It should be noted that the operated animals were all considerably heavier than the controls by the time this fast was given.

In all the behavioral tests the operated animals performed more poorly than the controls, and in most instances the differences were clearly significant statistically. Because of the consistent results with such a variety of tests, it seems more plausible to assume that the operation interfered with hunger than to assume that it had specific effects on the different functions involved in each of the various tests.

While they were on a diet of ground lab chow, some of the operated rats ate consistently more than the controls, whereas others ate somewhat less. The performances of both operated groups were highly similar on the behavioral tests; both of them were poorer than the controls. The fact that one of the operated subgroups was heavier and the other lighter than the controls rules out the factor of body weight as an explanation for their inferior performance.

When placed on a high-fat diet, both operated groups ate consistently more than the controls in all ad libitum situations throughout the experiment. The reduced intake of the Operated Low-Eater subgroup on the less-well-liked ground lab chow diet seems to be analogous to the poorer performance of the operated animals on the behavioral tests.

One interpretation of the results of this study is that the hypothalamic lesions cause the mechanism regulating hunger to "stick" at a relatively constant low level. This explanation would not be sufficient by itself, however, to account for the poor performance of the operated animals on bar pressing immediately after satiation. Another interpretation would be that the lesions interfere seriously with the mechanism of stopping eating and somewhat less seriously with the mechanism of hunger. Whatever the final explanation may be, the striking fact is that the measures of the amount of food eaten in ad libitum situations yielded results opposite to those of the tests where some form of work had to be done or "resistance" overcome. This suggests caution in drawing inferences about "drive" from consummatory behavior in both psychological and psychiatric studies.

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Comments and Communications

"Funginert"—A Designation for Inherently Fungus-resistant Material

During and following World War II there has been increasing recognition of the importance of biological factors in the deterioration of engineering materials. Fungi and other microorganisms, already known to be destructive to products such as lumber and cotton textiles, were found to exert a malign effect also on electrical equipment, with resultant degradation and operational failure. In many cases damage was indirect, as when operational failure resulted from corrosion of a metal surface, caused in turn by metabolic products from fungi supported by an adjoining nutrient surface.

In attempts to prevent such damage, military and other specifications are now increasingly being phrased to require that materials used in equipment have resistance to fungus growth. For the kind of resistance that depends on fungistatic or fungicidal chemicals, the terminology and test methods for the chemicals and for the treated engineering materials may follow somewhat along the lines of the older parallel usages in medicine and agriculture. In other cases, however, materials are desired which have innately the property of not supporting fungus growth because of absence of nutrients rather than because of presence of fungistatic chemicals. Such materials have been designated as "nutriently inert" or "not supporting fungus growth" in certain publications (Bureau of Ordnance Specification 52T15 (Ord). *Treatment, moisture- and fungus-proofing, of elements, components, and assemblies, electrical and electronic: general specifications.* 22 pp. Proposed draft, Feb. 14, 1947), which have also provided special test procedures by which this property of "nutrient inertness" might be demonstrated. With these inconveniently long terms it was still necessary to add modifying words to make the meaning precise.

As the concept discussed is applied more and more broadly (for example, to plastics, tape, transformers, and electrical insulated wires), it becomes desirable to designate it by a distinct and concise name. To fill this need, the coined words "funginert" for the adjective and "funginertness" for the characteristic are proposed. Definitions are:

Funginert. Not supporting fungus growth because the material, part, or component in question does not furnish the necessary nutrients for such growth. To be distinguished from both "fungistatic," which indicates presence of a chemical or physical agency that actively prevents growth of fungi, and "fungicidal," which indicates presence of an agency (usually chemical) that can kill

fungi—as in "Pyrex glass is funginert but not fungistatic."

Funginertness. The characteristic of being funginert —as in "The funginertness of nylon-jacketed wire is permanent and not limited by the period of effectiveness of a somewhat instable fungistatic chemical."

