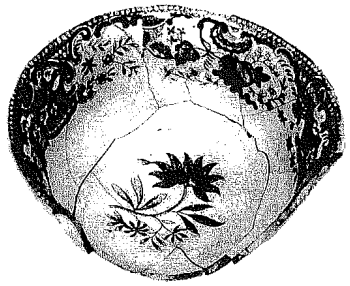

Plate 5: Fruit and Flowers bowl (DlLg-21: 96A/222).

Plate 6: Broseley bowl (DlLg-21:96A/312).

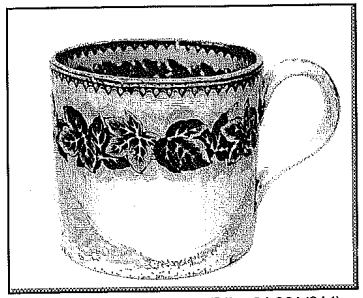

Plate 7: Ivy and Acorn cup (DlLg-21:96A/314).

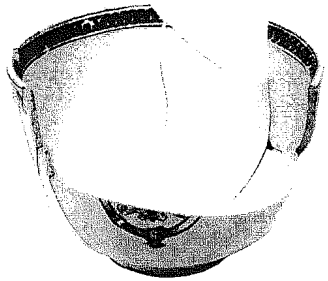

Plate 8: Honeycomb cup, Hudson's Bay Company (DlLg-21:96A/307).

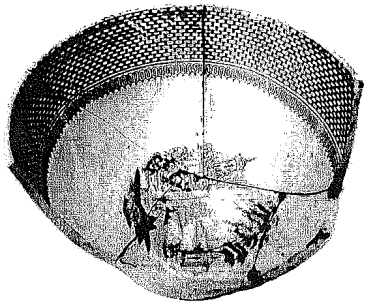

Plate 9: Fountain bowl (DlLg-21:96A/300).

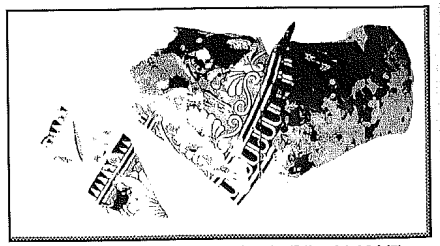

Plate 10: Honeysuckle pitcher sherds (DlLg-21:98A/5).

A Geomorphological Perspective on the Antiquity of the "Forks"

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Introduction

The Forks, at the junction of the Assiniboine and Red rivers in Winnipeg, is frequently portrayed as if it has been a permanent feature of the landscape during all of human occupation of the area. However, evidence exists that this isn't the case. Indeed, the geomorphologic evidence suggests that another, earlier, Forks exists within Winnipeg's present boundaries — and that for a long period of time before that, there was no Forks at all.

This paper will discuss the physical history of the lower Assiniboine River (from Portage la Prairie to the Red River) to add an earth science perspective to the potential human history of the Forks. The geomorphological content of the paper summarizes research conducted a decade ago by the author, Harvey Thorleifson (Geological Survey of Canada) and Jim Teller (University of Manitoba). The results have been published elsewhere (Rannie et al. 1989; Rannie 1990) but are reviewed here because of their relevance to the archaeological community and others who are interpreting the significance of the Forks. Much of the credit for the geomorphological reconstruction is due to Thorleifson and Teller, but they bear no burden for the archaeological interpretations given below, which are entirely the responsibility of the present author.

The Portage la Prairie Alluvial Fan

The key to the Holocene history of the lower Assiniboine River lies at Portage la Prairie and the alluvial fan which the river has constructed there. An alluvial fan is a conical, fan-shaped deposit of alluvium which typically forms where a river emerges from a confined valley into an unconfined situation, frequently accompanied by a marked reduction in slope. Most are relatively small, steep features composed of coarse sediments formed in semi-arid or arid regions by multiple-channel ephemeral streams having rapidly-varying regimes and heavy sediment loads with abundant bed load. The Assiniboine River and Portage la Prairie fan have few of these characteristics. The Assiniboine is a perennial single channel, meandering stream with an unflashy regime and modest sediment load dominated by silt and clay. The fan is an abnormally large feature with a downfan gradient which is 10-100 times more gentle than normal for other fans. In only two ways is the Portage la Prairie fan situation comparable to fans elsewhere — the sudden loss of confinement and abrupt reduction in slope as the river emerges from the lower Assiniboine Delta onto the Lake Agassiz Plain.

