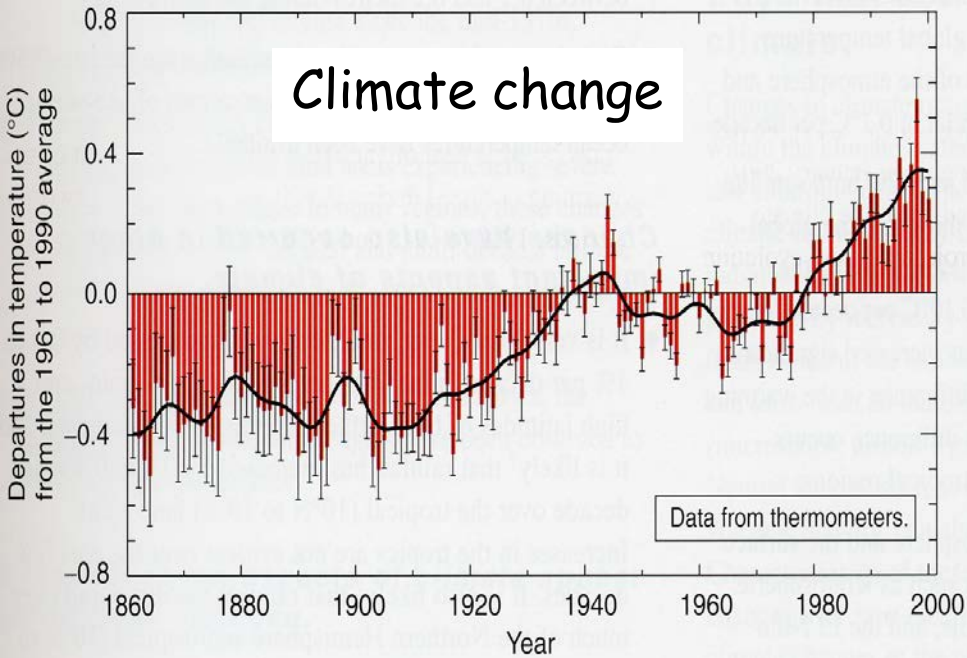


Scientists & managers:
the best of times & the worst of times

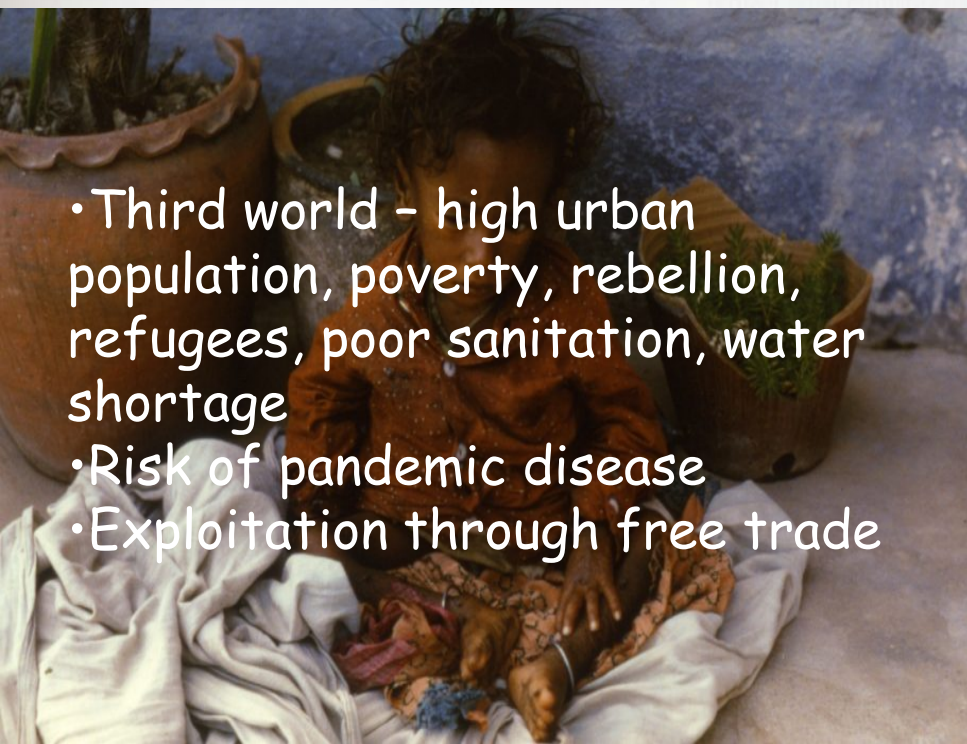


Brian Moss, University of Liverpool





- Life-style problems in the West (obesity, escalating debt)
 - Population increase through increased longevity
- Export of problems to newly industrialising countries



- Third world - high urban population, poverty, rebellion, refugees, poor sanitation, water shortage
- Risk of pandemic disease
- Exploitation through free trade



Habitat destruction. Loss of natural goods and services

Biomes < 25%;
Anthromes > 75%



Authority (Government) acknowledges (sometimes) the problem. Sees it in isolation. Wishes to fix it simply and quickly. Desires minimal disruption to growth economy. General public colludes

Electores

Commercial organisations
Largely self-interested
Emphasise minimisation of regulation

Authority (Government) acknowledges (sometimes) the problem. Sees it in isolation. Wishes to fix it simply and quickly. Desires minimal disruption to growth economy. General public colludes

