

Scienza e democrazia nella Global Knowledge-society del XXI secolo



DIPARTIMENTO DI
SOCIOLOGIA E
RICERCA SOCIALE

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MaCSIS

Master in Comunicazione della Scienza
e dell'Innovazione Sostenibile

La relazione in breve

2

1. Knowledge = currency

Land, work/capital, knowledge= commodities

2. Short-termism

Quarterly-capitalism

4. Remedies not
diagnosis

Real things, not
(sociological)
imagination

Due battaglie
in una: Scienza
& democrazia

3. Publish AND perish!

Parody of an accountant
nightmare. The imbecile
idiom of the financial
fashion

5. Consensus-building

Remedies and social work

Natural sciences

A (brave?) new social structure

Horizon 2020 – a low-social-science one as an horizon!

More resources for R&D and innovation are a necessity but they are an insufficient means to achieve the goal of an Innovative Europe. A **paradigm change** is needed in which European values are preserved but in a new social structure.

An **independent monitoring panel** with support from the Commission should **report annually on progress** in relation to the Pact.

Europe and its citizens should realise that their way of life is under threat but also that the path to prosperity through research and innovation is open if large scale action is taken now by their leaders **before it is too late.**

Really is it possible?

Who wrote down such Pact?
What legitimacy?
Who signed it?

Who's threatening European values?
Too late at whose watch?
Our shorttermism is the problem,
not having short time to decide!

Science & society, Social sciences & Humanities lines of research

(9) In addition, the dialogue between science and society in Europe should be intensified in order to develop a science and research agenda that meets citizens' concerns, including by fostering critical reflection, and is aimed at reinforcing public confidence in science.

FP7 establishing act

(22) With the aim of deepening the relationship between science and society and reinforcing public confidence in science, Horizon 2020 should foster the informed engagement of citizens and civil society in research and innovation matters by promoting science education, by making scientific knowledge more accessible, by developing responsible research and innovation agendas that meet citizens' and civil society's concerns and expectations and by facilitating their participation in Horizon 2020 activities. The engagement of citizens and civil society should be coupled with public outreach activities to generate and sustain public support for Horizon 2020.

H2020 establishing act

*“in today’s global economy
knowledge is more like a
currency: the trick is to make it
work for you”*

Utilitarian argument

*“that’s why we want to turn
European Union in an
Innovation Union, the plan to
get good ideas to market faster”*

Acceleration, urgency

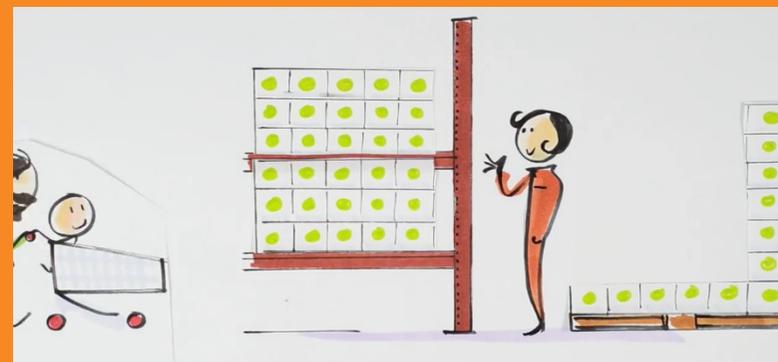
EC, 2014. Horizon 2020 video - General overview - European Commission. Available at:
<http://ec.europa.eu/programmes/horizon2020/en/news/horizon-2020-video-general-overview> [Accessed March
25, 2015].

*“deliver innovation from the lab to the market
much faster than anyone dreamed in Europe”*

(Strong) economic orientation

*“to boost the **economy**,
create jobs and improve life”*

Linear path from economic growth to
quality of life





EC, 2014. Horizon 2020 video - General overview - European Commission. Available at: <http://ec.europa.eu/programmes/horizon2020/en/news/horizon-2020-video-general-overview> [Accessed March 25, 2015].

