ONE HUNDRED YEARS OF LAND USE*

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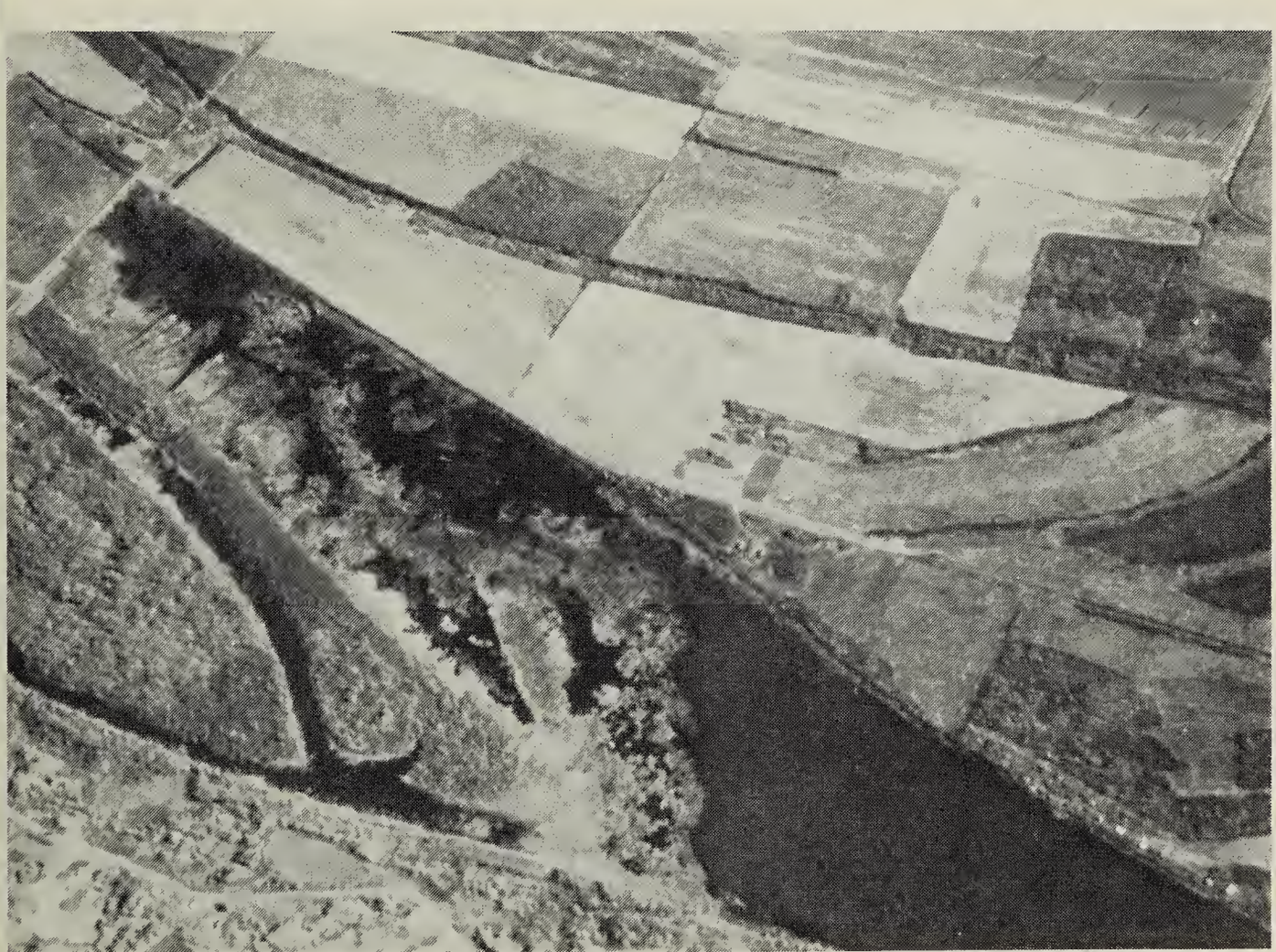
Little more than a century ago the shift in land use from hunting-and-gathering to agriculture was initiated on the Western Plains. Today the prairie scene is completely changed from what it was when John Macoun came botanizing by, exclaiming at the marvelous flowers while also declaring the grasslands fertile and suitable for farming. As we look out from the land rectangles that enclose us in town and country - the legacy of the cadastral grid land surveys of the 1870s and 1880s - it is difficult to imagine the curvilinear sights, sounds and smells of the primeval grasslands, now reduced to a few forlorn and untypical fragments.