Electorate

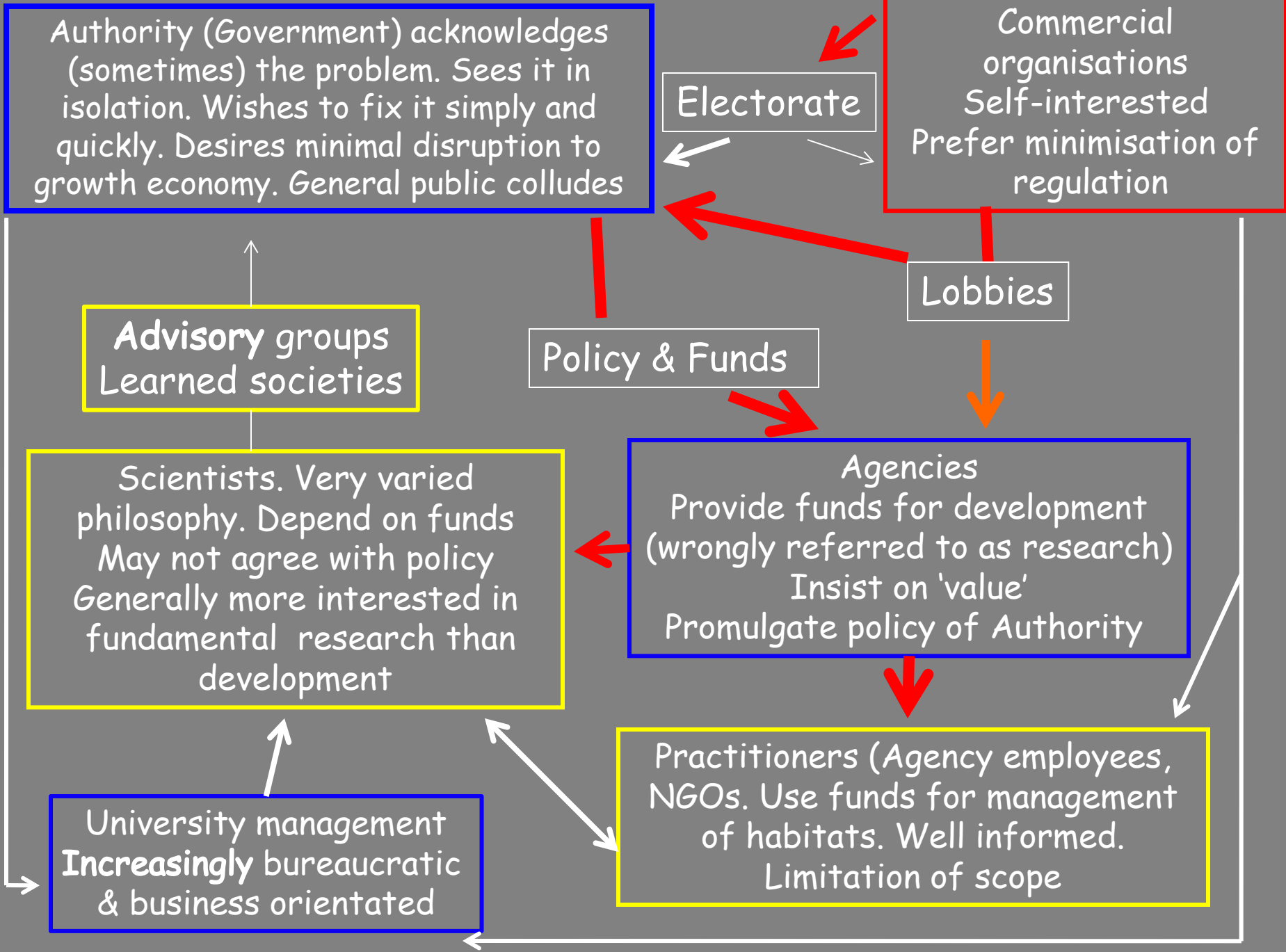
Commercial organisations
Self-interested
Prefer minimisation of regulation

Lobbies

Policy & Funds

Agencies
Provide funds for development (wrongly referred to as research)
Insist on 'value'
Promulgate policy of Authority

Practitioners (Agency employees, NGOs. Use funds for management of habitats. Well informed. Limitation of scope



Authority (Government) acknowledges (sometimes) the problem. Sees it in isolation. Wishes to fix it simply and quickly. Desires minimal disruption to growth economy. General public colludes

Policy & Funds

Agencies
Provide funds for development (wrongly referred to as research)
Insist on 'value'
Promulgate policy of Authority

Scientists. Very varied philosophy. Depend on funds
May not agree with policy
Generally more interested in fundamental research than development

Comprehensive Everglades Restoration Plan

A policy of pretty much unregulated, unplanned development at the state level and the county level is just not in synch with restoration, or even stopping the damage that is currently ongoing, the current degradation. Every day, every new house that goes up is another bite—another water user, another waste load and it probably would be adequate if there was some sort of a plan that said there is a limit.

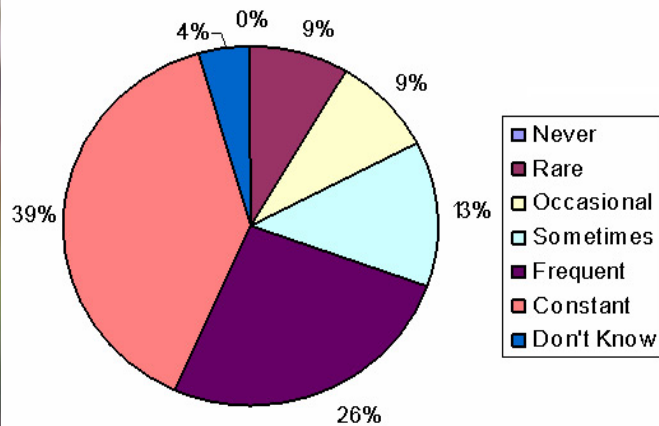
Scientist

Do you truly want to restore the Everglades America? Is this truly a national treasure? Are you serious about this? And if you are, please explain to me how you plan to keep 6 million people down there in a sustainable environment and how you even forecast that to grow to 10 or 15 million people by the year 2025 and you're still going to maintain the Everglades? Tell me that please, because I don't think we can. **Manager**

Fling, 2006

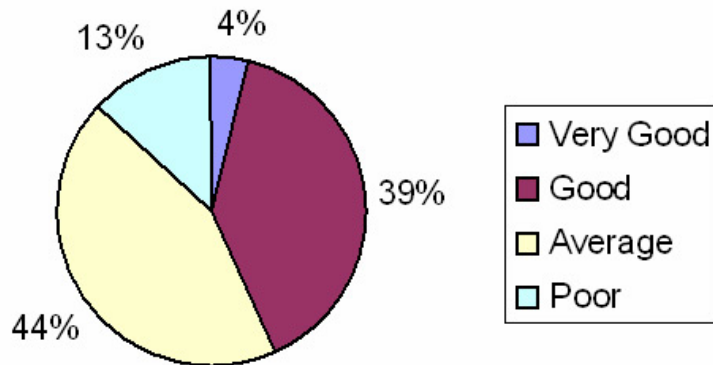
Organisational Framework of Comprehensive Everglades Restoration Plan

Frequency of Politics as a Barrier to Effective Scientific Communication



Unclear science policy
Unclear roles and responsibilities
Uncertainties and disagreements
Political and economic influence
Lack of network structure
Poor participant interface


Science Communication in Support of Everglades Restoration Has Been



Mistrust

Poor relationships

Minimal progress



I am the very model of a worker professorial,
I stand up for a lecture and I sit for a tutorial,
But since I'm not a humble wren, more like a scarlet tanager,
The last thing I will ever be's a wretched 'module manager'.

We have a tongue that's rich in words from Saxon, Dane and Caesar,
A pity that it's often spurned by those who have amnesia.
I lead, direct and organize, design and plan and machinate
I engineer, control and nurse, but to manage's not my fate.

For I'm not the very model of a company-led manager
Neat and spruce and rarely puce, unlike the scarlet tanager
With tidy desk, compliant smile and avoiding deviation
Better die and where you lie, just spurn standardisation.