*“Horizon 2020 will also be more in tune with science’s role in society, so it focuses on challenges we urgently need to address, like clean energy, recycling, caring for the elderly, health care, food safety and our oceans: **real things!**”*

Challenge-based approach
Frame of urgency
Pragmatism/anti-intellectualism

“Getting close to real every day needs like these doesn’t mean basic research is out in the cold. That’s the beauty of coupling science and innovation: it covers a much wider range, from research to retail and all forms of blue-sky thinking and innovative approach that make this possible”

Role of basic research: free but innovation (=market) oriented

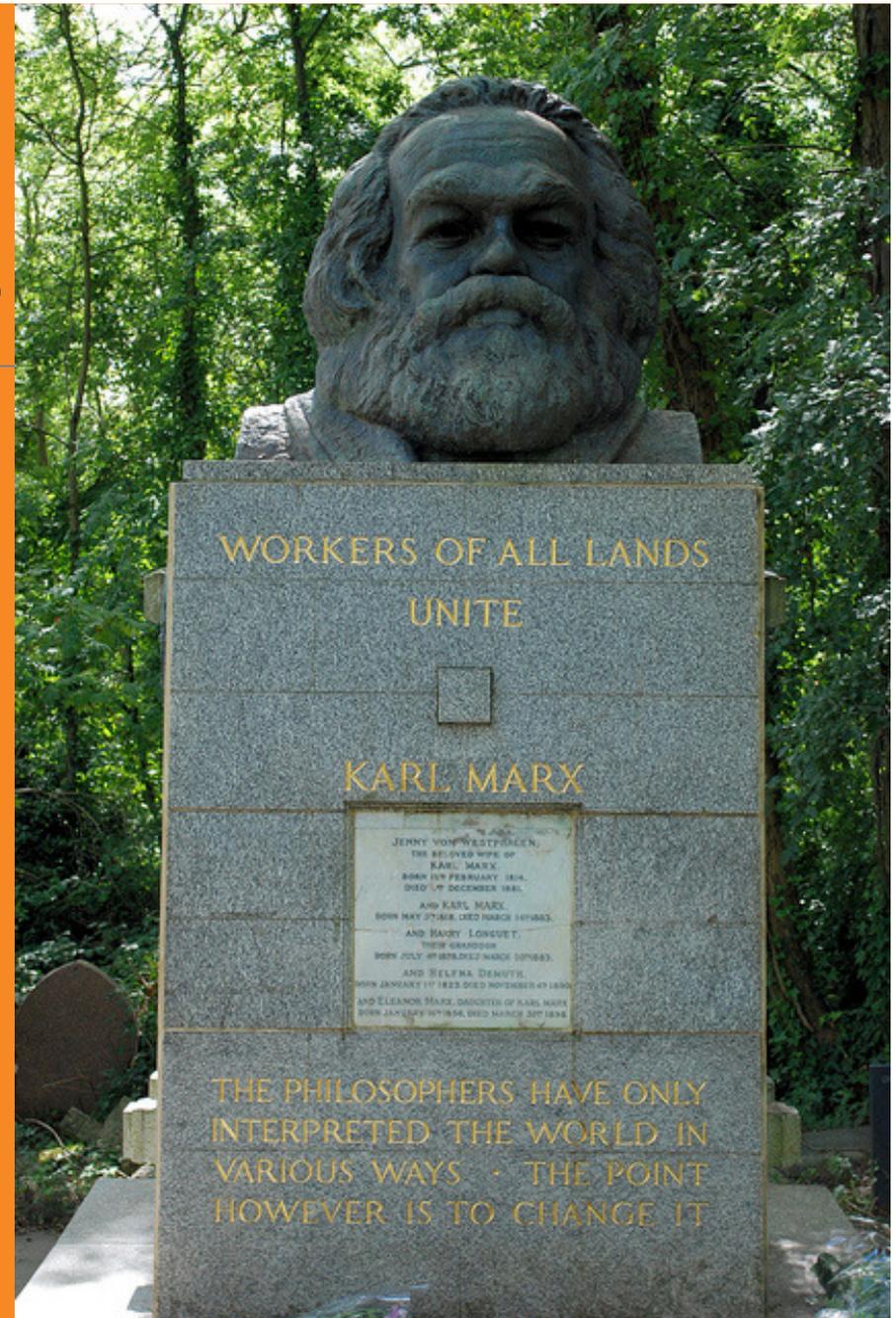
“Official” vision of the European Commission regarding the EU Framework Programme for research funding.



Andrea Cerroni (University of Milano Bicocca)
Rita Giuffredi (CERN, University of Bologna)

Anti-intellettualismo?

“There is a large gap between the rhetoric of a political system that preaches the knowledge society and the reality of budgetary and other priorities that have shown little shift in preparing to engage with it. Our emphasis is on **remedies not diagnosis** but we must also recognize the magnitude of the problem. There are many indicators both of insufficient effort to innovate and of the consequences of not doing so (...)”



