted on you. The Indians, accustomed to every kind of uncleanness, seem to have a special predilection for a certain kind of domestic animal, and even consider it a delicacy.

So, for instance, I have repeatedly seen an old granddam summering before the tent with her gray-haired spouse, and busily picking the "Heavy cavalry" from his head. But the fingers that deftly caught the prisoner with equal deftness carried him to the mouth, where the unhappy creature was buried alive. Chacun à son gout!

"The rendezvous usually lasts a week."

After 1843, when the fur business had declined, the trading post established by Bridger⁹³ became the meeting place. A decade later, the establishment of the Mormons at Salt Lake City created a major competitor, who was eager for the Indians' trade for political and religious as well as commercial purposes. Consequently it is not surprising to read that:

"It was the custom of the tribe to make a journey almost every fall to Salt Lake City, and other white settlements, and swap their buckskin and buffalo robes for red blankets, beads, ammunition, and other things they needed."⁹⁴

The 1860's marked the beginning of treaty relations with the United States government, and the first white settlements in Wind River Valley. We may note that \$10,000 worth of skins and furs was got in the winter of '66.⁹⁵ This income doubled through later grants resulting from treaties; the consequences are discussed in another publication.

Trade with other Indian tribes was generally inconsequential. The Wind River people often made a fat profit reselling furs bought from the Sheep Eaters or Mountain Shoshone. Otherwise, however, barter was largely a ceremonial exchange of equivalent goods between close friends, blood-brothers of different localities. It had no true economic function.

The final means of livelihood among the Wind River Shoshone, and the least, was mineral exploitation. This consisted of the minor quarrying of obsidian and various pipestones in several places on the west slope of the Wind River Range (unfortunately, unlocated); the obtaining of salt, principally from Soda Springs, Idaho; and the gleaning of sea shells and agates from the fossil beds near Black's Fork. Obsidian was the most important article on this list, although sea shells were valued for ornament. (In addition, natural hot springs were much appreciated in the treatment of rheumatism.)

Most of these mineral products were directly used. Only in recent days have Shoshone sold agates to white people near Evanston. And they themselves--so far as I know--paid, and were paid, nothing for usage rights in the favored localities.

⁹³ Beard, 1925:134.

⁹⁴ Wilson, 1926:68.

⁹⁵ Shimkin, MS a.

ADAPTATION: DETAILED ETHNOBOTANY AND ETHNOZOÖLOGY

In table 2 below there are listed all the plants and animals of which I have a record, with their common and (probable) scientific names, their Shoshone terms, their life-zone distributions, their Shoshone uses, and, for "useless" plants, their applications among other tribes. Here, some explanatory remarks are in order.

The plants classified as "Identified" were collected by me in May and June, 1937, along a fifteen-mile line from Fort Washakie (Upper Sonoran) to the top of Hobbs Peak (Arctic-Alpine). Some supplementary collections were made in the lower Owl Creek range. All of these plants were then identified by either Pivo Brown or Dick Washakie (assisted by Marshall Washakie and his wife). Miss Alice Eastwood, of the California Academy of Sciences, kindly made the scientific identifications.

I made a number of other, tentative identifications by comparing the plant names with cognates in Gosiute⁹⁶ and other Basin Shoshone⁹⁷ groups.

In all, I believe that the plants with simple linguistic stem names are the most satisfactorily and the most certainly classed. They are those which everyone probably knew; examples are: wo'gwe'ip (Opuntia), kun' (Allium), wo'ngopi (Pseudotsuga), ši'hiβi (Salix). Other plant names are derivatives of pok (thistle), so'nip (grass), ak' (sunflower), wa'ra (grass), etc. These are modified according to color: e'nga- (red), o'xa- (yellow), e:βi- (blue or green), ku'si- (gray), du:- (black), etc. Other characteristics may also stand out: do'ya- (mountain), zi- (pointed), so'goβi- (ground), te:- (some sort of), etc. Some names I cannot analyze.

Although Shoshone and our categories are more or less parallel, it should be borne in mind that they are not identical. For instance, ya'nawēci, a:šia, and to'nziap all apply to *Gaura coccinea*. On the other hand, mo'hagwanat includes the distinct genera *Sophia* and *Cupinus*.

Table 2
Plants

Identified

Common name	Scientific name	Shoshone name	Distribution	Shoshone use	Use by other tribes
Mountain maple	<i>Acer glabrum</i> Torr.	do'yasihi	Trans.-Can.		Plains Ind.: <i>A. sacherrum</i> , etc., for sugar
Alpine yarrow	<i>Achillea millefolium</i>	háne:'engē	<i>A. alpicola</i> , Arct.-Alp.		Basin Sho.: applied to sores, for indigestion.--Plains Ind. (Winnebago): for swellings
	<i>Achillea millefolium</i> L.	Kušiangangē	<i>A. alpicola</i> , Arct.-Alp.		Basin Sho.: applied to sores, for indigestion
Indian hemp	<i>Actinella simplex</i>	e'ngatonziap	<i>A. androsae</i> mi- folium, Trans.	Bark of last year's plant dried for rope, etc.	Kiowa: chewing gum
	<i>Allium reticulatum</i>	o'xartonziap			
	<i>Apocynum hyperfolium</i>	ziocgi or zitogi			
	<i>Arabis retropecta</i>	yu:'wēnt	<i>A. lyalli</i> , Arct.-Alp.		
Sagebrush	<i>Artemisia frigida</i> Willd.	po'hə	Trans.	For infusions in fever; for adornment	Basin Sho.: seeds eaten
Milk vetch	<i>Astragalus</i>	ya'ngangia	Trans.		Plains Ind.: boy's rattle, febrifuge (Omaha-Ponca)
Ground beans	<i>Astragalus shortianus</i>	so'gōβihura	All zones		
	<i>Astragalus tri-dactalicus</i> G.	ku'sipaβohə	All zones		

⁹⁶ Chamberlin, 1911.