Attitudes Shape Uses of Land

The land-use changes that began toward The end of the 19th century were no accident. They were the logical expression of European attitudes toward and perceptions of lands utilized by hunter-and-gatherers as nothing but wilderness, waste, barren, desert, and deserted, until colonized and "improved" for human uses. (The adjective "improved" when applied to natural landscapes tells us much about ourselves and our attitudes to nature.)

The rapidity of the land-use transition reflected a Canadian National Policy, promulgated in 1879 in response to several political urgencies. One was the perceived threat of an American expansion north of 49 degrees, to be countered by the establishment of a communication and



Aerial view at north end of Pike Lake, Sask. *J.B. Gollop*

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transportation system that would make possible - through settlement -the occupation of the Prairie Region. Another was the ambition to create a new and relatively exclusive market for the expanding financial and industrial productions of Eastern Canada.

Railways, tariffs, and immigration were parts of the same package, aimed at contributing both to the military protection and to the economic integration of the new Dominion. And of course times were opportune to sell cereals abroad, particularly the seeds of the desert grass, wheat, because the booming industrial revolution in the Old World continued to boost the growth of urban labour forces and their demands for bread.

Prairie settlement was born into a capitalistic era of machine agriculture, and did not represent a development imposed on older village-centred feudal forms such as existed in Europe and Asia. There the constant threat of raids and of warfare, the lack of police protection and of sanitation, had encouraged rural people to cluster together in villages from which they travelled out daily or seasonally to engage in subsistence agriculture.[1] The comparative safety of Western Canada as well as the methods of allocating land to the CPR, the HBC, land corporations, individual settlers, and for schools, had the effect of scattering farmsteads, with towns subsequently appearing at grain-shipping points. The latter, 12 to 15 miles apart on the railway lines, were spaced to suit the capabilities of horse-powered transportation.

Furthermore, from the beginning and with few exceptions farming was oriented to the market, to raising food for export, for cash. Ideas of traditional subsistence farming, and of regional self-sufficiency in food, were not in the books.

The early insinuation into Prairie

Wheat *Gary W. Seib*

agriculture of the idea of farming as a commercial enterprise, as a business (and for some as a money-making means to move to the West Coast) rather than as a provisioner of healthy food for domestic consumption, lies at the root of the exploitive land uses that continue to plague the West today. For attitudes as to what farming is all about - the cultural goals of agriculture - have much to do with the way rural society is organized and with how the land is managed and conserved, or mismanaged and degraded. Attitudes have determined land use on the Prairies and only profound changes in attitudes will change, for the better, the land uses of the future.

Despite continuing rhetoric about farming as primarily a way of life, and after that a money-making enterprise, the suspicion grows that the family farm and its virtuous farming life-style is a nostalgic relic, a museum piece, at least where the majority is concerned. The Jeffersonian farmer and husbandman, self-sufficient and secure on his small holding, the bulwark of democracy because of his rugged unsubsidized independence, is long gone.[2] President Mitterand visiting Regina in the spring of 1987 defensively asserted that on the average each Canadian farmer is subsidized about $30,000 yearly.

Economic Goals Subvert Conservation

Massive industrialized production on ever-larger farms is the present goal, and development economists set the standards to which most farmers adhere, willingly or not. According to current theory, progress is gauged by productivity figures; that is, by output per person. Applied to agriculture as just another business, progress is therefore inversely related to the percentage of the population engaged directly in agriculture. Thus the fewer the farmers on the land the more advanced the economy, on the assumption that reduced employment in primary production - in farming (and in forestry, fisheries, mining) - frees up labour and capital for more worthy industrial and service pursuits in the cities.

The land use changes that have accompanied the intensified industrialization of Prairie agriculture since its beginning are well known and will only be mentioned briefly. The average size of farm has steadily increased as the percentage of rural population has decreased. Just as energy-intensive technology in the form of the tractor made horses obsolete on the land, so powerful machines for tilling, seeding, spraying and harvesting have also made people obsolete on the land. (We sold the horses for meat; we still have not figured out what to do with the excess people.) In general, mixed farming or diversified farming has not been encouraged "because of the loss of efficiency compared to specialized production," to quote a Report on Manitoba's Economic Future.[3] Thus in the attempt to coax increased production from the soil and so beat the cost/price squeeze, the landscape is more and more simplified in bigger and bigger chunks.

