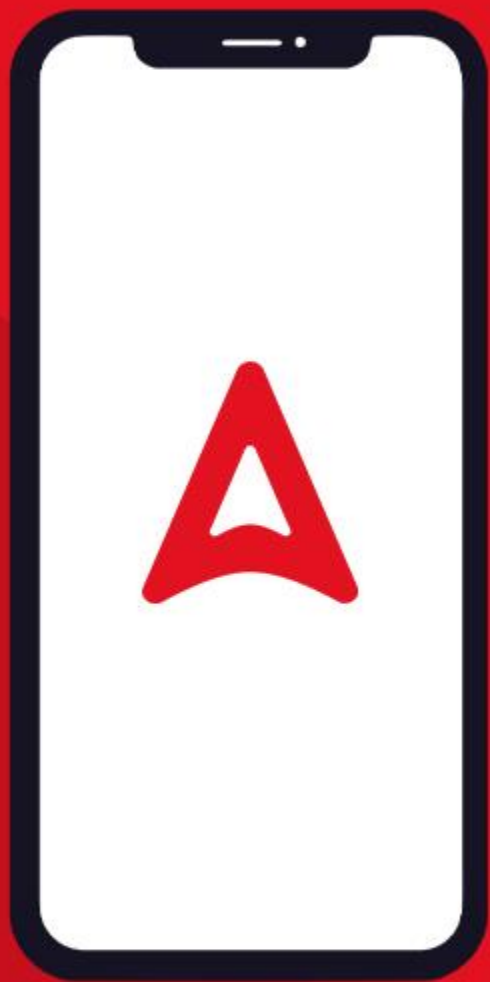


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nothing
impossible to
they who will
try."*

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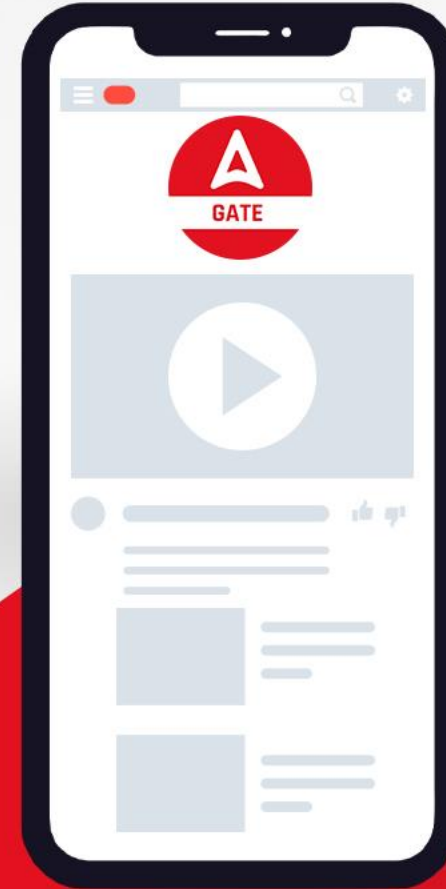


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GATE 2024



प्रत्नोस Batch

PRODUCTION

Casting

Mechanical Engineering



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GATE 2024



Casting, Forming and Joining Processes: Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.

Machining and Machine Tool Operations: Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM).

Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools; additive manufacturing.

Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.



