

Pharmacy Education Triangle: Linking education, science and stakeholders

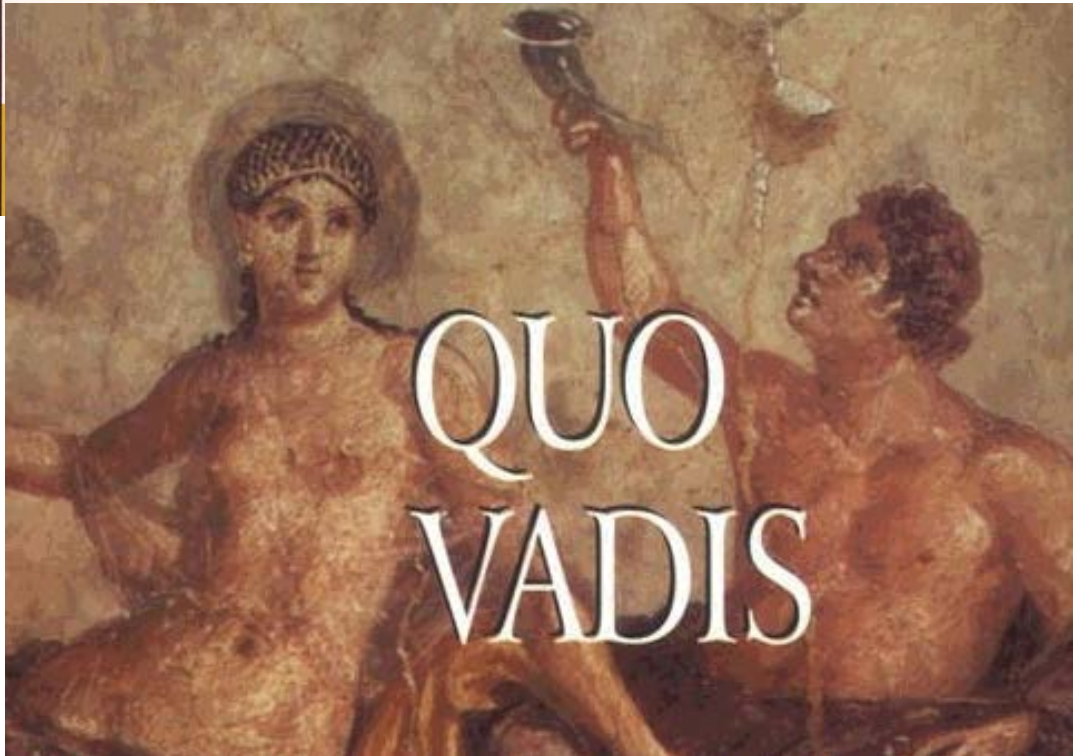
Scenario analyses

**EAFP meeting
Slovenia May 2014**

**Daan J.A. Crommelin,
Emeritus professor Utrecht University**



THE FUTURE.



Scenarios are not forecasts

Ljubljana Weather Forecast – 10 Day (Ljubljana, Slovenia)

10 Day Weather Forecast Issued: 1 pm Wed 21 May local time

[View 3 Hour Detailed Ljubljana Weather Forecast for Today](#)

Ljubljana 1 – 3 Day Weather Forecast Summary: Mostly dry. Warm (max 25°C on Thu afternoon, min 15°C on Wed night). Wind will be generally light.

	Wed 21 after- noon	Wed 21 night	Thu 22 morn- ing	Thu 22 after- noon	Thu 22 night	Fri 23 morn- ing	Fri 23 after- noon	Fri 23 night	Sat 24 morn- ing
Weather Map <i>See all maps</i>									
Metric <input checked="" type="radio"/>									
Imperial <input type="radio"/>									
Wind (km/h)	15	10	15	20	15	20	15	10	10
Summary	clear	clear	clear	clear	clear	clear	some clouds	clear	clear
Rain (mm)	-	-	-	-	-	-	-	-	-

Scenario analysis: Applications in the private sector

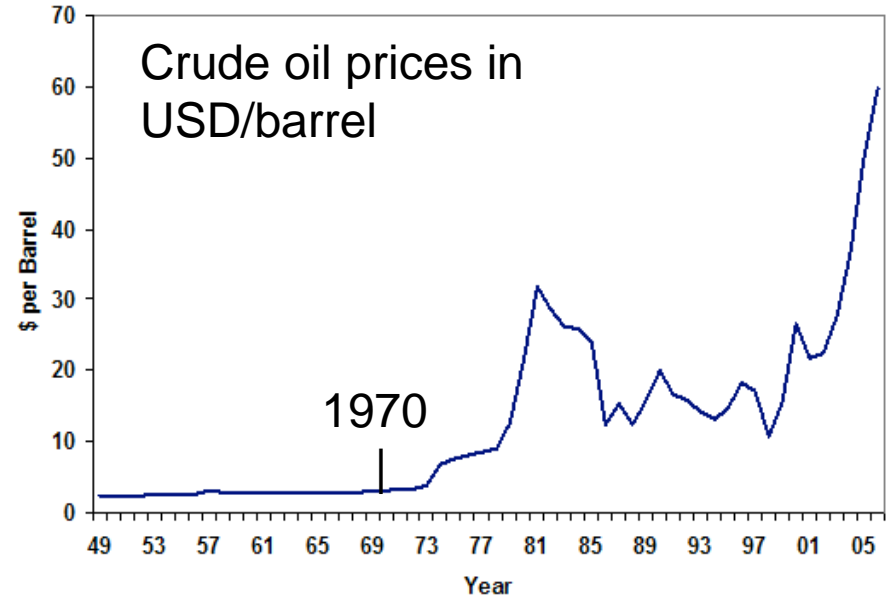


Pierre Wack
(1922- 1997)