Unfortunately, and this is largely unrecognized, the cost/price squeeze is the heart and soul of the industrial agriculture system, both driving it and setting its priorities. Anyone with open eyes can see that the industrialization mania is a sure formula for the destruction of wetlands, the clearing of woodlands, the abuse of marginal lands, the deterioration of soils, but convention continues to intone, "Have faith and doubt not! That's Progress. That's the rule of Impersonal Market Forces - the God that none should question." And so the trends continue.

Uncultivated Lands Threatened

Is this the full story of land use over the last 100 years? Is it fair to imply that we are a non-conserving people? What about all the uncultivated land of the Prairies - the rangelands and the aspen parklands - offering the promise of a balance in uses alternative to till agriculture? Or is it, too,

Ploughing the prairie using horse power. *Archives of Sask.*

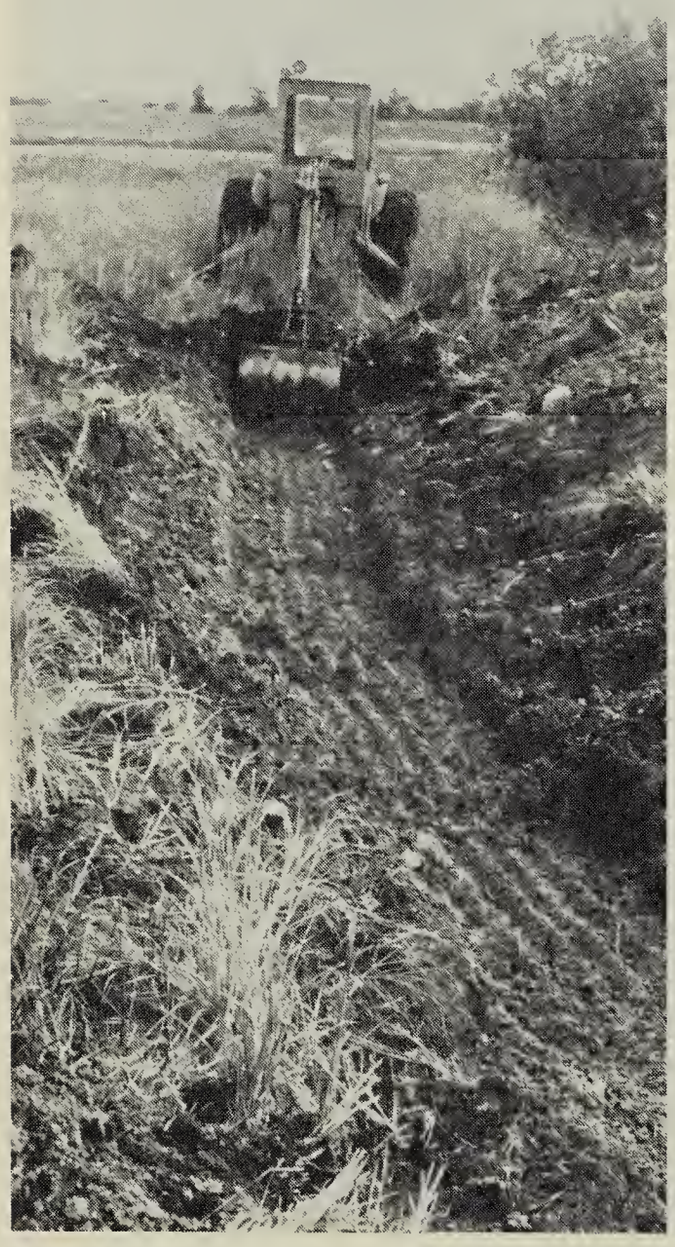
Ploughing around bushes in the parkland with early tractor. *Archives of Sask.*

Pulling stumps to clear bush in 1910. *Archives of Saskatchewan*

Bush cleared by caterpillar tractor and piled for burning. *Lorne Scott*

ticketed for "improvement" by the plough?

According to Dr. R.T. Coupland, the common belief is erroneous that land not already in arable agricultural use will remain so, with such factors as stoniness, rough topography, salinity, sandiness and droughtiness guaranteeing immunity from drastic disturbance.[4] On the contrary, the Canada Land Inventory figures for Saskatchewan indicate that irremediable impediments to cultivation exist on only 5 percent of the land surface in the grassland zone.[5] Thus in theory about 95 percent of southern Saskatchewan could be tilled (including, for example, the site of the proposed Grasslands National Park) either for cereal and oil-seed crops (approximately 60 percent of the land surface) or for "improved pasture" (approximately 35 percent of the land surface). The area on which these calculations are based includes Indian Reservations and Crown Lands, but excludes provincial parks, major water bodies, and urban areas (which are small in total).



