

Science Governance: priority to scientific institutions

J.P.Contzen

Universidade do Porto

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The new World of Science (1)

- Science and its role in Society has largely evolved since Einstein's time when he affirmed :
" Science should be done in isolated communities away from economic pressures"
- Science can no longer be performed in splendid isolation and the pressure from Society is unavoidable. Together with its companion Technology, its contribution to economic and social development, to security and welfare, has become essential.

The new World of Science (2)

- The link between Science and Education on the one hand and Science and Innovation on the other hand have been so much reinforced that they create now a continuum that must be steered in a coherent fashion.
- Science requires more resources, financial and human, than it was the case in the past.
- Science has always developed itself beyond political borders but globalization, the creation of transnational political structures such as the EU, have accelerated the pace of internationalization.

The new World of Science (3)

- This evolution dictates a reengineering of the scientific system:
 - In the way it is controlled - *policy*
 - In the way it is structured - *institutions*
 - And in the way it is operated – *autonomy*
- Good governance requires a clear identification of the constituting components of the scientific system.

The components of the scientific system (1)

- These components belong both to the public and the private sectors.
- In the private sector:
 - *Corporate research centers*: mostly at the level of large industries. Until now, in most cases, “fortresses” heavily guarded and closed to the outside world.
 - *Professional cooperative research centers*: a way (the only one?) for SME's to perform research.
 - *Private Scientific Foundations*: generally based on the initiative of individuals, with precise objectives.
 - *Private Think Tanks*: give a certain arm's length relationship with their sponsors, back to Einstein concept.

The components of the scientific system (2)

- In the public sector:
 - *The University*: traditionally the seat of Science, combining research and education. Scientific activities organized mostly on a disciplinary basis. Little inclined in the past to collaborate with the economic world.
 - *Public research laboratories*: created to serve the State in its exercising its sovereign functions. In many cases, another type of “fortress” by fear of loss of neutrality.

The components of the scientific system (3)

- In the public sector (cont.):
 - *Institutes of Academies of Science*: a variant to public research laboratories, a Russian success.
 - *Public Think Tanks*: same motivation as for the private ones.
 - *Public Foundations, Research Councils*: mostly funding agencies with policy implementation functions.

Policy for a complex system (1)

- Organizing in an effective way the various components of the system is compulsory. This is the role of the State, irrespective of its political inspiration. Leaving it to self-organization or market forces is not effective for complex, interactive, dynamic systems.
- Organizing means:
 - Creating a favorable regulatory and fiscal environment for private research, notably for SME's.
 - Establishing measures inciting collaboration between the various components.
 - Favoring the links with Education and Innovation.

Policy for a complex system (2)

- Organizing means (cont.):
 - Allowing structural adaptation.
 - Providing the adequate resources for the operation of the public segment. This implies prioritizing access to these resources.
 - Applying the subsidiarity principle: determining the right level of action, international, EU, national, regional.
 - Exercise control essentially through peer review.

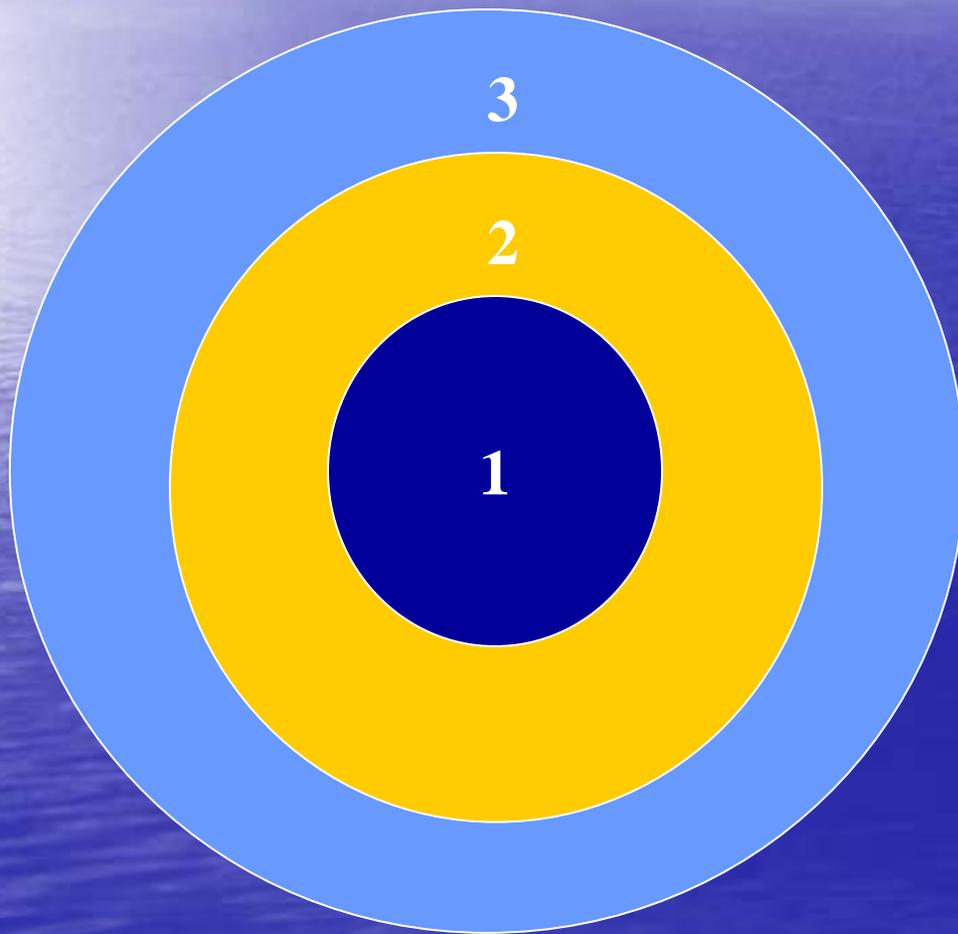
Policy for a complex system (3)