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Weightage of Production

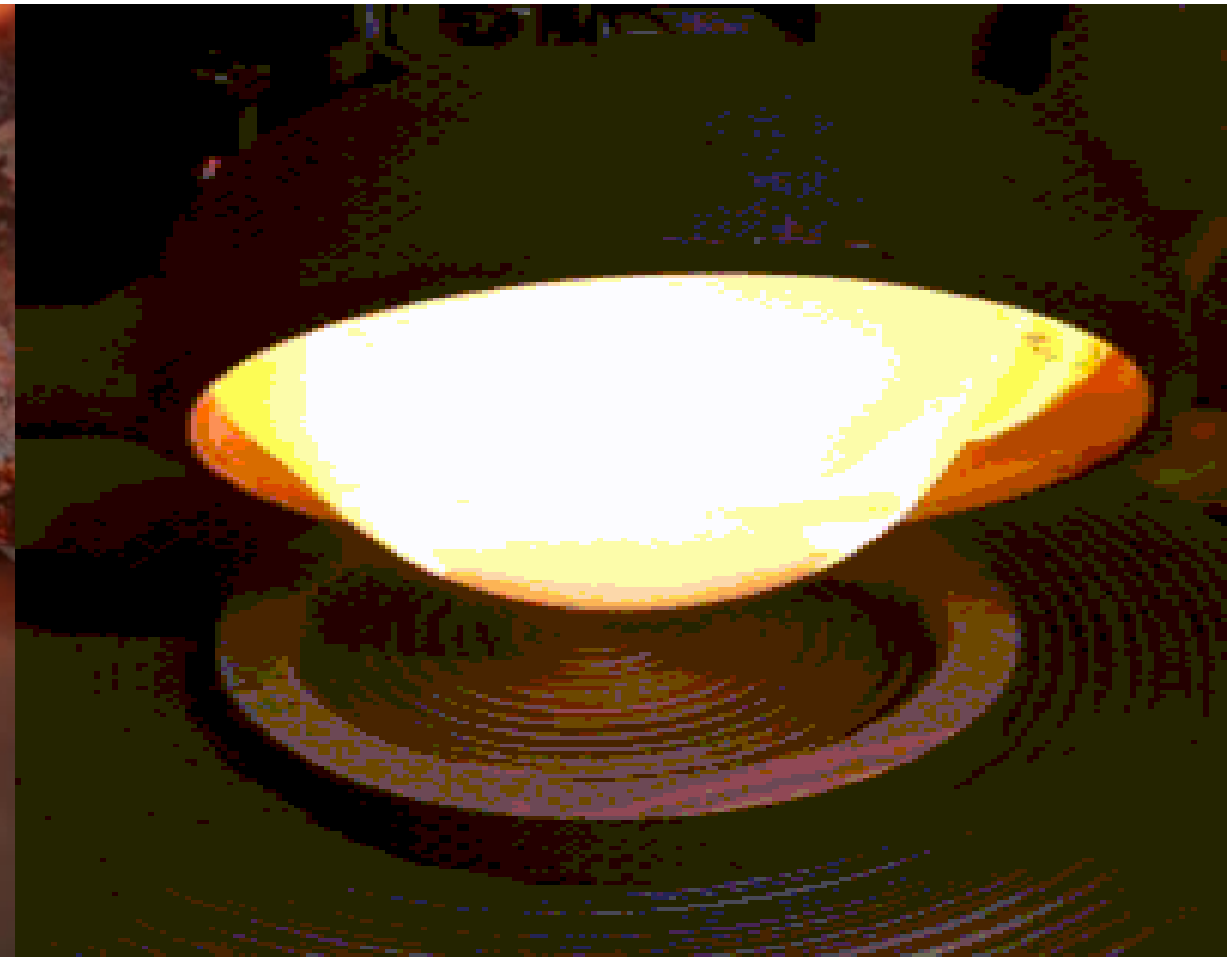
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CASTING



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INDEX

Introduction of Casting

Broad Steps in Sand Casting

Cooling Curve for Sand Casting

Pattern Design

Gating System Design

Solidification Time or Chvorinov's Rule

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Basic Concept of Riser Design

