Applying scientific standards to social and forensic evidence
(Just an outline)

A. Daubert, and so on.

a. The Popperian epistemology applied by Justice Blackmun in *Daubert* has been criticized by many commentators (and specially by Susan Haack). Moreover, It has limits (as we shall see in sec.B)

However, *Daubert* correctly stressed the need of an effective control on the scientific validity of expert evidence, and determined a shift in the attitude of judges toward such an evidence, from the traditional adversarial model to a more inquisitorial role (Sanders). Some even think that *Daubert* was not radical enough from this point of view (Bernstein).

b. Scientism. Haack and others are right in addressing well founded criticisms to the “myth of science”, but

although science never provides absolute certainties and may be to some extent uncertain and variable (but we should distinguish less or more uncertain fields of knowledge, and in order to do so we need some standards of control),

without science (when there is no science available or we don’t use it)

we are left with common sense, i.e. with the “average culture”, the “common experience” of the “reasonable man”, and with the stock of knowledge that in the Twining’s words is a “ill-defined agglomeration of beliefs that typically consists of a complex soup of more or less well-grounded information, sophisticated models, anecdotal memories, impressions, stories, myths, proverbs, wishes, stereotypes, speculations and prejudices”. A soup in which facts and value are not sharply differentiated, nor are facts, fantasy and fiction.

c. Science is not ontologically different from other other and more common types of knowledge (Haack) but it seems clear that the degrees of difference are great and the levels of reliability are much higher in the case of science than in the case of common sense.

d. In the judicial process we are searching for the truth of a specific individual fact but very often the general knowledge provided by science is necessary in order to prove a connection of specific causation, in the same way and with the same methods we use in any other field of experience.

There are limits to the admissibility of some items of evidence, but they are different in the various procedural systems. Many limits are antiepistemical (as those prohibiting the proof of some facts protected by privileges, or prohibiting the use of specific types of evidence), but some are epistemical (as those aimed at protecting the jury against its own errors).
There are also specific methods for the presentation of evidence, but some of them are antiepistemical, while some are epistemical because they are aimed at the search of truth (as cross-examination according to Wigmore).

However, rules concerning the admissible evidence and the presentation of evidence do not imply any necessary distinction between the judgment on facts and the use of science in court and the judgment on facts and the use of science out of court.

B. Social sciences.
   a. At least since the end of the 19th century (Dilthey, Windelband) the notion of “science” includes not only the so-called “sciences of the explanation” (i.e. “natural” or “hard” sciences) but also the so-called “sciences of the comprehension” (i.e. “social” or “soft” sciences, such as sociology, history, psychology, anthropology, ethnology, and so forth). This is not only a cultural and philosophical topic: it has relevant effects also for the use of science in judicial contexts.

   b. The use of experts in various social sciences has become quite common since a while (Monaghan & Walker), not only in well known cases as that of Lawrence’s Lady Chatterley’s Lover, but also, for example:

   in frequent cases of employment discrimination litigation (Luke),
   of the reconstruction of historical facts (Morgan)
   of evaluation of historical importance of buildings
   of judgment about the cultural motivation of a crime (de Maglie)
   of judgment about the mental condition of a person,

   and so forth.

   c. The main problem is that the Daubert standards, which where tailored upon hard sciences (being Daubert a case about the effects of a drug), are not applicable to social sciences. The “sciences of comprehension” do not follow the Daubert idea of science, nor do they follow the Hempelian nomological paradigm (Borutti). They follow substantially different paradigms.

   Then the particularly difficult problem arises of establishing whether, when and under which conditions a social science is “scientific” at least in the sense that its paradigm is known and intersubjectively controllable, as a basis for the evidence it provides in specific cases.

   d. Moreover, since the forms of knowledge belonging to the vague category of “social sciences” are many and very different from each other, we are vaced with a variety of paradigms that should be followed depending on the kind of knowledge that is used. Referring to reliable statistics is not the same as establishing the historical importance of a building, and a psychological analysis aimed at checking the mental conditions of a person is not the same as proving whether and how the Olocaust occurred.

   e. However, the risk is of admitting methods of “junk science” (Huber) because of the lack of an adequate analysis of some of such paradigms. Even admitting (with Haack) that the borders of “good science” cannot be sharply defined, one could not ascribe a scientific validity to the interpretation of the tea leaves or to astrology. On the other hand, those who practice such methods are not trustable as judges of their realiability, and also the Frye test of the “general acceptance” within the field involved is disputable (Allen).

C. Science and forensic evidence. “Dark days for the forensic sciences”(Kaye)
a. The starting point of any discussion on these matters is now the 2009 report of the National Academy of Sciences named “Strengthening Forensic Science in the US: A Path Forward”, that has been and is discussed in dozens of essays. In the present perspective the main topic of the report is to stress that forensic evidence is –in most cases- lacking any form of scientific validation. The only exception seems to be that of DNA tests, which is taken by many as the “golden standard” of forensic evidence.

The recent literature on the topic makes clear that many erroneous convictions were based on traditional forensic evidence, and where proved as erroneous just by DNA tests (60% of e.c., according to Mnookin).

b. **Uniqueness.** In most forensic evidence the aim is to prove the *uniqueness* of an item (for instance: the fingerprints belong only to a “unique” person). But it seems that uniqueness, that is usually claimed by forensic experts, is impossible to prove if it is intended as a condition of “zero errors” (Mnookin about fingerprints). Then the best outcome that sometimes may be achieved is the practical acceptability of such an evidence when the probability of a match (i.e. of non-uniqueness) is extremely small (Kaye), although the problem is open of establishing the level of such acceptability in specific cases.

c. One of the most relevant problems in forensic evidence is that in most cases it is based upon a subjective comparison of two or more items (as in the case of fingerprints, toolmarks, bullet comparison, sound analysis, and so forth). That means that two experts may well come to different conclusions, with the corresponding lack of certainty and uniformity, mainly because of the lack of a validated scientific method according to which the comparison could be made.

d. Then the basic suggestion is to adopt the *Daubert* standards for the scientific validation of forensic evidence, but it seems clear that according to such standards most methods of forensic evidence should be found “unscientific”, at least insofar as basic scientific studies are lacking.