Draining wetlands *Gary W. Seib*

Quoting one agronomist, "We in the West have not yet exploited our agricultural potential to the full. There are 35 million acres of Western Canadian land in Canada Land Inventory classes 1 to 4 as yet unused."[6]

Not unexpectedly, agricultural policies have been directed toward the exploitation of the untilled areas that remain in the West. Subsidized "improvement" programs (conversion from the native state) are always popular - during prosperous times to take advantage of favorable markets, and during desperate times to provide that extra increment of production or of quota acreage that might make the difference between farm survival and failure.

Prairies Intensively Tilled

Even without this on-going attrition of native-prairie rangelands and other wildlands, the level of intensity of land use in the grassland zone of Western Canada is exceedingly high. Dr. Coupland has calculated that the unforested part of the Prairie Provinces occupies only 5 percent of the land area of Canada, but it comprises 74 percent of the country's annually cultivated land. Within this region, something over 60 percent of the land surface is at present devoted to arable (tilled) agriculture and more than 50 percent is cultivated annually. For comparison, in the most climatically comparable area of the United States, on 51 percent is in arable agriculture and 36 percent is cultivated annually. Thus the intensity of land use in the unforested region of Manitoba, Saskatchewan, and Alberta pro-

bably is not exceeded on such a grand scale anywhere else on earth.[7] Little wonder that the Prairies today have the dubious distinction of being at the centre of so many "Wildlife in Jeopardy" programs.

Northward, the Aspen Parkland with its fescue grassland is in the same predicament as the Mixedgrass Prairie zone - a patchwork of small remnant endangered ecosystems in a matrix of tilled land. In this area, already extensively exploited and simplified by agricultural use, trends are the same as in the south. Estimates of the areas surviving, compared to the original, range from a high of 20 percent to a low of 2 percent, depending on the subregions considered.[8] The fragments that remain are mostly of small size, and are increasingly important as refugia for plants and animals whose surrounding natural systems have been destroyed. A few major blocks are protected in National Parks and Military Reserves. The larger Provincial Parks, however, with few exceptions allow multiple uses such as grazing, gravel mining, oil and gas exploration and extraction, forestry, and of course various kinds and intensities of recreational use, so that the total effect is to deteriorate and decimate the type. Other tracts of public land are also exposed to multiple uses with little regard for preservation, and for example community pastures that should be managed in the public interest by the maintenance of their native biota display notorious carelessness in this regard.

To the eastward, Manitoba's Tall Grass Prairie is more than 99 percent gone, and only at this late date, 1987, has an inventory effort been mounted to locate the last few acres of what was once a rich and beautiful type.

The difficulties in obtaining a balance between agricultural and other legitimate land uses are pointed up by the almost insurmountable obstacles encountered in trying to preserve native landscapes for

Parklands and forest margins are being cleared *J.B. Gollop*

their own intrinsic values. Since 1941 attempts, largely unsuccessful, have been made in Saskatchewan to protect small areas of grassland permanently for scientific purposes. Negotiations with Provincial authorities in the 1950s provided legislation that could have given permanent protection to a number of designated grasslands, but it was repealed before it was used. Again, in the 1970s, the International Biological Program generated pressure for Natural Area preservation, and one hundred representative or unique landscape tracts were proposed. A few important areas, such as the Matador Grassland, gained the protection of the Parks Act, but under the Ecological Reserves Act, on the books for nearly a decade, the province has so far managed to designate only one small parkland area on the banks of the Assiniboine River. Meanwhile 99 percent of potential Ecological Reserves on lacustrine and till plain landforms in the Grassland Region have been wiped out by the plow and the cow.

So what do we have to show for "balanced land use" - the heart of any conservation strategy - in the southern half of Saskatchewan? About one half of the "improved" land in all of Canada - 47 million acres. Area devoted to National Parks? Nothing. (Prince Albert National Park, up in the forest belt, occupies just 0.6 percent of the province.) Area devoted to Provincial Parks - 0.7 percent, about the same as in road allowances, and most of them beyond the Grassland zone. Devoted to Wildlife Areas of various kinds 1.2 percent.[9] Putting them all together, a mere 2.5 percent of the total provincial area, and much less than 2 percent if the grassland region alone is considered. This is a disgrace to the Province (equalled only by the disgrace to Canada of having a mere 1.6 percent of the nation's area in National Parks).

