WET YEARS — DRY YEARS
"... a wharf had been built on Long Lake at the end of the completed portion of the railway.

But by the time the wharf was built a period of dry seasons had commenced, and the shore of the lake kept receding until the wharf was entirely on dry land.

That the drying up of the lake was not an extraordinary occurrence was shown by the fact that at the site of the wharf and well past the end of it, there were old buffalo trails and well worn Indian travois ruts plainly to be seen. This was good evidence that part of the lake had been dry in the past long before the wharf was built."

Thus did P. Turner Bone, the civil engineer who located the railway from Craven to Saskatoon in 1889 explain the failure of the navigation aspect of the Qu’Appelle, Last Mountain and Saskatchewan Railway and Navigation Co. The wharf at Craven had been unused from the date of its construction in 1883.

It is appropriate to consider the failure of attempts at steamship navigation on the Saskatchewan River during the period 1874 to 1889. Bruce Peel has documented the events in his book Steamboats on the Saskatchewan. There were perhaps 3 years in this interval when navigation enjoyed some measure of success but the progressive effect of drought left some 50 miles of riverbed dry around the southwest side of Cumberland Lake by 1889.

An abortive attempt at hydro-electric power development at La Colle Falls by the City of Prince Albert owed its demise to an inadequate knowledge of rainfall and streamflow variation. The drought of the 1930’s in Saskatchewan was disastrous for agriculture and business. It has been the writer’s contention that similar disasters are likely to occur again and that present water and land-use practices are more likely to aggravate than alleviate the possible consequences.

Recent Annual Reports of the Saskatchewan Department of Agriculture reveal an interesting departure from the original concept of the function of the Conservation and Development Branch. The 19 report enumerates projects which might be promoted:

1. Erosion control projects.
2. Water Stabilization and Development projects for
   (a) Irrigation
   (b) Drainage
   (c) Domestic purposes and industrial uses
   (d) Watershed protection.
3. Pasture Land Reclamation.
5. For the eradication of insect and weed infestations.
6. For the development of underutilized areas.
7. For the reclamation of misused lands for whatever purposes they may be best suited.

A study of the Annual Reports for the following 20 years shows how the C & D Branch deviated from the commendable objectives. Drainage received major attention during the three wet seasons of 1953-1955, and again during the late 1960’s when federal government (A.R.D.A.) grants became available for C & D Branch administration.

Latest available statistics (1971-72) on accumulative spending by the C & D Branch show a total of 11.5 million dollars under the heading “Flood Control” (a euphemism for “drainage to qualify for A.R.D.A. assistance). Irrigation received less than one-half...
this amount. When the Community Sture programme came under C & D jurisdiction, clear-cutting of wooded b-marginal lands (with extreme fencing costs due to stones) accounted for large part of the 12 million dollars spent. It seems timely for an appraisal of the consequences of two decades of emphasis on large scale drainage, involving several million dollars of public monies, while erosion control, shelter belts and wood lots receive scant attention.

Concern for inadequate water conservation and spring flooding due to short-sighted activity of the Conservation and Development Branch was outlined by the writer at the first Wetland's Project Advisory Committee hearing in Melfort in April, 1972. Mr. J. A. Wedgwood expressed the same concerns in the Blue Jay of December, 1972. Widespread flooding along the Carrot River a few days after the Melfort hearing may have emphasized the hypocrisy of the term "Flood Control". It is a common occurrence for rapid snowmelt to be followed by weeks or months of low precipitation as shown in the Carrot River Basin last year.

At this time (April, 1973) a year later, farmers are worried about dried up wells and dugouts. Dugouts are usually filled by snowmelt and otherwise take exceptional rainfall to refill. Groundwater levels decline and recover more slowly. Large road ditches and drainage schemes interfere with groundwater recharge. Groundwater has the greater potential for stabilizing rural water supplies and deserves more careful management.

Currently there is strong government pressure on farmers to increase livestock production. This diversification seems to be as dependent as navigation and hydro-electric power on a reliable daily source of water. Dryland grain farmers are capable of withstanding weeks or months of drought more successfully than the livestock producer who may find it necessary to market his animals prematurely when feed or water supplies are not sufficient.