Riser Design

Different Methods For Riser design

Core, Core Print & Chaplets

Properties of Moulding Sand

Chills & Padding & Skin Thickness

Expendable & Non Expendable Mould & Pattern

Special Casting Processes

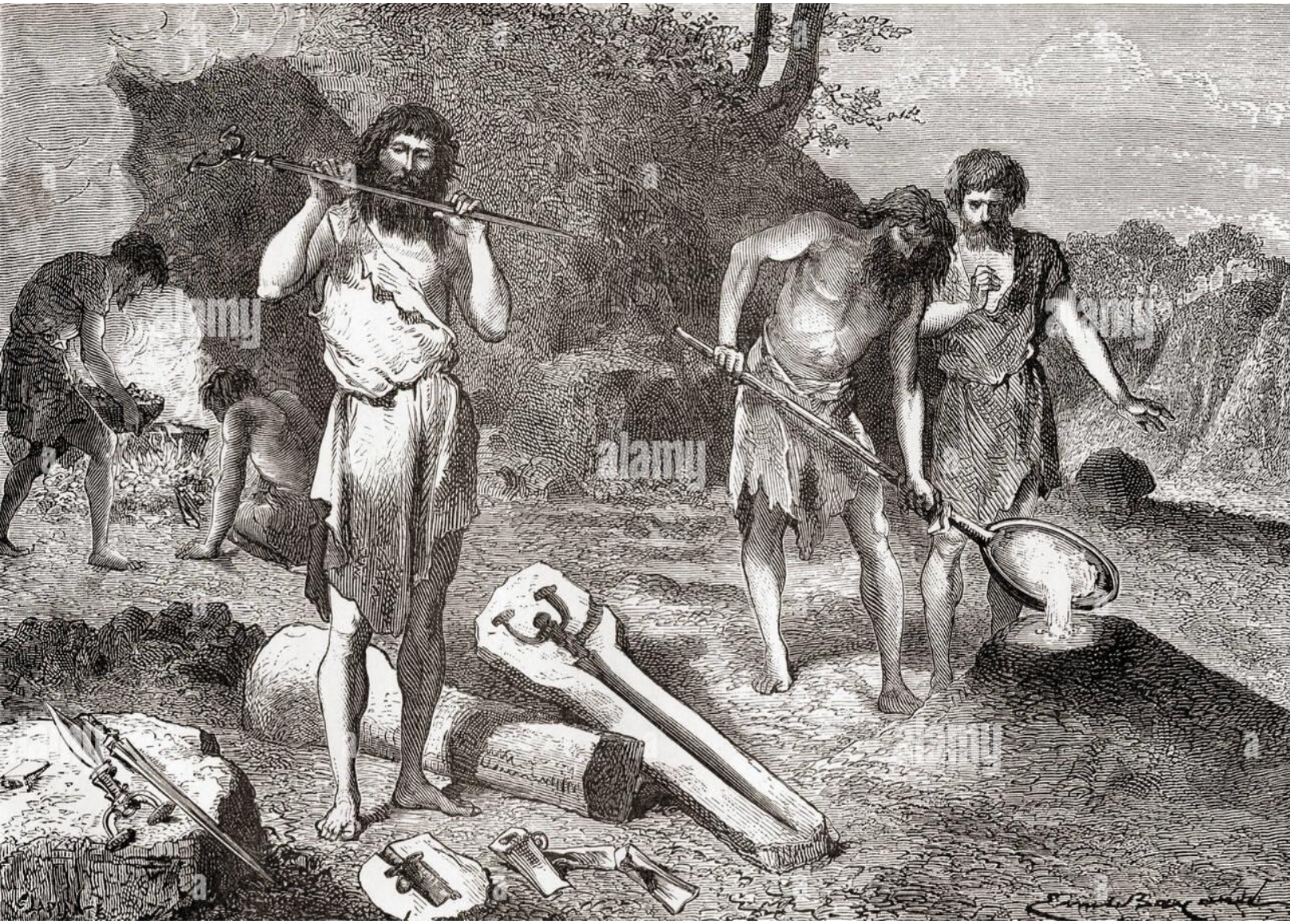
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Classification of Manufacturing Process

