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On a New System of Units to Quantify Failure

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Abstract

This subject is indeed very abstract.

It has long been clear to the author (if to no one else) that science lacks a convention for measuring failure. While the discovery of many other basic laws of nature has led to an eponymous unit that describes a measurable quantity in the law - to wit, Newton's Law and the force unit of '*newton*', Ampere's Law and the '*ampere*', etc. - there does not yet exist a quantitative physical expression of Murphy's Law. We propose to remedy the situation by defining a set of units that quantify failure, and then casting Murphy's Law in a mathematical form based on these units. As part of this undertaking, we attempt (and fail) to identify the physical principles that underlie this most basic of scientific pronouncements.

Although Murphy's Law has long been in the canon of accepted truths, we restate it here for the benefit of those few that have been living under a rock for their entire lives: "*If anything can go wrong, it will*".

We recognize that there already exists a colorful but imprecise English system of units to describe failure - e.g., the '*goof*', the '*screwup*', the '*royal screwup*', and onwards into the realm of profanity. Though highly descriptive and rich with history, these units are basically qualitative. We feel that our scientific goals require a metric system.

Our basic unit, which we modestly propose to call the '*murphy*', represents the magnitude of a standardized thing that can go wrong. This unit should be referenced to a universal standard of failure that is maintained by a public institution. We suggest that almost any Federal, state, or municipal agency would be an appropriate custodian of the standard.

A metric approach to failure immediately leads to a magnitude scale ranging from, e.g., the '*millimurphy*' (spilling coffee on a blue dress) to '*megamurphy*' (spilling the

president's coffee on a blue dress), and composite units such as '*murphys per second*' as a rate of fouling up, and '*murphys per square meter*' as a concentration of incompetence.

With a unit of measurement in hand we are in a position to develop a mathematical expression of Murphy's Law. In this effort we are drawn to a quantum mechanical formulation, in which the degree to which something goes wrong is the expectation value of the wrongness operator, or Wrongskian. This has the virtue of defining a failure wavefunction whose integral over time is identically one, since according to Murphy's Law the probability of something going wrong sometime is unity everywhere.

Clearly the wavefunction is normalized, since it is normal to screw up, and the entire formalism is renormalizable, in the sense of allowing us to turn failures into successes, successes into failures, and bad science into good public relations. Finally, the wrongness operator is diagonalized on the U.S. Senate and goes to infinity in the limit that George Bush becomes President.

We find empirically that there is a conjugate relationship between the impact of a failure and its likelihood, which allows us to formulate the Murphy Certainty Principle, stating that "the more you have to worry about failure, the more likely it becomes". This Principle allows a single unit - the '*murphy*' - to describe both the magnitude and probability of a failure.

We expect the '*murphy*' to be valuable in evaluating statistically the results of experiments. This usage would be in the nature of an inverse unit of confidence, as $murphy^{-1}$ is the probability that the result is correct, and $murphy^{-2}$ the probability that it is both correct and useful.

The physical picture of a natural law is not complete until the underlying mechanism has been revealed. For all those who feel that their own personal failures have been caused by some malevolent cosmic agency, there is now compelling evidence that disasters are in fact mediated by a massless, charmless, and pointless particle called the *murphion*. This particle, previously misclassified as a weakly amusing *bozotron,* travels backward in time (thus allowing it to retroactively spoil apparent successes) and, after interacting with its victim, transfers whatever spin that project management cares to put on it. The *murphion* is, however, extremely difficult to observe, since it has the anti-quantum mechanical property of instantly confounding the state of any detector that it interacts with. Consequently, its existence and properties have been inferred by assuming that all science experiments must make an equal amount of sense and then assigning to the *murphion* all of the missing sense in any actual observation.

Interactions of the *murphion* with normal matter are described by Murphy-Kojak statistics. In this picture, the *murphion* preferentially fills states of excess arrogance (beginning with the states of Texas and New York) until the Murphy surface - the level of maximum ineptitude - is reached. At this point, the particle begins to fill states of reduced arrogance, such as North Carolina, until ultimately every state, province, and

principality in the world is awash in the little pests. At this moment of saturation nothing works and all the physicists get jobs pricing bond derivatives. (The consequences of that will be analyzed in another article as soon as the stock market stops bouncing like a wad of flubber.)

Figure 1 - Artist's conception of the ***Fiascotron*** *– a new particle accelerator to be built outside Washington DC. The design was developed jointly by engineers from the Stanford Linear Accerator Center and Fermilab.*

The possibility of harnessing the *murphion* for military applications has led the Department of Defense to begin developing the **Fiascotron** (figure 1) – a revolutionary new particle accelerator designed specifically to produce intense beams of *murphions* that can be directed at a distant target. In the first test run of a small prototype system, the beam was inadvertently aimed at the White House, where security cameras detected a *murphion* just as it decayed into two *bozotrons* (figure 2).

Figure 2 – a murphion photographed just as it decays into two bozotrons.

Every suggestion of a new particle sets cosmologists quivering with excitement as they rush to see if it will be the one that magically closes the universe, proving once and for all that you only need a pencil and an eraser (actually, forget the eraser) to completely settle the fate of the universe for all time and still make it home for dinner. But before cosmologists embrace the *murphion* as their latest best hope they should be advised that this particle is not only massless but also heartless, and the only universe it will deflate is the one bounded by a physicist's ego.

Apart from its obvious role in science and engineering, we expect widespread application of this formalism to such diverse fields as economics, management, and politics, where a logarithmic scale would probably be useful. In economic applications it might be argued that the unit of '*murphy*' measures the same thing as the '*dollar*', based on the observation that the probability of failure goes up with its cost, but clearly the '*murphy*' is the more fundamental unit. Furthermore, it has not escaped the author's notice that this formalism provides a means of evaluating the useful outcome of experiments and projects beforehand, thus sparing us the trouble of starting any more expensive exercises in futility such as the Superconducting Supercollider.

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