The oil industry in the early 70s, assumptions:

1. Oil would remain plentiful;
2. Prices would remain low.

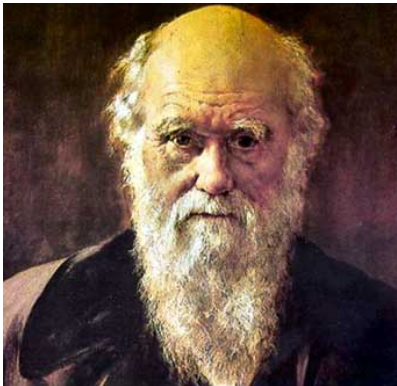
But: What if an accident in Saudi Arabia led to the severing of an oil pipeline? What would happen to global supply and prices?



1973 – Yom Kippur war / oil embargo:
1979 – Iranian Revolution
1980-1988 – Iran/Iraq war
1990 – Iraq invades Kuwait
And so on...

Scenario analysis

- Scenarios are not forecasts
- Scenario planning is about changing minds, not making plans
- Scenarios are learning devices to take a long view and to open (rusty) mental maps
- Think the unthinkable



Charles Darwin
(1809 - 1882)

And keep in mind:

It is ***not*** the survival of the fittest.....

It is the survival of those who can ***adapt best***

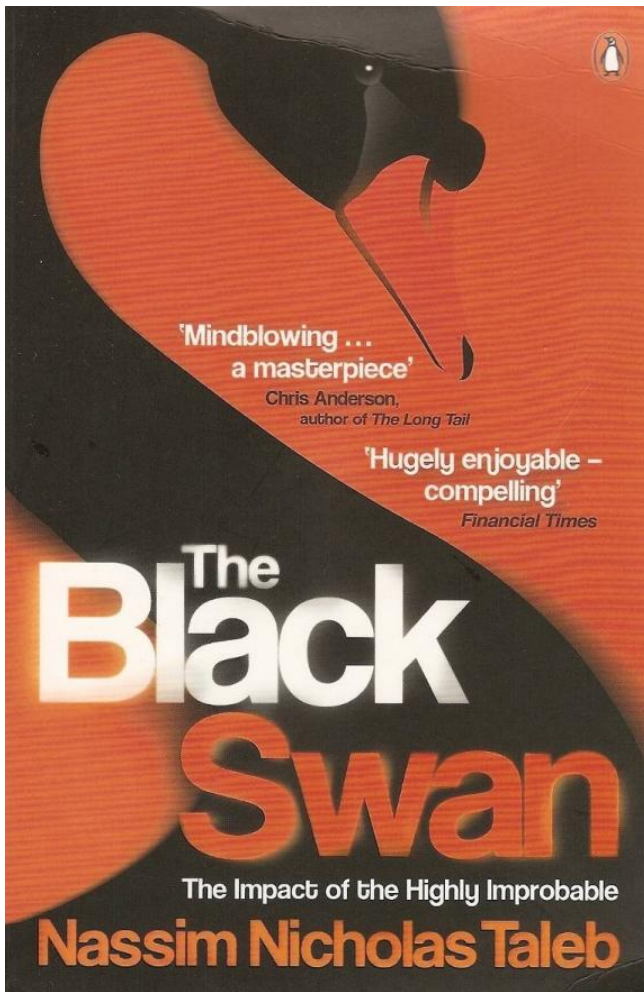
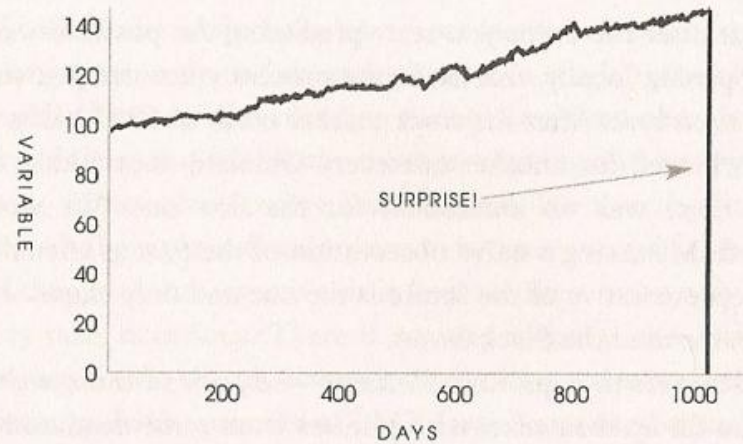


