It's all about who you know…

(A 100% Web of Trust)

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The invisible thing called a good name is made up of the breadth of numbers that speak well of you.

-- Lord Halifax (1881 - 1959)

What is a reputation system?

- a way of computationally reproducing social network
  (ebay, slashdot, orkut – all aspects)

What are the properties of a reputation system?

- **associable** (users must be reliably and securely linked to the information they provide)

- **peer interaction** (users are evaluated by their peers)

- **feedback** (user status changes based on peer interaction)

If all men knew what others say of them, there would not be four friends in the world

-- Blaise Pascal (1623--1662)

Why a reputation system?

- The more information we have, the less likely that we can find out what we want to know

- How do you know who to trust, or what services are worthwhile?

What can you use a reputation system for?

- Trust relationships

- Sharing opinions

Many a man's reputation would not know his character if
they met on the street

-- Elbert Hubbard (1856-1915)

Basic Concepts:

Centralisation is bad

- It's easier to compromise one or a small number of hosts

- A central source, or small number of sources can bias data

Data is dirty

- We expect that a certain percentage of the data available will be bad*

- Gaming and compromise is unavoidable

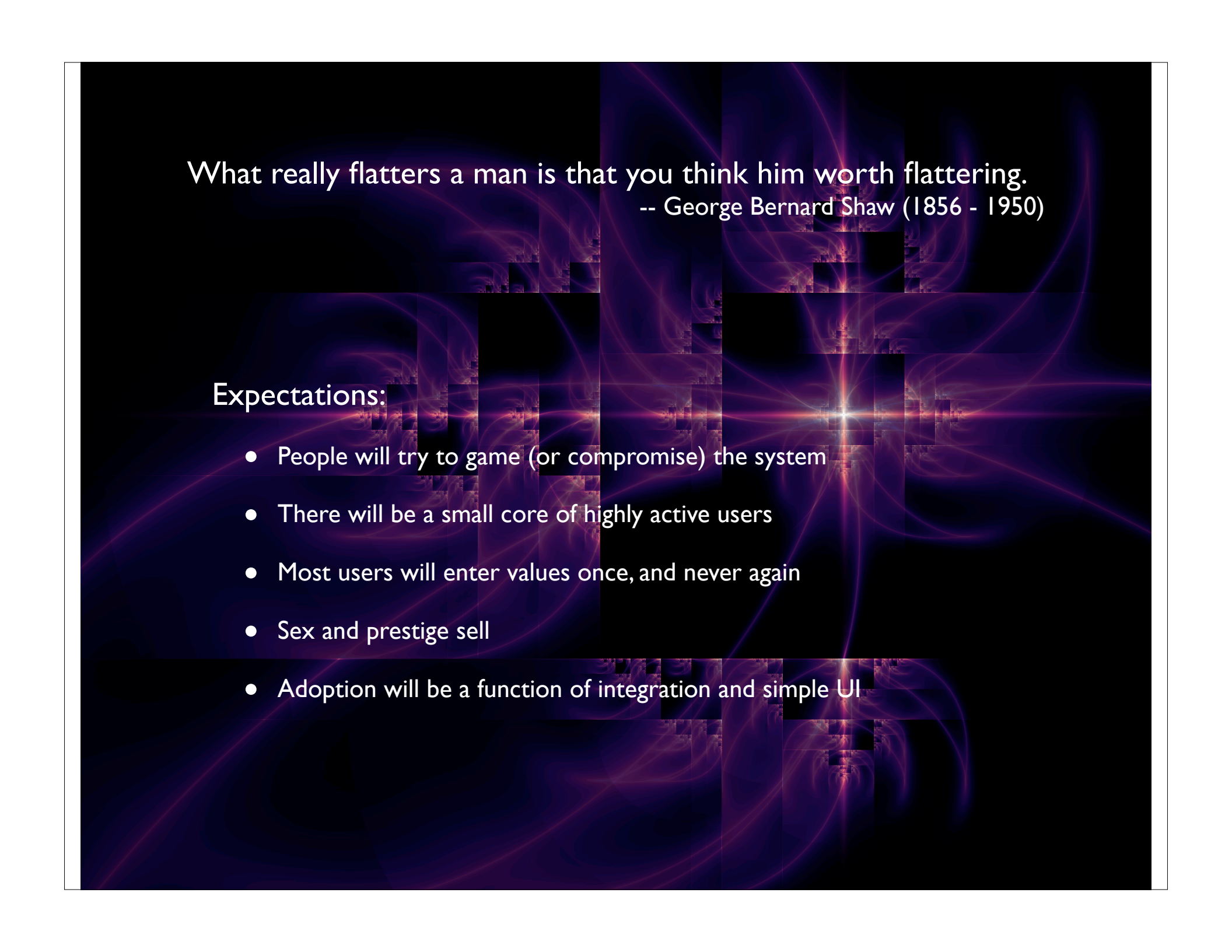They only recognise greatness when some authority confirms it.