⁹⁷ Steward, 1938:21-32, 306-314.

TABLE 2 (Continued)
Plants

Identified					
Common name	Scientific name	Shoshone name	Distribution	Shoshone use	Use by other tribes
Balsam root	Balزامorriزا Hookeri N.	do'ya o'xaya'han'	B. sagitata, Trans. B. incana, Trans.		Basin Sho.: seeds eaten (kušiak)
Rocky Mt. birch	Betula fentinalis Sargt.	ta'nētīgwai	Trans.	Whips, firewood, shades	Plains Ind.: vessels. Dakota, also Algonkin
Mariposa lily	Calochortus nuttali	sīgoβi tonziap	C. gunnisoni, Trans.	Roots like onions, eaten	
Harebell	Campanula rotundi-folia	do'šitīngišap	Trans.-Can.		
Arctic or Parry harebell	Campanula rotundi-folia L.	du'ci wampi	C. uniflora, Arctic C. parryi, Hud.		
Wild root	Carum gairdineri B.	yamp		Eaten	
Painted cup	Castilleja angustifolia	e'nga ya'han	Hud.	Pistil as children's sweets	Basin Sho.: not used
	Castilleja lirariaefolia	eṅga ya'hait	Can.		
Thistle	Cirsium Parryi Cirsium undulatum	do'ya bok ^w kušibag	Can. ? Trans. ?	Eaten in summer	E.A.: leaves may be eaten. Kiowa: burns and sores; formerly eaten
Purple Virginia bower	Clematis douglasii H.	da'βip	Trans.		
Red cleome or honey plant	Cleome serrulata	kīngantonziap	Upp. Son.	"Wild onions," used in summer	Hopi: boiled for food
	Cleome serrulata	e:'βitonziap	Upp. Son.		Gosiute: medicine
	Crepis acuminata Nutt.	ta:βip			
	Crepis acuminata Nutt.	yambawu:ra			
	Crepis acuminata Nutt.	do'yariβa (hanixend)			
	Cupinus argenteus P.	mo'xagwana			
Larkspur	Delphinium scapulorum Gray	du:'pohi tonziap	D. subalpinum, Hud.		Hopi: D. scaposum; emetic
	Descuriana	po'hiye		Seeds eaten; soup	
	Descuriana	o'hartawišiwēp		Only animals eat it	
Willow cress	Draba andina (Nutt.) Nelson	pa:'bahop	Several sp., Arct.-Alp.		
Giant rye grass	Elymus condensatus Presl.	pi'a šonip	Upp. Son.-Trans.	For sore eyes; scraping	Basin Sho.: seeds eaten Gosiute: seeds for food
Fleabane	Erigeron concinus	gašonziñi	Several sp., Hud. E. pinatisecus, Arct.-Alp.		
	Erigeron radicans Hook.		Arct.-Alp.-Hud.		
Eriogonum	Eriogonum	pa'βo hoas	Many species, all growing in Upp. Son.		Basin Sho.: stomach disorders. Kiowa: eaten. Hopi: birth medicine

TABLE 2 (Continued)
Plants

Identified					
Common name	Scientific name	Shoshone name	Distribution	Shoshone use	Use by other tribes
Eriogonum (continued)	Eriogonum subalpinum Pursh.	gušegi			
Alpine forget-me-not	Eriogonum concinnum	ša:tunziaxand	Arct.-Alp.		
Wild strawberry	Etrichium argenteum wight Fragaria	e:ʔiyapuci dɔ'säyahe:d	Can.-Trans.		Plains Sho.: eaten widely
	Gaillardia aristata P.	dɔ'yaɔ'hayap			
	Gaura coccinea	ya'na wēci a:šša	Upp. Son. Upp. Son.		
Gilia	Gilia aggregata (Pursh)	to'nziap tambi'xarikai	Upp. Son. Trans.-Upp. Son.	Ends sweet; sucked by children (In Sun Dance)	
Gum plant	Gnaphalium Grindelia squarrosa P.	pa'wohʔ do'yakwičmbaga	Upp. Son.		Gosiute: Ute cough medicine
Hedysarum	Hedysarum cinerascens Ryd.	pe:'anadikap	Trans.	Bees' food	
Sunflower	Helianthus petiolaris Nutt. Holodiscus dumosus	dɔ'yaba:k doyawogonap	Upp. Son. Trans.		Basin Sho.: seeds eaten Basin Sho.: tea from roots
Barley	Hordeum jubatum L.	kwekšigat			
Blue flag	Iris missouriensis Nutt.	še:gikigin	Trans.		I. versicolor: pulverized for eye water (Omaha Ponca), Pl. Ind.
Creeping juniper or trailing savin	Juniperus sabina L.	wɔ'ngohiwonia	Trans.		
Rocky Mt. juniper	Juniperus scopulorum Lepidium apetalum W.	wo'ŋgohi'ŋgwɔia ku'šidot wanawunt	Trans.-Upp. Son.	For smoking oneself	(Red cedar) not used
	Melilotus officinalis	dī'repohapi			
Lungwort	Mertensia alpina Oenothera trichocalix N.	e:ʔiyahe:d e:guβi	Arct.-Alp.-Hud.		Basin Sho.: seeds eaten
Prickly pear	Opuntia polyacantha Haw.	wo'gwe'ip	Upp. Son.	Inside burned, for glue and paint	Gosiute: formerly eaten. Basin Sho.: eaten. Pl. Ind.: eaten; glue. Kiowa: glue. Hopi: eaten
Oreocarya	Oreocarya	ya:'ŋgēnē	O. flava, Upp. Son.		
Silky phacelia	Oreocarya virgata Phacelia sericea (Graham) Grey	dɔ'sae:guβi piazo:na	Trans. Hud.-Arct. Alp.		Basin Sho.: not used
Phlox	Phlox canescens	šogofaca'cawagiu	Hud.-Can.		
White-bark pine	Pinus albicaulis	te:wapi	Hud.	Firewood,	
Cottonwood	Populus augustifolia	šɔ'hop	Trans.	Sweets	
Aspen	Populus tremuloides	šš'naβ	Can.	Firewood, posts, etc.	
Cinquefoil	Potentilla glandulosa	dɔyaε'ŋgaparaŋ	Trans.-Hud.-Can.	Like strawberries; eaten	Gosiute: poultice