The Portage fan was formed by the process of alluvial ridge building and abandonment. Many meandering rivers develop levees and in some, the deposits which build up in the vicinity of the river elevate the entire channel so that the levees and channel are the highest features of the floodplain and

the river is flowing on an 'alluvial ridge'. If the levee is breached at some point, perhaps during an exceptional flood, the flow will be diverted into the surrounding lower area and an entire reach of the channel will be abandoned, suddenly and more or less permanently, in a process called 'avulsion'.

The Assiniboine has built and abandoned numerous ridges, arranged in a pattern radiating through nearly 180° from a point just west of Portage la Prairie where the river becomes unconfined (Fig. 1). The result is a broad, fan-like dome of alluvial sediment — an alluvial fan with its apex just west of Portage la Prairie which has characteristics that set it apart from others in the geomorphic literature. The fan gradients are extremely gentle, both downstream and across the fan, but the alluvial pile with the superimposed channels and levees of the alluvial ridges shows clearly on profiles constructed from very detailed topographic maps with a contour interval of 1.0ft (Fig. 1, inset). Most of the abandoned channels are indistinct on the ground, being merely shallow linear depressions most commonly distinguished by vegetation which differs from the adjacent agricultural cover. In some favourable locations, scroll bars impart an undulating topography to an otherwise sensibly flat landscape. From the air, however, the channels are strikingly apparent (Fig. 2). The meander geometries of these channels are comparable to the modern Assiniboine, suggesting comparable channel-forming discharges.

No avulsions have occurred in historic times and thus it is only possible to guess at the causes of the prehistoric events. It seems probable that ice jams coupled with particularly large discharges

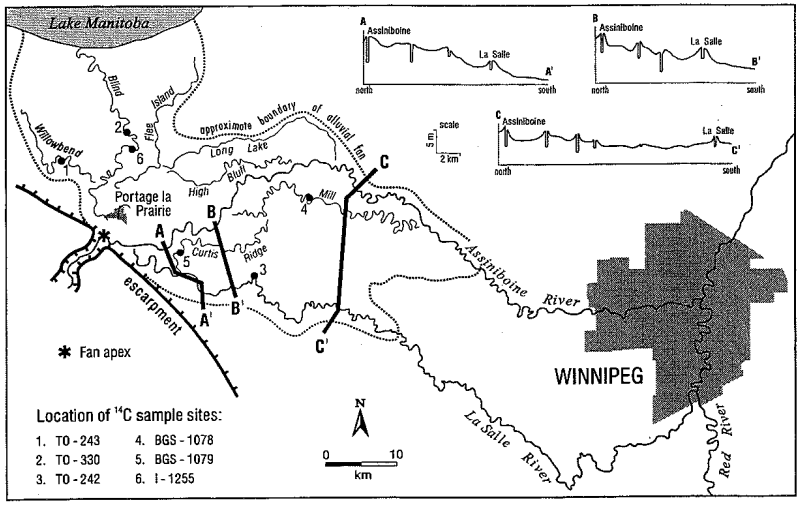

Figure 1: Alluvial fan, paleochannels, location of ^{14}C samples, and alluvial fan cross-profiles (modified from Rannie et al. 1989).