FIGURE 1: ONE THOUSAND AND ONE DAYS OF HISTORY

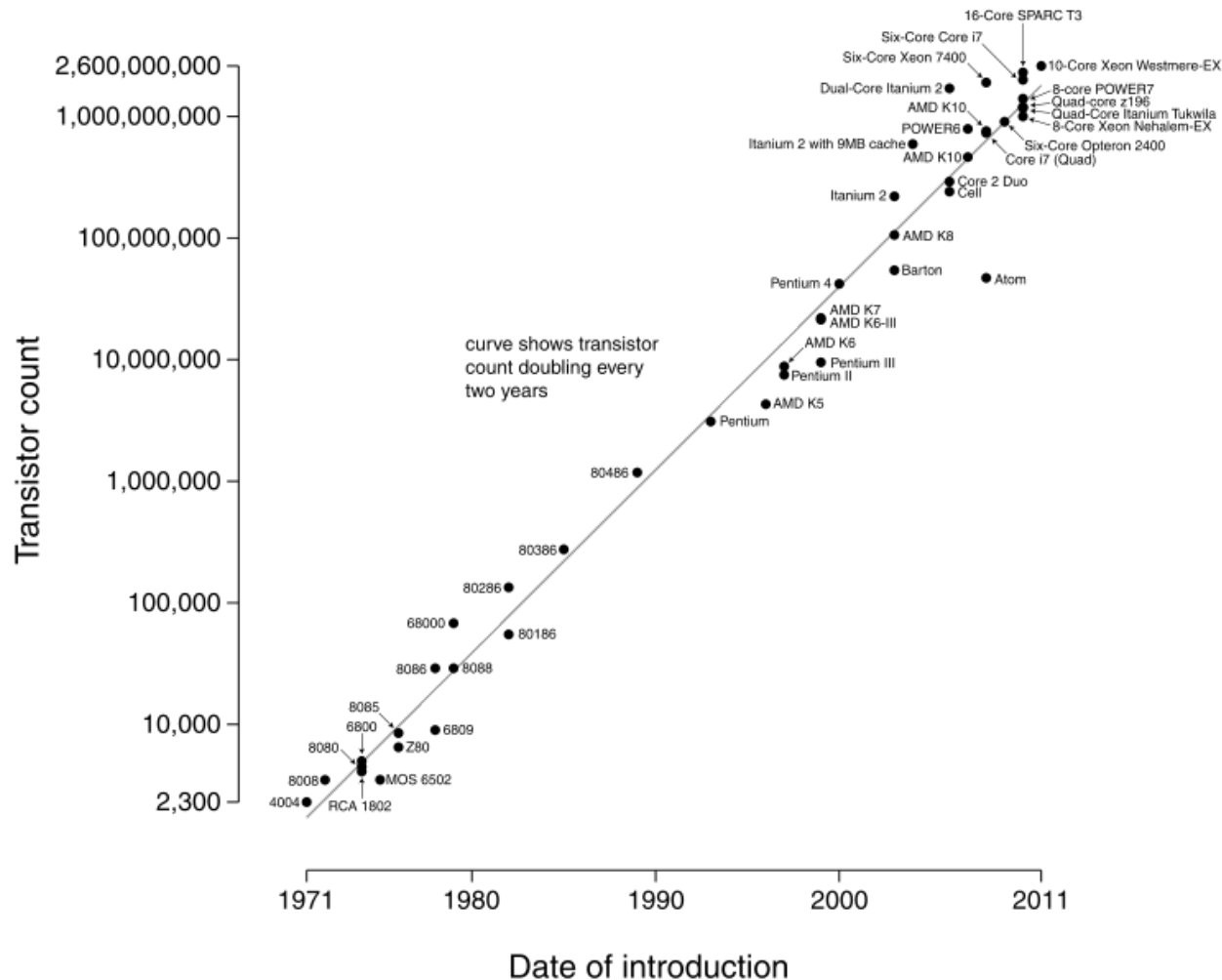


A turkey before and after Thanksgiving. The history of a process over a thousand days tells you nothing about what is to happen next. This naïve projection of the future from the past can be applied to anything.



We are **not** accustomed to think in exponential terms, but some developments are exactly like that...

Microprocessor Transistor Counts 1971-2011 & Moore's Law



the number of transistors on integrated circuits **doubles approximately every two years**



October 2008 – Meeting in Amsterdam BPS – FIP (International Pharmaceutical Federation) as organizer/driver for a scenario analysis for 2020

About 30 experts, including: investors, industry professionals, academics, regulators, NGOs, pharmacists




Plenary presentations



Small group discussions





What is the most important driver for the future?

1. Molecular biology, biomarkers, genomics
 2. Information and other new (material) technologies
 3. Rethinking pharma business model
 4. Funding and investing models, risk sharing
 5. Regulatory constraints and opportunities
 6. Health care environment, payers in the hot seat
 7. Therapeutic gaps, unequal access
 8. Patient/public advocacy, zero risk culture, ethics
 9. Demographics, longevity, chronic diseases
 10. Globalization, emerging markets (BRIC countries)
 11. Financial system
- 