-- Bill Waterson (1958 -)

Basic Concepts (cont):

Volume is important

- A million monkeys can't be wrong

- Route around damage

- Trusted seeds are essential

Catastrophe is a primary means of determining failure

What really flatters a man is that you think him worth flattering.
-- George Bernard Shaw (1856 - 1950)

Expectations:

- People will try to game (or compromise) the system

- There will be a small core of highly active users

- Most users will enter values once, and never again

- Sex and prestige sell

- Adoption will be a function of integration and simple UI

The secret of managing is to keep the guys who hate you away from the guys who are undecided.

-- Josef von Sternberg (1894 - 1969)

Design Intentions:

- Secure

- Simple

- Small

- Fast

- Portable

The world cares very little about what a man or woman knows;
it is what the man or woman is able to do.
-- Booker T. Washington (1856 - 1915)

Design Specifics:

- Peer-to-peer

- Database back-end

- Encrypted

- Access controls

Eccentricity is such a badge of honour to be given in these conformist times.

-- Vivienne Westwood (1941 -)

Design Concepts

- guise

- entity

- reputation

- group

A free society is a place where it's safe to be unpopular.

-- Ambassador Adlai Stevenson (1900 - 1965)

Implementation:

- Problem 1:

    How can I decide what email is worth reading when I receive hundreds a day?

- Problem 2:

    How can I find out which Tor servers offer the most anonymous path for my traffic?

I am invisible, understand, simply because people refuse to see me.

-- Ralph Ellison (1914 - 1994)

How can I decide what email is worth reading?

Current Solutions:

- Killfiles, pattern matching, scanning subjects, ticketing systems, summary lists, hope that somebody else finds the critical things and tells you.

With a reputation system:

- Prioritise based on reputation - and environment

- Follow conversations

- Yes - this is also a way of addressing spam

Who do you know / Who do you trust
-- Jay Farrar

How can I find out which Tor servers offer the most anonymous route for my traffic?