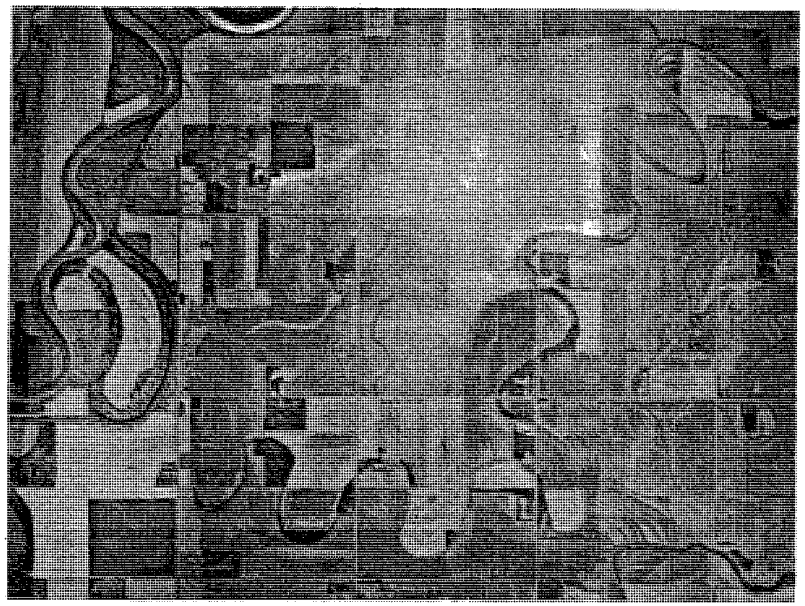

Figure 2: Air photo of a portion of Mill Creek paleochannel, with Assiniboine River on left. (Manitoba Department of Natural Resources, photomosaic of Township 12, Range 4 W).

may have been important. Before artificial straightening of the channel in this century, ice jams were frequent occurrences on the upper (Portage la Prairie) part of the fan, where sinuosity is high. Another important factor is the fact that the channel position is fixed upstream of Portage la Prairie by the valley incised in the lower glacial Assiniboine delta, and downstream of the fan where it is incised into the underlying Lake Agassiz clays. Thus, only the middle section can migrate laterally in the normal fashion of meandering streams. In this section of the fan, the sediments are relatively coarse-grained sands and lateral migration is active (as indicated by the very visible scroll bars in Fig. 2).

The most striking aspect of the channel system is that some of the channels end in Lake Manitoba and some end in the Red River. Thus, because the fan is poised on the drainage divide between the Red River and Lake Manitoba, repeated avulsions have caused the river to switch drainage basins, a most unusual situation. It is the changes in channel position that make the alluvial fan relevant to the history of the Forks.

Changes in Channel Position

A beginning point in the reconstruction of the evolution of the lower Assiniboine River is the observation that the channels north of the present river, which end in Lake Manitoba, appear older than those south of the river. To the south, the scroll bar details are fresh and not obscured by subsequent overbank deposition and infill as are the ones north of the river. Additional evidence is provided by the soils in the vicinity of the channels. Adjacent to the northern channels, the soils have mature chernozemic A horizons, generally exceeding 50.0cm in thickness (Michalyna and Smith 1972), indicating considerable time available for their development, whereas those adjacent to the southern channels have thin or no organic A horizons. Thus, it was generalized initially that the northern channels with Lake Manitoba outlets developed first.

From cross-cutting relationships among the channels, the subjective sequence of channel formation given on the left of Table 1 was developed. Datable materials recovered from five of the channels confirmed this sequence (the materials were obtained from the scroll bars of the channels to assure that they related to the time of active channel formation rather than subsequent infill). An additional date for Blind Channel (3375 ± 250 BP) was obtained by J.A.Gilliland and reported in Teller (1980). All dates are uncorrected radiocarbon years Before Present (BP); in the discussion which follows, all dates will be rounded to the nearest century for simplicity and to avoid impressions of false precision.

Table 1: Relative and absolute ages of major Assiniboine paleochannels.

Inferred Relative Age			^{14}C Dates		
Outlet		Channel	Material	Laboratory No.	Years BP
Lake Manitoba	Oldest	Willowbend	Shell	Isotrace TO - 243	7030 ± 60
Lake Manitoba		Flee Island	-----	-----	-----
Red River		Long Lake	-----	-----	-----
Red River		High Bluff	-----	-----	-----
Lake Manitoba		Blind	Shell	Isotrace TO - 330	4520 ± 60
Lake Manitoba		Blind*	-----	Unknown	3375 ± 250*
Red River		La Salle	Wood	Isotrace TO-242	2980 ± 70
Red River		Mill	Wood	Brock BGS-1078	1330 ± 100
Red River		Curtis Ridge	Wood	Brock BGS-1079	700 ± 70
Red River	Youngest	Assiniboine	-----	-----	0

*date obtained by J.A.Gilliland and reported in Teller (1980)

The reconstructed evolution of the channel system is portrayed schematically in Figure 3. The oldest channels flowed into Lake Manitoba. The earliest in this sequence was the Willowbend, flowing into the southwestern margin of Lake Manitoba about 7000 BP (and presumably for some time prior to this date). This northward drainage then shifted to the southeastern lake margin via the undated Flee Island Channel, and then, by 4500 BP, to the Blind Channel. Two other undated channels, the Long Lake and High Bluff, appear to have intervened between the Flee Island and