Based on expert input we created 2 axes for scenario drivers

Attitude towards treatment and prevention of diseases

- Non-pharmacological

vs

- Pharmacological

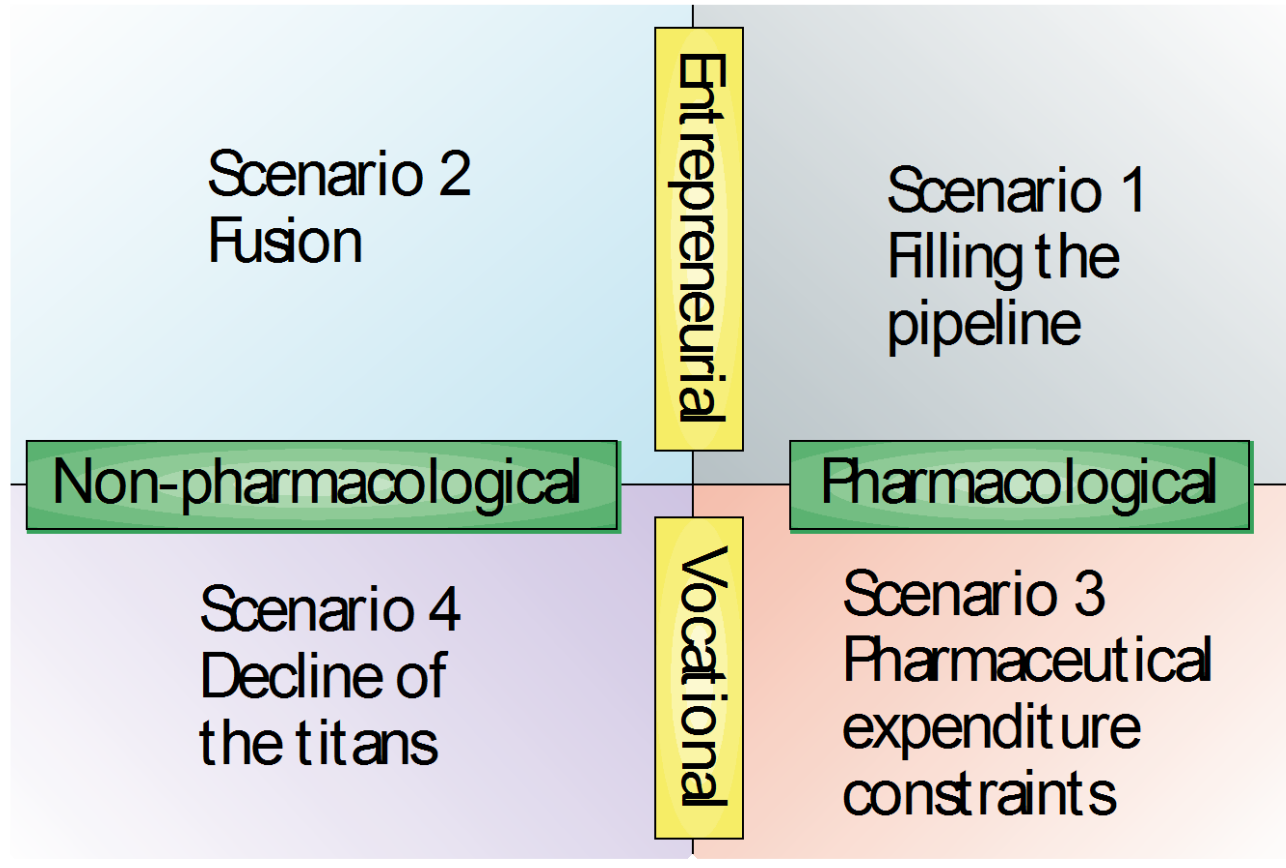
Science Culture

- Dominance of entrepreneurial science

vs

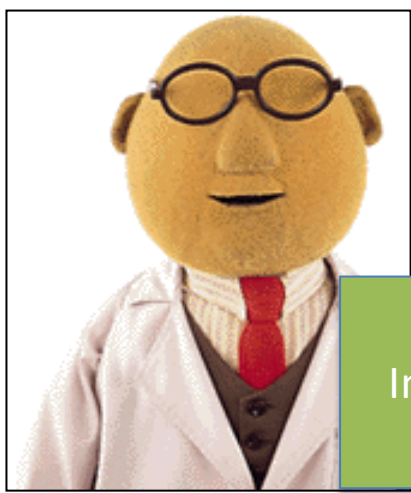
- Dominance of vocational science

The 2 x 2 scenario matrix is the basis for the 4 scenario narratives



- Science culture
- Treatment and prevention of diseases

Narrative Scenario I – Filling the pipeline



Industry

Academia

Funding

Regulation

- The patent cliff has been crossed: big pharma dominant in innovation, SMEs as suppliers of early-stage developments;
- Governments are partners through PPPs.
- Academia works closely with Industry;
- Entrepreneurship is highly valued.
- Basic and applied sciences are well funded;
- Substantial part of funding is channelled through PPPs.
- Strong drive for global harmonization;
- Regulators are faced with high-tech and complex technologies.



ELSEVIER



Commentary

The pharmaceutical sciences in 2020—Report of a conference organized by the Board of Pharmaceutical Sciences of the International Pharmaceutical Federation (FIP)

Vinod P. Shah^a, Luc J.R. Besançon^{a,*}, Pieter Stolk^b, Geoffrey Tucker^{a,c,d}, Daan J.A. Crommelin^{a,b}

^a International Pharmaceutical Federation (FIP), Netherlands

^b Dutch Top Institute Pharma, Netherlands

^c Simcyp Ltd, Sheffield, UK

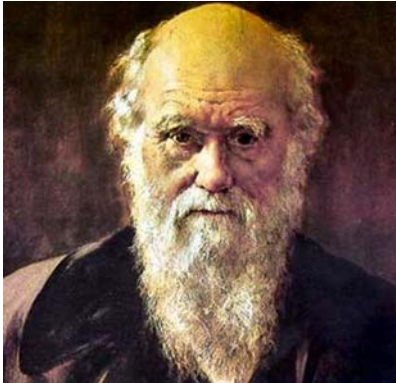
^d University of Sheffield, UK

FROM THE ANALYST'S COUCH

Pharmaceutical sciences in 2020

*Daan Crommelin, Pieter Stolk, Luc Besançon, Vinod Shah,
Kamal Midha and Hubert Leufkens*