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Introduction of Casting

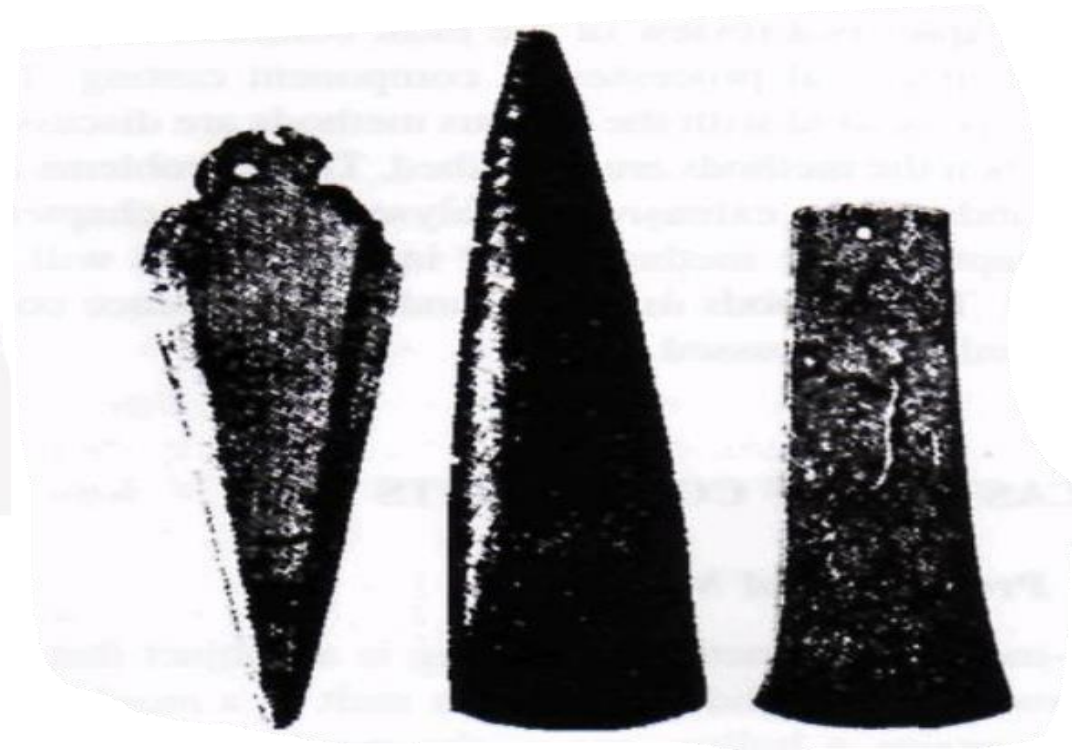


History of Metal Casting

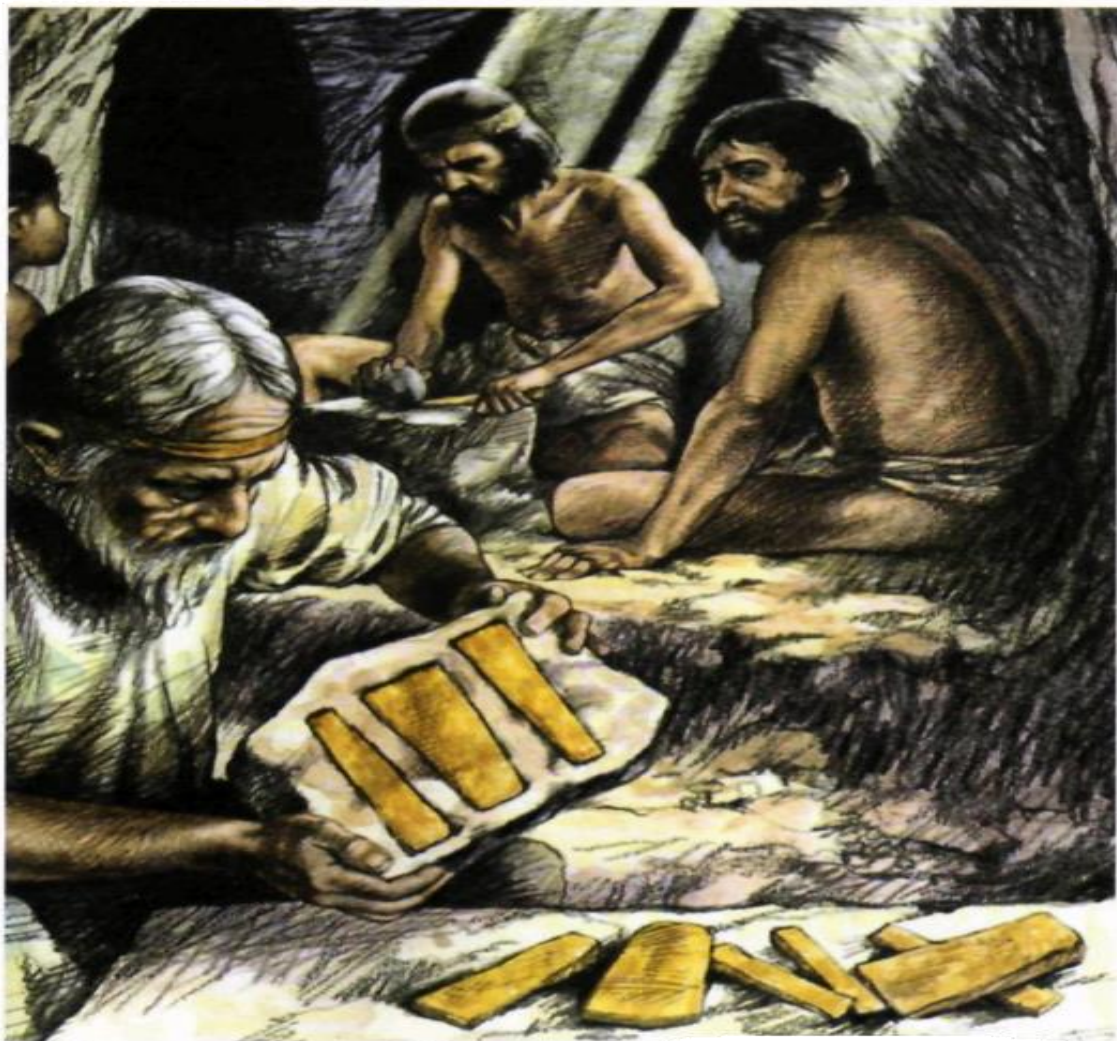


Stone mould for casting of axes, dating from 3000 BC