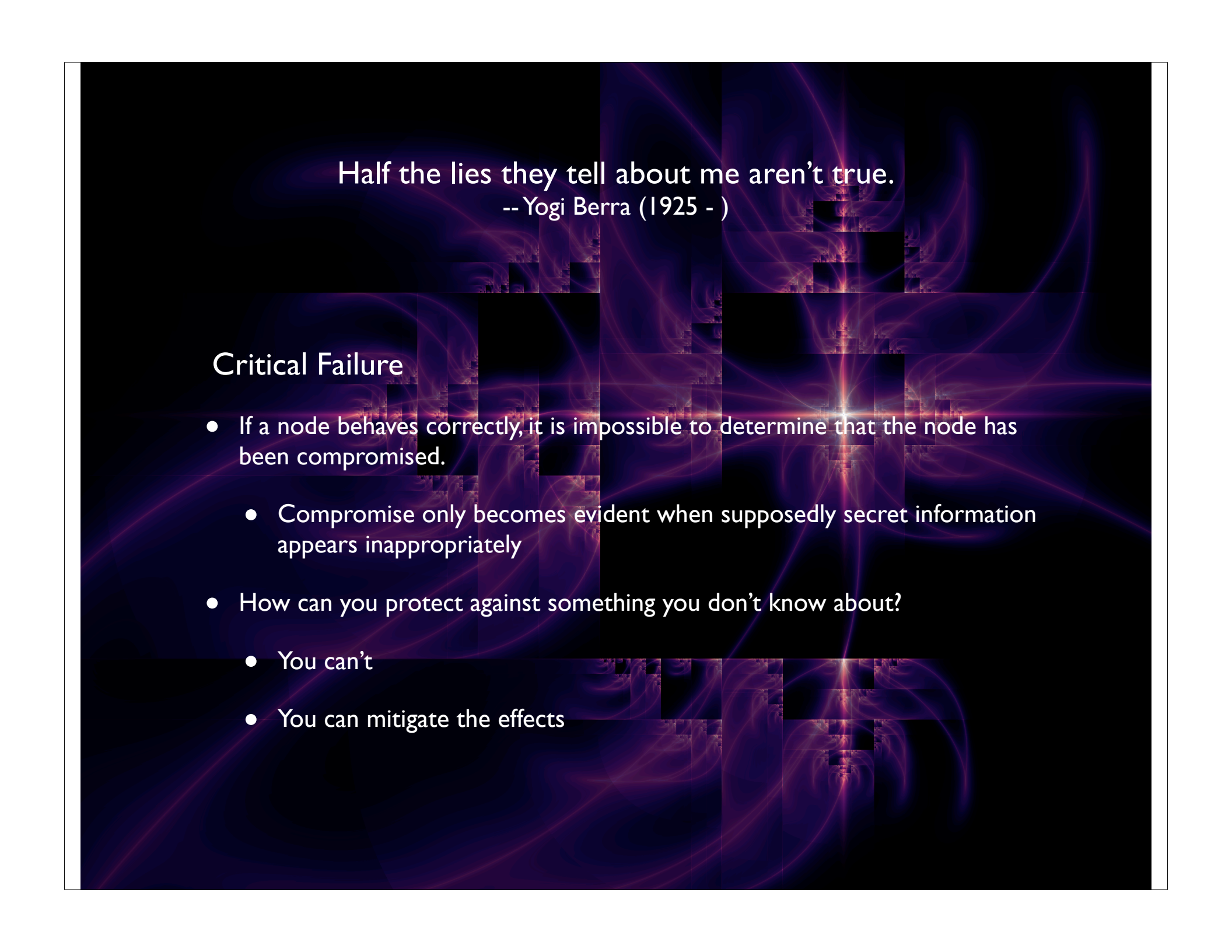- Need to figure out which nodes can be trusted

- What criteria do you have for "trust"?

  - Technical?

  - Personal?

  - Social?

Our enemies come nearer the truth in the opinions they form about us than we do in our opinion of ourselves.
-- Duke Francois de la Rochefoucauld (1613 - 1680)

- What does "bad" mean?

  - Poor performance?

  - Not anonymous?

- How can you tell if a node is "bad"?

  - Doesn't behave according to spec

  - Unreliable

  - What if the node behaves according to spec - but also records all of your traffic?

Half the lies they tell about me aren't true.
-- Yogi Berra (1925 -)

Critical Failure

- If a node behaves correctly, it is impossible to determine that the node has been compromised.

    - Compromise only becomes evident when supposedly secret information appears inappropriately

- How can you protect against something you don't know about?

    - You can't

    - You can mitigate the effects

Never trust a man who speaks well of everybody.
-- John Churton Collins (1848 - 1908)

A million monkeys can't be wrong?

- Actually a million monkeys can be very wrong - but on average, you'll end up with a reasonable result.

- What about gaming the system

  - Give somebody a bad reputation

  - Scratch my buddies back, and give us all good reputations

  - Create a million new "people", and overwhelm the system

Nicknames stick to people, and the most ridiculous are the most adhesive.

-- Thomas C. Haliburton (1796 - 1865)

What about the kiddies?

- How do you handle gaming the system

  - Start with a known seed

  - Trust and weighting

  - Containment/Contagion

If you care about what people think about you , how will you
ever know how you feel about you?

