Research Integrity
Best Practices for the Benefit of Society

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Research Integrity

- Firm adherence to a code of high moral or artistic values in research

- Possessing, and adhering to, high moral principles and professional standards in research

- Honesty is a synonym for integrity -

"One of the truest tests of integrity is its blunt refusal to be compromised."

Chinua Achebe

"Integrity is not a conditional word. It doesn't blow in the wind or change with the weather. It is your inner image of yourself, and if you look in there and see a man (person) who won't cheat, then you know he (the person) never will."

John MacDonald

"Integrity is so perishable in the summer months of success."

Vanessa Redgrave

<u>Research Misconduct</u>

Violation of the standard codes of scholarly conduct and ethical behavior in research

- Dishonesty is a component of misconduct -

Federal Policy on Research Misconduct

Research Misconduct Defined

Research misconduct is defined as <u>fabrication</u>, <u>falsification</u>, or <u>plagiarism</u> in proposing, performing, or reviewing research, or in reporting research results.

Research misconduct <u>does not include</u> honest error or differences of opinion

Federal Policy on Research Misconduct (continued)

Findings of Research Misconduct

A finding of research misconduct requires that:

• There be a significant <u>departure from accepted practices</u> of the relevant research community;

• The misconduct be committed <u>intentionally</u>, or <u>knowingly</u>, or <u>recklessly</u>; and

• The allegation is <u>proven</u> by a preponderance of evidence.

U.S. Office of Science and Technology Policy

Societal Values

What ARE the standard <u>codes</u>
of scholarly conduct and ethical behaviour in research?

What ARE the best <u>practices</u>
for the conduct of research on a global basis?

Credibility

Research credibility
(scientific believeability)
is pivotal in both cases.

"What skills do we need to be creative and innovative? Good scientific training, and a rigorous approach to research is fundamental, as is being prepared to change your mind in the face of fresh scientific data."
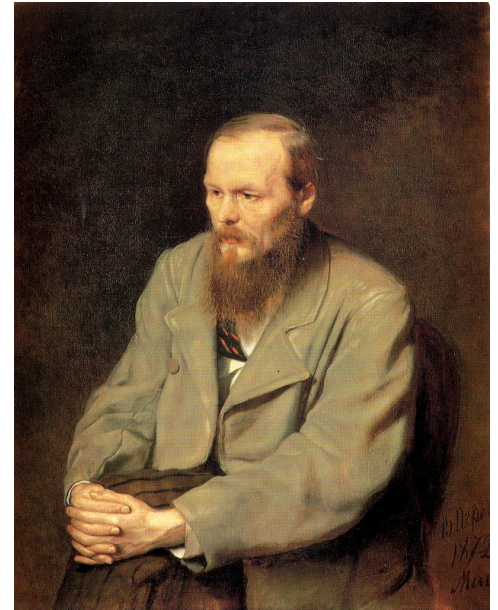
Patrick Mulqueen

2007 Creativity in Industry Award

Royal Society of Chemistry, U.K.

Consider

- Academic Dishonesty Committee (1974)
- Fabrication, Falsification, Plagiarism, Sabotage
- Case of plagiarism on a research-based term paper

Fyodor Dostoevsky – Crime and Punishment (1886)

"***Dostoevsky gives me more than any scientist.***" (A. Einstein)

Challenges for those individuals who are honest but, because of …

- National goals,
- Being in the limelight,
- Peer pressure or
- Other factors,

… are tempted to take liberties with results, falsify or fabricate data, plagiarize, etc.

Challenge: National Goals

Example Korea

"What do you need to do to get a Nobel Prize?"

Challenge: National Goals

Example China

(a) Goal to Publish in the Journal of the American Chemical Society (JACS)

- A remarkable proportion of papers submitted to JACS come from China – but it turns out that many are of low quality

- Temptation to make exaggerated claims, and to "massage" results to make the work significant enough for acceptance in JACS

  - e.g. Product yields of 90+% – reality is 2-20%

Challenge: National Goals

Example China Continued

(b) Need to publish several papers during <u>Ph.D. Thesis Research</u>

• Many institutions in China <u>require one publication per year</u> in order for the student to submit a Ph.D. thesis.

• Students are thus under pressure to <u>contribute 4-5 papers</u>, often of less than excellent quality, rather than 1-2 meaningful contributions.