moulds



A knife and two axes of pure copper, cast in stone



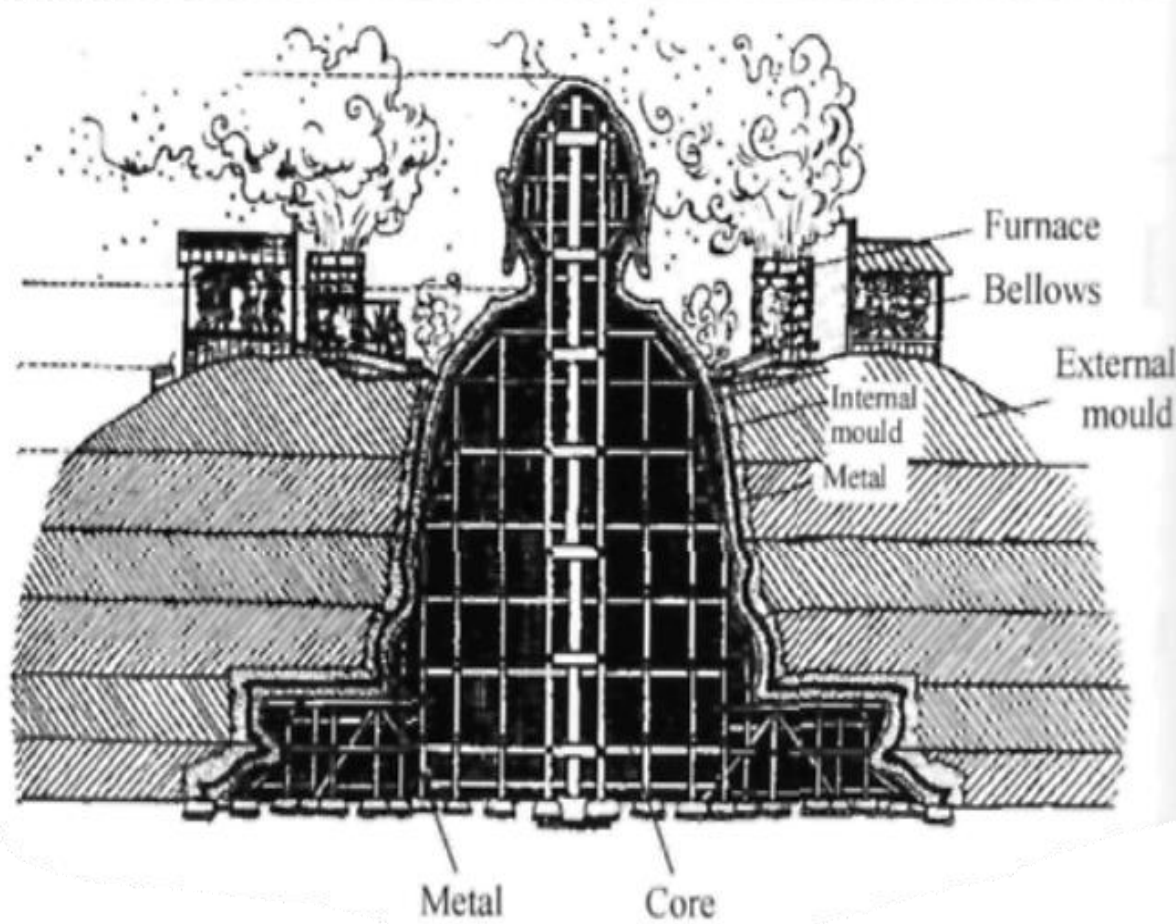
Early Bronze Age foundrymen



Statuette casting in the Early Bronze Age