Scientific Management

The most efficient manner to perform a task is determined and everyone does it that way

Personnel Selection and Training

Bureaucratic organizational structure

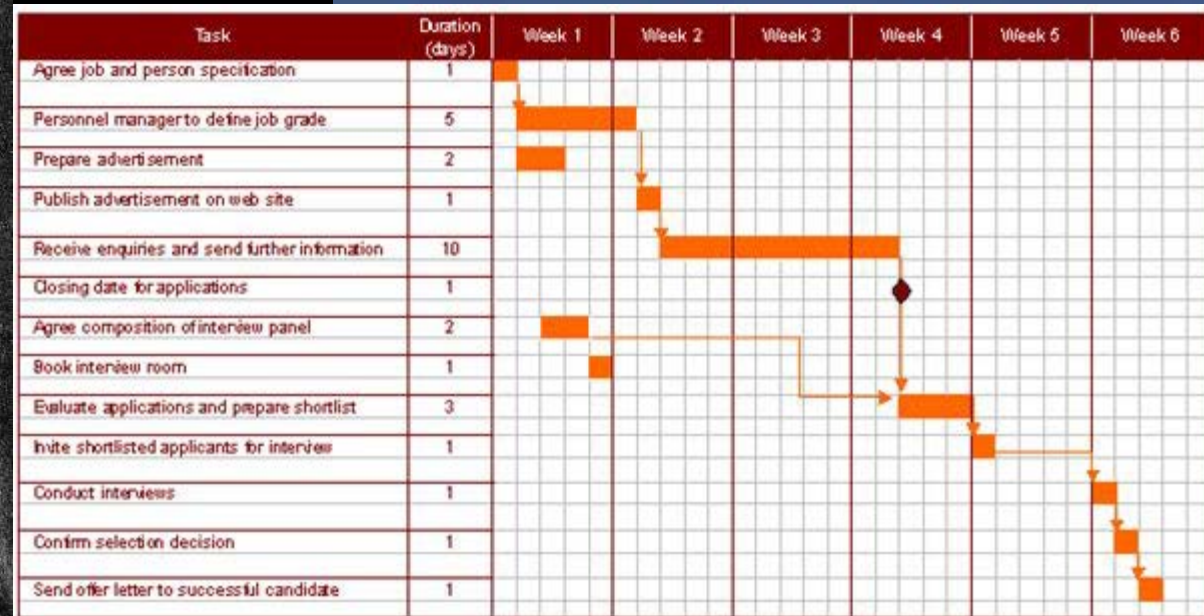
Control and top down management

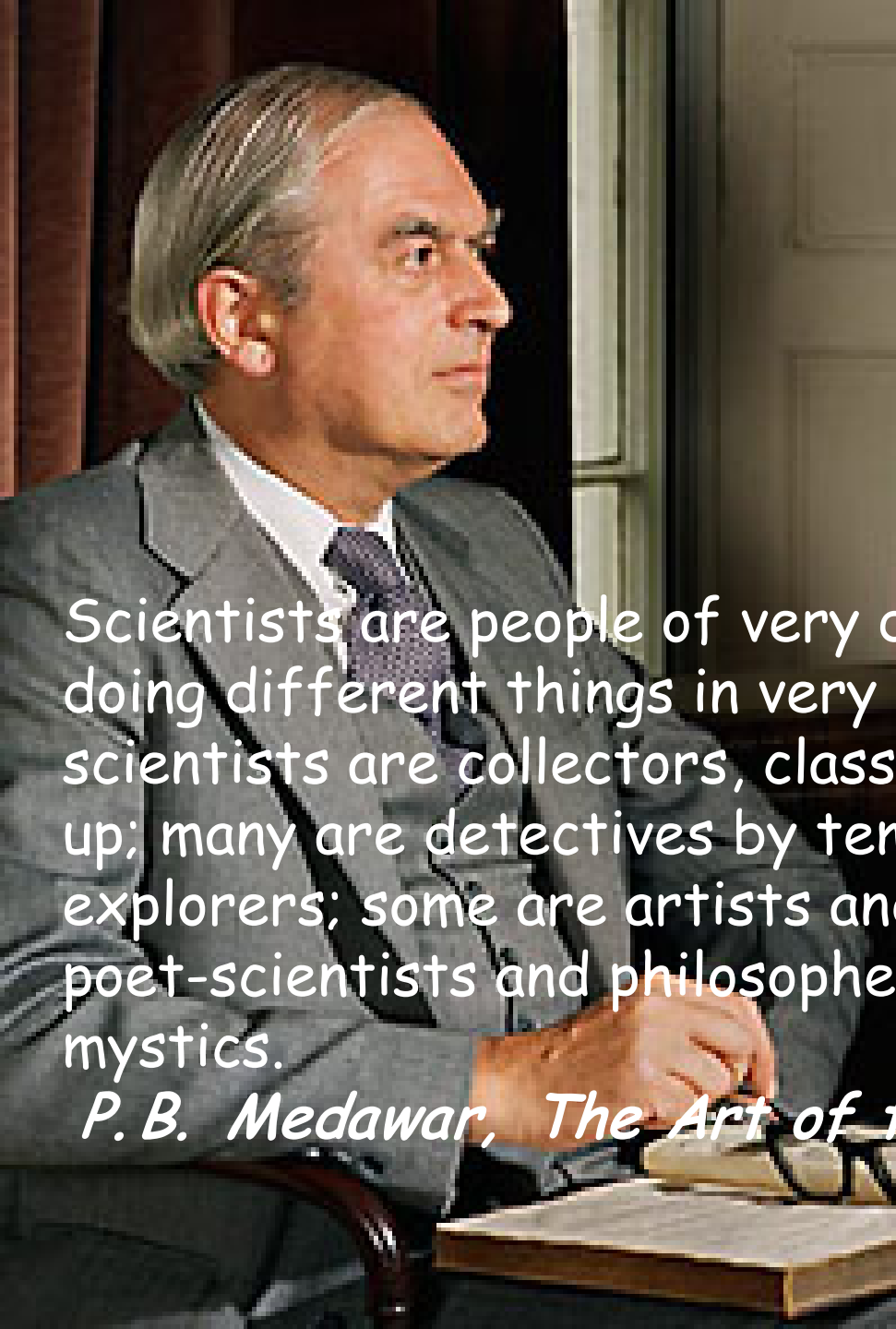


Henry Gantt



Frederick Taylor





Scientists are people of very dissimilar temperaments doing different things in very different ways. Among scientists are collectors, classifiers and compulsive tidiers-up; many are detectives by temperament and many are explorers; some are artists and others artisans. There are poet-scientists and philosopher-scientists and even a few mystics.

P. B. Medawar, The Art of the Soluble (1967)

P. B. MEDAWAR

*The Art of
the Soluble*

SIL News 50
June 2007

Limnology At Plön to Vanish. An Indication of a General Trend?