Capire per cambiare (in meglio)

Paul Krugman (2015)

Until the Card-Krueger study, most economists, myself included, assumed that raising the minimum wage would have a clear negative effect on employment. But they found, if anything, a positive effect. Their result has since been confirmed using data from many episodes. There's just no evidence that raising the minimum wage costs jobs, at least when the starting point is as low as it is in modern America. How can this be? There are several answers, but the most important is probably that **the market for labor isn't like the market for, say, wheat, because workers are people**. And because they're people, there are important benefits, even to the employer, from paying them more: better morale, lower turnover, increased productivity. These benefits largely offset the direct effect of higher labor costs, so that raising the minimum wage needn't cost jobs after all.

Hillary Clinton (2015)

Too many pressures in our economy push us toward **short-termism**. Many business leaders see this. They've talked to me about it.

One has called it the problem of **quarterly capitalism**. They say everything is focused on the next earnings report or the short-term share price and the result is too little attention on the sources of long-term growth: research and development, physical capital and talent.

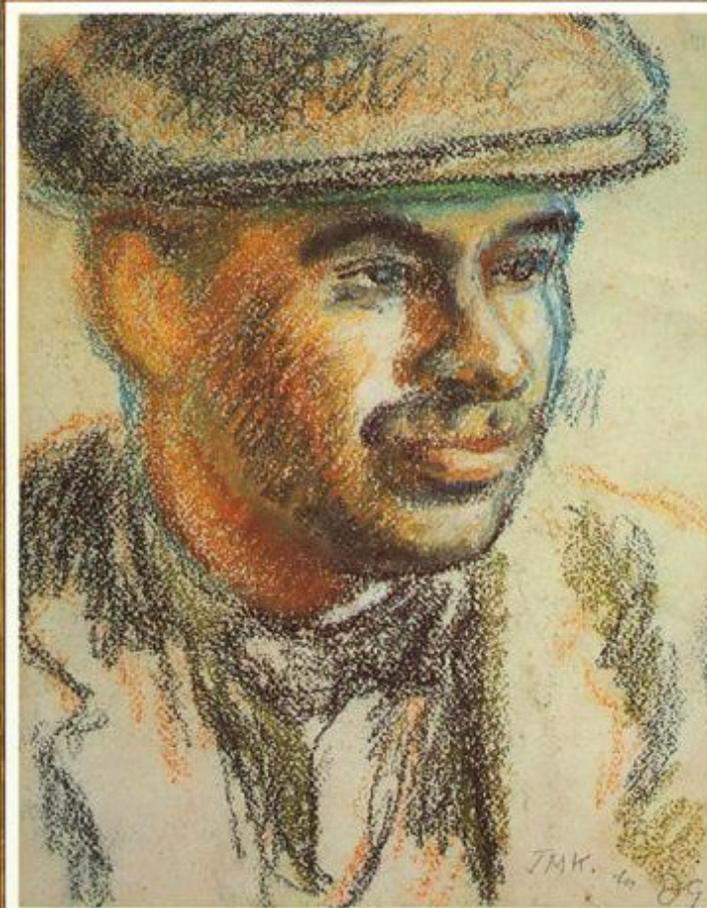
Net business investment, which includes things like **factories, machines and research labs, have declined** as a share of the economy.

In recent years some of our biggest companies have spent more than half their earnings to buy back their own stock and another third or more to pay dividends. That doesn't leave a lot left to raise pay or invest in the workers who made those profits possible or to make new investments necessary to ensure a company's future success. These trends need to change.

Parody of an accountant nightmare The imbecile idiom of the financial fashion

The nineteenth century carried to extravagant lengths the criterion of what one can call for short the financial results, as a test of the advisability of any course of action sponsored by private or by collective action. The whole conduct of life was made into a sort of parody of an accountant's nightmare. Instead of using their vastly increased material wealth and technical resources to build a wonder-city, they built slums; and they thought it right and advisable to build slums because slums on the test of private enterprise 'paid', whereas the wonder-city would, they thought, have been an act of foolish extravagance, which would in the imbecile idiom of the financial fashion have 'mortgaged the future'; though how the construction today of great and glorious works can impoverish the future no man can see until his mind is beset by false analogies from an irrelevant accountancy. . . .

