To:jfe@jhu.edu CC:mandrews@mengr.tamu.edu
Subj: **Re: Note from Adiutori**
Date: 12/3/2004
File: **C:\Documents and Settings\Owner\My Documents\Papers\MoodyPaper\Katz041203.doc** (25600 bytes) DL Time (32000 bps): < 1 minute

please see the attached Word file

Attachment to 12/3/2004 e-mail to Professor Joe Katz, Johns Hopkins University, Editor of ASME *Journal of Fluids Engineering*

File C:\Documents and Settings\Owner\My Documents\Papers\Moody\Paper\Katz041203.doc

Dear Professor Katz,

Thank you for responding to my e-mails.

I have read over my e-mails to you and to Mrs. Murphy. They are frank, not rude. And I am disappointed, not angry. Also, I do not see how my innocuous comment about civil engineering journals could be construed as inappropriate.

My Moody chart article is not about "the replotting of the same Moody data with a modified coordinate system". It is about the following:

- New methodology. The article presents and demonstrates a new way to deal with fluid flow that does not use the dimensionless parameter "fluid friction factor". (Note that the transformed Moody chart has nothing to do with fluid friction factor.)

- Demonstrating that the new methodology is better than conventional methodology. The article demonstrates that fluid friction factor complicates the solution of fluid flow problems. Problems that must be solved iteratively or by trial-and-error when fluid friction factor is used are solved directly and much more simply when fluid friction factor is not used—ie when the new methodology is used.

- Applying "the new engineering" to the problem of fluid flow.

The new engineering observes that engineering phenomena are cause and effect processes—temperature difference causes heat flux, pressure difference cause fluid flow, etc. It notes that parameters that combine cause and effect greatly complicate the solution of problems in which there is a nonlinear relationship between the cause and the effect. The complexity arises because parameters that combine cause and effect make it necessary to solve problems with the variables combined, whereas it is generally much simpler to solve problems with the variables separated..

Because simpler is better, the new engineering abandons all parameters in which cause and effect are combined—all dimensional parameters such as "heat transfer coefficient" (the ratio of heat flux to temperature difference) and all dimensionless parameters such as "fluid friction factor" (since it includes the ratio of pressure drop to flow^2).

When the new engineering is applied to conventional fluid flow methodology, fluid friction factor is abandoned, and the original Moody chart is transformed to eliminate fluid friction factor. The transformed Moody chart is read directly to determine pressure

drop, flow rate, or pipe diameter, whereas the original Moody chart must be read iteratively to determine flow rate or pipe diameter.

The original Moody chart is still presented in mechanical engineering texts and handbooks. If it is to be replaced by the transformed and improved version, as it should be, by what mechanism do you suppose this replacement will come about? Aren't the Journals supposed to lead the way? Doesn't the proper scope of the Journals include reporting on and promoting new and improved methodology, particularly when the new methodology requires that a widely used parameter be abandoned?

My article makes no mention of the new engineering per se because I wanted the article to be a stand alone contribution. The fact that the article describes and demonstrates how to simplify the solution of an entire class of fluid flow problems is, in my view, sufficient to warrant its inclusion in the JFE. The fact that it does so by abandoning a parameter that has been a keystone of fluid flow analysis for many decades, and replacing it with new and improved methodology is, in my view, more than sufficient to warrant its inclusion in the JFE.

I have been invited to speak on the new engineering at Howard University on December 15. I hope you will attend. If you are interested in attending, please let me know and I will send you the particulars.

Again, thank you for taking the time to respond to my e-mail.

Warm regards,

Gene Adiutori

PS There is no Moody data. Moody performed no fluid flow experiments, he plotted no fluid flow data, and he examined no fluid flow data. In his own words: "The author does not claim to offer anything particularly new or original, his aim merely being to embody the now accepted conclusions in convenient form for engineering use."

Moody is mistaken—the Moody chart is not in a convenient form for engineering use—it is convenient for determining pressure drop, but it is decidedly inconvenient for determining flow rate or pipe diameter, since these determinations require that the chart be read iteratively. The transformed Moody chart in my article is in fact "in convenient form for engineering use" because it is read directly whether pressure drop or flow rate or pipe diameter is to be determined.

Moody further states "The author has drawn up a new chart . . . taking advantage of the functional relationships (ie correlations) established (by others) in recent years." In other words, Moody simply faired together several widely accepted literature correlations that described behavior in different Reynolds number ranges.