Winfried Lampert

- Max Planck Institute for Limnology, Plön. Founded 1892
- Review of the field when the Director retires
- General trend towards applied issues and solving water quality problems
- Curiosity-driven, fundamental research with potential for discoveries and the development of new paradigms is declining.
- Driven by European funding, political issues, socio-economic impact (WFD)
- Strategy does not favour creative, risky research; it rather supports the safe re-invention of the wheel.
- Experience as an editor suggests a renaissance of classification and descriptive studies in limnology, although with the new tools for multivariate statistics available, the description is on a higher academic level.

The Water Framework Directive (2000/60/EC)

• Thirty years of discussion; increasing water problems in Europe - pollution, flood and scarcity, over abstraction, habitat destruction, erosion and desertification, enlargement of the Community. Failure of 'end of pipe' legislation

• Finally passed in 2000

Red hot and Revolutionary

22.12.2000 EN Official Journal of the European Communities L 327/1

I
(Acts whose publication is obligatory)

DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 23 October 2000
establishing a framework for Community action in the field of water policy

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission⁽¹⁾,

Having regard to the opinion of the Economic and Social Committee⁽²⁾,

Having regard to the opinion of the Committee of the Regions⁽³⁾,

Acting in accordance with the procedure laid down in Article 251 of the Treaty⁽⁴⁾, and in the light of the joint text approved by the Conciliation Committee on 18 July 2000,

Whereas:

(1) Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such.

(2) The conclusions of the Community Water Policy Ministerial Seminar in Frankfurt in 1988 highlighted the need for Community legislation covering ecological quality. The Council in its resolution of 28 June 1988⁽⁵⁾ asked the Commission to submit proposals to improve ecological quality in Community surface waters.

(3) The declaration of the Ministerial Seminar on groundwater held at The Hague in 1991 recognised the need for action to avoid long-term deterioration of freshwater quality and quantity and called for a programme of actions to be implemented by the year 2000 aiming at sustainable management and protection of freshwater resources. In its resolutions of 25 February 1992⁽⁶⁾, and 20 February 1995⁽⁷⁾, the Council requested an action programme for groundwater and a revision of Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances⁽⁸⁾, as part of an overall policy on freshwater protection.

(4) Waters in the Community are under increasing pressure from the continuous growth in demand for sufficient quantities of good quality water for all purposes. On 10 November 1995, the European Environment Agency in its report 'Environment in the European Union - 1995' presented an updated state of the environment report, confirming the need for action to protect Community waters in qualitative as well as in quantitative terms.

(5) On 18 December 1995, the Council adopted conclusions requiring, inter alia, the drawing up of a new framework Directive establishing the basic principles of sustainable water policy in the European Union and inviting the Commission to come forward with a proposal.

(6) On 21 February 1996 the Commission adopted a communication to the European Parliament and the Council on European Community water policy setting out the principles for a Community water policy.

(7) On 9 September 1996 the Commission presented a proposal for a Decision of the European Parliament and

⁽¹⁾ OJ C 184, 17.6.1997, p. 20, OJ C 16, 20.1.1998, p. 14 and OJ C 108, 7.4.1998, p. 94.
⁽²⁾ OJ C 355, 21.11.1997, p. 83.
⁽³⁾ OJ C 180, 11.6.1998, p. 38.
⁽⁴⁾ Opinion of the European Parliament of 11 February 1999 (OJ C 150), 28.5.1999, p. 419), confirmed on 16 September 1999, and Council Common Position of 22 October 1999 (OJ C 343, 30.11.1999, p. 1). Decision of the European Parliament of 7 September 2000 and Decision of the Council of 14 September 2000.
⁽⁵⁾ OJ C 209, 9.8.1988, p. 3.
⁽⁶⁾ OJ C 59, 6.3.1992, p. 2.
⁽⁷⁾ OJ C 49, 28.2.1995, p. 1.
⁽⁸⁾ OJ L 20, 26.1.1980, p. 43. Directive as amended by Directive 91/692/EEC (OJ L 377, 31.12.1991, p. 48).



- Management on a catchment basis
- A typology (pigeon-holing; mail-boxes) of different sorts of river, lake, transitional water, coastal water (ecotypes)
- A classification scheme for ecological quality in each ecotype (high, good, moderate, poor, bad)
- Reference-based. High quality, essentially pristine
- ('no or only very minor anthropogenic alteration')
- Good quality - 'deviates only slightly from... undisturbed conditions'

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No catchment legislation.
Management still on an in-lake, in-river basis

Standards for rather few variables. Politically manipulated to be liberal. No holistic view

No concept of ecological quality beyond pressure/ driver/ effect. Biological variables calibrated against individual chemical variables. Naïve EQ ratios.

References are often severely damaged. At best 1850 as baseline

Definitions of very minor and slightly are several orders of magnitude deviant from conventional dictionary understanding



EUROPEAN
COMMISSION

Brussels, 14.11.2012
COM(2012) 670 final

**10 years of the Water
Framework Directive:
A Toothless Tiger?**
A snapshot assessment
of EU environmental
ambitions

BIODIVERSITY AND NATURE

**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND
THE COUNCIL**

on the Implementation of the Water Framework Directive (2000/60/EC)

River Basin Management Plans

(Text with EEA relevance)