Grasslands - the "Failed Resource"

Partly the problem of attaching importance to natural grassland is one of perception. Neil Evernden tells the story of a trip

Jumping Deer Creek Valley nw of Lipton, Saskatchewan *Gary W. Seib*

by rail across the Prairies, looking out from the dome car, while the conductor commented, "Don't know why - there's nothing to see." Evernden ironically calls the prairie "A Failed Resource" because to eyes attuned to forests and lakes, to mountain and sea, it baffles with its spatial volume and apparent emptiness; its big sky, sweep of wind, and brilliant sun that threatens "to bleach the ego." As various people have remarked, "How can there be an interesting Grassland National Park?" Henry Kelsey, one of the first white travellers on the Yellow Head Route 300 years ago, heading westward toward the Battlefords like so many tourists since, expressed the sentiment in memorable doggerel:

"This plain affords nothing but Beast and Grass, And over it in three days time we past."

Like Kelsey, the settlers of Manitoba and the Northwest Territories (from which Saskatchewan and Alberta were carved in 1905) came mostly from the milder climates of Europe and eastern North America. Grasslands to them seemed to lack an essential ingredient - trees. In his Report of the Forestry Commissioner to the Minister of the Department of the Interior in 1888, J.H. Morgan conjectured that the rich soils were treeless because of their heavy rank growth that encouraged fires.[10] Stop fires and the forests will return. He drew attention to John Macoun's 1880 report of a "desert" in southwest Saskatchewan (the Great Sandhills) where grew large cottonwoods and " a perfect oasis of nearly 700 acres surrounded by sandhills that kept out fire." Morgan recommended establishment of Experimental Forest Stations to ascertain the tree species most suitable and valuable, following which "our next duty would be the reserving of large tracts of land for permanent forests." Encouraging words such as these eventually led to the establishment of Forest Reserves at various sandhill sites in the grasslands, for example at Shilo, Elbow, and Dundurn. Although the federal government began an active farm tree-planting program in 1901 with stock provided by the Indian Head Nursery, it was not until 1916 that plantations were started on Forest Reserves. This culturally motivated attempt at an alternative land use was unsuccessful. The plantations were ravaged by drought, fire, and rabbits that showed no respect for the theories of Macoun and Morgan. In the general transfer of resources to the provinces in 1930 the federal government surrendered its sandhill forest reserves, doubtless with a secret sigh of relief. Now these sandhill lands, failed as forest producers, are cleared for pastures, grazed, and even ploughed.