Can we cope with new developments? Case study

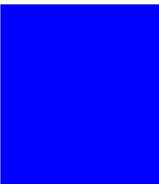


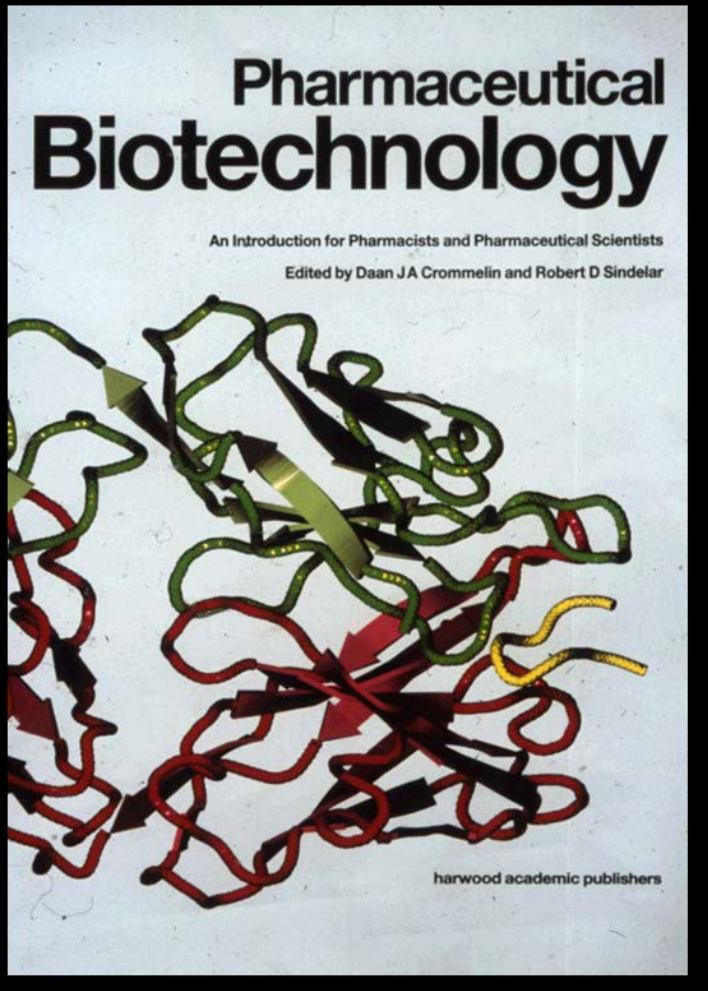
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(1809 - 1882)

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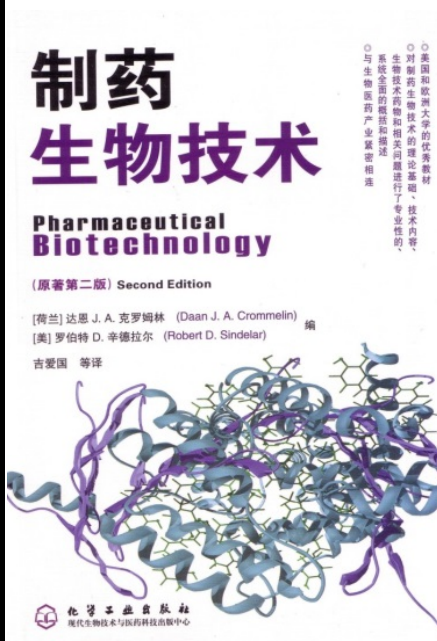
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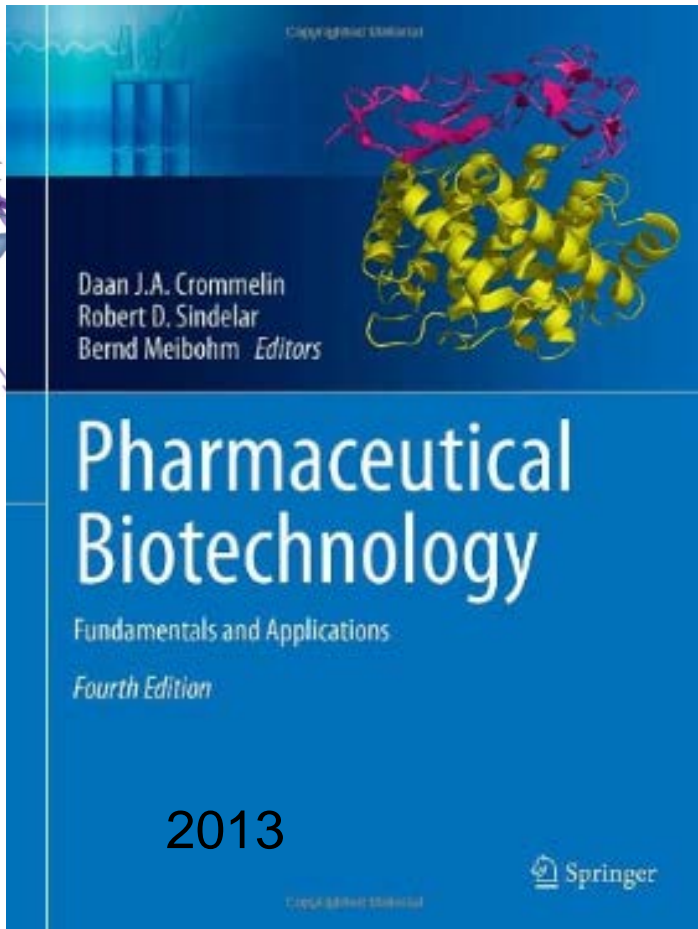




Pharmaceutical Biotechnology
Edited by Crommelin and Sindelar
Taylor and Francis, 1997



2013: Biologicals sales: 90 billion\$



Blockbusters in 2012: ranking in terms of global revenue

7/10 are biopharmaceuticals

→	1	Humira	→	9	Avastin
→	2	Enbrel		10	Lipitor
	3	Advair/Seretide		11	Abilify
→	4	Remicade		12	Plavix
→	5	Rituxan		13	Cymbalta
	6	Crestor		14	Gleevec
→	7	Lantus		15	Spiriva
→	8	Herceptin			

ORIGINAL ARTICLE

How to select a biosimilar

Niels Boone,¹ Hugo van der Kuy,¹ Mike Scott,² Jill Mairs,² Irene Krämer,³
Arnold Vulto,⁴ Rob Janknegt¹

ABSTRACT

In the past few years biosimilars have penetrated the market following the expiry of patents of originator variants. This offers the opportunity to apply high-tech

A different generic approach

Non-protein drugs are typically organic molecules of low molecular mass and well defined molecular structure. Because the molecular structure of such

Introduction of pharmaceutical biotechnology as subject in curricula of schools of pharmacy in Europe?