TABLE 2 (Continued)
Plants

Identified					
Common name	Scientific name	Shoshone name	Distribution	Shoshone use	Use by other tribes
Douglas spruce	<i>Pseudotsuga taxifolia</i> <i>Rhustridobattum</i> Nutt. <i>Eriogonum</i>	wo'ngopi e'nga wu'uwunt	Trans.-Can.	Wood for tipi poles	Basin Sho.: basketry, eaten. Kiowa: eaten. Hopi: dyeing, eaten
Current	<i>Ribes cereum</i> <i>Ribes congiflorum</i>	ho'a te'ngwipogop	Can.-Trans.-Hud.	Soup out of berries; and for arrows	
Rose	<i>Rosa californica</i> <i>Rosa fendleri</i> crepin	zi'amp o'hapaziwe	Can.-Trans. Can.-Trans.	Berries, religion, etc.	
Sand dock	<i>Rumex venosus</i> P.	doya:'eu	Upp. Son.	Boiled and drunk for stomach-ache	
Willow	<i>Salix</i> <i>Sedum stenopetalum</i>	šihibi o'hayap	Many sp.; all zones	Shades, wood, etc.	Plains Ind.: Omaha basketry Gosiute: leaves formerly smoked Gosiute: chewing gum. Hopi: sap smeared on sores
Paint brush	<i>Senecio</i> <i>Senelis perplexans</i> N. <i>Sophia ochroleucia</i> wooton <i>Sphaeralcea coccinea</i> <i>Sphaeralcea coccinea</i>	oxakaβonzinikid ne'wižaiwē'šingēn mo'hagwanat do'yazo:na tu'šig up	Hud.-Arct.-Alp.	Not eaten Not eaten	Basin Sho.: seeds eaten Hopi: for constipation
Stanleya	<i>Stanleya pinnata</i> (Pursh)	doyaša we':kai	Upp. Son.		Hopi: eaten as greens
Rabbit bush	<i>Tetradymia spinosa</i> <i>Tragupogon porrifolius</i>	tono:βi o'harlawišiwap	Upp. Son.	Arrow points Put in ears, pleasant smell	Basin Sho.: not used. Hopi: to aid uterine contraction in birth
Identification Doubtful					
Wild onion?	<i>Allium acunimatum</i>	kun'		Eaten	Basin Sho.: (kunk)
Alder	<i>Alnus tenuifolia</i>	hugužap	Can.	Bows, weaving	
Camassia?	?	pa:'sigo		Eaten	
Black hawthorn	<i>Crataegus rivularis</i>	wi:'yam	Trans.	Eaten	
Mountain mahogany	<i>Cercocarpus ledifolius</i>	tu:'namb	Trans.	For clubs, etc.	
Wild potato?	<i>Cleytonia caroliniana</i> ?	soguzi'na	Trans.?		
Dog-tooth violet	<i>Erythronium parviflorum</i>	do'yawitombak	Can.-Hud.	Painkiller in birth	
Sunflower	<i>Helianthus</i>	ak'; kušiak; hi'ump; pia':ak'	H. annuus; H. petiolaris, Upp. Son.	Seeds for soup	Basin Sho.: eaten. Gosiute: eaten
Gooseberry	<i>Grosularia inermis</i>	we'šibogun	Trans.	Eaten	Basin Sho.: eaten. Kiowa: eaten?

Table 2 (Continued)
Plants

Identification Doubtful					
Common name	Scientific name	Shoshone name	Distribution	Shoshone use	Used by other tribes
Cedar?	Juniperus	wa:'pi	Many sp., all zones	Smoking self, fire, bldg.	Gosiute: J. californica used?
Bitterroot	Lewisia rediviva	kan	Trans.	Eaten	
Tobacco	Nicotiana quadri-valvus	pu'hiba'u			
	Pachistima myrsinitas	da'cip		For rope	
Piñon	Pinus edulis	engati'βanahup	Upp. Son.	Little importance	
Primrose	Primula parryi	dɔ'yaratuwara	Hud.	For magic	
Chokecherry	Prunus melanocarpa	dɔ'ngisap or to:namp	Trans.	For bows, quivers	
Douglas spruce	Pseudotsuga mucronata	wongogwa'na	Can.-Trans.	Pitching baskets	
Wild rose	Rosa ultramontanum?	ʒo'nip	R. sayi, Can.-Trans.	Rose berries eaten with grease	
Smooth sumac	Schmaltzia glabra	kusēši	Trans.-Upp. Son.	Pipestems, bows	engahump (Rhus glabra) eaten?
Currants	Ribes sp.	bɔ'gunap	Many species in all zones		
Greasewood	Sarcobatus vermiculatus	to:'napi	Upp. Son.	For arrowheads	
Unidentified					
Fir?		engakwēnaga dɔ'sawar'	All zones	Seeds ground, eaten	
		dɔ'sawoga dakambɔʒ		For rope	
Wild parsnip		ku:'wizap		Small cherry, eaten	
Little kind of willow		kušišēhup		Vegetable	
		paro:'za		Painkiller in birth	Hopi: Tetradymia conescens to aid uterine contractions
		pi'yigwabwa		Weed, rubbed on breasts to promote milk	Hopi: Ptiloria pauciflora for same purpose
Sweet pine		na'gwadayingwi tu:šēhup		Pitch	
		tu'yašonip		Willow without berries, for firewood	
		tu'yašonip		Grass with black seeds	
		wi:'tēw		Nuts on it; eaten by children	
		yagwazacihup		"Very crooked" willows	

