Understanding Science and Scientific Methods:

An Overview for Lawyers

SUMMARY – 31 October 2005

Class on 24 October 2005 Covered 3.a.ii. to 3.a.iv. on the Syllabus

I. Bendectin and the Daubert (1993) Decision

A. What is Scientific Knowledge and when is it reliable? –

1. Scientific Knowledge is: *A Body of facts or truths systematically arranged and showing the operation of general laws.* To be scientific knowledge it must be Falsifiable, Reliable, and Valid (Logically Consistent and Agreement of a theory with experiment).

2. Can Scientific Knowledge be absolutely true? No. Hypotheses are never affirmatively proved, they are only falsified. Truth is Asymptotic!

3. Can you have a Social Science?

B. Does Scientific Knowledge have a Special Status?

1. Epistemological Relativism

2. Science as Social Construction


1. Measurement of Parameters
2. Uncertainty in the Model/Theory

3. Uncertainty about what to do to Remediate a Problem

4. Basic Decision Problem

<table>
<thead>
<tr>
<th>True State of World</th>
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<tbody>
<tr>
<td>Has Disease</td>
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<tr>
<td>------------------</td>
</tr>
<tr>
<td>Patient Has Disease</td>
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<tr>
<td>Doctor's Decision</td>
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<tr>
<td>Test is Positive: Disease</td>
</tr>
<tr>
<td>Test is Negative: No Disease</td>
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</tbody>
</table>

$\alpha$ = TYPE I Error = $P[\text{Reject } H_0: \mid H_0: \text{ is True}]$ and

$\beta$ = TYPE II Error = $P[\text{Accept } H_0: \mid H_1: \text{ is True}]$