• This <u>policy</u> of what can sometimes be designated as "unnecessary publication" instills, in the next generation of Chinese researchers, the principle that <u>quantity is central</u>, often trumping quality.

Challenge: "Limelight / Marquee" Effect

Health / medical care, and our climate, are two examples of issues which are of great importance to our well-being, and our quality of life.

- Medical and health science researchers: <u>Too many are marketeers</u> making exaggerated claims to secure

  media attention

- Climate change researchers: Biased, <u>ill-informed views peddled as hard facts</u> thereby impacting communication of science to the public

  (e.g., see http://www.science.org.au/reports/12july07.htm)

The phrase "economical with the truth" is sometimes used to characterize the above attributes.

Contention

Falsification and fabrication of research results <u>can go undetected</u>, if the work is of low importance and/or of marginal interest, and therefore unlikely to be subjected to tests of reproductibility by others. It is the significant/ landmark research which attracts attention, and is subject to scrutiny for reproducibility.

World Conference on Research Integrity

In addition to furthering <u>dialogue</u> on research integrity, and to establishing a <u>best practice framework</u> on a global level, the conference needs to also take cognizance of what <u>measures</u>, if any, can be taken to improve the quality of research, and of research reporting.

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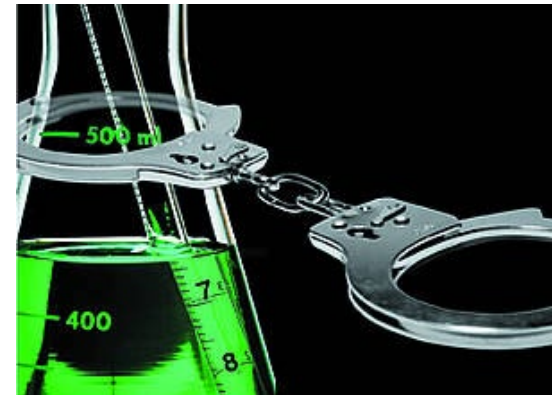
An Observation

As science evolves, as pressures increase to secure results in often unrealistic timeframes, the quality of research being executed and reported does not necessarily improve with new techniques, equipment, and methodology.

The human element is key – key to inventions, discoveries, innovations, resesarch integrity & responsible science.
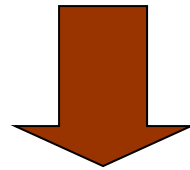

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Strategies – Focus on

A. The spirit, culture, and values of science
- i.e., the <u>values-based perspective</u>

B. Rules, policies including adherence to strict codes
- i.e., the <u>compliance-based perspective</u>

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Values _and_ Compliance

… rather than …

Values _or_ Compliance

⬇

Outcome-oriented Code

=

Combination of the best elements
of the two conventional approaches

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Values-based Perspective	Compliance-based Perspective
Flexibility	Consistency
Capable of informing decisions on unexpected issues	Standardized decision-making is predictable for outsiders & insiders
Lends itself to a dialogue approach	Lends itself to an analytic approach
Fosters team work	Fosters precision
Aids developing a dynamic workplace culture	Aids building a "safe", predictable workplace

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Values-based Perspective

Provides the actual values held in an organization

Owned" by all

Maintains elbow-room for own judgements

On the qualitative, subjective end of the spectrum

Compliance-based Perspective

Organizational environment can be taken fully into account

Implementation can be "top-down"

Enforceable

On the quantitative, objective end of the spectrum

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Values-based Perspective

Good outcomes at the workplace are achieved through the good judgement of participants

Good outcomes in the environment are achieved because an empowered, thinking and cooperative staff works together

Compliance-based Perspective

Good outcomes at the workplace are achieved through enforcement

Good outcomes in the environment are achieved because standards are clearly matched to the environmental requirements and corruption is actively prevented through audit and enforcement

Marc Saner, Policy Brief No. 20
Institute on Governance, June 2004, www.iog.ca

A. **Diagnosis** and analysis of this issue must be more clear, in-depth

B. **Prophylaxis**

   (i) Values-based perspective (encouragement)

      * <u>Education</u> in elementary and high schools

      * <u>Development of a strong science culture</u>

   (ii) Compliance-based perspective (deterrent)

      * <u>Rules and structures</u>

C. **Framework** based, in good measure, on an <u>outcome-oriented</u> code

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