The distribution of the plants used coincides fairly well with the relative importance of each life zone in terms of plant variety, area, and accessibility. The Transitional zone is easily first, followed by the Upper Sonoran, Canadian, and Hudsonian zones. The Arctic-Alpine zone was useless.

Some index of the relative efficiency of Wind River botany may be gained by examining the records of neighboring tribes⁹⁸ for uses not found locally. The data are not particularly flattering, for the Wind River Shoshone could have added some 40 per cent utility qualitatively; certainly far more (in comparison with the Hopi, or Gosiute), quantitatively. A later section will discuss this degree of utilization at greater length.

I made no scientific check of the animals other than to compare the common names with those given in the various zoölogical works for northwestern Wyoming. However, I doubt whether any important animals have been grossly misclassified.

Shoshone animal names are of three basic sorts: simple stems (usually Uto-Aztecan), descriptions, and onomatopoeic words. A number of animals with the first type of name are further differentiated according to sex: wə'rə (male bear), a'gwai (female bear); wa:nz (buck antelope), kwa'hari (doe antelope). Examples of the second class are: bat, hɔ'nɔβiɕ (Gulch-being); jay, di'ɕiwasip (Bad-killer); hummingbird, di'βiʃi mɔ'tɔxa (Buzzes-much). Finally, šu'akwakwa, for robin, and ka:k (modern), for crow, have an understandable basis of onomatopoeia.

TABLE 3
Animals

Common name	Probable scientific name	Shoshone name	Distribution	Shoshone use	Remarks
Ant Antelope	<i>Antilocapra americana</i>	a'nɪŋwɪɕip Buck: wa:nz; doe: kwa'hari	Upp. Son.- Trans.	Eaten	
Badger	<i>Taxidea taxus taxus</i>	hu:n	Trans.-Upp. Son.	Eaten; hunted	
Bat		hɔ'nɔβiɕ			Many species; all zones
Bear	<i>Ursus americanus</i>	Male: wə'rə; female: a'gwai	Trans.-Can.	Sometimes eaten; feared	
Beaver	<i>Castor canadensis</i>	ha:ni	Trans.-Can.	Used for fur	
Bee		pe:ana			
Blue jay	<i>Cyanocephalus cyanocephalus</i>	di'ɕiwasip	Upp. Son.- Trans.		
Bobcat		si'rukuβiɕ	Can.		See: wildcat
Buffalo	<i>Bison bison</i>	Bull: poʒin'; cow: kwiɕ	Upp. Son.		Cow is also named kuɕ
Bullhead		pi'aβeŋk ^w			
Bull snake	<i>Pituophis sayi</i>	šu:iyo	Upp. Son.		
Buzzard		do'gwarika			Vulture
Coyote	<i>Canis lestes; C. nebracensis</i>	i'ʒap:ɛ	Trans.-Upp. Son.	Usually not hunted	
Cricket		meʃ ^w		Eaten	
Crow	<i>Corvus brachyrhynchos hesperis</i>	ka:k	Upp. Son.- Trans.	Not eaten; feathers for arrows	Archaic name: hai
Chicken hawk	<i>Falco sp.</i>	gu'ia rika		Not eaten	
Deer		tɪ'hia			Also used for horse occasionally
Deerfly		ɔ'hapit p'iβit			
Dog		sari			
Duck		pu:yɪ		Eaten	
Eagle		pi'agwea		Feathers, pets	
Eagle (bald)	<i>Haliaeetus leucocephalus leucocephalus</i>	pa'sia			
Elk	<i>Cervus canadensis canadensis</i>	pa:R'hi	Trans.-Can.- Hud.		In summer goes to Arct.-Alp.
Fox (kit)	<i>Vulpes velox</i>	wa:N'	Trans.-Upp. Son.	Not hunted; not eaten	

⁹⁸ Basin Shoshone after Steward, 1938; Gosiute after Chamberlin, 1911; Hopi after Whiting, 1939;

Kiowa after Vestal and Schultes, 1939; various Plains tribes after Gilmore, 1912.