But once we allow ourselves to be disobedient to the test of an accountant's profit, we have begun to change our civilisation. And we need to do so very warily, cautiously and self-consciously. For there is a wide field of human activity where we shall be wise to retain the usual pecuniary tests. It is the state, rather than the individual, which needs to change its criterion. It is the conception of the Chancellor of the Exchequer as the chairman of a sort of joint-stock company which has to be discarded.⁶⁶



MAYNARD KEYNES

An Economist's Biography

Adam Ferguson (1767)

It may even be doubted, whether the measure of national capacity increases with the advancement of arts. Many mechanical arts, indeed, require no capacity; they succeed best under a total suppression of sentiment and reason; and **IGNORANCE is the mother of industry as well as of superstition.** Reflection and fancy are subject to err; but a habit of moving the hand, or the foot, is independent of either. Manufactures, accordingly, prosper most, where the mind is least consulted, and where the **workshop may, without any great effort of imagination, be considered as an engine, the parts of which are men.**

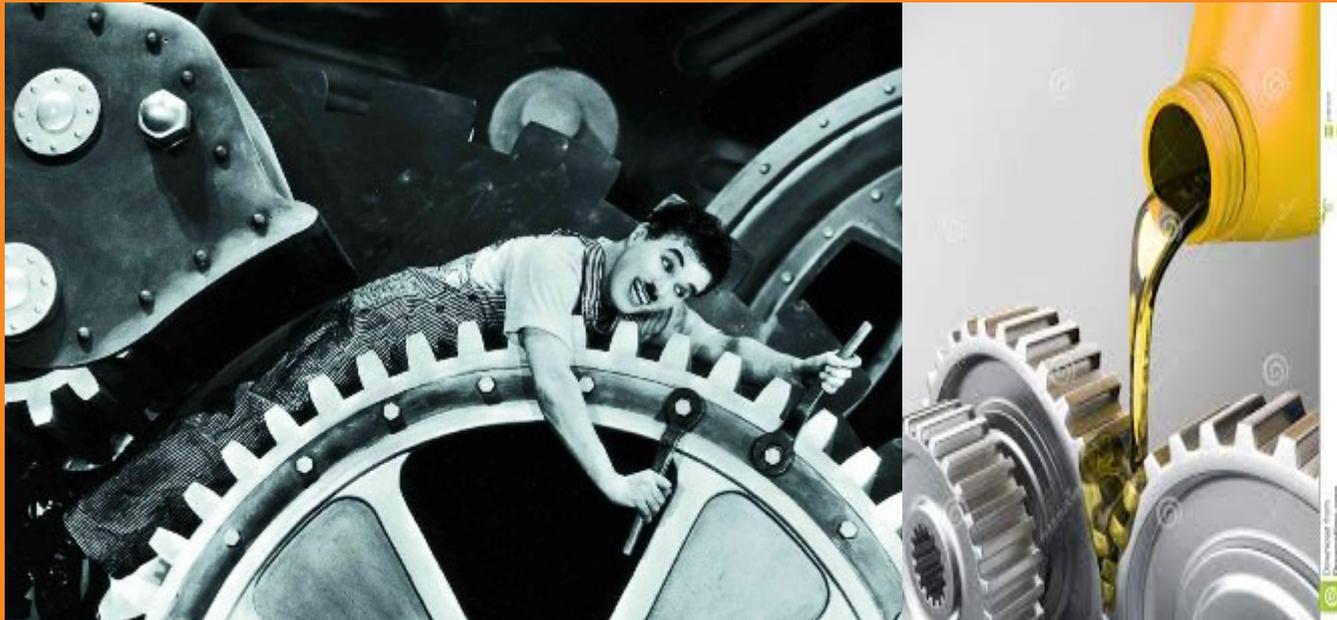
According to numerous governments and corporate funders, **education must favour economic value over independent inquiry and social engagement, while skills training must accept the paradox of increased demand and depressed rewards**—a contradiction at the heart of Stephen Harper’s assault on organized labour. If research is to be more short-term and for profit, then teaching must apparently be client-driven in the crudest sense, while community service must model itself on corporate partnerships where the risk is public and the benefits private.

So goes the shift from a liberal education to a neoliberal one; and from vocational training to training for a precarious workforce, in a fracked labour market rather than a unionized and occasionally fractious one. It is an economic policy shift which John Maynard Keynes in 1933 called “the imbecile idiom of the financial fashion.”

Now more than ever, those of us in the academy need to make the case for affordable access to quality education—education resting on the **tripod of academic freedom, fair compensation, and appropriate job security. We need to make that case for ourselves and for others because few academic managers care to do so any longer.**

Len Findlay, University of Saskatchewan, Past President of the Arts and Humanities Academy of the Royal Society of Canada. ORK - Our Right to Know 27-04-2015

A che serve la scienza sociale?



Consensus building???

A “cultural shift”, “before it’s too late”

“The problem is, however, that the Lisbon strategy has become too broad to be understood as an interconnected narrative.

Lisbon is about everything and thus about nothing. Everybody is responsible and thus no one. The end result of the strategy has sometimes been lost.

