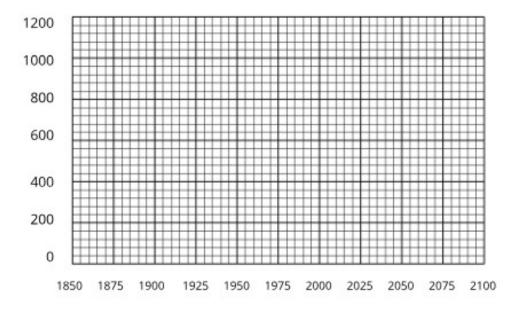
## 9 Glaciers

We will be working in class with a map of the Grinnell Glacier, originally from Johnson, Arthur (1980). Grinnell and Sperry glaciers, Glacier National Park, Montana, a record of vanishing ice, USGS Professional Paper 1180, and annotated at

http://serc.carleton.edu/quantskills/activities/glacial\_retreat.html

- On the map at the end, note the outline of the extent of the Grinnell Glacier in 1850. This is the first part of approximating the area of the glacier.
- Count the number of squares covered by the glacier. (Count partial squares part of the timee—this isn't perfect!)
- Repeat this for 1937, 1968, and 1993. (Each number gets smaller, as the area of the glacier shrinks. For 1850, you shouldget more than a thousand.)
- On the graph below plot the number of squares versus the year of the measurement.
- Based on the trend you observe, approximately when will the glacier melt

completely (area = 0)? \_\_\_\_\_



## **Out-of-Class Assignment**

The purpose of this section of the lab is to familiarize you with the local impact of glaciation. Read about Iowa's glaciers at [here.]

Then answer these questions and submit them at the beginning of next week's lab.:

- 1. What is the Des Moines lobe?
- 2. What is a kettlehole? Name one in Iowa.
- 3. What is a kame? Name one in Iowa.
- 4. What is an esker? Name one in Iowa.

## Grinell Glacier 1850-1993 Aerial View