-- Rebecca Fisher

A few questions for the audience
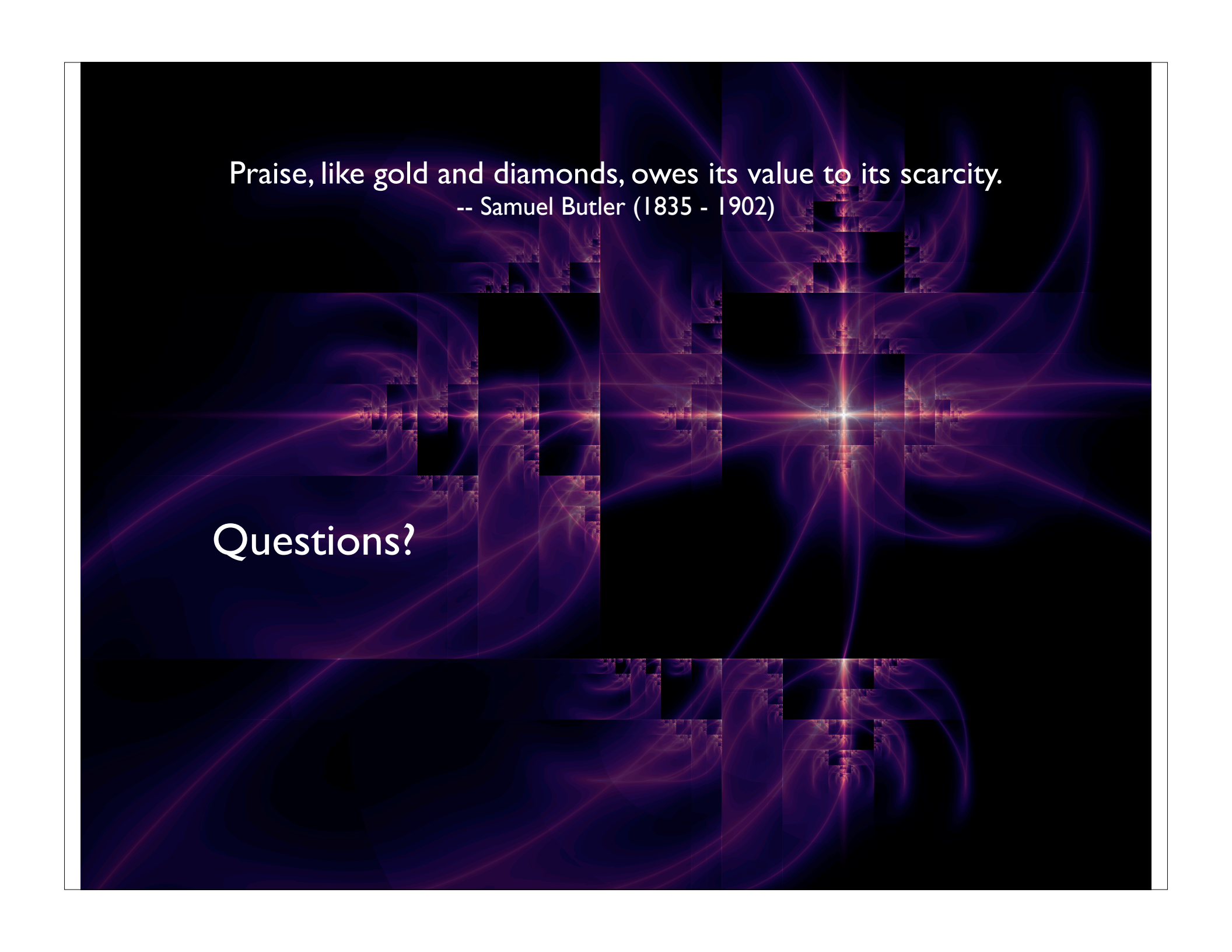
- Categorisation

- Path Chasing

Associate yourself with men of good quality if you esteem your own reputation; for 'tis better to be alone than to be in bad company.

-- President George Washington (1732 - 1799)

Many thanks go to Ben Laurie, Roger Dingledine, Michael Lasmanis, Nick Mathewson for valuable comments, Caezar for providing impetus, and my friends and spouse for their forbearance.

Tor can be found at: http://www.freehaven.net/tor/

Aura can be found at: http://www.geekness.net/tools/aura/

Praise, like gold and diamonds, owes its value to its scarcity.
-- Samuel Butler (1835 - 1902)

Questions?