TABLE 3 (Continued)

Animals

Common name	Probable scientific name	Shoshone name	Distribution	Shoshone use	Remarks
Fox (mountain red)	<i>Vulpex macrourus</i>	wa:'N'	Can.	Not hunted; not eaten	
Frog (leopard)	<i>Rana pipiens</i>	ya'gwaza	Upp. Son.	Not eaten; might be used for bait	
Goose	<i>Branta canadensis</i>	nugunt	Can.-Trans.	Eaten	
Ground squirrel	<i>Callospermophilus lateralis lateralis</i>	cip	Trans.-Can.	Hunted	
Heron	<i>Ordea herodias</i>	gwadata	Trans.-Upp. Son.		Great blue heron
Heron	<i>Nycticorax nycticorax naevius</i>	gwadata	Trans.-Upp. Son.		Crowned night heron
Horse		buŋk			
Horsefly (big)		piči piβit			
Horsefly (black)		tu'huβit piβit			
Horsefly (gray)		kušiget piβit			
Housefly		a:'niwui			
Hummingbird	<i>Selas phorus platycercus</i>	dī'βiši mɔtɔxa	Can.-Trans.		
Insect		pe:			
Lamprey		dō'gwaβenk ^w			
Locust		kea		Eaten	
Magpie	<i>Pica Pica hudsonian</i>	kwī'daβɔi	Trans.	Tails for dances	
Meadow lark	<i>Stunnella neglecta</i>	hi:to	Upp. Son.	Not eaten: not killed	
Mink?	<i>Mustela vision energumenus</i>	pa:'ŋzux	Trans.	Prized for fur	Very few
Minnow	<i>bu'ipengwi</i>	bu'ipengwi			
Moose	<i>Alces americanus shirasi</i>	du:'paR'hi	Can.	Eaten	
Mosquito		mɔ'p'ɔ piβit			mɔ'p'ɔ mβēpi
Mountain lion	<i>Felis hipolestes</i>	dɔ' yaruku	Trans.-Can.	?	
Mountain sheep	<i>Ovis canadenses canadenses</i>	Ram: duk; ewe: mu'zambia	Arct.-Alp.	Eaten	
Mourning dove	<i>Zenaidura macroura Carolinensis</i>	he:'wɔ	Upp. Son.	?	Also named hai'wɔ
Mouse	<i>Microtus?</i>	ba'mbune	All zones	Killed but never eaten	Loathed
Mule deer	<i>Odocoileus hemionus</i>	du:'tihi	Trans.-Can.-Upp. Son.	Eaten	
Otter	<i>Lutra canadenses canadenses</i>	du'pasawī	Can.-Trans.	Fur prized	
Owl		numbič	All zones	Very exception-ally eaten	Many species
Owl (burrowing)	<i>Speatyto cunicularia hypogaea</i>	po'ko	Upp. Son.		"Prairie dog's brother-in-law"
Owl (white)		dɔ'šaβit mumbič			
Owl		si'βako			Smallest of the owls
Perch?		wižaβenk ^w			"Calf of leg fish"
Porcupine	<i>Erethizon epixanthum</i>	yin'	Trans.-Can.	Eaten	Yellow haired
Prairie dog	<i>Cynomys leucurus</i>	tī'nzant	Trans.-Upp. Son.	Not eaten; feared	
Rabbit		taw'	All zones	Eaten	
Rabbit (jack)	<i>Lepus townsendi campanius</i>	dɔ'sakam	Trans.	Eaten	Also named ta'wun
Rabbit (snowshoe)	<i>Lepus bairdii bairdii</i>	wɔŋguraβ	Hud.	Eaten	

TABLE 3 (Continued)
Animals

Common name	Probable scientific name	Shoshone name	Distribution	Shoshone use	Remarks
Rattlesnake	<i>Crotalus confluentus</i>	do'gwa	Upp. Son.	Not eaten; not hunted	
Robin	<i>Planesticus migratorius propinquus</i>	šu'akwakwa	Can.-Trans.		
Rocky Mt. whitefish		mě'zěwi'a			Small mouth, small head
Sagehen	<i>Centrocercus urophasianus</i>	hu:'ža	Trans.	Eaten	
Salmon		a'gai			Not found on Atlantic drainage
Skunk	<i>Nephtitis hudsonica</i>	pɔ'N'yec	Trans.	Not eaten; not hunted	
Sparrow hawk	<i>Falco</i> sp.	gi'ni			gu'i; see chicken hawk
Small hawk	<i>Falco</i> sp.	da'βeŋ wasaβa			Brown, speckle-breasted; lives on nuts
Squirrel (pine)	<i>Sciurus</i> sp.?	wɔ'ngoraɕ		Not hunted, nor eaten	Many species listed, all zones
Sucker		a:'wuk			"Because they have lots of bones"
Swallow	<i>Tachycineta thalesina lepida</i>	pa'šokombe	Trans.-Can.		
Trout		ža:'penk ^w			D.W.
Water snake		pa'sunuwiyo			D.W.
Waxwings	<i>Bombycilla garrula pallidiceps</i>	wi'dɔiɕ		Eaten	
Weasel (Arizona)	<i>Mustela arizonensis</i>	pa:'βiži	Can.-Trans.	Fur in men's hair	
Weasel (dwarf)	<i>Mustela sicognianni leptus</i>	pa:'βiži?	Can.	Fur in men's hair	
Wildcat	<i>Lynx uinta</i>	ši'hiru kuβiɕ	Trans.	Fur for babies; sometimes eaten	
Wood rat	<i>Netoma cinerea cinerea</i>	ka or ka'i	Trans.-Upp. Son.	Hunted; eaten	
Wolf (buffalo)	<i>Canis nubilus</i>	pi'ai'žap:ë	Upp. Son.-Trans.	Not hunted	
Worm		wo:'ap			
Yellow throat?	<i>Geothlypis trichos?</i>	a'nŋ ^w akwa	Upp. Son.		

A count of animal species alone would assign first place to the Transitional zone in economic value. Actually, however, the numbers of the

bison alone throw the weight heavily toward the Upper Sonoran, Canadian, Hudsonian, and Arctic-Alpine follow the first two.

