CHAP 5: Robotics, Automation, and a New Industrial Revolution

I. First Industrial Revolution
   A. Steam-Driven Manufacture
      1. Circa 1800 England
      2. “Rapid, regular, precise, tireless”
   B. Factory Setting
      1. Advantages
         a. Introduction of regular shifts and hourly pay, as machine operators
         b. Mass production, both consistent and centralized
      2. Disadvantages
         a. Strict work regimen in unhealthy conditions
         b. Drastic change of lifestyle from rural, pre-industrial nations

II. Second Industrial Revolution
   A. Robotics
      1. Circa 1970 Japan (invented in US)
      2. Types
         a. Industrial robots: fixed, with manipulator arms or metal-cutting capabilities, for assembly
         b. Field robots: sensor-driven, for hazardous environments, like radioactive or airless situations
         c. Intelligent robots: A.I.
      3. Demography
         a. Japan
            i. highly-educated workforce
            ii. shortage of labor
            iii. easily available capital at low interest
            iv. top-quality design
            v. efficient production
            vi. high competition
            vii. government-support machine leasing company (JAROL)
            viii. trade union support
         b. US
            i. separation of state and big business
            ii. high interest rates
            iii. cheap labor existent
            iv. no immediate need to change
B. Automation

1. High initial investment \(\Rightarrow\) quicker production at less cost

2. Advantages
   a. Export-led growth
   b. Higher standard of living
   c. Increase in consumers

3. Requirements
   a. Developed, industrial nation
   b. Tradition in machining, electrical engineering, and design
   c. Surplus of capital and scientists and engineers
   d. Labor shortage
   e. Modest interest rates

4. Still controversial compared to cheap, human labor

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\(^1\) Landes, *Unbound Prometheus*, p. 41.