*An ambitious and broad reform agenda needs **A CLEAR NARRATIVE, IN ORDER TO BE ABLE TO COMMUNICATE EFFECTIVELY ABOUT THE NEED FOR IT.** So that everybody knows why it is being done and can see the validity of the need to implement sometimes painful reforms. So that everybody knows who is responsible.”*

Kok Report, 2004

*“Foster a **CULTURAL SHIFT WHICH CELEBRATES INNOVATION** and a desire to possess innovative goods and experience innovative services, such that Europe develops as a natural home for innovators”*

*“Europe and its citizens should realise **THAT THEIR WAY OF LIFE IS UNDER THREAT** but also that the path to prosperity through research and innovation is open if large scale action is taken now by their leaders **before it is too late.**”*

Aho Report, 2006

Social sciences and the Humanities in Horizon 2020

Social sciences and humanities

Social sciences and humanities research will be fully integrated into each of the priorities of Horizon 2020 and each of the specific objectives and will contribute to the evidence base for policy making at international, Union, national, regional and local level. In relation to societal challenges, social sciences and humanities will be mainstreamed as an essential element of the activities needed to tackle each of the societal challenges to enhance their impact. The specific objective of the societal challenge 'Europe in a changing world - Inclusive, innovative and reflective societies' will support social sciences and humanities research by focusing on inclusive, innovative and reflective societies.

Science and society

The relationship between science and society as well as the promotion of responsible research and innovation, science education and culture shall be deepened and public confidence in science reinforced by activities of Horizon 2020 favouring the informed engagement of citizens and civil society in research and innovation.

**Full integration or dilution?
Administrative (uncritical) social science?
The machine is good, we just need ... to oil the machine?
What is engagement? In what? For what?**

Vingt-six universités japonaises ont annoncé vouloir fermer leurs **facultés de sciences humaines et sociales**, ou du moins diminuer leur activité. Une décision qui fait suite à une lettre que le ministre de l'éducation, Hakubun Shimomura, a adressée le 8 juin aux présidents des 86 universités du pays, leur demandant « **d'abolir ou de convertir ces départements pour favoriser des disciplines qui servent mieux les besoins de la société** ».

Sur les soixante universités publiques qui proposent des cours dans ces disciplines, incluant le droit et l'économie, **dix-sept comptent cesser d'y recruter des étudiants**, précise un sondage publié par le quotidien conservateur Yomiuri Shimbun, que cite le Time Higher Education.

Les réactions ne se sont pas fait attendre. Le conseil scientifique japonais a exprimé en août « sa profonde préoccupation concernant l'impact potentiellement grave qu'une telle directive administrative implique pour le **futur des sciences humaines et sociales au Japon**. »

Une politique « anti-intellectuelle »

Plusieurs universités, dont celles de Tokyo et Kyoto, considérées comme les plus prestigieuses du pays, ont annoncé qu'elles n'appliqueraient pas la mesure. Takamitsu Sawa, le président de l'université de Shiga, s'est pour sa part insurgé, dans une tribune au Japan Times, contre la posture « anti-intellectuelle » du gouvernement, qui continue « d'évaluer l'apprentissage académique et les sciences en termes utilitaires. »

Selon lui, la politique du premier ministre Shinzo Abe fait écho à celle de son prédécesseur Nobusuke Kishi, qui, en 1960, avait voulu supprimer ces départements des universités publiques, afin qu'elles **se concentrent sur les sciences naturelles et l'ingénierie**. Dans le Japon impérial de la seconde guerre mondiale, déjà, une injustice permettait « aux étudiants de sciences naturelles et d'ingénierie d'être réformés, tandis que les étudiants en sciences humaines devaient servir dans l'armée », explique M. Sawa.

Karl Marx (1844)

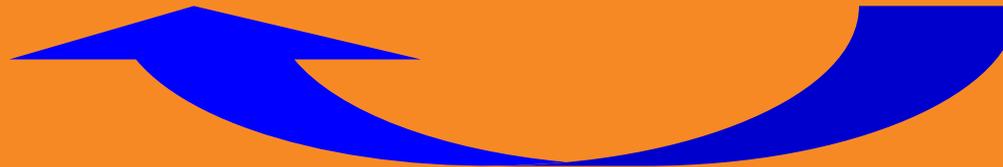
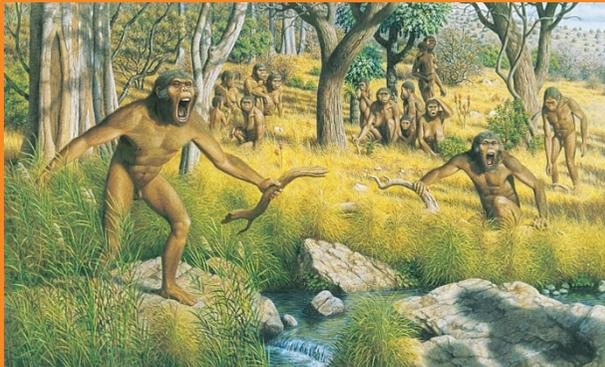
La scienza naturale comprenderà un giorno la scienza dell'uomo, come la scienza dell'uomo comprenderà la scienza naturale: non ci sarà che *una* scienza.