Quick survey among 8 schools of pharmacy in Europe: Very little attention/difficult to judge



*PHAR-IN: Competences for industrial
Pharmacy practice in biotechnology*

PHAR-IN: competences for industrial pharmacy practice in biotechnology.

A project funded by the EU: No

November 2015.

Coordinator:

Kristien De Paepe, P1, VUB, Brussel

Executive director:

Jeffrey ATKINSON, P2, PCN, Nancy
consultants.com/ (consultancy)



university)

[rraine.fr](http://pcn-rraine.fr), <http://pcn->

Partners:

P3: EIPG. jane@nicholi.plus.com (EU industrial pharmacist's association)

P4: Faculty of Pharmacy, University of Catania giuseppe.ronsisvalle@unict.it (university)

P5: Genzyme Belgium. gunther.pauwels@Genzyme.com (biotech big pharma)

P6: Areta International. vsousa@aretaint.com (biotech SME)

This project has been funded with support from the European Commission - 538252-LLP-1-2013-BE-ERASMUS-EKA

This communication reflects the views only of the author.

The Commission cannot be held responsible for any use which may be made of the information contained therein.



Future knowledge

4 scenarios for the future of Dutch universities



The scenarios

On the other side of this flap you will find the 4 scenarios. Useful to keep to hand while you read.

National solidarity



A stable environment with little competition

European variation



Society emphasises public value of education and research

A hyper-competitive environment in which competitive advantages are highly volatile



Regional power

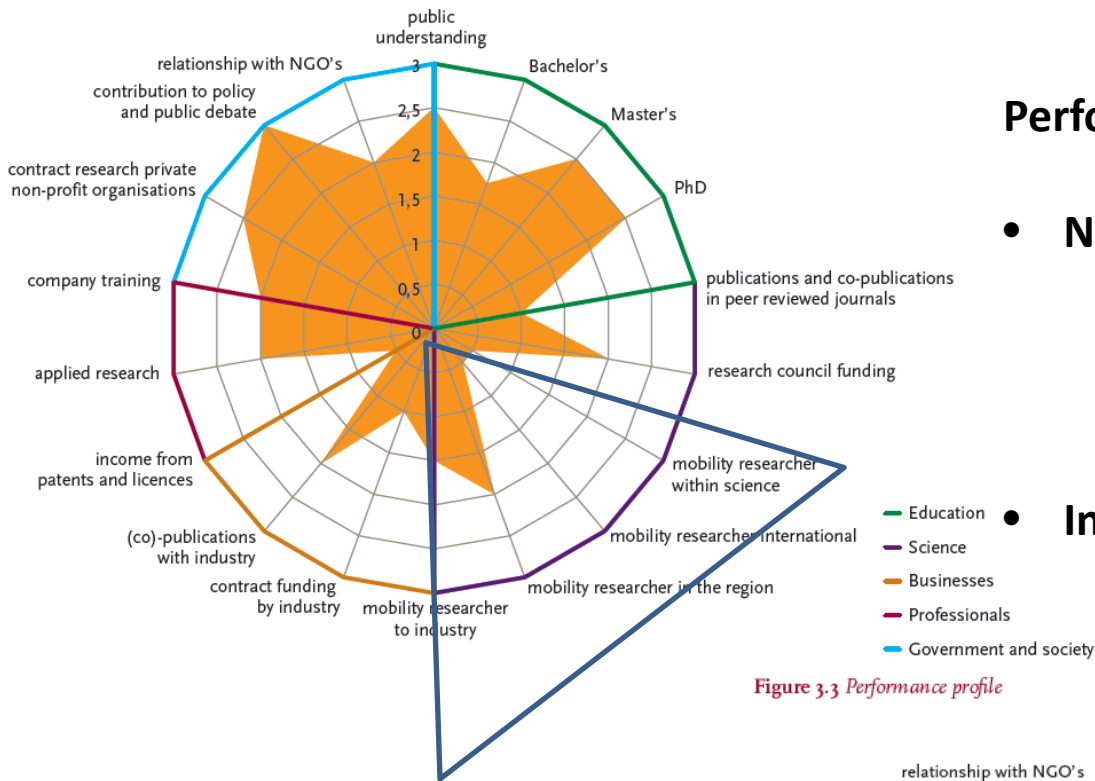
Knowledge is seen as a private commodity