ECOLOGY

Ecology and economy in the broadest sense are synonymous. Both describe the total relation between culture and environment. For the Wind River Shoshone, we are able to discuss briefly the following vectors of the subject: (1) the bases of subsistence, the ideal economic cycle, and the exploited areas; (2) the relation of the cultural to natural areas; (3) economic conditioning in the culture; (4) the efficiency of adaptation. The source material has been presented in previous pages.

As soon as the storms abated sufficiently to allow movement, and the snow had melted, the tribe gathered once more for the spring bison hunt. This was usually much shorter than that in the fall. Fish and greens were welcome additions to the diet. The horses soon recovered in the lush spring pastures.

With summer coming on, and a variety of food available, ambitions would flaunt themselves. Young men would go raiding; or enemies would attack. Now came the time for the Sun Dance. After

TABLE 4

The Ideal Cycle of Wind River Shoshone Economy

Month	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Locality	Wind River Valley		Buffalo grounds, Big Horn River, etc.		Wind River Valley		Fort Bridger	Bear River Black's Fork		Wind River Valley		Buffalo grounds, Yellowstone River, etc.	Absaroka Mt. Foothills Powder R. Sweetwater R. Valley
Social Grouping	Band		Tribe			Intertribal Rendezvous		Family Group		Tribe and Friends		Band	
Principal Foods	Bison (Pemmican) Elk Beaver		Bison Fish			Mule Deer		Marmots		Elk		Beaver	
Foods.			Rabbit, Virginia Deer, Moose, Bear, Duck, Goose, Wood Rat.			Jack Rabbit Flour, Coffee, etc.		Seeds + Pods (Thistles, etc.) Berries (Haws, etc.) Roots (Wildroot, etc.)		Antelope			
(Top to Bottom)			Early Greens Calochortis, etc.									Waxwings.	
Other Activities	Winter Games Story-telling or Starvation		Fattening Horses War Sun Dance			Getting Obsidian Pipes, etc.		Trade Gambling		Getting Salt Seashells		Preparing Weapons War Preparing Hides Pemmican, etc.	

These people were essentially meat and fish eaters. In the fall, the entire tribe gathered for its early bison hunt on the Shoshone River plains or elsewhere. Later, the four bands split off for the travel to their wintering places. They would subsist upon occasional bison, elk, beaver, and pemmican of dried bison meat and grease, sometimes mixed with berries. If food was abundant, this would be a happy time, with the day spent in tobogganing or spinning rocks on the ice; the evening, in storytelling. Alternative were grim pursuits of mountain sheep or elk on snowshoes, and starvation.

that, when the mountain passes became traversible, the entire tribe would travel to the west. On the way, they would kill marmots still sleepy from winter hibernation, or catch large, ravenous fish that bit at every moving thing. Mountain sheep furnished exciting sport.

Having crossed the divide, they would get obsidian from volcanic cliffs, as well as the steatite necessary for shamans' pipes. Eventually, they would arrive at the rendezvous. Here, their hard-won treasures of pelts and hides would be sold, sometimes at a fair bargain, sometimes for a song. But they were eager to get gems, cloth, flour,

whisky. That these were soon gone did not matter: an abundance of animals and plants provided a varied and easy life at this time.

Now the Shoshone would scatter, going about their private business in this safe country. Visits to poor western relatives would be in order, for wife-getting or other purposes. Or they might get salt from Soda Springs, or sea shells from fossil beds near Fort Bridger to adorn the ears of fops. Marmots, mule deer, roots, berries, and other foods nourished them.

As the leaves turned color and the first snows fell in the highest mountains, hunger for bison meat became strong. In full strength, often with Bannocks or others accompanying them, they would cross the Wind River Range to return to the social life, travel, war, feasting, and starvation of the Plains.

Areally, we may also visualize the constant contrast between concentration and dispersion typical of Wind River life. Fort Bridger, ya'handai, Wind River Valley, and pda'wnawisua were the foci; connecting them and the hinterlands were the main routes. The most important of the last were the Big Horn Basin, the Powder River Valley, the Rocky Mountains, and the Bear River Divide.

The relation with the natural areas of western Wyoming is highly interesting. The Shoshone lived principally in Green River-Wind River valleys area (steppe climate, loam soils, transitional fauna, 5000-7500 feet in elevation). This, they used most carefully and thoroughly. The Rocky Mountains area (taiga climate, no soils, Canadian-Arctic Alpine fauna, above 7500 feet in elevation) and the Big Horn Basin (desert climate, loam soils, Upper Sonoran fauna, below 5000 feet) were regions of widespread but superficial exploitation. Curiously, the situation has changed in reservation days. Now, they live in and use carefully the Upper Sonoran zone in lower Wind River Valley, while the Transitional zone has become marginal, along with the high mountains.⁹⁹ These changes have resulted from the adoption of agriculture and sedentary life.

Insistence upon the economic conditioning of culture is, as Steward points out,¹⁰⁰ far from rigid economic or ecological determinism. It is simply an attempt to elucidate the adjustments that exist once both environment and general culture patterns are given. In this tribe the following seem to represent the more important of such adjustments.

The routes of travel coincided with economic resources. The alternation between concentrated bison provisions and diffuse elk, deer, fish, etc., made for a like alternation in social groups: the tribe in the spring and fall, the band in the winter.¹⁰¹ This also led to increased

emphasis upon two types of leadership: the dominating warrior (or war chief), and the wise old man who could lead his people to food (principal chief).¹⁰² It also strengthened the cross currents of individualism and collective discipline: individual prestige in war honors and hunting versus united military societies and collective bison hunts.