The new terms, being coined words, can cover precisely the desired total concept of fungus resistance because of absence of nourishment for the organism and not because of presence of fungistatic or fungicidal influences. A number of parallel words can obviously be formed—for example, "bacterinert" and "bacterinertness" or "microbinert" and "microbinertness" for cases in which it is desired to describe materials with reference to bacteria or to microorganisms in general.

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Quantum Theory and Phytoplankton Photosynthesis

In the first issue of *Hydrobiologia,* R. Maucha (*Hydrobiologia,* 1948, **1**, 45) has a paper that would seem to represent an important application of quantum theory to ecology. However, a study of the mathematics contained in the paper reveals two erroneous assumptions that invalidate his work: (1) he assumes that a graph of photosynthesis against light intensity represents a sine function, and (*2*) he assumes that the phytoplankton photosynthesis system is a closed system.

It is well known that high light intensities inhibit photosynthesis in phytoplankton that are adapted to dim light. E. I. Rabinowitch (*Photosynthesis and Related Processes, I.* New York: Interscience, 1945) has a chapter on "Photautoxidation" in which light inhibition of photosynthesis is discussed in detail. The phenomenon is, however, so variable in different plants and in the same plant under varied conditions, that resemblance of such a graph to a sine curve is superficial and is not a reliable foundation for mathematical deduction. Maucha does not discuss photautoxidation, and it is not a variable in his equations.

Even if the graph were a sine function, Maucha's other error would still invalidate his deductions. That he assumes phytoplankton photosynthesis to be a closed system is emphasized by repeated attempts to demonstrate that the law of energy conservation is obeyed in the system. L. v. Bertalanffy (*Science,* 1950, **111**, 23) has pointed out that living systems are not subject to the laws of closed system thermodynamics, and that the extension of these laws to open systems leads to very unexpected results. Maucha's analogy of a quasi-elastic resonating system that suffers an equilibrium shift proportional to the intensity of the applied impulse (light, in the photosynthetic system) leads him to the dubious conclusion that intense light uses up the CO_2 inside the cell so rapidly as to reduce photosynthesis to zero. "*Ist nämlich die Lichtenergie viel zu gross, dann verringert sich* c_g [the intracellular CO_2 concentration] *schliesslich zu* 0. . . . *die Photosynthese kommt zu einem Stillstand, wir haben mit inaktiver Lichtstärke zu tun.*" From equations based on these assumptions Maucha extracts a constant which, when multiplied by 10^{-27}, agrees closely with Planck's constant.

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Our Decelerating Planet

I was amused by C. A. Cotton's letter (*Science,* 1950, 111, 14) regarding the deceleration of the earth in a mere 56 million years. I do not doubt the accuracy of Dr. Cotton's position and arguments, but we have much more startling arguments regarding the earth's rotation seriously proposed in this country. For example, *Harper's* January issue indicates that there is sound and even scientific reason for believing that the earth stood still in Joshua's time, a mere 3,500 years ago, and that, *mirabile dictu,* it has regained its present momentum since that relatively recent date.

In case some scientists are inclined to dismiss *Harper's* lightly, allow me to explain that this magazine is very proud of its long literary record, that it does not hesitate to lecture scientists severely for their inability to write in good literary style—i.e., by *Harper's* fantastic standards. The present writer is willing to admit that no honest scientist can possibly compete on a literary basis with such startling proposals as may be found in the January number of that learned magazine. It appears that all objections based upon physical laws, biological principles, and historical facts are clearly and unequivocally overruled.

This article, "The Sun Stood Still," is only one of the recent and startling revelations contained in this sedate magazine. Only last November, *Harper's* considerably improved on a recent U. S. Supreme Court decision. Apparently both the legal and scientific professions must look to their laurels, or their literary rivals, who benefit by a broad liberal education, will completely overshadow their achievements. Indeed, the advantages of a broad liberal education are such that in the near future we may expect all scientific advances of any significance to come from our poets and literary critics.

If Mr. Cotton and the editors of SCIENCE will merely read the January number of *Harper's,* they will discover how very old-fashioned is their concern over the deceleration of the earth from a 6¾-hour day to a 24-hour day in so long a time as 56 million years.

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