International selection



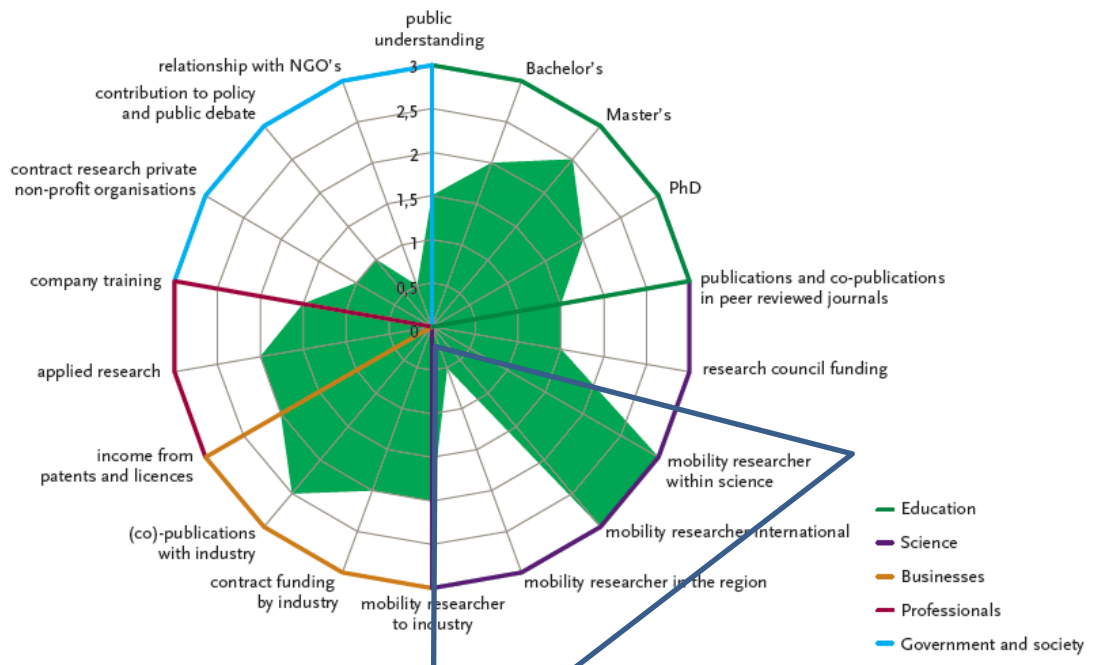
Figure 1.3 Performance profile



Performance profile for two scenarios

- National Solidarity
- International selection

Figure 3.3 Performance profile





And keep in mind:

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It is the survival of those who can ***adapt best***

How to improve adaptability?

- Improve the interaction between academia and stakeholders (think tanks, advisory boards,...)
- Stimulate mobility of knowledge workers, between knowledge institutions and public and private pharmaceutical institutions
- No permanent contracts anymore.....
- But, keep *education and research* in the Schools together

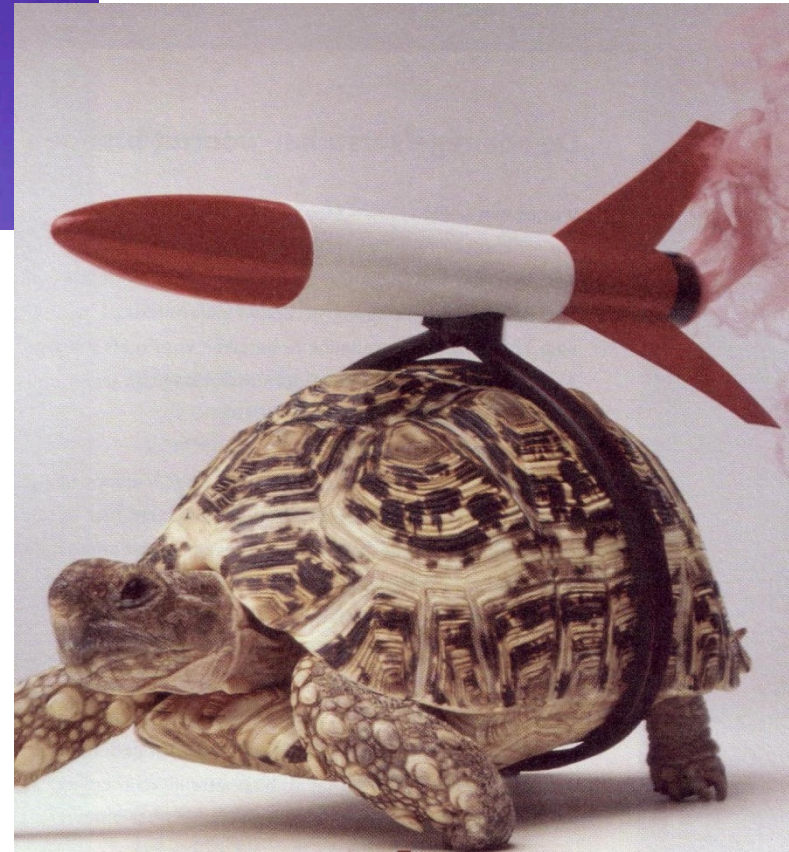
Number of pharmacist among **full time** professors at different schools of pharmacy/quick survey (September 2013)

• Croatia Zagreb	10/18
• Portugal Lisbon	10/10
• Germany Frankfurt	8/10
• The Netherlands (Gron/Utrecht)	1/17
• Japan Kyoto	12/15
• UK Nottingham	8/15
• UK London	12/20
• USA Utah	8/38
• Belgium Leuven	22/26