{SWD(2012) 379 final}



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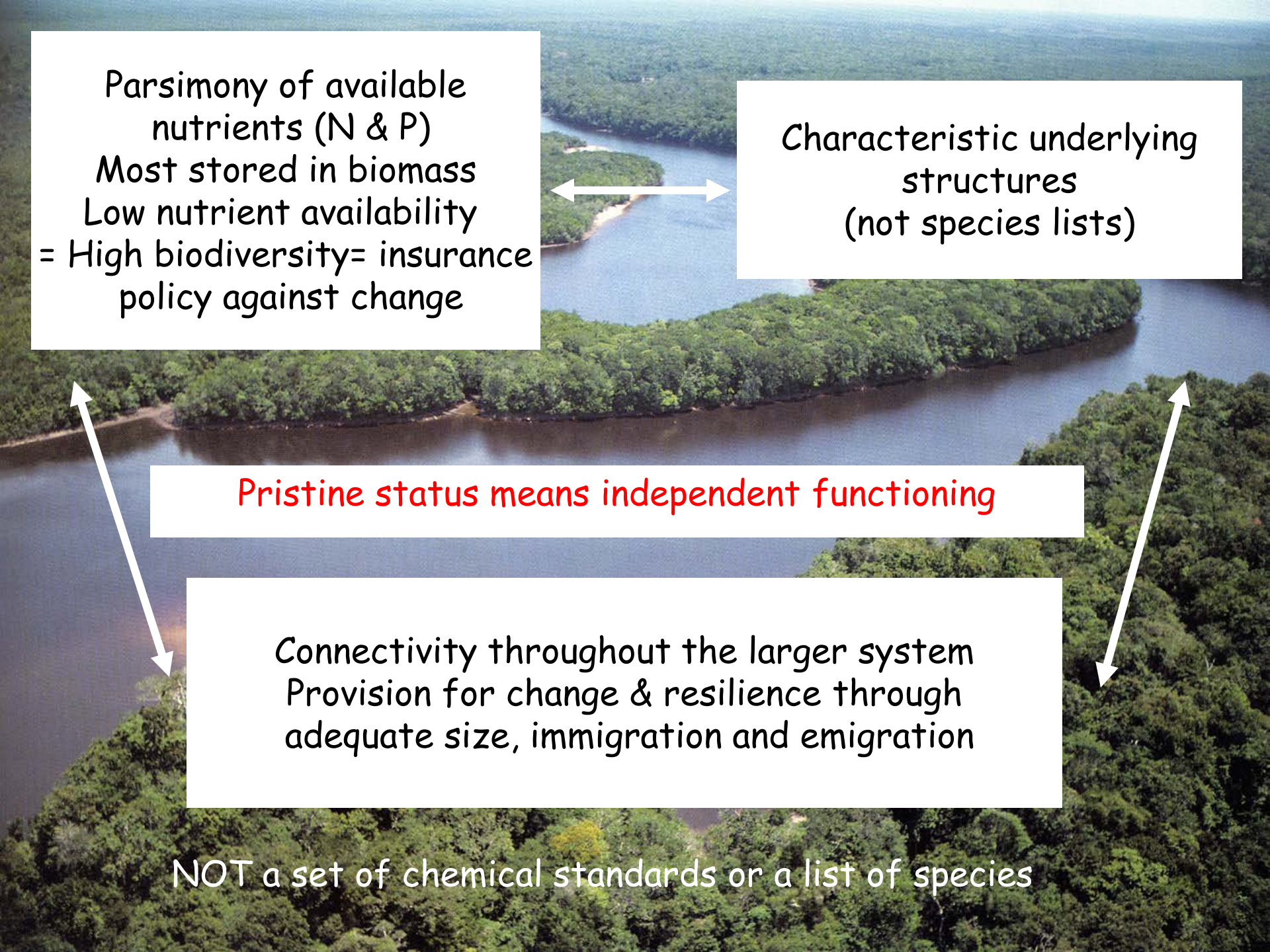
(Text with EEA relevance)

{SWD(2012) 379 final}

- Outdated ecological approach in original drafting
- Rigid management interpretation on detail. Wide use of derogations.
- Sloppy interpretation where politically convenient



1. The fundamental unit is the catchment.
2. Pristine land ecosystems efficiently retain nutrients. Most freshwater systems are naturally highly nutrient deprived
3. Because water flows, freezes and evaporates, freshwater systems are naturally disturbed systems and well adapted to disturbance
4. Freshwater communities are determined by an infinitely varying combination of random biogeographic accident, past history, microevolution, water chemistry-linked physiology, competition & predation



Parsimony of available nutrients (N & P)
Most stored in biomass
Low nutrient availability
= High biodiversity= insurance policy against change

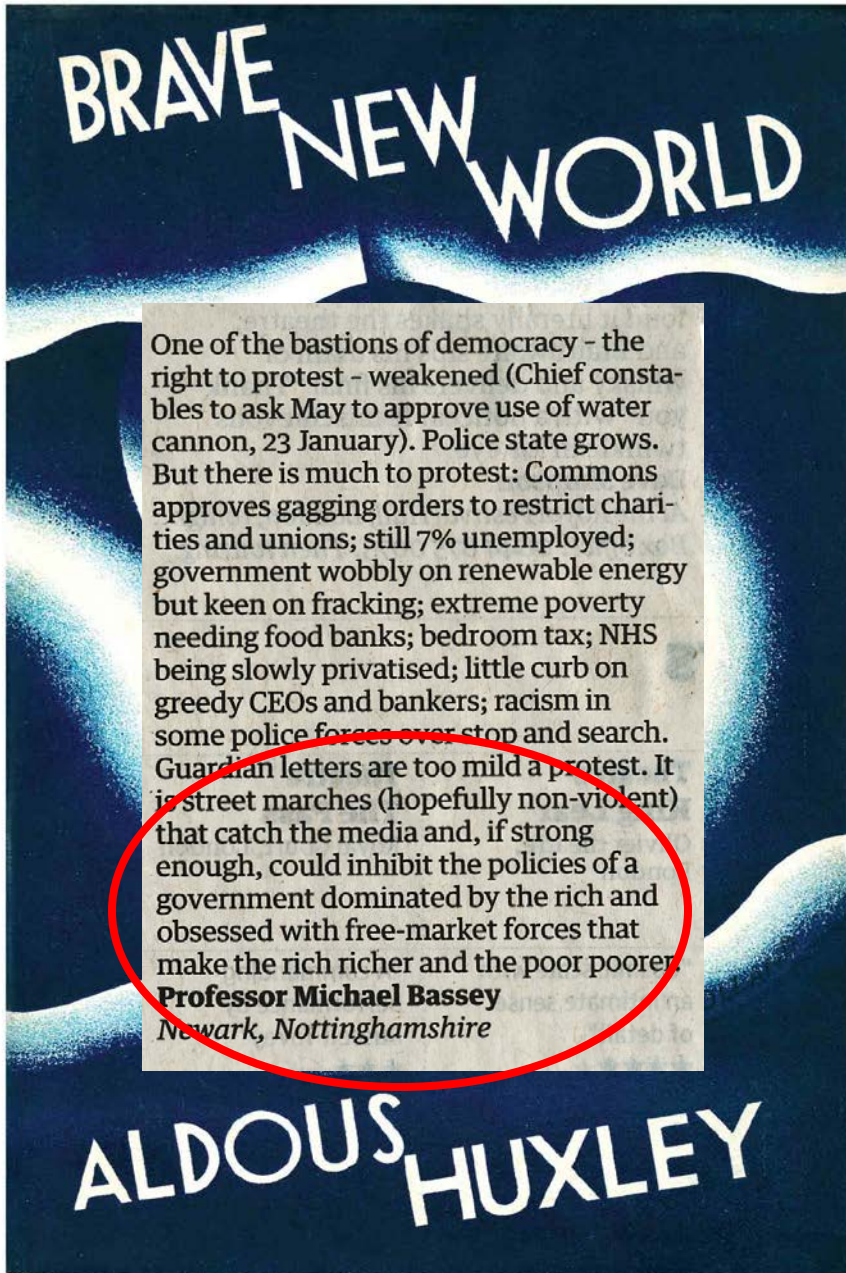
Characteristic underlying structures
(not species lists)