Travel on a large scale threw out pottery. Furthermore, it made the curing of grasses for basketry difficult; loving care of seed patches, impossible. The horse, furthermore, was cared for by men; women, when horses were few, had to walk in order to save the animals' strength. The man had to be fresh for hunting. These factors upset the economic and social balance between sexes. We hear nothing more of the casual polygyny and polyandry of the Basin.¹⁰³ Probably, only the influence of the matrilineal Crow¹⁰⁴ prevented a further approach among the Wind River Shoshone to the frankly patriarchal Comanche.¹⁰⁵

Private property was both hindered and abetted. On the one hand, private rights in hunting, fishing, or gathering localities became impossible to a widely traveling people. On the other, horses meant more movable goods, more wives, more purchased fineries. War, climatic uncertainties, and strong pressure toward generosity combined to prevent the development of a pastoral wealth-graded society.

Consideration of the efficiency of Wind River Shoshone economy has some weight upon theories of the influence of the horse upon Plains culture.

As I see it, the horse did not at all improve the total sum of Wind River economy. Bison slaughter with the horse was, as noted before, incredibly wasteful. Furthermore, the wide migrations of these people lost them their intimate knowledge of the country, vital for the gaining of small game: witness the great variety of habitats chosen by different races of ground squirrels.¹⁰⁶ The same was true for gathering. The conservation of resources, typical, for example, of the Ojibwa,¹⁰⁷ was not in evidence at all. Beavers, decimated in one locality after another, died out; killing a surplus would have continued the supply indefinitely. The technical specialization and simplification of Plains life were other limiting factors. Horsemanship, tactics, and other such learning allowed no time for knowledge of even such simple devices as pit-falls for deer, or effective traps for other animals. Finally, the strongest evidence of all is in the population figures: as many people lived in each square mile of the desolate Basin as in the far richer country of western Wyoming.

¹⁰² Also Comanche--see Hoebel, 1940.

¹⁰³ Steward, 1938:241-246.

¹⁰⁴ Shimkin, 1941a.

¹⁰⁵ Hoebel, 1938; 1939.

¹⁰⁶ Davis, 1939.

¹⁰⁷ Landes, 1937:89 ff.; Speck, 1915.

⁹⁹ Shimkin, MS a.

¹⁰⁰ Steward, 1938:260-262.

¹⁰¹ Cf. Mauss, 1906; Shimkin, 1939.

As I see it, the principal effect of the horse was to create a life of extreme cyclicality, of ups and downs to an incredible degree: there were gorging and starvation, great assemblies and complete solitude, elaborate ermine tippets and the crudest of basketry.¹⁰⁸ To what extent the same

¹⁰⁸ Also see Steward's important discussion of the influence of the horse on Basin culture. In the north, possession of this animal allowed

was true for the rest of the Plains only further research can tell.

greater and more permanent assemblages than before, increased the range of travel, and allowed exploitation of the buffalo. Steward gives no evidence, however, that it increased the total population or made its livelihood more secure. On the contrary, tribes in the heart of the Basin apparently rejected the horse as a liability. Steward, 1938: 232-236.

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ABBREVIATIONS

AA	American Anthropologist.	UC-AR	University of California, Anthropological Records.
AAA-M	American Anthropological Association, Memoirs.	-PAAE	Publications in American Archaeology and Ethnology.
AMNH-AP	American Museum of Natural History, Anthropological Papers.	-PG	Publications in Geography.
BAE-B	Bureau of American Ethnology, Bulletin.	YU-PA	Yale University Publications in Anthropology.
-R	Report.		
SI-MC	Smithsonian Institution Miscellaneous Collections.		

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PLATES

EXPLANATION OF PLATES

PLATE 1

a. An alkali flat near Fort Washakie. Grass and scattered greasewood. Upper Sonoran life zone; steppe. About 5500 feet. b. Sagebrush plain at Sage Creek. Wind River Mountains in the distance. Transitional zone; steppe. About 7000 feet. c. South Fork Canyon, looking east. This shows the basic importance of topography and exposure in plant associations. The glacial and river deposits at right, with more adequate conservation of moisture, maintain a lush stream vegetation. Transitional zone (cf. also pl. 1, b); taiga. About 7000 feet. d. Hoback Canyon. Lower edge of the Canadian zone: mixed vegetation, aspen, pine, grasses, and sagebrush. Around 8000 feet. e. South Pass. Lower edge of the Canadian zone, but almost barren. Climatically, it is not recognized as a desert.

PLATE 2

a. Mosquito Park in Wind River Range; upper hill and west, meadow associations of the Canadian zone: Douglas fir, lodgepole pine opposed to grasses, shrubs, and the like. The protection of a glacial valley from wind and the accumulation of snow make this vegetation possible (see pl. 2, b). Near 9000 feet. b. Muddy Pass in the Big Horn Mountains. Dry-meadow association of the Canadian zone. Its poverty is due to the openness of the range and its lack of protecting elevations. Sagebrush at 9500 feet. c. Hudsonian zone, below Hobbs Peak in the Wind River Mountains. Soil for a struggling tree growth has accumulated in scattered depressions. Note the evenness of the Rocky Mountains peneplain (10,500 feet). d. Canadian to Arctic-Alpine zones in the Teton Range. Steep slopes prevent much development of a Hudsonian zone. e. The Grand Teton from Jenny Lake. Here the asymmetrical anticline of the Tetons, with their sheer rise on the east of over 7000 feet, is clearly seen.