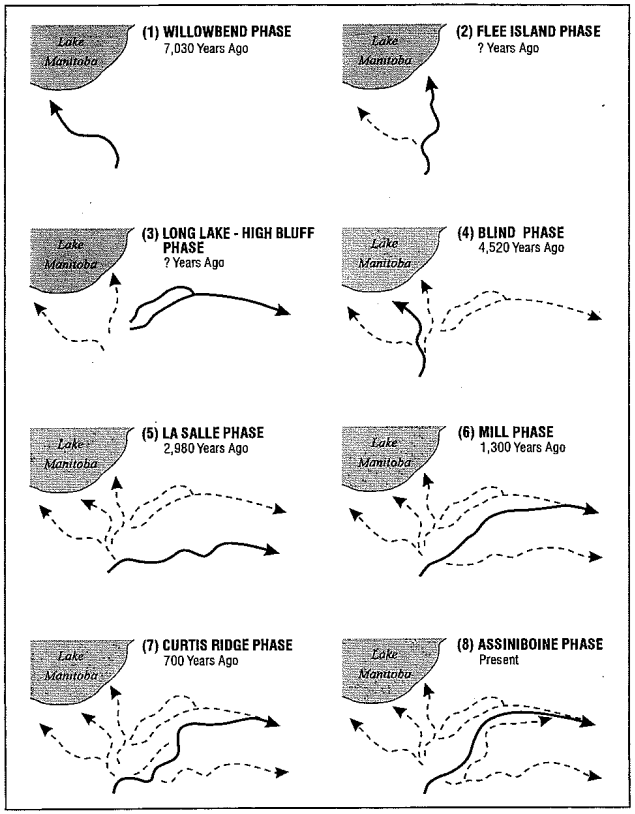

Figure 3: Schematic sequence of paleochannel evolution (redrawn from Rannie et al. 1989).

Blind Phases and will be discussed in more detail below since their apparent Red River outlet makes them particularly relevant to the Forks site. From Gilliland's date on the Blind Channel, a Lake Manitoba outlet appears to have been maintained at least until 3400 BP.

As the space available for additional northward routes became "filled", subsequent avulsion took the river eastward to the Red River. The first eastward route was established by 3000 BP along the line now occupied by the La Salle River, joining the Red River in St. Norbert (the modern La Salle River is an underfit stream which merely carries local drainage along the trench of the paleochannel). By 1300 BP, the Assiniboine was following its modern lower course in the Mill Phase but took a somewhat different course across the fan. A minor change in the fan reach occurred

in the Curtis Ridge Phase (by 700 BP) and finally, sometime between 700 BP and the earliest fur trade accounts (about 200 BP), the entire modern route from Portage la Prairie was established.

At this level of analysis, then, the lower Assiniboine has a two-phase history — an initial series of routes northward to Lake Manitoba followed by eastward routes to the Red River. This general interpretation is supported not only by the air photo analysis of cross-cutting relationships, soil development, the "freshness" of appearance of the channel details, and the radiocarbon dates, but also by independent evidence of sedimentation rates in Lake Manitoba. Radiocarbon dates for organic horizons in three cores in the lake bottom sediments (Teller and Last1981) suggest a virtually constant sedimentation rate until about 3000 BP, indicating a relatively constant influx of sediment during the period when the Assiniboine is postulated to have flowed into Lake Manitoba (Fig. 4). After the change to a Red River outlet via the La Salle channel (ca. 3000-3400 BP), the accumulation rate declined sharply.

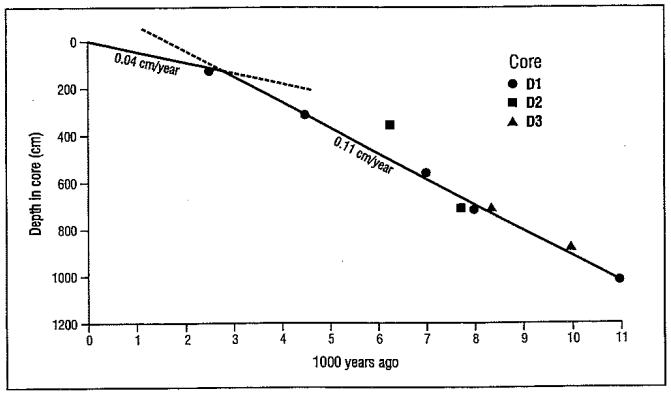

Figure 4: Sediment accumulation in Lake Manitoba (redrawn from Rannie et al. 1989).