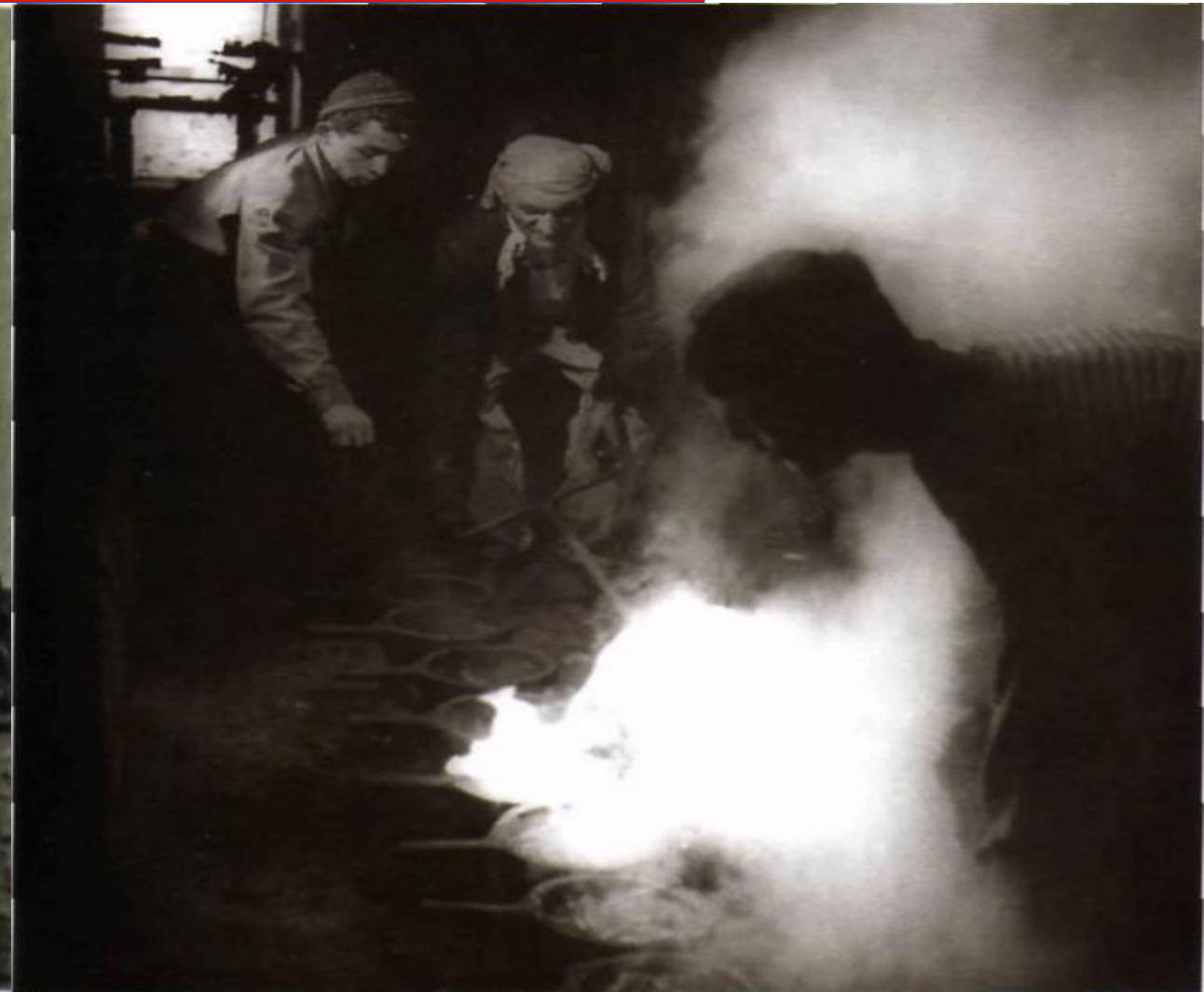
Dagger casting in the Early Bronze Age



Picture of a cast bronze Buddha statue.

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Zeytinburnu iron casting plant

