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**

C. How Certain Can Science Be? Errors in Science.

1. Measurement of Parameters

2. Uncertainty in the Model/Theory

3. Uncertainty about what to do to Remediate a Problem

4. Basic Decision Problem

	True State of World: Has Disease	True State of World: Not Have Disease
Patient Has Disease / Doctor's Decision	$1 - \alpha$	β
Patient Does Not Have Disease	α	$1 - \beta$

α = TYPE I Error = P[Reject H_0: | H_0: is True] and

β = TYPE II Error = P[Accept H_0: | H_1: is True]

	True State of World: Has Disease	True State of World: Not Have Disease
Test is Postive:Disease / Doctor's Decision	A	B
Test is Negative: No Disease	C	D

A = True Positives
B = False Positives
C = False Negatives
D = True Negatives