1. Asymmetries

- **Introduction to Epistemic Asymmetry**
  - Defines "prehistory" and focuses on paleontology and geology.
  - Introduces epistemic asymmetry: more knowledge of the tiny (microphysical) than the past.
  - Importance for philosophers, scientists, and others.
- **1.1 Limits to Our Knowledge of Prehistory**
  - **Sauropod Trackways Example**
    - Differentiates wide-gauge and narrow-gauge tracks.
    - Explores hypotheses: same species, substrate, different species.
    - **Wilson and Carrano's Biomechanical Analysis**
      - Forces on large quadrupeds' limbs.
      - Femur morphology differences support titanosaurs making wide-gauge tracks.
    - **Speculation on Titanosaur Locomotion**
      - Semi-bipedal hypothesis with cautious support.
    - **Conclusion**
      - Transition from solid science to speculation in historical sciences.

1.2 The Time Asymmetry of Knowledge

- **Introduction to Time Asymmetry**
  - More knowledge of the past than the future.
  - **Paul Horwich's Explanation**
    - **Recording Systems**: Stable states responding to specific conditions (e.g., sandbox).
    - **Precording Systems**: Hypothetical systems recording future events.
    - **Fork Asymmetry**: Correlated events have common causes, not common effects.
- **Implications**
  - Extensive past records, limited future knowledge.
  - Role of recording systems in enhancing past knowledge.

1.3 The Past vs. the Microphysical

- **Introduction to Epistemic Scope Asymmetry**
  - Contrasts knowledge of the past with the microphysical.
- **Asymmetry of Manipulability**
  - **Ian Hacking's Perspective**
    - Manipulation of microphysical entities enables theory testing.
    - Past events cannot be manipulated.
- **Role Asymmetry of Background Theories**
  - **Dampening Role**: Limits evidence availability (e.g., taphonomy).
  - **Enlarging Role**: Expands observable evidence (e.g., optics).
  - **Contrast**: Past theories rarely create new evidence; microphysical theories frequently do.
- **Conclusion**

- Asymmetries create an epistemic asymmetry: more knowledge of the microphysical than the past.

1.4 Scientific Realism

- **Overview of Scientific Realism**
  - Belief that scientific theories describe both observable and unobservable aspects of the world.
- **Epistemological Optimism among Realists**
  - **Richard Boyd**: Knowledge of unobservable phenomena is possible and actual.
  - **Stathis Psillos**: Successful theories are well-confirmed and approximately true.
  - **Ernan McMullin**: Long-term success justifies belief in entities and structures.
  - **Jarrett Leplin**: Minimal epistemic realism acknowledges potential empirical conditions warranting truth.
  - **Michael Devitt**: Independent existence of unobservable scientific types.
- **Critiques and Alternatives**
  - **Social Constructivists**: Knowledge of unobservables but deny independent existence.
  - **Arthur Fine's NOA**: Shares optimism but remains agnostic on metaphysical claims.
- **Skeptical Arguments Against Realism**
  - **Pessimistic Induction**: History shows many scientific beliefs about unobservables were later discarded.
  - **Underdetermination**: Observable evidence insufficient to determine unique truths about unobservables.
- **Realists' Defense**
  - **Inference to the Best Explanation**: Success of scientific theories implies their approximate truth.

1.5 A Skewed Debate

- **Fictional Analogy**
  - **Universe with Investigators and Unobservables K and K***
    - Investigators specialize in studying two kinds of unobservables.
    - Realist philosophers focus on one kind (K), neglecting the other (K*).
- **Epistemic Differences Between K and K***
  - **Genus/Species Confusion**
    - Overgeneralizing from K to all unobservables, ignoring differences with K*.
  - **High-Level Generality vs. Specificity**
    - Philosophers debate at a general level without addressing species-specific epistemic challenges.
- **Parallel to Realism Debate**
  - **Realists Focus on Microphysical (K)**
    - Neglect unique epistemic challenges of studying the past (K*).
  - **Consequences**
    - Realism debates overlook epistemic asymmetries between the past and the microphysical.
    - Leads to incomplete and potentially misleading conclusions about scientific knowledge.

Conclusion

- **Summary of Key Claims**
  - **Epistemic Asymmetry**: Differences in knowledge capabilities between the past and the microphysical.
  - **Limits and Challenges**: Historical sciences face unique limitations leading to speculative conclusions.

- **Time Asymmetry**: Recording systems enhance past knowledge, absence of precording systems limit future knowledge.
- **Manipulability and Background Theories**: Enable greater knowledge of the microphysical world compared to the past.
- **Scientific Realism Debate**: Skewed by focusing on the microphysical, neglecting historical epistemic challenges.
- **Historical Hypo-Realism**: Realist arguments are weaker for prehistory than for the microphysical.

- **Implications for Scientific Realism**
  - Calls for a nuanced understanding of realism that accounts for epistemic differences.
  - Advocates for integrating considerations of epistemic asymmetries into the realism debate.