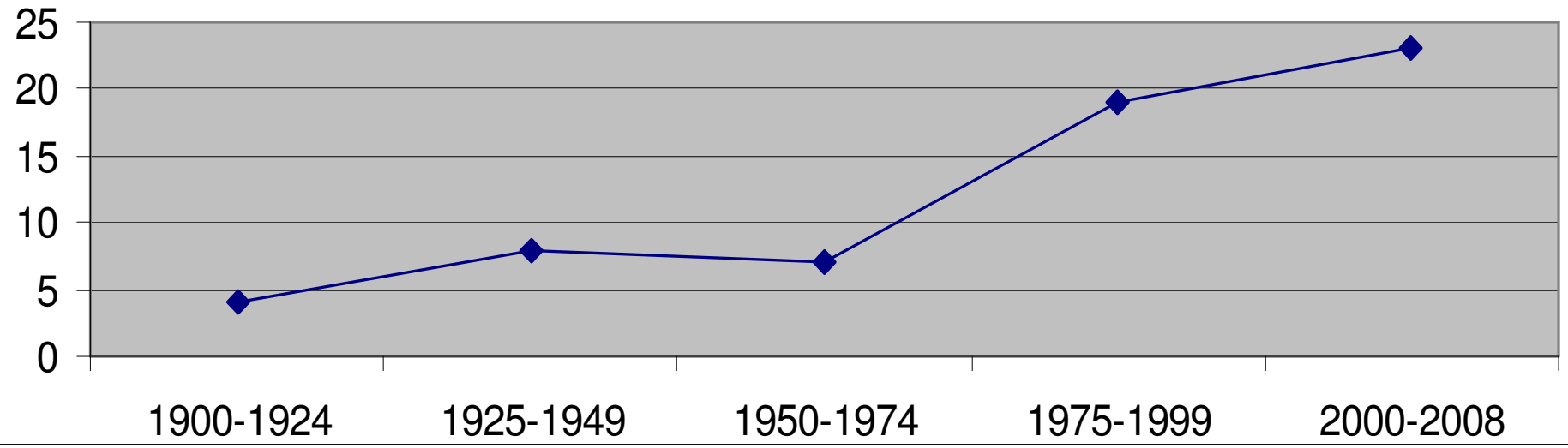
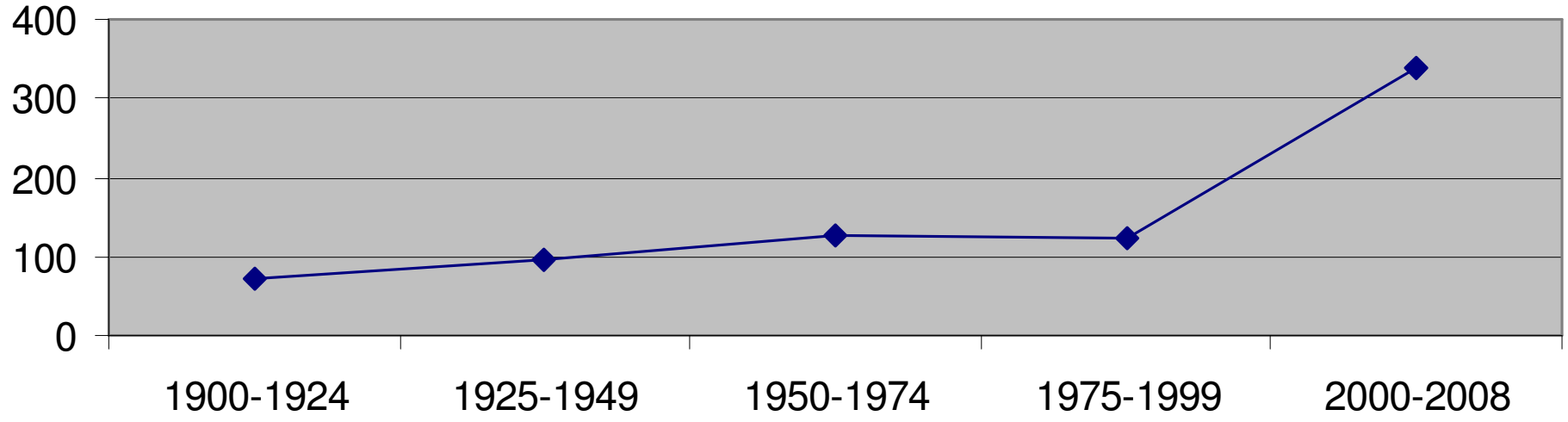
Science, Rationality and the Human Mind