Pristine status means independent functioning

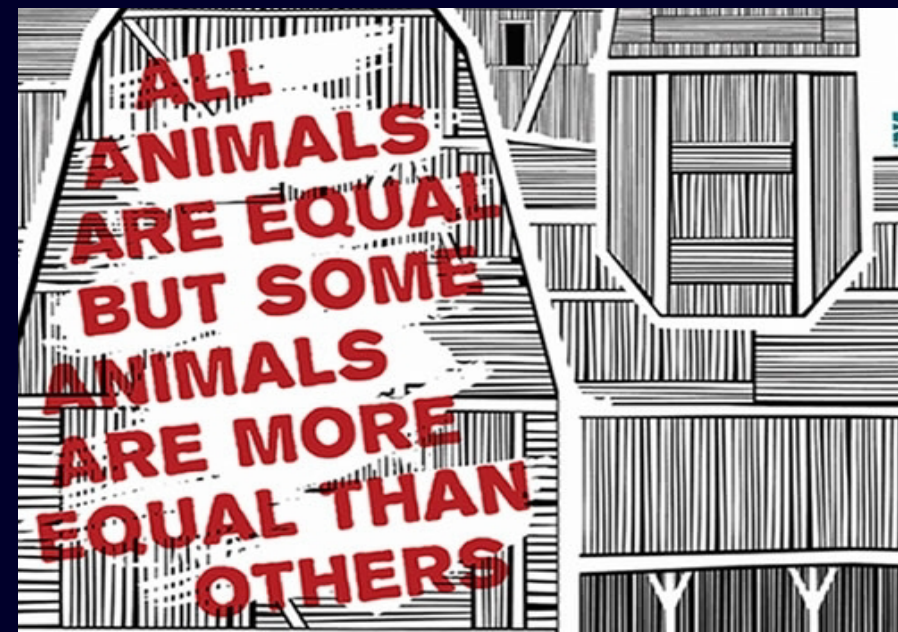
Connectivity throughout the larger system
Provision for change & resilience through adequate size, immigration and emigration

NOT a set of chemical standards or a list of species

George Orwell: 1984



George Orwell: Animal Farm



The Guardian, Saturday 25 January 2014

Frozen out

Canada's government should free its scientists to speak to the press, as its US counterpart has.

Media interactions with government scientists have undergone a reversal across North America during the past six years. In the United States, President Barack Obama's administration has directed federal science agencies to develop integrity policies with clear guidelines for scientists who are approached by journalists.

In December, agencies including the US National Science Foundation (NSF) and the US National Oceanic and Atmospheric Administration (NOAA) issued guidelines that promote openness with the press. For instance, NOAA and NSF-funded scientists and staff are free to speak to journalists without first seeking the approval of a public-affairs officer. The NSF's policy states that researchers are free to express their personal views as long as they make clear that they are not speaking on behalf of the agency. And scientists also have right of review over agency publications and press releases that claim to represent their expert opinions. Such policies may not be implemented successfully in all cases, but they show that attitudes have evolved encouragingly since 2006, when charges that then-president George W. Bush's administration had silenced US government researchers made front-page news.

Over the same period, Canada has moved in the opposite direction. Since Prime Minister Stephen Harper's Conservative Party won power in 2006, there has been a gradual tightening of media protocols for federal scientists and other government workers. Researchers who once would have felt comfortable responding freely and promptly to journalists are now required to direct inquiries to a media-relations office, which demands written questions in advance, and might not permit scientists to speak. Canadian journalists have documented several instances in which prominent researchers have been prevented

from discussing published, peer-reviewed literature. Policy directives and e-mails obtained from the government through freedom of information reveal a confused and Byzantine approach to the press, prioritizing message control and showing little understanding of the importance of the free flow of scientific knowledge.

The Harper government's poor record on openness has been raised by this publication before (see K. O'Hara *Nature* 467, 501; 2010), and *Nature's* news reporters, who have an obvious interest in access to scientific information and expert opinion, have experienced directly the cumbersome approval process that stalls or prevents meaningful contact with Canada's publicly funded scientists. Little has changed in the past two years: rather than address the matter, the Canadian government seems inclined to stick with its restrictive course and ride out all objections.

That position is coming under increasing pressure as a result of the scientific-integrity policies taking shape across the border. The clarity of the US guidelines undercuts the Canadian government's assertion that its own media policies are adequate and have simply been misunderstood. If the Harper government truly embraces public access to publicly funded scientific expertise, then it should do what the Canadian Science Writers' Association and several other organizations have called for in a letter sent to the prime minister on 16 February: "implement a policy of timely and transparent communication" like those used by NOAA and the NSF.

The letter coincided with a symposium, 'Unmuzzling Government Scientists: How to Re-open the Debate', which was held last week at the meeting of the American Association for the Advancement of Science in Vancouver, Canada. With the country taking centre stage as the meeting's host, the Harper government found its media policies in the international spotlight. Scientists and other visitors from around the globe discovered, to their surprise, that

Canada's generally positive foreign reputation as a progressive, scientific nation masks some startlingly poor behaviour. The way forward is clear: it is time for the Canadian government to set its scientists free.

NATURE.COM

To comment online,
click on Editorials at:
go.nature.com/shungy

A rise of subtle censorship?

What is Horizon 2020

- **Initial Commission proposal for a €80 billion research and innovation funding programme (2014-2020); now just over €70 billion**
- **A core part of Europe 2020, Innovation Union & European Research Area:**
 - Responding to the economic crisis to invest in future jobs and growth
 - Addressing people's concerns about their livelihoods, safety and environment
 - Strengthening the EU's global position in research, innovation and technology