L'uomo è oggetto immediato della scienza naturale; perché l'immediata natura sensibile è, per l'uomo, immediatamente la sensibilità umana (un'espressione identica), immediatamente come l'altro uomo presente a lui sensibilmente; perché la sua propria sensibilità c'è per lui stesso come umana sensibilità solo mediante l'altro uomo.

Ma la natura è oggetto immediato della scienza dell'uomo, il primo oggetto dell'uomo – l'uomo – è natura, sensibilità, e le peculiari forze sensibili essenziali all'uomo, in quanto hanno la loro oggettiva realizzazione soltanto in oggetti naturali, possono trovare la loro autoconoscenza soltanto nella scienza dell'ente naturale in genere.

L'elemento stesso del pensare, l'elemento della manifestazione vitale del pensiero, il linguaggio, è di natura sensibile. Realtà sociale della natura e scienza naturale umana, o scienza naturale dell'uomo, sono espressioni identiche.

DOPPIO CONTENIMENTO NATURA \leftrightarrow SOCIETÀ



Natural & Social Sciences: contenimento reciproco

- **Science** needs good citizens (beyond technocracy):
 - Brain power (numbers, openness, civiness)
 - Thought freedom (qualified public opinion)
 - Common sense applied with rigour
- **Democracy** needs good knowledge (beyond demagogy):
 - Knowledge-able citizens for good democracy
 - Social & natural sciences for good policies (coproduction)
 - Knowledge (extended typology) as means and ends

Misurare!

Keith Hoskin (1996)

When a measure becomes a target, it becomes a bad target.

‘The awful idea of accountability:
inscribing people into the
measurement of objects’

The San Francisco Declaration on Research Assessment (DORA), initiated at the 2012 Annual Meeting of the American Society for Cell Biology by a group of editors and publishers of scholarly journals, recognizes the need to improve the ways in which the outputs of scientific research are evaluated.

What does **DORA** say?

DORA makes one general and 17 specific recommendations.

General recommendation:

Do not use journal-based metrics, such as Journal Impact Factors (JIFs), as surrogate measures of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.

For Organizations That Supply Metrics

- Be transparent
- Provide access to data
- Discourage data manipulation
- Provide different metrics for primary literature and reviews

For Publishers

- Cease to promote journals by Impact Factor, provide an array of metrics
- Focus on article-level metrics
- Identify different author contributions
- Open the bibliographic citation data
- Encourage primary literature citations

For Research Institutions

- When hiring and promoting, state that scientific content of a paper, not the JIF of the journal where it was published, is what matters
- Consider value from all outputs and outcomes generated by research

For Funding Agencies

- State that scientific content of a paper, not the JIF of the journal where it was published, is what matters
- Consider value from all outputs and outcomes generated by research

For Researchers

- Focus on content
- Cite primary literature
- Use a range of metrics to show the impact of your work
- Change the culture!

San Francisco
DORA
Declaration on Research Assessment



See the full text of DORA at www.ascb.org/SFdeclaration.html. Sign the Declaration!

Misura
per
misura...

Press

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ASA Press Releases

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Pressure to 'Publish or Perish' May Discourage Innovative Research, Study Suggests

WASHINGTON, DC, October 14, 2015—The traditional pressure in academia for faculty to "publish or perish" advances knowledge in established areas. But it also might discourage scientists from asking the innovative questions that are most likely to lead to the biggest breakthroughs, according to a new study spearheaded by a UCLA professor.

Researchers have long faced a natural tension and tradeoff when deciding whether to build on accumulated knowledge in a field or pursue a bold new idea that challenges established thinking. UCLA assistant professor of sociology Jacob Foster and his co-authors describe it as a conflict between "productive tradition" and "risky innovation."

To study this tension, Foster and his colleagues assembled a database of more than 6.4 million scholarly publications in the fields of biomedicine and chemistry from 1934 to 2008. They then analyzed whether individual publications built on existing discoveries or created new connections — in effect, creating a map of the growing web of scientific knowledge. Finally, they explored each of the two broad strategies in relation to two types of rewards: citations in subsequent research and more substantial recognition conferred by 137 different scholarly awards.

