SPRING AND SUMMER PHENOLOGY AT BAKER LAKE, KEEWATIN, N.W.T., DURING 1959-62

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THERE ARE VERY FEW phenological records for the Canadian arctic taken at the same place over a series of years. The following observations were made at Baker Lake (64° 19′ N, 96° 02′ W) in central Keewatin during a four-year study of lemming populations sponsored by the Arctic Institute of North America.

WEATHER

Table 1 summarizes the temperature and rainfall data for 1959-62 as gathered by the Baker Lake Meteorological Station. There was considerable variation between these four summers. In temperature they ranked: 1960 (warmest) > 1961 > 1962 > 1959 (coldest), and in rainfall 1959 (wettest) > 1962 > 1960 = 1961 (driest).

TABLE 1. — Temperature and rainfall data during the summers of 1959-62 at Baker Lake, and the mean values for 1950-60.

	June	July	August
Mean Monthly Temperature (°F)			
1959	35	50	46
1960	46	54	52
1961	41	53	46
1962	36	52	50
Mean 1950-60	39	52	50
Total Rainfall (in.)			
1959	0.89	1.78	2.71
1960	0.14	1.28	1.11
1961	0.37	0.24	1.98
1962	1.24	1.49	1.73
Mean 1950-60	0.73	1.55	1.72

PHENOLOGY

Figure 1 presents data on eleven physical and biological events of the spring and summer phenology in the Baker Lake area. Most of these events are self explanatory. *Pedicularis lanata* is usually the first flower of the season and *Epilobium latifolium* is usually the last plant to bloom (excluding grasses, sedges and willows). Plants in unusual situations were disregarded in determining the dates when blooming began.

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COMPARISON OF GROWING SEASONS

Information on the amount of standing forage in sedge marsh habitats at the end of each summer's growing season was gathered on paired enclosed and open quadrats in order to measure the effect of lemmings on their forage. These data, reported in detail elsewhere (Krebs, 1963), show a steady increase in forage produced from 1959 to 1962 in both the open and enclosed quadrats:

	1959	*1960*	*1961*	*1962*
Enclosed	100%	139%	168%	175%
Open	100%	124%	150%	192%

The reasons for this steady increase in production remain unknown. The yields are poorly correlated with temperature and rainfall, cannot be attributed to the grazing effects of lemmings (which peaked in 1960), and are not due to changes in techniques.

DISCUSSION

Bruggemann and Calder (1953) have pointed out that spring phenology appears to be later as one moves north to about Baker Lake and Chesterfield Inlet, but in the high arctic above this latitude spring comes slightly earlier. Savile (1959) has supported this observation, and the data presented here also seem to fall into this pattern.

Table 2 summarizes the reported dates of first flowering for two species which occur at many of the localities studied, and shows that the high arctic stations have as early or earlier springs as Baker Lake.

There is some difficulty in comparing dates of first flowering for all these different areas because it is not always clear whether this refers to the earliest date the species was found in flower in the most favorable situations (e.g. on the south side of a large rock in dark soil) or the earliest date the species was found in flower in a normal, open tundra situation. I have used the latter meaning. For the species from Baker Lake discussed here these two dates would differ only slightly; in other situations these dates could differ by as much as two weeks.

TABLE 2. — Phenological comparison of eastern arctic stations.

	Date of first flowering	
	Saxifraga oppositifolia	*Dryas integrifolia*
Alert[1], 1951	8 June	1 July
Isachsen[2], 1954	20 June	—
1960	18 June	—
Chesterfield Inlet[1], 1950	22 June	6 July
Frobisher Bav[1], 1948	—	22 June
Baker Lake, 1959	6 July	10 July
1960	14 June	16 June
1961	24 June	27 June
1962	30 June	4 July

[1]Bruggemann and Calder, 1953.

[2]Savile, 1961.