Business

Dow Jones, Hang Seng Index

GDP

Executive remuneration, bonus

Projected outturn, annual growth rate

Exclusive management speak

Science

Citation index, Hirsch factor

Number of publications

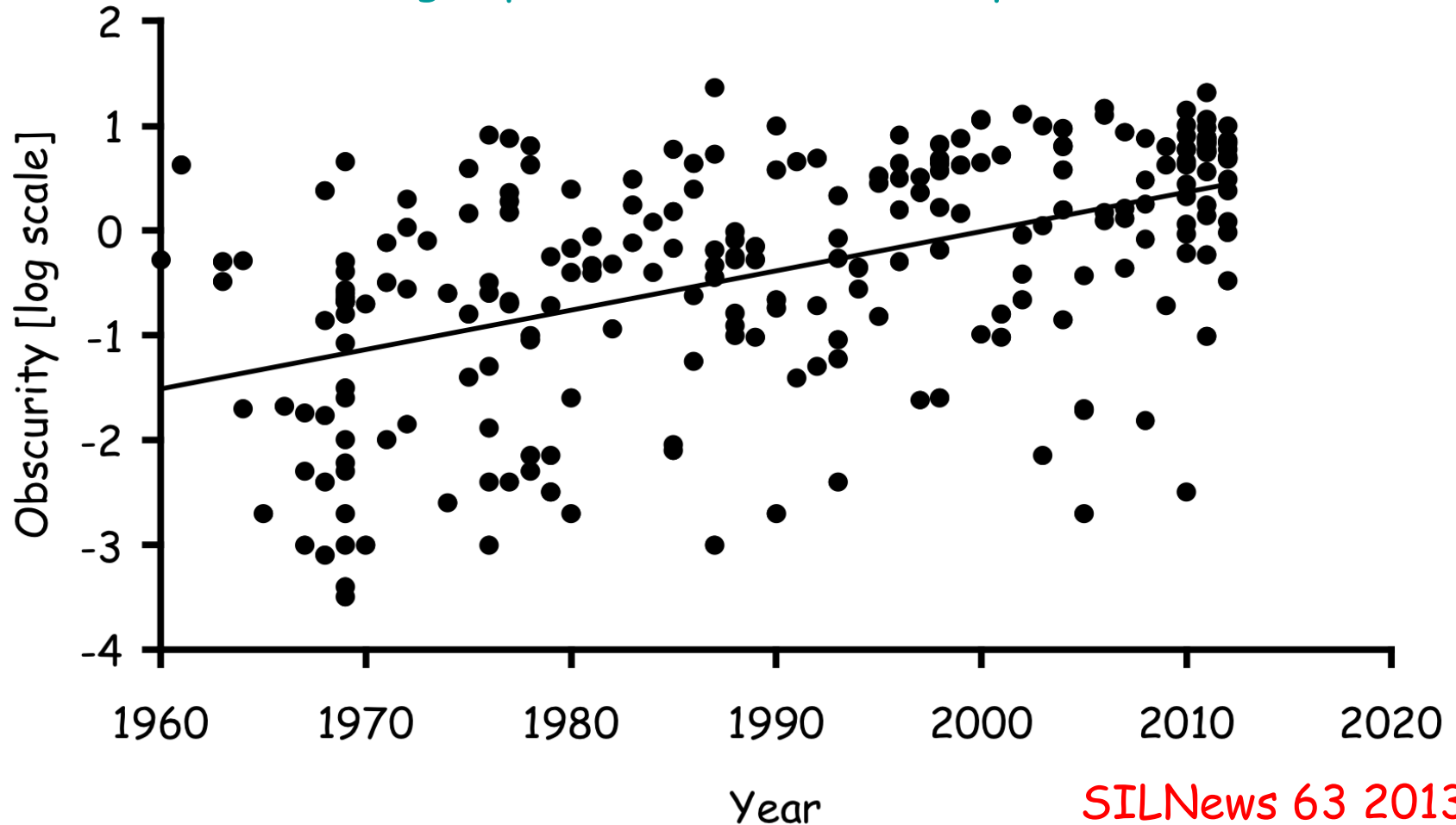
Prestige of large grants and contracts

Speed of publication, priority

Exclusive scientific jargon and style

Is something rotten in the state of our scientific writing?

- 240 random freshwater papers from 1960-2013
- Abstract rewritten to be understandable by any one
- Obscurity index = % change in number of words x number of changes per word x time taken per word to rewrite



The Passionate
Shepherd to his
Love

Come live with me and be my Love
And we will all the pleasures prove
That hills and valleys, dale and field,
And all the craggy mountains yield.

There will we sit upon the rocks
And see the shepherds feed their flocks
By shallow rivers, to whose falls,
Melodious birds sing madrigals.

There will I make thee beds of roses
And a thousand fragrant posies
A cap of flowers, and a kirtle
Embroider'd all with leaves of myrtle.

A gown made of the finest wool,
Which from our pretty lambs we pull,
Fur lined slippers for the cold,
With buckles of the purest gold.

A belt of straw and ivy buds
With coral clasps and amber studs:
And if these pleasures may thee move,
Then live with me and be my Love.



Co-operation is proposed
To optimise our working load,
And maximise the features spatial
Of a landscape innovational.

Observations we will clock
Of management of grazing stock
Close to lotic flowing systems
With avian audio-based customs

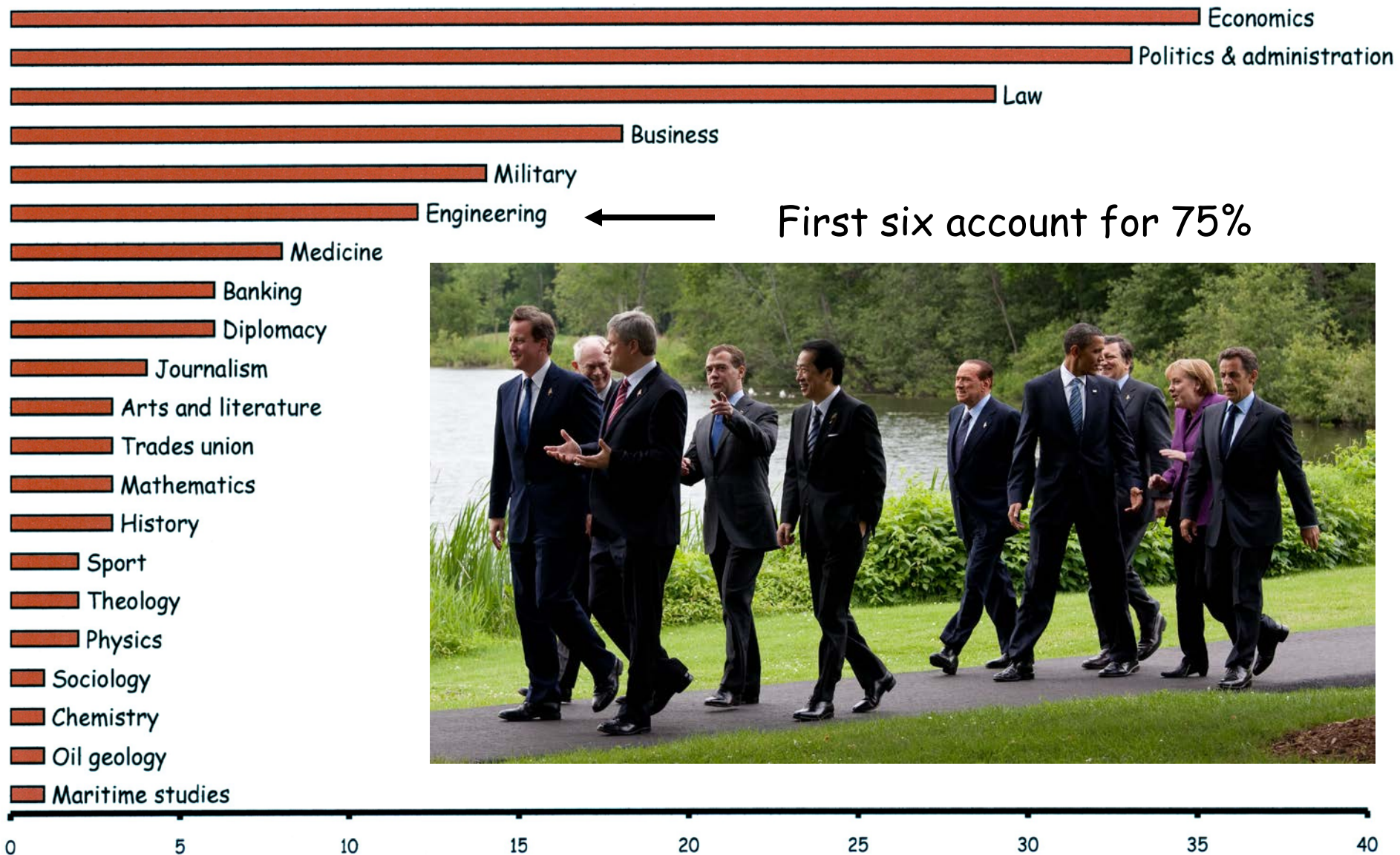
PIs will construct a matrix
Formed of floral-derived metrics
To ensure that every key term
Will be covered by their program