Their study, published in the October issue of the *American Sociological Review*, is among the first to analyze the tension between productive tradition and risky innovation on this massive scale.

The study found that a remarkably consistent pattern characterizes contemporary research in biomedicine and chemistry: more than 60 percent of the papers had no new connections, meaning that they primarily built on tradition and eschewed innovation.

Drawing on their analysis of scientific rewards, Foster and his colleagues argue that researchers who confine their work to answering established questions are more likely to have the results published,

Publish
AND
perish!

Science & democracy: together or none

- **Science** needs good citizens (beyond technocracy):
 - Brain power (numbers, openness, civiness)
 - Thought freedom (qualified public opinion)
 - Common sense applied with rigour → critical thinking
- **Democracy** needs good knowledge (beyond demagogy):
 - Knowledge-able citizens for good democracy
 - Social & natural sciences for good policies (coproduction)
 - Knowledge (extended typology) as means and ends

Max Scheler (1924)

<< La scienza è e fu, dovunque sorse, in Europa, in Arabia in Cina, ecc., la figlia del connubio tra la filosofia e l'esperienza del lavoro>>, e più precisamente fu decisivo l'incontro di due *strati sociali*:

<< rappresentati da **un ceto di uomini liberi e contemplativi** e da **un [nuovo] ceto di uomini** che razionalmente hanno messo insieme le esperienze del loro lavoro e della loro occupazione e che, per il fatto di sentirsi intimamente spinti ad accrescere la loro libertà ed emancipazione sociale, hanno il più intenso *interesse* per tutte quelle immagini e idee sulla natura che rendono possibile la *previsione* dei suoi processi e il *dominio* su di essa.

[...] desideriamo che nel nostro Regno **molte divengano prudenti e muniti per sete di scienza e diffusione di dottrine**, i quali risultando essersi approfonditi attraverso lo studio e l'osservazione del diritto, servano giustamente Dio al cui servizio sono tutte le cose, e piacciono a noi col culto della giustizia, ai cui precetti intimiamo tutti obbediscano. Disponemmo pertanto che presso l'amenissima città di Napoli siano insegnati le arti e gli studi che regolino qualsiasi professione, affinché coloro che sono digiuni e avidi d'apprendere nel Regno trovino colà di che soddisfare la loro brama, né siano costretti a dover peregrinare e andare mendicando in regioni straniere per la ricerca delle scienze. **Miriamo infatti a che ne derivi un vantaggio al nostro regime, mentre provvediamo, per particolare grazia d'affetto, al vantaggio dei nostri sudditi, nella speranza sfolgorante che ciò favorisca la loro erudizione, e nell'attesa che da animi solleciti derivi abbondanza di beni, non potendo risultare sterile l'accostarsi alla bontà conseguente la nobiltà, cui preparano i tribunali, derivano guadagni, si pongono a raffronto il favore e la grazia delle amicizie.** Richiamiamo al nostro servizio, non senza grandi meriti e lodi, uomini studiosi, affidando l'amministrazione della giustizia a coloro che siano provveduti di studi giuridici. Siate dutique solleciti, e con gioia, alle professioni desiderate dagli scolari, ai quali destiniamo, perché vi abbiano dimora, quel luogo dove abbondino i mezzi, dove sia per loro alloggio sufficientemente ampio e spazioso e dove i costumi sono per tutti benevoli e dove esiste facilità di trasporti, per terra e mare, di tutto il necessario alla vita degli uomini. E ad essi ricerchiamo noi stessi vantaggi, diamo disposizione, facciamo ricerca di maestri, promettiamo beni e conferiremo donazioni a coloro che giudicheremo degni. E, per così dire, li poniamo sotto gli occhi dei loro genitori, li solleviamo da molte fatiche, li liberiamo da lunghi viaggi e, quasi, dal peregrinare. Li rendiamo sicuri dalle insidie dei predoni, e coloro che andando peregrini in lontane terre erano spogliati delle loro fortune e dei loro averi, godranno con sicurezza, per la nostra liberalità, delle loro scuole, a minor spesa e con breve percorso. [...]