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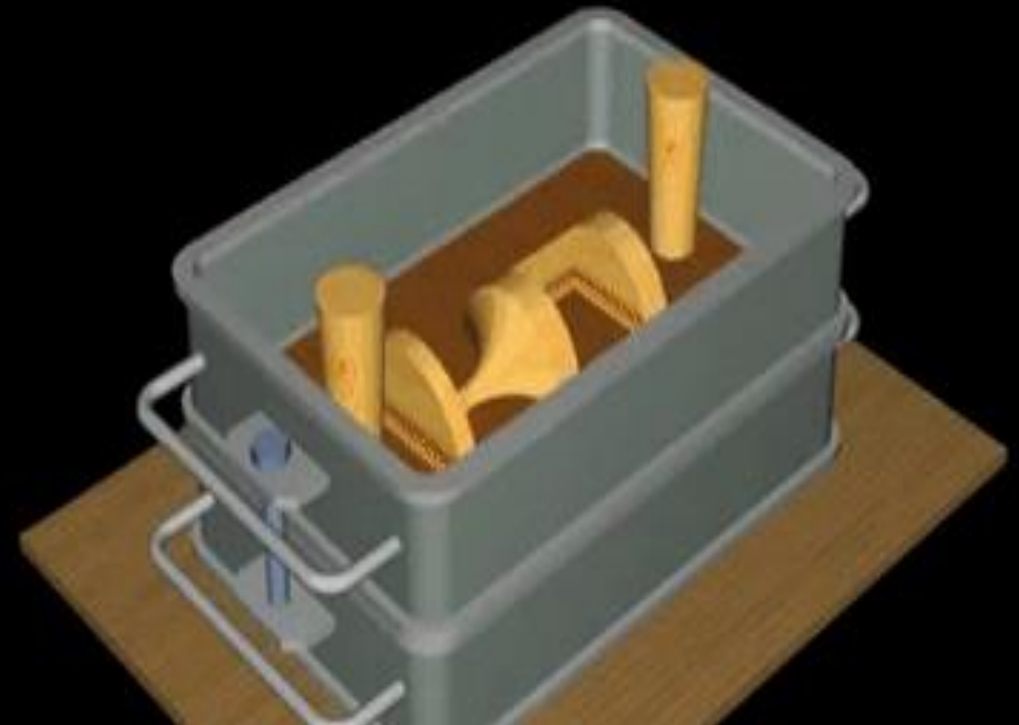
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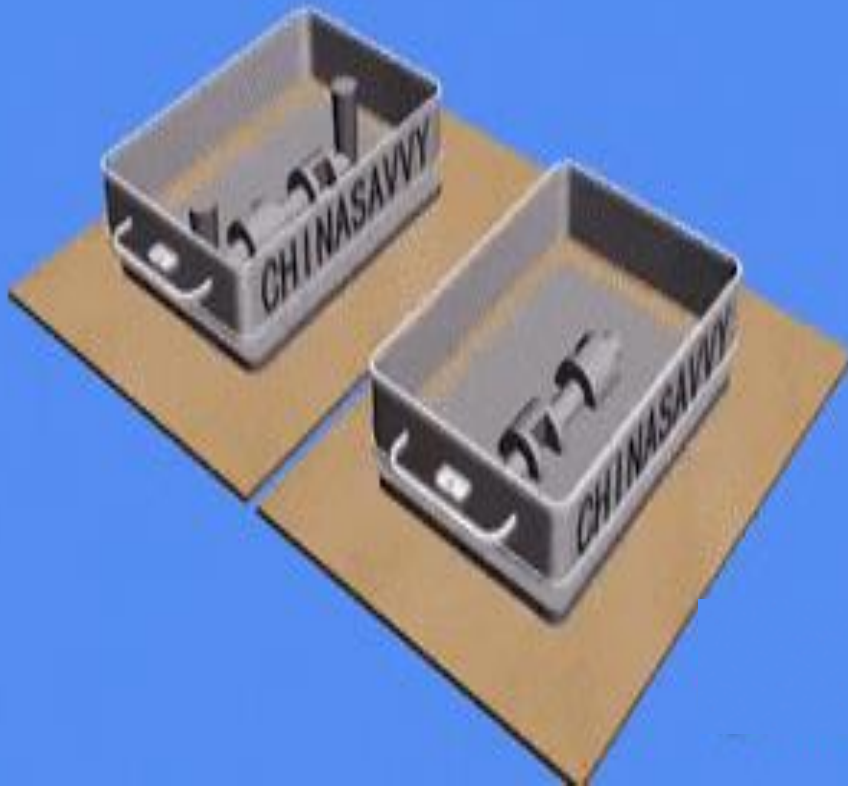
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MOULDS