Unguided Technology Leads Land Use

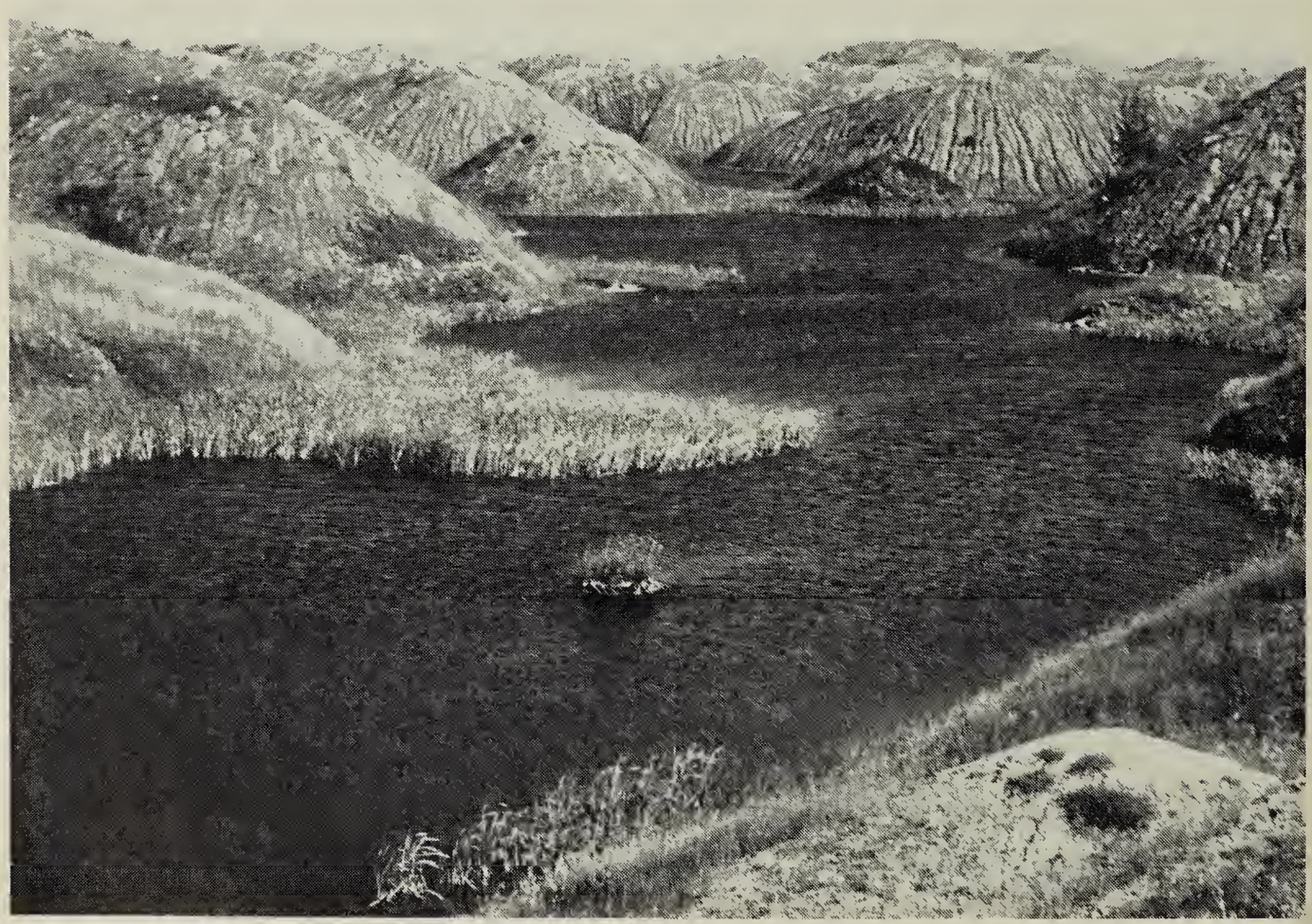
Technology seems to be the force that continually molds land uses. Technology's goals of efficiency and of minimizing risk appear to propel agriculture from hoe-and-sickle to horse-drawn plough and reaper, then toward the use of huge air-seeders and combines plus massive uses of chemical fertilizers, toxic biocides, and all the other techniques that go with and justify large monocultural fields. Similarly, transportation technology, another important determinant of land use, has evolved over the century from travel by horses and railroads to the automobile, airplanes, helicopters, all-terrain vehicles. Again, as with agriculture, the face of the earth is modified more and more drastically, and the changes are not friendly to the native landscapes.

Under the influence of energy-intensive technology, a third land use, mining, has moved from scraping gravel, salt, and sodium sulphate from the earth's surface to the shallow strip mining of lignite, the underground mining of bituminous coal and potash, and the deep drilling for petroleum. Each technological "advance" requires greater expenditures of fossil fuel and hydro-electric energy, and is marked by greater environmental damage.

The example of mining as a land use is particularly instructive for it shows clearly the dangers of unguided technology. Life, as we know it, evolved in the world of renewable and replenishable resources, in the post-Precambrian green world of organisms, organic soil, clean water, fresh air. The hostile environment that had existed earlier in the geological pre-life period of the earth's history was succeeded by the safer pro-life environment, screened by ozone from excessive exposure to ionizing ultraviolet rays from above, blanketed by sediments from excessive exposure to the hot radioactive rocks below. Dangerous toxic substances - heavy metals, sulfurous compounds, radionuclides, and hydrocarbons - were safely sequestered beneath the planet's surface. (These we call "non-renewable resources" and dread the day when humanity will be without them. We should call them "Unnatural Resources," mark them with a skull and cross-bones, and pray for the day when humanity will choose to do without them.)

Over the last few centuries, through mine shafts and bore holes, the technology of mining has introduced the Unnatural Resources in massive amounts back into the earth's life space, depleting the ozone layer and poisoning air, water, and soil. In a sense, mining, and the modern use of mining products, is turning the geological clock back, recreating the Precambrian environment when acid rain laced with radionuclides and heavy metals washed the soilless rocks of a hostile-to-life world. Sudbury in spades. Yet today like idiots we stand and stare at accumulating toxic wastes, at the dying fish and dying forests - clear signals to us, like the belly-up canary in the mine shaft - and ask, How can this be? Surely the technology of non-renewable resource use is good?