Vogliamo pertanto e ordiniamo, a voi tutti che reggete le province, presiedete alle amministrazioni, che rendiate pubbliche e intimiate tutte queste cose in ogni luogo, sotto pena delle persone e delle cose, **che nessuno osi uscire dal Regno per motivi di studio** né che entro i confini del Regno osi apprendere o insegnare altrove, e che intimiate, sotto la pena predetta, ai genitori di regnicoli che si trovano in scuole fuori del Regno, di farli ritornare entro la festa del prossimo San Michele. Queste sono le **condizioni accordate agli studenti**: in primo luogo che nella città predetta saranno dottori e maestri di qualsiasi disciplina. Quanto poi agli studenti, da qualsiasi luogo provengano, potranno trattenersi, dimorare e far ritorno, garantiti tanto nella persona quanto negli averi, senza subire alcun danno. Di quanto di meglio dispone la città in fatto di alberghi sarà dato in affitto agli studenti contro una pensione di due once d'oro, senz'altri carichi. Tutti gli alloggi saranno attribuiti in base alla valutazione di due cittadini e di due studenti, nei limiti della somma predetta e non oltre quella. Agli studenti sarà fatto un prestito da coloro che sono di ciò incaricati, saranno dati libri in prestito con carico di restituzione, garanti gli scolari che li abbiano avuti. Quanto allo studente che abbia ricevuto un mutuo, non lascerà la terra finché non abbia restituito il prestito stesso, o abbia restituito quanto avuto a titolo precario, sia che il prestito sia soddisfatto dallo stesso o che il creditore sia stato tacitato altrimenti. I predetti precari, poi, non saranno revocati dai creditori finché lo studente voglia rimanere nello studio napoletano. Tutti debbono essere sottoposti ai loro dottori e maestri. Non fissammo alcun limite riguardo al frumento, il vino, le carni e i pesci e le altre cose che facciano comodo agli studenti, poiché tutte quelle cose abbonda la provincia, e saranno vendute agli studenti secondo le modalità con cui sono vendute ai cittadini, anche per contratto. Voi pertanto, che invitate a così grande e così lodevole opera e studio, avete da noi la promessa che saranno osservate le condizioni a voi prescritte e che da noi sarà reso onore alle vostre persone, e che sarà disposto perché da tutti sia resa osservanza a quanto di sposto.

Manifesto di Ventotene (1941-1944)

<< Questi sono i cambiamenti necessari per creare, intorno al nuovo ordine, un larghissimo strato di cittadini interessati al suo mantenimento e per dare alla vita politica una consolidata impronta di libertà, impregnata di un forte senso di solidarietà sociale. Su queste basi **le libertà politiche potranno veramente avere un contenuto concreto e non solo formale per tutti, in quanto la massa dei cittadini avrà una indipendenza ed una conoscenza sufficiente per esercitare un efficace e continuo controllo sulla classe governante.** >>.

Conoscenza & democrazia

Piero Calamandrei (11/2/1950)

<< **La scuola, come la vedo io, è un organo “costituzionale”**. [...Uno di] Quegli organi attraverso i quali la politica si trasforma in diritto, le vitali e sane lotte della politica si trasformano in leggi. Ora, quando vi viene in mente di domandarvi quali sono gli organi costituzionali, a tutti voi verrà naturale la risposta: sono le Camere, la Camera dei deputati, il Senato, il presidente della Repubblica, la Magistratura: ma non vi verrà in mente di considerare fra questi organi anche la scuola, la quale invece è un **organo vitale della democrazia** come noi la concepiamo. Se si dovesse fare un paragone tra l'organismo costituzionale e l'organismo umano, si dovrebbe dire che la scuola corrisponde a quegli organi che nell'organismo umano hanno la funzione di creare il sangue [...]. La scuola, organo centrale della democrazia, perché serve a risolvere quello che secondo noi è **il problema centrale della democrazia: la formazione della classe dirigente**. [...anche] nel senso culturale e tecnico: coloro che sono a capo delle officine e delle aziende, che insegnano, che scrivono, artisti, professionisti, poeti. Questo è il problema della democrazia, la creazione di questa classe, la quale non deve essere una casta ereditaria, chiusa, una oligarchia, una chiesa, un clero, un ordine. No. **Nel nostro pensiero di democrazia, la classe dirigente deve essere aperta** e sempre rinnovata dall'afflusso verso l'alto degli elementi migliori di tutte le classi, di tutte le categorie. [...] **l'art. 34**, in cui è detto: “La scuola è aperta a tutti. I capaci ed i meritevoli, anche se privi di mezzi, hanno diritto di raggiungere i gradi più alti degli studi”. **Questo è l'articolo più importante della nostra Costituzione**. Bisogna rendersi conto del valore politico e sociale di questo articolo. [...] **seminarium rei publicae**: la scuola elabora i migliori per la rinnovazione continua, quotidiana della classe dirigente. >>

**Nella k-society con la scienza
aperta giochiamo due partite
perché il sistema-scienza è**

SEMINARIUM REI PUBLICAE