…hanno sin qui la maggior parte de i filosofi creduto che la superficie (della Luna) fosse pulita, tersa et assolutissimamente sferica; et se alcuno disse di credere che ella fusse aspra e montuosa, fu reputato parlare più presto favolosamente che filosoficamente. Hora io di questo istesso corpo lunare, da noi veduto mediante la illuminazione del sole, asserisco il primo, non più per immaginazione, ma per sensata esperienza et per necessaria dimostrazione, che egli è di superficie piena di innumerabili cavità et eminenze, tanto rilevate che di gran lunga superano le terrene montuosità …

Galileo Galilei, 1611

Versuche

über

Pflanzen-Hybriden,

von

Gregor Mendel.

(Separatabdruck aus dem IV. Bande der Verhandlungen des naturforschenden Vereines.)

“**Nessuno punisce coloro che commettono ingiustizie per il semplice fatto che sono stati ingiusti**, a meno che non voglia vendicarsi in modo irrazionale, come una bestia; chi, invece, vuole punire secondo ragione, non vendica l’ingiustizia commessa - dal momento che non può annullare ciò che è stato **- ma punisce in vista del futuro, affinché non venga commessa ingiustizia di nuovo**, né da quello né da un altro che lo veda punito. Ha un tale proposito perché è convinto che la virtù sia insegnabile; **dunque punisce per distogliere dal vizio**.”

Platone, Protagora

Scientific Misconduct: Do the Punishments Fit the Crime?

Barbara K. Redman[1,2] and Jon F. Merz[3]*

SCIENCE VOL 321 8 AUGUST 2008

Indagine su 43 scienziati sanzionati per violazioni gravi

- 36 di questi erano stati dichiarati colpevoli di falsificazione o di fabbricazione, 10 di plagio, e 12 di false dichiarazioni.
- 17 avevano commesso una sola infrazione, e i restanti 26 avevano commesso più violazioni.
- Tutti avevano ricevuto una o più sanzioni, anche severe.

Dopo alcuni anni dalla sanzione:

- 37/43 continuavano a pubblicare articoli scientifici.
- 18/23 rintracciati dagli autori, continuavano a fare i ricercatori (quasi l'80%) .
- 10 di loro erano professori in una Università degli Stati Uniti.

BC601 Principles of Conduct in Biochemical Research
Class meets F, 9-11, MRB 123, Spring Semester, Annually

Jennifer K. Nyborg. Office: MRB 281. Phone: 491-0420, Email: Jennifer.Nyborg@ColoState.edu
Paul Laybourn. Office: MRB 279. 491-5100. Email: Paul.Laybourn@ColoState.Edu

Objectives: Students will develop an understanding of moral reasoning in issues related to the collection of biochemical data, publishing, and grant writing. Students will gain exposure to biases that arise in the execution of research and in the activities related to research. The presentation of actual case-studies will provide relevant examples for discussion. Through lectures, presentations, and discussions, students will obtain a framework for principled decision making applicable to their research-oriented scientific endeavors. This is critical for our students who are beginning their research careers in the biological sciences, as it is vital to the pursuit of their discipline.

Evaluation: The course will consist primarily of lectures, discussions, outside reading, and student presentations. The material is not amenable to standard format exams. Grades will be based on student attendance (20%), participation in the discussions (30%) and a 20-30 min. oral presentation on an actual scientific misconduct case (50%). Attendance is essential. Due of the nature of the course, the absence of exams, and the importance of student participation in class discussion, regular attendance at class sessions is critical. Therefore, student attendance will be recorded. Students must inform me ahead of time if they must miss class, and absences may result in additional assignments or reduced grade.

Text: *On Being a Scientists*, Online resources (see below), handouts, news articles.

Course schedule: (updated to reflect actual coverage of material)

Jan. 23:
Discussion of course content, examples of misconduct

Jan. 30:
Examples of misconduct, con't.
Acceptable data "cleaning"
Plagiarism

Feb 6:
Plagiarism, con't.