Complicating this simple two-phase reconstruction are the Long Lake and High Bluff channels, both of which suggest eastward courses to the Red River along the modern lower route of the Assiniboine and a junction with the Red at the location of the modern Forks. No datable materials were recovered from these channels, but their context suggests that they were formed between the Flee Island and Blind Phases, i.e., between 7000 BP and 4500 BP. Both channels convey a sense that they were not active for long and it is tentatively suggested that they were short-lived eastward routes which were supplanted by the Blind Phase. Allowing sufficient time for the Flee Island Phase following the Willowbend, a cautious interpretation might place them in the 5000-6000 BP period. The relevance of this interpretation is that these channels would have created the first junction of the Assiniboine with the Red, producing an early "Forks" at the modern location, which was then abandoned for several millennia.

It is unlikely that such channel changes will occur again. The Assiniboine Diversion at Portage la Prairie is capable of diverting to Lake Manitoba an amount of water slightly greater than the channel capacity of the Assiniboine, thereby more than doubling the river's ability to convey water without overbank flow downstream of the fan apex. Thus the evolution of the fan is probably completed. Ironically, it is the existence of the fan itself that makes this diversion possible by raising the elevation of the river at Portage la Prairie sufficiently to allow water to flow naturally into the lake.

Implications for the Human Occupation of the Forks

The human history of the Forks is an archaeological question best addressed by those with that expertise. However, there is substantial agreement between the archaeological evidence for human occupation at the Forks and the sequence of Assiniboine channel positions and outlets described above.

Radiocarbon dates for occupation horizons reported in the Forks literature known to the writer are listed in Table 2. Not included are dates of 16,330±200 BP, 3515±75 BP, and 1820±80 BP which were rejected by Kroker (1989), Kroker and Goundry (1993) and Kroker and Goundry (1990) respectively because of possible contamination by coal dust.

Table 2: ^{14}C dates for occupation horizons at Forks archaeological sites.

Sample No.	Date (BP)	Source
BGS - 1375	340±70	Kroker and Goundry 1990:142
--------	540±70	Kroker and Goundry 1993:1
BGS - 1373	630±90	Kroker and Goundry 1990:142
BGS - 1372	675±100	Kroker and Goundry 1990:142
BGS - 1377	740±100	Kroker and Goundry 1990:142
BGS - 1371	870±70	Kroker and Goundry 1990:142
S - 2565	1105±160	Priess and Bradford 1985:34
S - 2563	1225±160	Priess and Bradford 1985:34
S - 2564	1440±165	Priess and Bradford 1985:34
BGS - 1479	2160±100	Kroker and Goundry 1993:125
BGS - 1370	2330±70	Kroker and Goundry 1990:142
BGS - 1480	2340±90	Kroker and Goundry 1993:125
BGS - 1483	2815±75	Kroker and Goundry 1993:158
BGS - 1482	2850±75	Kroker and Goundry 1993:140
BGS - 1374	2850±90	Kroker and Goundry 1990:142
BGS - 1316	2870±80	Kroker 1989:159
BGS - 1481	2990±80	Kroker and Goundry 1993:140

The majority of the dated occupation levels are younger than about 1500 BP, a period which is entirely compatible with the geomorphological interpretation in which the modern lower course of the Assiniboine (and thus an active Forks) was in existence by about 1300 BP and probably for some centuries before that. These archaeological dates, then, can be interpreted with confidence as referring to occupation of a true "Forks" (i.e., a junction of the Assiniboine and Red Rivers). Three dates in the period 2200-2300 BP may also refer to an active Forks site. If it is accepted that the La Salle channel was initiated between 3400 and 3000 BP and was used for an extended period before being abandoned in favour of the modern route, it is conceivable that the 2200-2300 BP dates reflect this change. Thus, a Forks with an actively flowing Assiniboine may be about 2300 years old, an age which would encompass most of the dated occupation levels prior to the historic period.

