"If you put the federal government in charge of the Sahara Desert, in 5 years there'd be a shortage of sand." – Milton Friedman, Rutgers Class of 1932, Nobel Prize 1976

LESSON 41: APPROXIMATE INDETERMINATE ANALYSIS
Dec. 7th: A day that will live in infamy

LESSON OBJECTIVES
1. **Draw** the elastic curve (deformed shape) of an indeterminate structure neatly and reasonably, consistent with the structure’s boundary conditions, connections, and applied loads.
2. **Solve** indeterminate beams and frames by assuming the locations of inflection points.
3. **List** the assumptions of the portal method and describe when it is applicable.
4. **Solve** a rigid frame by the portal method and plot its moment diagram.

**Empire State Building:** Completed 1931
- **First Exact Method to Analyze Indeterminate Rigid Frames:** Invented 1932

How was Empire analyzed?
- **Approximate Methods**

(of course, before 1932, they weren’t called Approximate Methods. They were just called Methods)

**HOMEWORK (DO NOT HAND IN. THIS MATERIAL WILL CONSTITUTE A BONUS ON THE FINAL)**
1. Consider the rigid frame, below using the Portal Method (all connections and foundations are moment-resisting). Plot the moment diagram for the frame (beams and columns), reporting all values.

2. Referring to the previous frame, solve the FBD’s necessary in order to report what the column tension is at point A.