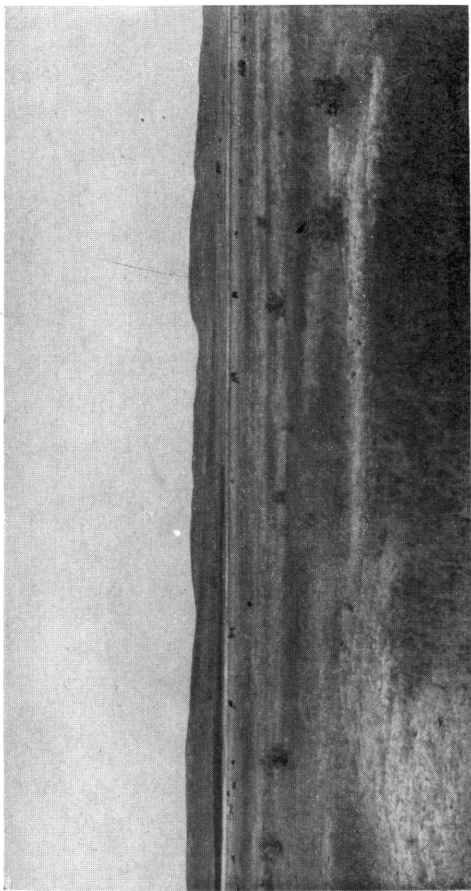
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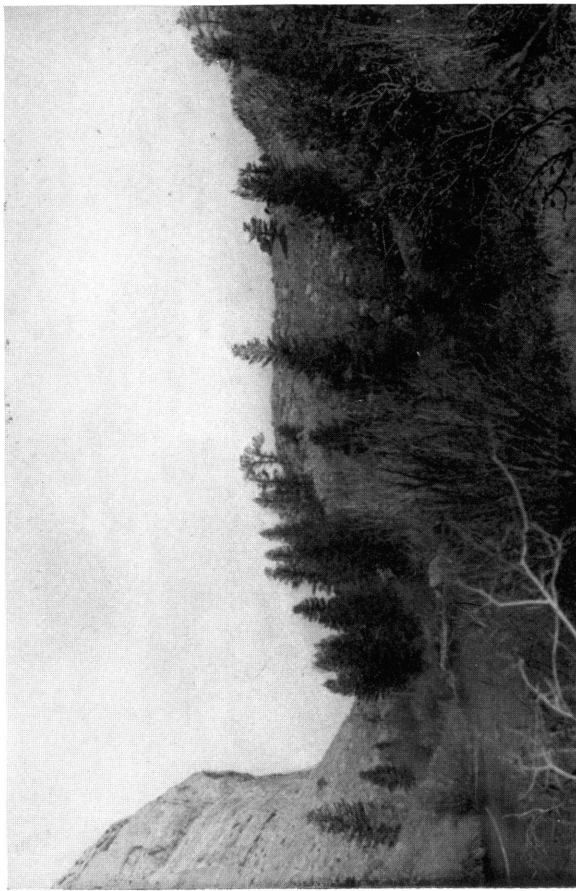
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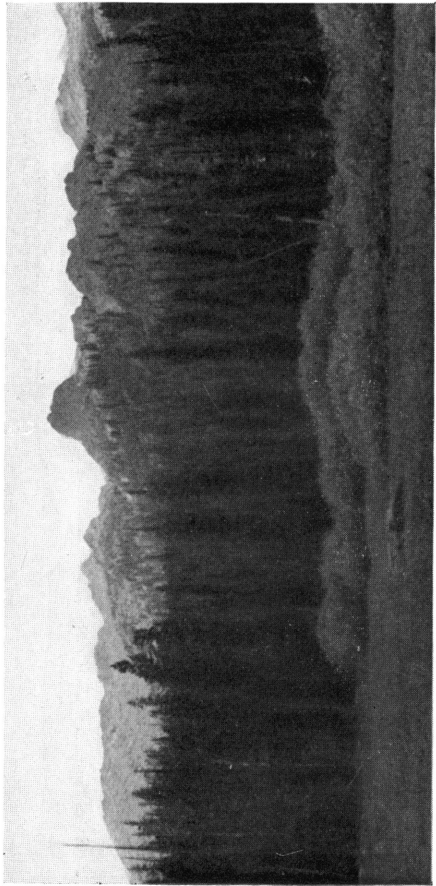
PLATE 1. TYPICAL ECOLOGICAL ZONES, UPPER SONORAN TO CANADIAN



b



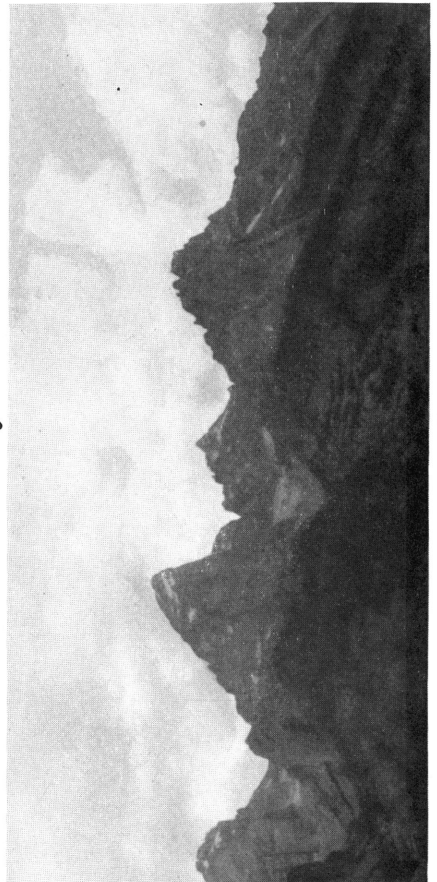
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PLATE 2. TYPICAL ECOLOGICAL ZONES, CANADIAN TO ARCTIC-ALPINE