chemical reactions which may be occurring in the phases, or

$$\frac{dn_1^{\alpha}}{dt} = \dot{n}_1^{m}$$

and (4)

$$\frac{dn_2^{\alpha}}{dt} = \dot{n}_2^{m}$$

No physically definite material currents as defined by Eq. 2 now exist, since each segment of the material current as it crosses the barrier suffers a change in composition. Equations 1 and 2, if now used, merely estimate the magnitude of hypothetical currents which correspond to rates of transfer obtained by an equivalent two-path-ordered mechanism. In contrast to the implications of Eq. 2, the material currents defined by Eq. 4 may be said to be actual currents, and they do depend upon the concentration gradients.

Therefore, the comments made by Essig and by others, including C. W. Sheppard in his excellent book *Basic Principles of the Tracer Method* [(Wiley, New York, 1962), p. 165], are largely concerned with semantics. The physical meanings of *"net" flow, inflow, outflow, material current,* and so on, are to be found in the assumptions, implicit or otherwise, made in the attempt to answer the question, "Why do material currents appear within the membrane of a unit transfer system?" In the quantitative description of any system, the smaller the number of unverifiable assumptions required to give physical meaning to the terms appearing in the mathematical relations representing the behavior of the system, the better the description.

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"Grantitis"

I am prompted by the excellent editorial "The need for skepticism" [*Science* **138**, 75 (1962)] to mention some thoughts which have long been on my mind.

Over the past several years a disease has spread rampant throughout science, until today it shows promise of becoming pandemic. The proper name for this affliction is "grantitis," and it exists in all phases of scientific endeavor. From my own very small

niche I see individuals and programs ridden with the disease.

The etiology and description of grantitis is clear. An individual engaged in solitary research requiring and receiving little or no logistical support is, of course, in a nonprestigious position. The way to prestige (in the eyes of his peers and administrative superiors) is through the acquisition of a grant. This immediately gives the project an air of respectability, regardless of the quality of the work. The receipt of a grant is immediately accompanied by notices in local newspapers, announcements to the faculty by college presidents, and accolades by department chairmen, even occasionally by somewhat pompous declarations by senators. This is heady recognition for one accustomed to obscurity. It appears, then, that the individual is impelled to apply for the grant not only to further his research but also to win the prestige he so richly deserves (all of us, of course, richly deserve prestige!). The acquisition of the grant now assumes importance in its own right, with the research project, perhaps, subordinate. The question becomes, "What kind of proposal is most likely to be favorably received by those who act upon such things?"

Answering this question requires that much time be spent learning who the people are that dispense the money, what disciplines are represented, and what kinds of grants have been given in the past. It is also very helpful to make the acquaintance of someone in a position of authority in such things. Once this "background" work has been accomplished, the interminably long application forms must be completed to the satisfaction of those who must be satisfied about such things. A diagnosis of grantitis may be made when an individual begins to adapt his area of research concern to what he believes will be favorably received by the grantors. A lesser form of the affliction is manifested by a willingness to modify approach and procedure while retaining the major area of concern.

Science programs may be infected in a slightly different, but related, way. In my own department it is increasingly apparent that our better graduate students in science education are being lured to those schools that have grant-sponsored institutes providing liberal stipends. Ours, then, is a problem of survival—we must woo them back or attract suitable replacements. This requires that we also have an institute with liberal stipends. Symptoms similar to those in the individual now appear in the institution. We must determine what sort of institute will be favorably received by those with whom we must court favor, and develop our request accordingly. The question becomes, "What kind of institute will sell?" not, "What kind of institute should we offer in terms of our capabilities?" The disease has once more appeared.

In the credentials of applicants for science jobs, lists and amounts of grants received appear more and more often. As evidence of research ability, administrators view these as equal in significance to the published works (if any) of the applicant. Departments of science and colleges disseminate lists of grants with great pride, and scientists frequently view these as evidence of scholarly achievement. Grantitis is widespread.

The prognosis is far from simple. The greatest danger lies in the increased willingness, indeed the eager desire, on the part of individuals and departments of science to become the servants of the granting organizations rather than seekers of knowledge. The founts of creativity lie not in the granting organizations but in healthily

skeptical individuals who operate "in spite of" rather than "because of" the desire for financial support.

The cure for the disease is also complex. Surely complete honesty would be palliative. In lieu of this, perhaps greater control in the hands of the individuals seeking support is indicated. This could be accomplished through a plan whereby appropriations are made to colleges and universities, grants then being allocated to individuals and programs by representative local committees.

Whatever cure is indicated, I hope it will soon be applied, for I, too, have grantitis!

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Tenate and Dialysate

The simple new word *tenate* is proposed as a general term for that which is held back or retained in various chemical operations. *Tenate* has the same root as *tenant* or *tenable*. It can be both noun and adjective.

The need for a new word grew out of the search for a single word to describe the part which does not pass through the membrane during dialysis —the dialysis residue or the nondialyzable fraction. However, it seems reasonable to refer to the "tenate" in filtration and distillation also. This would lead to the following sets of terms.

Operation	Feed material
dialysis	*dialysand*
filtration	*filtrand*
distillation	*distilland*
Part which passes	**Part retained**
dialysate	*tenate*
filtrate	*tenate*
distillate	*tenate*

Note that the world *dialysate* should be applied only to the part that passes through the membrane. This is general usage (*1*). For one of two reference works where *dialysate* is given another meaning, the author has agreed to correct the usage in the next edition. These corrections should prevent extension of the appalling confusion which led *Webster's* third edition (*2*) to retreat to the following useless definition of *dialysate*: "used either of the material that has failed to diffuse through the membrane or of the diffusate."

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