by Garry Jacobs

Earthquakes in Japan 1900-2008

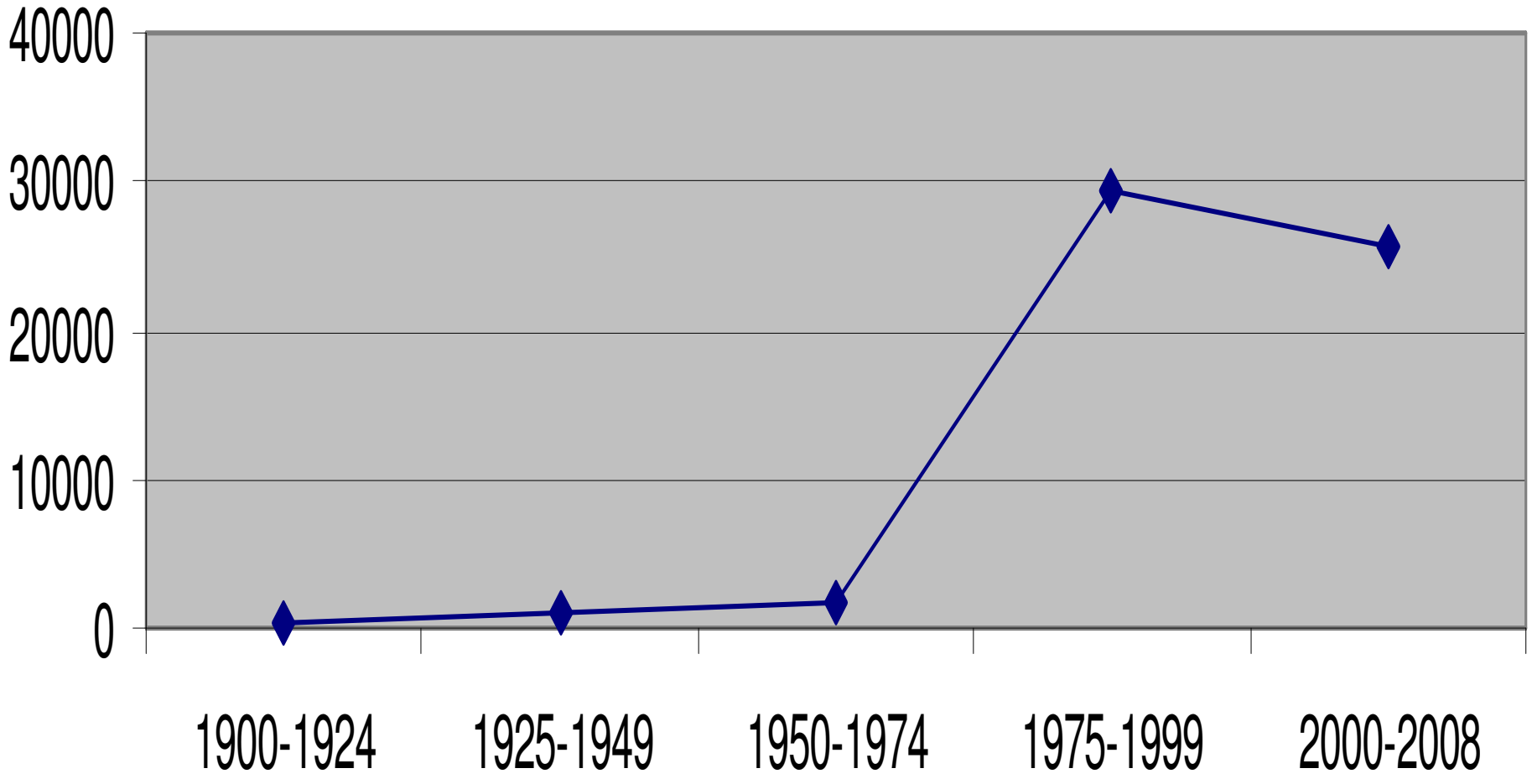


Worldwide Earthquakes 1900-2008



USA

Earthquakes in USA 1900-2008



Dr. Watson's dilemma

- Is rationality born on earth?
- If so, where is it evidenced?