Prior to 2300 BP, two periods of occupation have been identified: a cluster of ^{14}C dates about 2800-3000 BP and a single estimated "age" of about 6000 BP. The older age, derived by extrapolating sedimentation rates backward from 3000 BP (Kroker and Goundry 1990), is only approximate, but it falls in the general period of Lake Manitoba outlets for the Assiniboine. The Long Lake-High Bluff channels offer a possible way to reconcile this apparent discrepancy. If these channels are correctly located within the sequence, they would indicate an eastward course for the river and a junction of the Assiniboine with the Red at its present location sometime in the interval between the Blind and Willowbend Phases (i.e., 4500-7000 BP). The very approximate date of 6000 BP is not precluded, even allowing for considerable variation in sedimentation rates. This channel seems to have been abandoned in favour of the Blind Channel route by 4500 BP at least and presumably for some time before that. In this interpretation, the modern lower course of the Assiniboine would have been initiated perhaps 5000 to 6000 years ago, but would have been a relict feature until it was reoccupied in the Mill Phase several thousand years later. At the Forks, this paleochannel would have existed as an embayment in the Red River but would have been occupied by a small, relatively inactive stream comparable perhaps to the modern La Salle. This embayment might also account for the existence of the dates clustered between 2800 and 3000 years BP. Again, the site would not have been an active "Forks" in the sense that the term is generally used today, but might have provided a favourable campsite on some occasions. Only after the abandonment of the La Salle route would the Forks have assumed its modern connotation.

An alternative interpretation of the dates clustered at 2800-3000 BP (most < 2900 BP) is that they do refer to a true junction of the Assiniboine with the Red, i.e., an active Forks. This might be possible if the 3000 BP date on the La Salle is late in the existence of that channel and if the 3400 BP date for the Blind Channel also refers to the very end of the Lake Manitoba phase. The implied interval of 400-500 years for the La Salle is short but not impossible, and it could have been somewhat longer since the standard deviation of the Gilliland date from the Blind Channel is large.

During the La Salle Phase, the "Forks" would have been located in St. Norbert and if the junction of the two rivers was truly advantageous, some evidence of occupation might be discovered in the vicinity of the La Salle mouth. Recoveries have been made at two sites in this area. At the Lord site, the only ^{14}C date (1170±90 BP, S-625; Ebell 1988) is too young to refer to the La Salle Phase, since by that time the Assiniboine seems clearly to have occupied its present location. Ebell

(1982) recovered a point fragment from the ground surface approximately 2.0km west of the La Salle mouth, but his identification of the artifact as Altithermal suggests an age considerably older than the La Salle Phase.

As a final cautionary note, it is recognized that any attempt to reconcile the geomorphological and archaeological evidence tacitly assumes that the Forks had qualities which made it particularly attractive in comparison with other reaches of the Red River. The existence of archaeological sites along the Red from Lockport to Ritchot and abundant unexcavated remains (Nielsen, personal communication 1999) indicate that the river was important to the early inhabitants but it does not *necessarily* follow that the confluence itself actually had special significance. It is unlikely, for example, that the site was a significant crossing place for bison. The Assiniboine channel at the junction is deep with steep banks, and bison would have had difficulty getting into or out of the river. Preferable crossing places with shallower waters and more accessible banks existed upstream where the river channel is not incised. This may account for the *relative* paucity of bison remains in the excavated sites, but the remains which do exist require some explanation. Mass bison drownings were not uncommon on Prairie streams; Alexander Henry and other fur traders reported drowned bison numbering in the hundreds passing down the Red and Assiniboine Rivers on numerous occasions. Could the remains found in modern archaeological excavations have reflected the fortuitous recovery of bison which had drifted into the slack water at the mouth of the Assiniboine? Similarly, abundant fish remains show that the Forks locale was used for fishing, periodically at least, again perhaps because the slack water out of the main Red River current made the site convenient.

The Forks is also frequently portrayed as the junction of potential transportation routes to/from the south via the Red River and to/from the west via the Assiniboine. Obviously, this was the reason for the importance of the site during the fur trade era. The availability of canoes to the inhabitants of the Plains several millennia ago is not clear to the writer, but if they were not used extensively for water-borne transportation, the rivers would have been important only as overland travel corridors or navigational aids. Archaeological excavations indicate active trading among widespread groups. Because the Red River Valley has few distinctive landscape features, the Forks, once established, would have been a convenient landscape feature where groups from different areas could easily arrange to meet. The relevance of the Forks to humans is not a geomorphological question, but should be borne in mind when correspondence between the geomorphological and archaeological evidence is being sought.