There is great variability in our precipitation from year to year and seasonally. Compilers of data are inclined to average this information without further interpretation. Yearly averaging is only slightly improved when standard deviations or coefficients of variation are quoted. The simple bar chart has much to recommend it as a visual portrayal of monthly precipitation. Crop yields vary in relation to previous autumn rainfall as well as growing conditions. Farmers have learned to employ summerfallowing as a means of insuring an adequate soil moisture level for crop production. Although there is new evidence that this may be poor practise from the point of view of soil management, the consensus is that additional soil-stored moisture increases yields. Optimum rainfall amounts for wheat are 18 inches, for coarse grains 16 inches, rapeseed 25 inches. For forage production the optimum moisture requirement is likely to be close to 25 inches. Yearly precipitation, including snowfall, is usually much less than these amounts.

It is not commonly realized that yearly precipitation for Estevan exceeds that for Melfort or Prince Albert; nor that snowmelt losses are greater in the northern agricultural areas. Snowfall at Melfort is equated at 4.7 inches, rainfall at 11.37 inches; at Prince Albert 4.0 inches equivalent snowfall and 10.83 inches rainfall; while Estevan reports 4.4 inches equivalent snowfall and 11.96 inches rainfall. In view of such data it is difficult to find justification for government sponsored drainage in areas like the Carrot River Basin. Drainage schemes in the "Land of Rape and Honey" seem destined to reduce available water to two-thirds that required for wheat and to less than half the optimum for rapeseed.

Snowfall accumulates unevenly due to drifting; this fact should be exploited to allow runoff to be utilized for groundwater recharge. A good deal of soils and groundwater research has been done in Saskatchewan, but government employees and farmers show little interest in it. Dugouts are sub-

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Ground-water is better protected from contamination and evaporation and in many areas there is potential capacity sufficient to meet several successive years of drought. Surface water, however, must be admitted to the soil to maintain underground reservoirs.

Climate is said to be a combination of factors including precipitation, evapo-transpiration and temperature. Plants suffer heat-stress just as do animals and humans. The benefits of significant areas of trees can be seen by the rapeseed grower and the cattleman. Evapo-transpiration from native willows surrounding potholes may be the best possible way of dewatering these catch basins. These bluffs provide shade for cattle and local air conditioning for periods of excessive temperature. Evapo-transpiration is an overlooked factor in dry hot periods. Soils specialists, however, recognize it in the “Soil Moisture Efficiency Index”.

After drainage the soils in potholes usually differ in texture from the surrounding fields so that production is only marginally increased. Assessors who are trained in soil capability usually recognize this by leaving sloughs at a nominal evaluation $1.00 to $3.00 per acre. Some farmers admit this fact, but justify drainage mainly on the economics of field patterns during operations. They overlook the inconvenience of ditches.

An examination of drainage costs revealed in Saskatchewan Department of Agriculture Annual Reports, commonly shows estimates are exceeded by up to 50%. The C & D Branch refers to a $136.00-per-acre cost as justifiable basis for drainage. They give no detailed evidence to support this figure nor for their contention that subsequent increased land assessments pay for the reclaimed acreage. This sort of economic logic was displayed at the Wetlands hearings in Melfort. Farmers promoting drainage should have been required to submit their field assessment sheets and Wheat Board Permit books in evidence. Instead the seem to have influenced the Committee by questionable data on farming costs and alleged duck damage.
petition of drought conditions such experienced in the 1930's or 1883-98 periods will show wastage of snowmelt to have been folly.

Precipitation data for Melfort (1910-1971) shows 35 of these years with less than 16 inches and only 27 years above this amount. Using 16 inches as a dividing point for Prince Albert (1885-1949), there were 36 years below and 27 years above. One might advance the argument that the odds favor dry years 4 to 3.

In conclusion, the farmer and conservationist must recognize their common problem is the intelligent storage of water for survival during the inevitable and unpredictable dry years.


Rennie, D. A. 1973. In a paper presented at Farm Week, Saskatoon, Sask.


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LOOKING AT SASKATCHEWAN'S FUTURE

The Saskatoon Environmental Society is arranging a meeting of people from all over the province interested in sketching out possible futures for Saskatchewan, determining the environmental, social and economic implications of these alternative futures, and beginning to plan strategies and activities which will help to bring about the sorts of environmental, social and economic futures they desire.

The meeting will be held at Camp Rayner, Lake Diefenbaker, on November 3 and 4, 1973. Persons interested in attending should contact T. H. J. Gilmour, 1614 Ruth Street East, Saskatoon S7J 0L8.