Not in Politics

- Democracy – dictatorship of the majority
- UN, which was founded to establish democracy, is itself undemocratic
- Nuclear Non-proliferation Treaty – nuclear powers want other countries to abstain from nuclear weapons while they refuse to give them up.
- Arms race – Mutually Assured Destruction

Not in Economics

- Taxation
- Inflation
- Efficient Market Theory (EMT)
  - "prices are always correct"
  - "futures stabilize the market"
  - EMT performed no better than random
- Subprime Crisis

Power vs. Rationality

- Fear, hunger, sex and power are dominant human drives
- In the name of rationality, people want to assert authority, power, importance over other people.
- Apparently rational behavior occurs when we are compelled by circumstances = **limits to power**
- World is run by power & strength, which are physical & social
- Rationality is mental

Rationality & Accomplishment

- All work is based on the assumption that people will be rational (Pres. Reagan knew better)
- Great accomplishments are by idealism & determination, not rationality (Churchill)
- Most fears are based on superstition. (Jevon's coal problem)
- Being rational, most problems will disappear
- We will discover we have far more resources than we are tapping

Tales of ‘rationality’
Paul Johnson’s *Intellectuals*

- Rousseau
- Shelley
- Marx
- Tolstoy
- Sartre
- Bertrand Russell

Rationality =

- “Justifiable on the basis of reason” (logical)
- What we know of reality by mind’s direct knowledge of objective facts, undistorted by sense data, emotion or imagination.
- Knowledge free of assumptions, preconceived notions & prejudices

Science

First or last bastion of rationality

- Science prides itself on its rationality in contrast to the faith-based approach of religion.
- Public confidence in science is largely based on faith in experts – which other scientists know better than to accept at face value
- Just because a theory generates powerful technologies (practical utility) does not mean it is theoretically valid.
- Science uses many tools. Mind and rationality are its premier instruments. What are their limits?

The Trouble with Physics
by Lee Smolin

- “It is difficult to have a cordial discussion, even among friends.”
- “I believe in the ability of the scientific community to rise above acrimony.”
- “conjectures that were widely believed to be true, in spite of never having been proved”
- “pressures that young scientists pursue topics sanctioned by the mainstream in order to have a decent career”
- “the conflict between the need to make scientific judgments and make tem in a way that doesn’t alienate you from the mainstream”
- Belief in theory “with a certainty that seems emotional rather than rational”

Popper on scientific method

- Popper points out inherent logical inconsistencies in most scientific practice
- An empirical theoretical system has to satisfy several conditions
- **Objectivity**: Scientific knowledge should be justifiable independently of anyone's whim or preferences, testable by anyone
- **Falsifiability**, not verifiability, is essential
- **Induction**: Inference to theories from statements derived from data/experience is logically inadmissible

Can science be rational if scientists want to --

- Convince others of their views?
- Want to be personally recognized for their discoveries?
- Search for data that confirms their theories?
- Hesitate to express views that are contrary to common belief?
- Accept a statement as true simply on the strength of the person who speaks it or the journal that publishes it?

Process of Scientific Discovery

- William Harvey – circulation of the blood by analogy to the movement of solar system
- Frederick Kekule's discovery of the structure of benzene
- Becquerel's discovery that certain rocks, uranimum salts, emit X-rays

Jules Henri Poincaré

- French mathematician, one of the greatest mathematicians and mathematical physicists at the end of 19th century.
- He made a series of profound innovations in geometry, the theory of differential equations, electromagnetism, topology, and the philosophy of mathematics.
- “It is through science that we prove, but through intuition that we discover."

Einstein

"Intuition does the work.
Reason comes to harvest."

Karl Popper

"Every discovery contains 'an irrational element or 'a creative intuition', in Bergson's sense."

Carlo Rubbia, Nobelist, CERN Director

"Science for me is very close to art. Scientific discovery is an irrational act. It's an intuition which turns out to be reality at the end of it--and I see no difference between a scientist developing a marvelous discovery and an artist making a painting."

Scientific method is only a method for testability

- We need to understand the process of intuition or nature of mind that makes discovery possible

Beyond Rationality

- Objectivity
- Linearity
- Division
- Contradictions (dialectic intellect)
- Abstraction
- Totality
- Integrality

Emperor's new clothes

- If it could be proved global warming is a myth or in any case is based in insubstantial evidence
  - How many would have the courage to say it?
  - What ulterior motives would be attributed to the claim?
  - How many would believe it?

WAAS

- This workshop as a significant initiative of WAAS.
- The issue is relevant to all fields of knowledge and life.
- WAAS is ideally positioned to address this issue because it is representative of the highest standards of intellectual attainment and values.

Future Agenda for WAAS

- Compile lists of unanswered questions
- Compile lists of implicit assumptions
- Compile lists of unproven theories
- Identify the limitations and inconsistencies between theories
- Draw lessons from past discoveries