Conclusions

Geomorphological evidence suggests that the Forks, as an active confluence of the Assiniboine with the Red, is relatively young, dating with some certainty to about 1300 BP and possibly to 2000-3000 BP. This period would encompass all dates obtained from modern archaeological excavations. Prior to this, there was a long interval during which there was no active Forks in its present location because the Assiniboine flowed either into Lake Manitoba or joined the Red at St. Norbert. During

this earlier period, however, there was a (probably short) interval when an active Forks existed, which may account for the extrapolated occupation date of 6000 BP.

Archaeological excavations and the redevelopment of the Forks have given Winnipeg an excellent focal point with cultural, historical, and economic significance, but a broader understanding of the site should also include its geomorphological evolution. The sequence of channel changes of the lower Assiniboine which has changed its outlet from one drainage basin to another is very unusual, and thus the river's history is interesting in and of itself. This should make the Forks a more, not less, interesting place and provides an opportunity to make particularly useful connections between the archaeological and earth sciences.

References Cited

Ebell, S.B.
1982 A Caribou Lake Complex Point from St. Norbert, Manitoba. *Manitoba Archaeological Quarterly* 6 (4):103-106.

Ebell, S. B.
1988 The Red and Assiniboine Rivers in Southern Manitoba: A Late Prehistoric and Early Historic Buffer Zone. *Manitoba Archaeological Quarterly* 12(2):3-26.

Kroker, S.
1989 *North Assiniboine Node Archaeological Impact Assessment.* The Forks Renewal Corporation, Winnipeg. 225 p.

Kroker, S. and P. Goundry
1990 *Archaeological Monitoring of the Stage 1 Construction Program.* The Forks Renewal Corporation, Winnipeg.

Kroker, S. and P. Goundry
1993 *Archaeological Monitoring and Mitigation of the Assiniboine Riverfront Quay.* The Forks Renewal Corporation, Winnipeg. 217 p.

Michalyna, W. and R. E. Smith
1972 *Soils of the Portage la Prairie Area.* Manitoba Department of Agriculture, Winnipeg.

Priess, P. J. and S. E. Bradford
1985 The Forks. *Manitoba Archaeological Quarterly* 9(3):31-43.

Rannie, W. F.
1990 The Portage la Prairie 'Floodplain Fan'. In *Alluvial Fans: A Field Approach*, edited by A.H.Rachocki and M. Church, pp. 179-193. John Wiley and Sons, London.

Rannie, W. F., L. H. Thorleifson and J. T. Teller
1989 Holocene Evolution of the Assiniboine River Paleochannels and Portage la Prairie Alluvial Fan. *Canadian Journal of Earth Sciences* 26:1834-1841.

Teller, J. T.
1980 *Radiocarbon Dates in Manitoba.* Geological Report GR80-4, Manitoba Department of Energy and Mines, Mineral Resources Division, Winnipeg,

Teller, J. T. and W. M. Last
1981 Post-Glacial Sedimentation and History in Lake Manitoba. Report 79-41, Manitoba Department of Mines, Natural Resources, and Environment, Winnipeg.

A Summary of Besant Communal Bison Hunting

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Introduction

Communal bison hunting is a phenomenon that experienced a peak of activity during Besant times on the Northern Great Plains. The intensive use of pounds and jumps is evidenced by the large number of kill sites containing Besant components. At this time, environmental conditions allowed bison populations to increase, thereby supporting an intensification of hunting. The ability to store and transport large amounts of meat also allowed Besant groups to effectively process large amounts of bison. A surplus of meat and access to a valuable lithic source provided Besant people with powerful trading goods, which is evidenced by their probable connection with the Hopewellian Interaction Sphere.

This paper will first briefly examine the history and nature of communal bison hunts on the Northern Plains. A short definition of Besant culture will follow. This will include radiocarbon dates, spatial distribution, ceramics and lithic technology. Next, a systematic description of the major Besant kill sites (Fig. 1) will allow some comparisons to be made. Finally some possible reasons as to why Besant hunters conducted such massive kills, seen for the first time on the Northern Plains, will be explored.

Communal Hunting on the Northwestern Plains

Bison have been an important resource for North American hunters from Paleo-Indian times until their near extermination during the Historic period. Mass communal kills of large, now extinct species of bison (*Bison antiquus* and *Bison occidentalis*) by Paleo-Indians are rare and probably resulted from spontaneous acts, luck, or circumstance (Kehoe 1973:3; Forbis 1992:41). Early Middle Prehistoric hunters followed the Paleo-Indian style of hunting and again, few mass kills are