The precise answer is rubbish; except perhaps for a minority of mineral forms such as phosphorus and potash, two of the few life-enhancing substances dug out from underground. But even concerning



Spoil piles near Estevan, Saskatchewan *Fred Lahrman*

P and K some hard questions arise as to WHAT ON EARTH we are doing with them to our land and to our use of it. Have we any idea of how to handle in perpetuity the dangerous salt wastes that are accumulating wherever potash is mined in Saskatchewan?

Technology seems to have a life of its own, forcing its mechanical, non-organic efficiencies on the landscape, destroying in the process the world's wildness that more and more people are recognizing as priceless. Yet technology comprises human inventions, susceptible to guidance once goals are clearly defined. In the case of mining, for example, a better goal would be the extraction and use of those surface earth minerals and substances to which evolving life has long been exposed. An industrial world based on safe ceramics is preferable to the dangerous one we seem bent on reinventing.

Similarly with agriculture; are the goals toward which our land uses incline reasonable and life-enhancing? In a world awash with wheat and canola, will we continue to add to the surplus, depreciating what remains of the fertility and beauty of Prairie landscapes, subsidizing with cheap grain the misuse of land in receiving countries?

Concepts and Attitudes to Guide Land Use

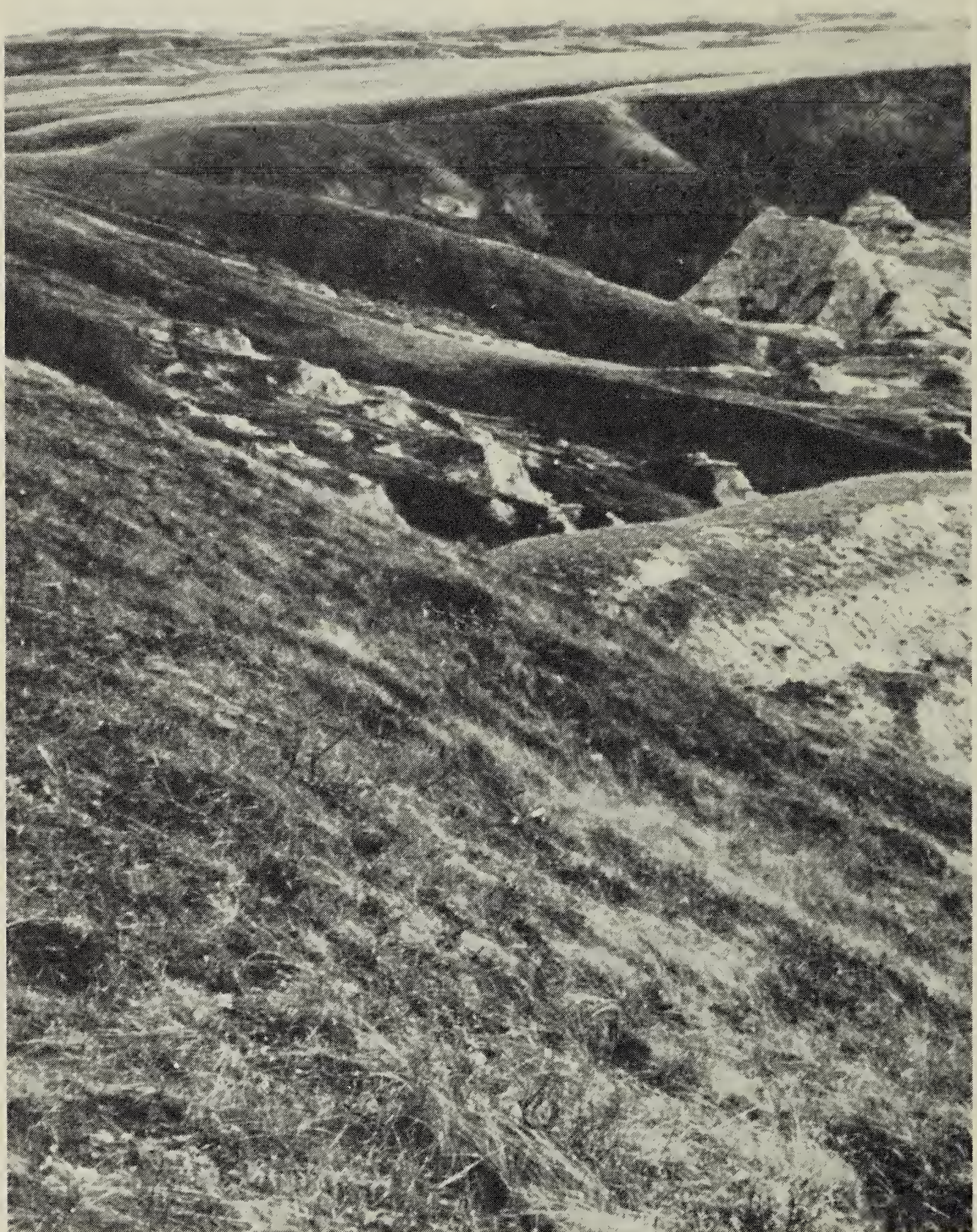
Problems with land use are to a large extent the reflection of failed values, attitudes, concepts, which the inertia of technology perpetuates. One hundred years of land use on the single track of high agricultural productivity will not be side-switched, let alone reversed, without radical changes in the underlying motive forces. Let me briefly mention two related ideas, conceptual and attitudinal, whose absence hurts the land and whose presence could bring a more balanced perspective to land use in Canada and everywhere in the world.