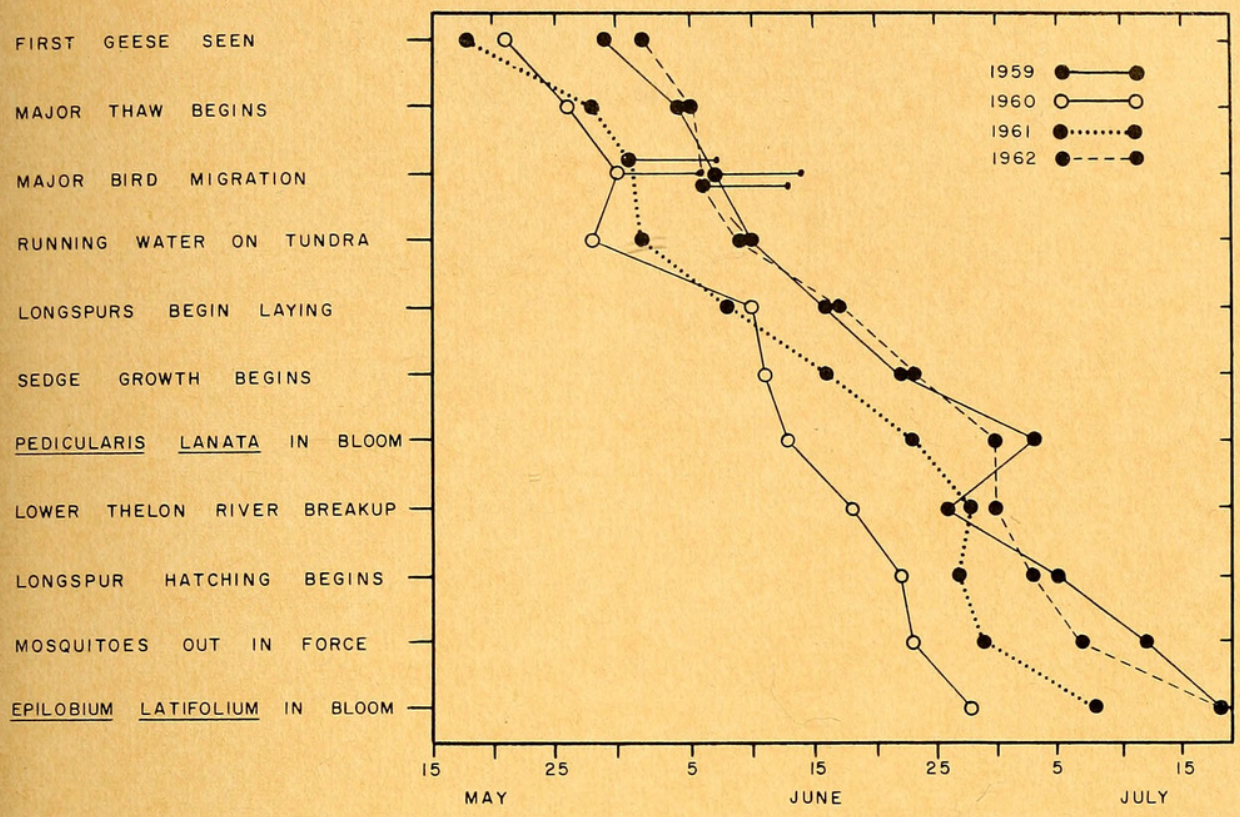

FIGURE 1. Spring and summer phenology at Baker Lake, Keewatin, 1959-62.

SUMMARY

1. Four years' data on eleven physical and biological events of the spring and summer phenology at Baker Lake, N.W.T., show wide variation between years.
2. There is also great variation in the amount of standing forage produced in wet habitats, and this does not seem to correlate well with temperature, rainfall, or with the season's phenology.
3. The evidence presented seems to support the observation of Bruggemann and Calder (1953) that high arctic stations have earlier springs than do low arctic stations like Baker Lake.

REFERENCES

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