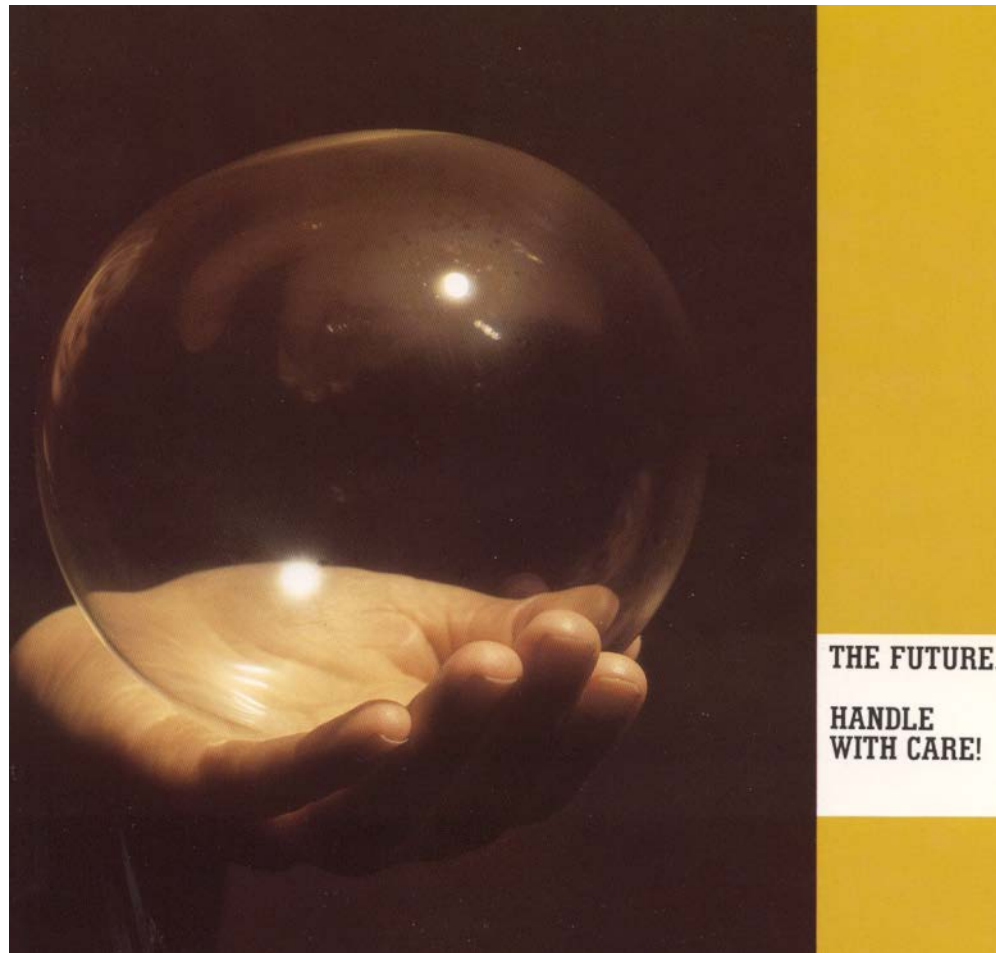


Pharmacist-professor in NL

In Aesop's fable,
the thirsty crow knows that
in order to get a drink from
the pitcher, he must force
the water to rise, one stone
at a time



Alternative to Scenario Analysis



MEDICAL STUDENT CONCENTRATION DURING LECTURES

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R. J. D. RUTHERFORD

*Advisory Service on Teaching Methods, University of
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THE LANCET, SEPTEMBER 2, 1978

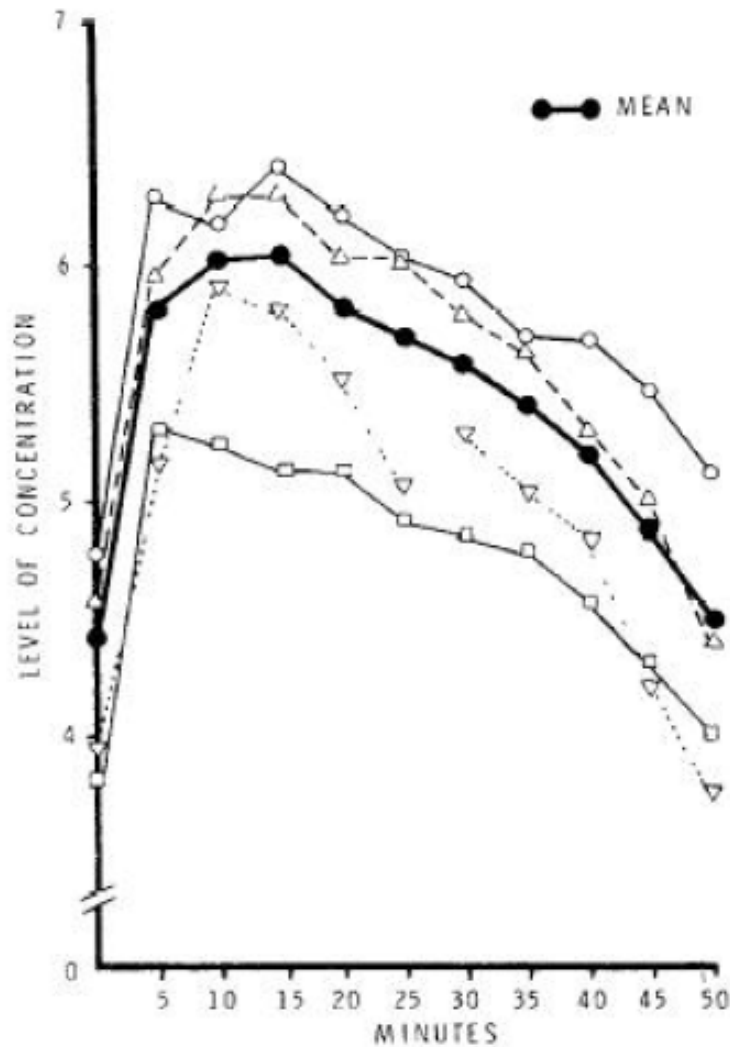


Fig. 2—Variation in mean level of student concentration with time from start of lecture (mean for 12 lectures plus profiles for each of the four lecturers).