The missing concept is the ecological one of landscapes-as-ecosystems, literally "home systems," within which organisms, including people, exist. The realities of the world are not organisms in a vague environment but the ecosphere with its sectoral landscapes and waterscapes of which organisms are just some of the vital parts. As conservationists and preservationists we spend too much effort on threatened species, as if (next to us of course) they are the only important things on God's Green Earth. True the importance of preserving "habitats" is more and more recognized as essential to the species which cannot exist without them, but "habitat" like "environment" is a weak and woolly concept that has failed to project to the public the sense of importance of the enveloping natural world and the urgency of protecting it.

The task as I see it is to begin to think ecosystems, from the BIG ONE shown in satellite pictures - the Ecosphere, the Home-Sphere - down to the small landscapes that it comprises; those that regionally and locally support all existence. These enfolding land-and-water systems, used and abused by humanity, are more than resources; they are part of the miraculous world ecosystem that brought life into being, sustains it, and renews it.

The missing attitude is sympathy with and care for the land and water ecosystems that support life. This can only come of course after we have conceived landscapes as real three-dimensional things to be valued, and have recognized their importance within the educational system. Human beings, incorrigibly homocentric, species-centred, have difficulty conceiving that things other than themselves (with the exception of some look-alike animals) merit compassionate attention.

Even in the big-sky West, the sun has not sufficiently bleached the collective



Killdeer area of proposed Grasslands National Park *Frank Bellamy*

ego. Yet here if anywhere humans should clearly see their roots in the land, understanding that they are from the land, and belong to it in a way that it can never belong to them. This realization sets the foundation for the Land Ethic that Aldo

Leopold preached as essential for humanity's salvation. The land, he said, is not a commodity that belongs to us; it is a community to which we belong.

To repeat my central message, instead of endangered species we should be focussing on endangered landscapes-as-ecosystems. The emphasis on rare and threatened animals and plants misleads the public into believing that bigger and better zoos and botanical gardens, gene banks and seed banks, can fill the need. We would not be worrying today about Swift Foxes, and the last four Greater Prairie Chicken in southern Saskatchewan, if years ago we had done some constructive worrying about the massive plough-down of native landscapes.

I have a proposition to which I hope you will all subscribe: that we petition our provincial and federal governments to change the mission and name of their Wildlife Services to Wildland Services. The CWS would still be here, but with its horizons expanded to more important entities than birds and mammals, After all, on the day the last patch of Wildland disappears all concerns for Wildlife except those of nostalgia will also vanish.

One hundred years of land use in Western Canada is prompting people to change their ways. Hopeful signs are the many different conservation and preservation programs supported by government agencies and by NGOs [non-government organizations]. After years of inaction, they all sound so good! Let us, however, remember as we support them that without concurrent conceptual and attitudinal changes, these and all such conservation programs will prove to be only stop-gap measures, finger-in-the-dike exercises, glimmerings of hope, but not the new day dawning.

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NOTE: Additional wildlife lands have been designated by interdepartmental agreements since 1980, but their permanency as fully protected lands is doubtful. Further, provincial parks are questionable sanctuaries for native landscapes and their biota, for they are managed under the rubric "multiple use" which all too often translates into "anything goes."