- What organizing does not mean:
 - Being too much top-down and yielding to short-term fashion. Science still needs a bottom-up component. Reinstall some Science push: in recent times, the emphasis has been too much on demand/market pull. The excess of “utilitarian” Science is sterile in the long term.
 - Forcing alliances between reluctant partners or introducing rigidity in networking.
 - Being too prescriptive, setting too much details in defining priorities.
 - Applying micro-management rather management by objectives: define what should be achieved but not how it should be done.

Institutions (1)

- Among all institutional components, five deserve particular attention:
 - *The University* (the real one) emerges as the backbone component of the scientific system. It has gained strength and influence on the institutional scene. It has to adapt itself to its reinforced role, notably by opening itself to partnerships, by reorganizing its interface with the outside world. While strengthening disciplinary science within its core, it should develop interdisciplinary science in an outer layer, in strong interaction with other public and private actors.

A new structure for the University



Three layers:

1:teaching and basic research in disciplinary areas

2:teaching and research in multidisciplinary areas

3:innovation (spin-offs, incubators, joint ventures, entrepreneurship centers, etc) as well as social fora

Institutions (2)

- *Public Foundations, Research Councils*: their role should be reinforced. Creation of a European Research Council, leading role of Russian Foundations.
- *Private Corporate Research*: needs to open itself to partnership with the University.
- *Think Tanks*: their usefulness within the system should be better recognized, notably for assessment and foresight.

Institutions (3)

- *Public Research Laboratories*: the component that requires the most attention. Do they maintain a useful role in the system? Yes, if:
 - They are the site of big/specialized/sensitive infrastructures that Universities could not or should not possess (CERN, VKI, nuclear installations)
 - They concentrate on direct assistance to policy formulation or implementation where their proximity to government is an asset.
 - They are the foci, the assemblers of advanced research performed with University (Nanotechnology in Japan, Chemistry in Russia, Life Sciences at French CEA)

Institutions (4)

– *Public Research Laboratories (cont.):*

- Their role in industrial innovation is a question mark. Industry does not appear to be much interested.
- In all cases, the reinforcement of the two-way cooperation with the University is essential. Should it go as far as to apply the US GOCO system of Federal Laboratories being run by Universities?
- Public research centers, even coming from different horizons, should institutionalize their dialogue.

Autonomy (1)

“The crazy desire of always being in control not only leads to unacceptable costs, but is increasingly choking social and political creativity”

Thomas Held, Avenir Suisse

- The autonomy of scientific institutions means having a say in the organization of its activities while respecting strictly the mandate and the boundary conditions defined by the governing authority. Autonomy is only viable if trust does exist between those who delegate and those who receive the delegation.

Autonomy (2)

- Autonomy allows the introduction of management practices adapted to the new environment:
 - The decentralization within the scientific structures themselves.
 - The introduction of modern administrative and financial procedures.
 - The setting-up of a human resources' policy adapted to the specificity of the scientific career, promoting scientific mobility.
 - The observance of an adequate balance of power between the scientific community and the administration.
 - The reinforcement of the inner governance by installing such structures as Board of Trustees or Strategic Councils.

In conclusion (1)

- Science has evolved to a degree of complexity requiring that the necessary creativity of isolated individuals should be completed – and not substituted – by networking. Good governance in networking means taking care about the links (cooperation, competition) but also about the nodes, i.e. the institutions. These institutions should be framed within a clear policy context and enjoy an appropriate autonomy respectful of the prerogatives of their authorities.

In conclusion (2)

- The scientific system of the 21st Century should belie the 20th Century vision expressed by the US philosopher George Santayana (1863-1952) in *"The Crime of Galileo"* :

"The working of great institutions is mainly the result of a vast mass of routine, petty malice, self interest, carelessness, and sheer mistake. Only a residual fraction is thought".