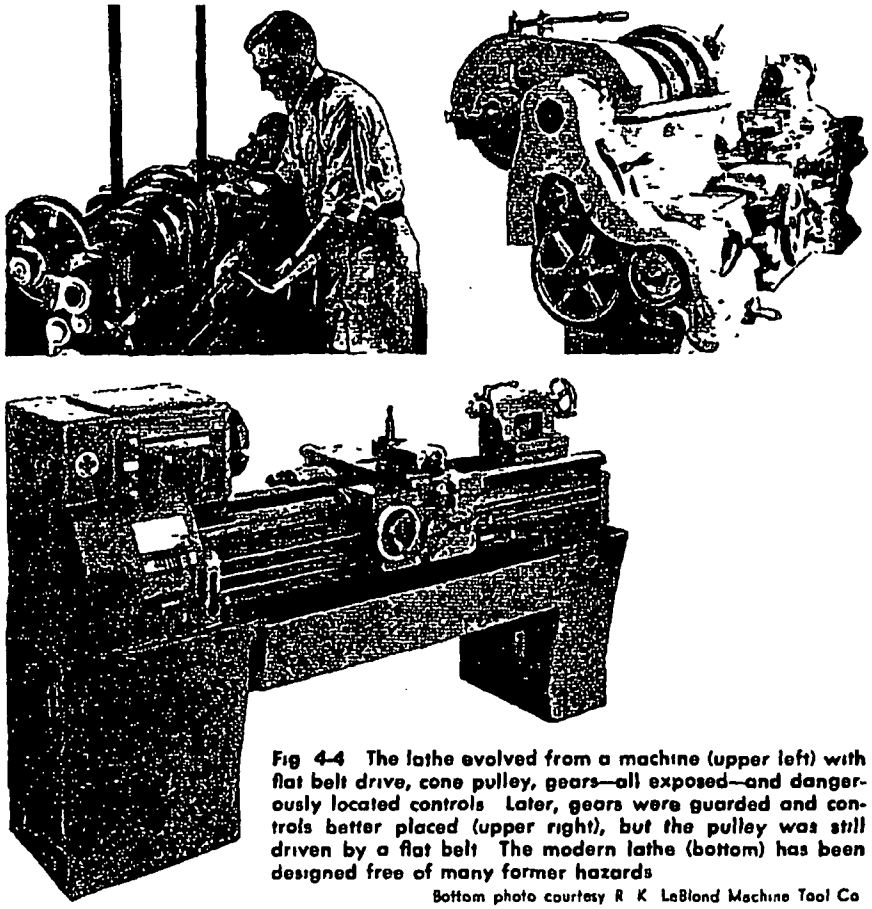

Fig 4-4 The lathe evolved from a machine (upper left) with flat belt drive, cone pulley, gears—all exposed—and dangerously located controls Later, gears were guarded and controls better placed (upper right), but the pulley was still driven by a flat belt The modern lathe (bottom) has been designed free of many former hazards

Bottom photo courtesy R K LeBlond Machine Tool Co

inefficiency, or fatigue The operator's age may also affect his efficiency

The physical environment in which the operator works must be taken into consideration, too Environmental factors may include temperature, humidity, toxic gases, altitude, clothing, and many others If the designer fails to consider all factors, the machine or equipment he designs may place too great a demand upon the physical and mental capabilities of the operator

Advance analysis If there are any defects in the design of a piece of machinery, it is usually only a matter of time before some operator fails and an accident ensues Therefore, all possible faults in the design of equipment and all possible hazards in the work area of a machine, as well as the physical and mental capabilities of the operator, should be studied in advance for the purpose of preventing accidents

An advance analysis can, according to McFarland, be based on the following considerations *

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*Ross A McFarland "Human Engineering Aspects of Safety" *Mechanical Engineering*, 76 407-10 (May 1954)