Deliv'rables will be provided
Reports and milestones due formatted
To ensure that partners stash
The maximum allow'ble cash

Re-sourc-es, spat-io-temporal
Though never thought to be quite ample
In work programs are encoded
Co-operation is propos-ed



Backgrounds of world leaders: inappropriate for solving the real problems



Fighting talk Taiwan MPs brawl



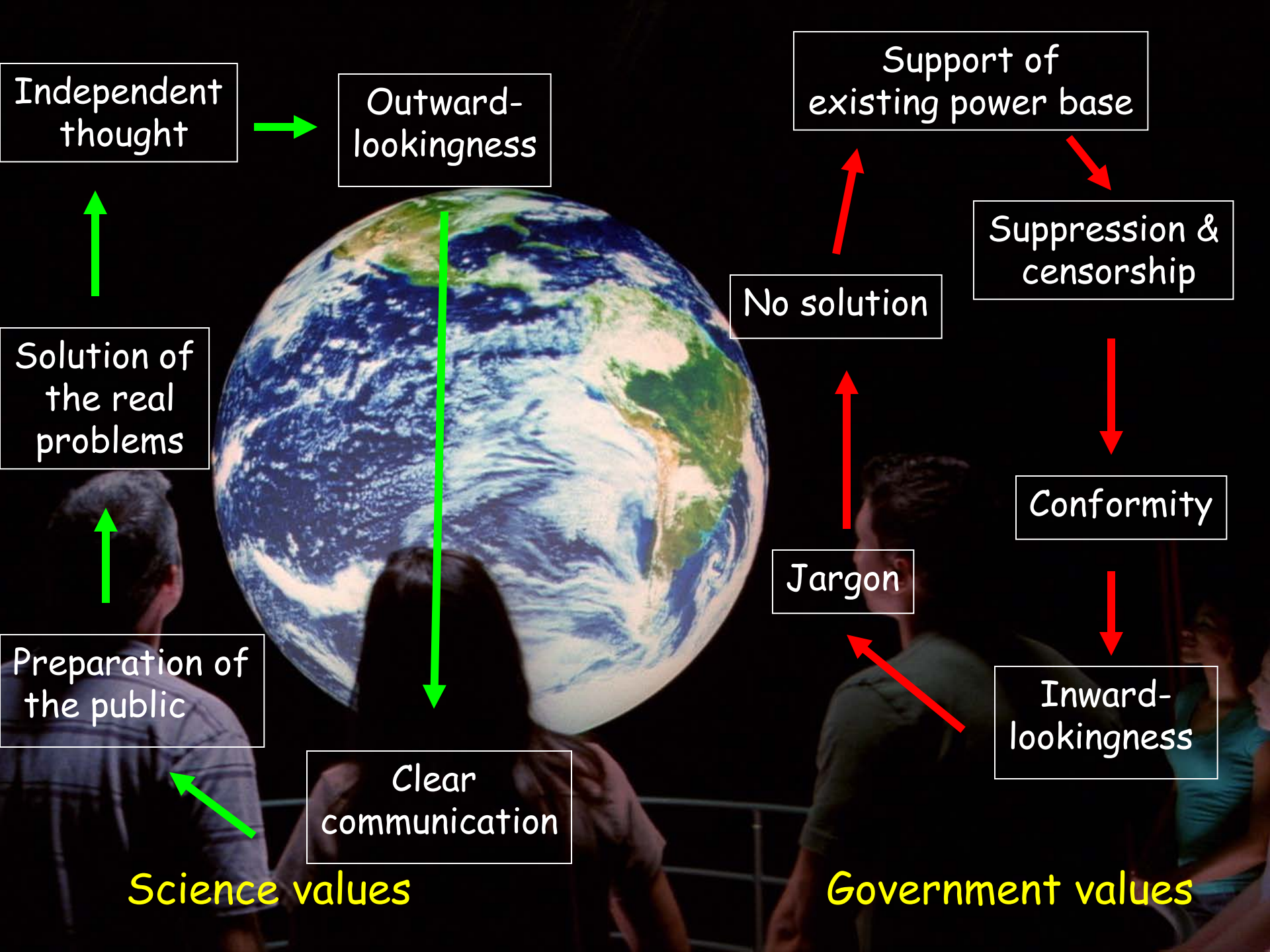
Change will have to come from bottom-up public concern. Scientists have a strong responsibility to educate, help & probably to lead



What would Gandalf like us to be doing?

- Looking outwards
- Priorities in informing the public not pandering to the existing power bases
- Readyng the public to promote positive change, and act when the inevitable environmental and social crises come
- Communicating





- 
- An aerial photograph of a large, multi-colored cyclone or storm system. The storm is characterized by a central eye and several concentric rings of clouds. The colors range from dark blue and purple in the outer rings to bright yellow and white in the inner rings, indicating varying cloud heights and intensities. The storm is positioned over a green landscape, possibly a coastal area, with a dark, winding path or river visible in the lower-left quadrant. The overall scene is dramatic and captures the immense scale and power of the weather system.
- Equalise access to government by commercial lobbies and opposing views. Make it entirely public
 - Bring in top-flight intellectuals & scientists in the development of policy and legislation at every stage
 - Change the balance of funding from development to research
 - Improve hugely the standards of communication between scientists and everyone else

We would rather be ruined than changed
We would rather die in our dread
Than climb the cross of the moment
And let our illusions die

W.H. Auden, Epilogue, *The Age of Anxiety*, 1947