Moulding Box

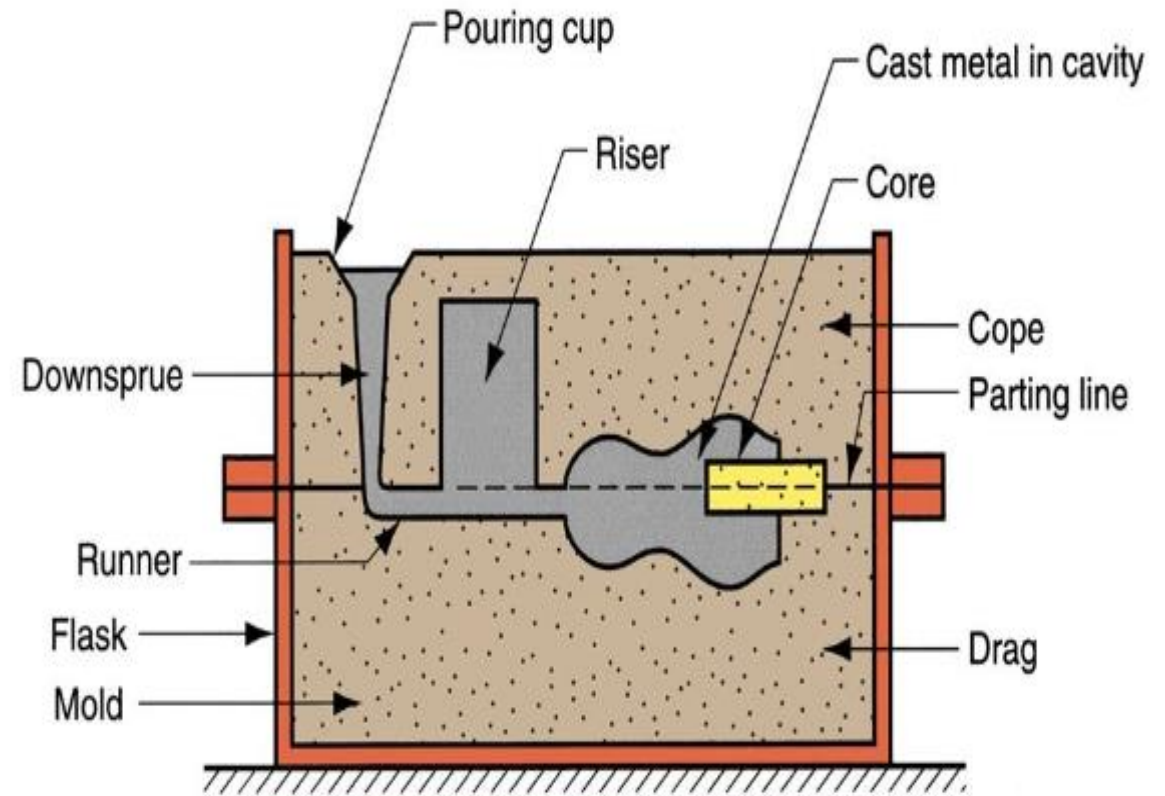
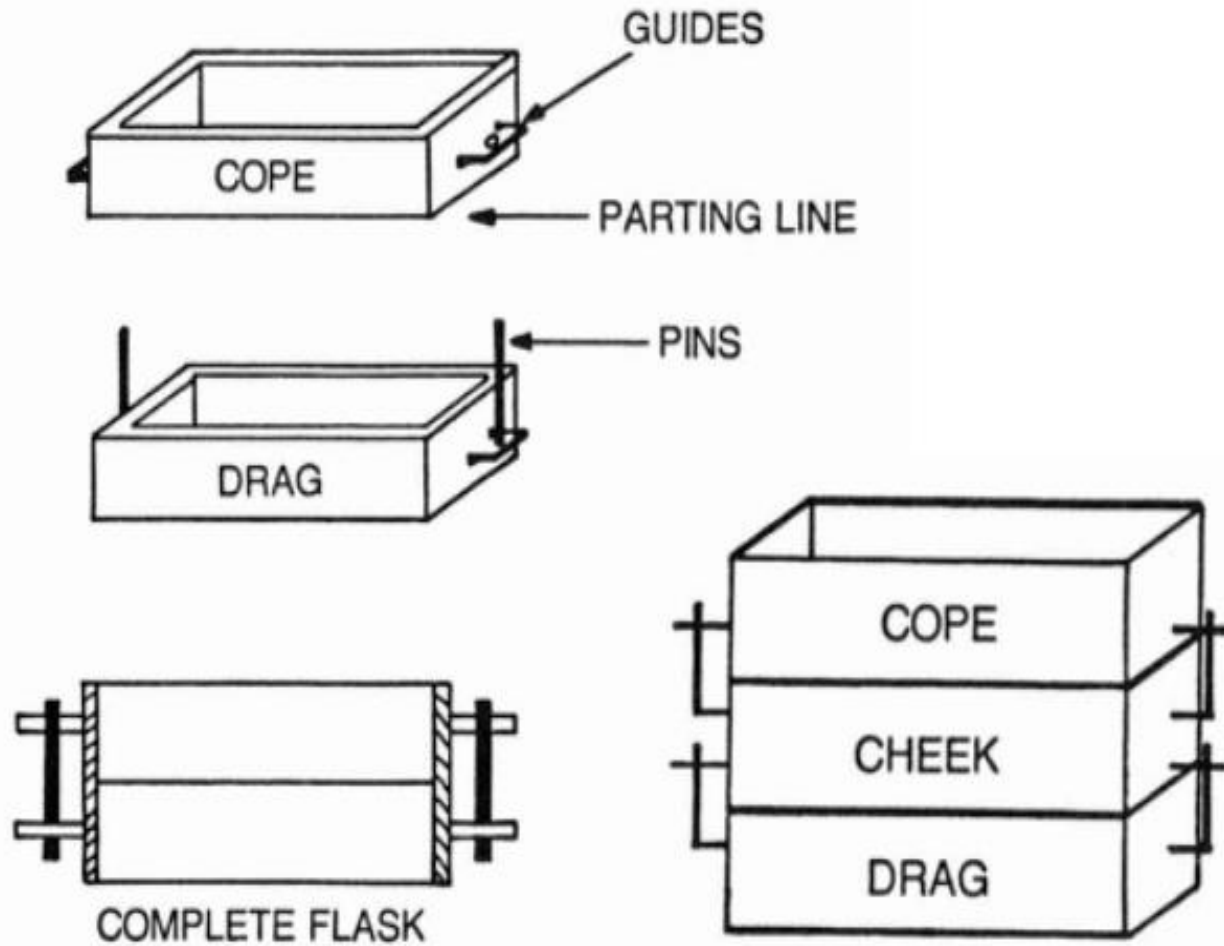
Metal or wooden sand boxes are placed on the patterns



COPE & DRAG PATTERN

Molten metal is poured into feed hole





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Advantages of casting

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Disadvantages of casting

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Patterns



Types of Allowances

Shrinkage or contraction

Draft or Taper

Machining or Finish

Shake or Rapping

Distortion or camber

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Shrinkage or contraction Allowances



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Draft or Taper Allowances



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