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CALIFORNIA

Avoiding Being Penalized: Research Misconduct

Introduction to Research Misconduct

USC faculty, staff, and students are expected to conduct research in accordance with the highest ethical standards and all relevant regulations. The university does not tolerate misconduct in any aspect of research and will investigate all such allegations. Responsible conduct of research is expected of all university faculty members (including part time and visiting faculty), staff, other employees, (such as postdoctoral scholars), and students who propose, conduct, or report research on behalf of the university regardless of funding or source.

This booklet provides an overview of research misconduct including historical and contemporary examples, guidelines on reporting misconduct, and a brief description of the investigatory process. The booklet includes reference lists and case studies on research misconduct.

BROKEN SYMMETRIES AND THE MASSES OF GAUGE BOSONS

Peter W. Higgs
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(Received 31 August 1964)

In a recent note[1] it was shown that the Goldstone theorem,[2] that Lorentz-covariant field theories in which spontaneous breakdown of symmetry under an internal Lie group occurs contain zero-mass particles, fails if and only if the conserved currents associated with the internal group are coupled to gauge fields. The purpose of the present note is to report that, as a consequence of this coupling, the spin-one quanta of some of the gauge fields acquire mass; the longitudinal degrees of freedom of these particles (which would be absent if their mass were zero) go over into the Goldstone bosons when the coupling tends to zero. This phenomenon is just the relativistic analog of the plasmon phenomenon to which Anderson[3] has drawn attention: that the scalar zero-mass excitations of a superconducting neutral Fermi gas become longitudinal plasmon modes of finite mass when the gas is charged.

The simplest theory which exhibits this behavior is a gauge-invariant version of a model used by Goldstone[2] himself: Two real[4] scalar fields φ_1, φ_2 and a real vector field A_μ interact through the Lagrangian density

$$L = -\tfrac{1}{2}(\nabla\varphi_1)^2 - \tfrac{1}{2}(\nabla\varphi_2)^2 - V(\varphi_1^2+\varphi_2^2) - \tfrac{1}{4}F_{\mu\nu}F^{\mu\nu}, \qquad (1)$$

where

$$\nabla_\mu\varphi_1 = \partial_\mu\varphi_1 - eA_\mu\varphi_2,$$

about the "vacuum" solution $\varphi_1(x)=0$, $\varphi_2(x)=\varphi_0$:

$$\partial^\mu\{\partial_\mu(\Delta\varphi_1) - e\varphi_0 A_\mu\} = 0, \qquad (2a)$$

$$\{\partial^2 - 4\varphi_0^2 V''(\varphi_0^2)\}(\Delta\varphi_2) = 0, \qquad (2b)$$

$$\partial_\nu F^{\mu\nu} = e\varphi_0\{\partial^\mu(\Delta\varphi_1) - e\varphi_0 A_\mu\}. \qquad (2c)$$

Equation (2b) describes waves whose quanta have (bare) mass $2\varphi_0\{V''(\varphi_0^2)\}^{1/2}$; Eqs. (2a) and (2c) may be transformed, by the introduction of new variables

$$B_\mu = A_\mu - (e\varphi_0)^{-1}\partial_\mu(\Delta\varphi_1),$$
$$G_{\mu\nu} = \partial_\mu B_\nu - \partial_\nu B_\mu = F_{\mu\nu}, \qquad (3)$$

into the form

$$\partial_\mu B^\mu = 0, \quad \partial_\nu G^{\mu\nu} + e^2\varphi_0^2 B^\mu = 0. \qquad (4)$$

Equation (4) describes vector waves whose quanta have (bare) mass $e\varphi_0$. In the absence of the gauge field coupling ($e=0$) the situation is quite different: Equations (2a) and (2c) describe zero-mass scalar and vector bosons, respectively. In passing, we note that the right-hand side of (2c) is just the linear approximation to the conserved current: It is linear in the vector potential, gauge invariance being maintained by the presence of the gradient term.[5]

When one considers theoretical models in which spontaneous breakdown of symmetry under