and the programs contained therein are designed to give an analytic solution for the following:

(*a*) Stresses and deflections in pipe bends terminated by flanges, infinitely long tangent pipes or short equal length flange-ended tangents when under pressure (PRESEF), or pure in-plane bending (BENDEF).

(*b*) Stresses in flange-ended pipe bends from in-plane end loading other than pure bending (SHEFEF), coil spring type out-of-plane loading (COILEF), or any other type of out-of-plane loading (TURNEF).

(*c*) Flexibility matrices for flange-ended pipe bends under any in-plane end loading (FLEXIN) or out-of-plane end loading (FLEXOT).

Individual programs PRESEF and BENDEF are available from the National Energy Software Center, Argonne National Laboratory, while the total BENDPAC package has been recently supplied to the Center.

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Authors' Closure

As was stated, the objective in our research is to obtain a *simple* pipe element that can be used in practical and general analyses of large piping systems – static, dynamic, materially nonlinear, and large displacement analyses of assemblages of many bends and straight sections [1–4]. Clearly, in this development we must balance the simplicity of formulation and solution cost versus the predictive capability of the element, and our primary objective is to predict the flexibility of the structure accurately.

There is no doubt that for single pipe bends with or without straight sections or flanges, more accurate solutions on detailed stress distributions, than obtained with our simple pipe model, can be calculated. For example, finite element idealizations using isoparametric shell elements can be used to obtain very high accuracy solutions for linear and nonlinear conditions [5], or for certain solutions Whatham's programs can be employed.

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Characteristic Forms of Differential Equations for Wave Propagation in Nonlinear Media[1]

M. Ziv[2]. I was most surprised to see this paper whose objectives and outline are systematically the same as those in my paper [1]. These two papers seem too similar to be a coincidence. My surprise stems from the fact that my manuscript was first submitted on June 17, 1980 for publication to Professor Ting, acting as an Associate Editor of the JOURNAL OF APPLIED MECHANICS. Based on his own opinion that my analysis is wrong, Ting rejected my manuscript from being published in the JOURNAL OF APPLIED MECHANICS. Yet, a few months later, Ting submitted his paper, without referring to my work, presenting results which are obtainable from my manuscript.

In his paper, Professor Ting claims that his results are equations (21) and (64). But it is immediately seen that his equation (21) is a special case of my result, equation (35) of [1]. Upon a straightforward reduction, my result, equation (17) of [1], also agrees with his equation (64). Obviously, while rejecting my work, Professor Ting has adapted my objectives only to arrive at results already available to him from my manuscript. Yet, no mention of my manuscript is found in his paper.

In order to show that equation (35) of [1] becomes Ting's equation (21) upon reduction, the following changes in representations are made in equation (35) of [1]: the body force is deleted, the distinction between upper case letters and lower case letters is neglected, the symbols become those of Ting's, and finally rectangular Cartesian coordinates are used taking, for example, the x-direction. With these simplifications, equation (25) of [1] now reads

$$\frac{d\sigma_{xx}}{dt} - \rho_0 c \frac{dv_x}{dt} = M_{xxqp} v_{q,p} - \rho_0 c^2 v_{x,x} - c\sigma_{xp,p} + c\sigma_{xx,x} \quad \text{along} \quad dx/dt = c$$

where M_{kqdl} is the term $\dfrac{\partial^2 w}{\partial E_K^N \partial E_D^Q} x^d_{,D} x_{l,}^N + T_Q^K \delta_l^d$

in equation (35) of [1].

When Ting's equation (21) is now written in terms of his equation (15), i.e., $b_i = cn_i$ and the x-direction, for example, is taken, Ting's equation (21) becomes the one written in the foregoing. It was thus shown that equation (21) of Ting's paper is a special case obtained directly from equation (35) of [1]. In the same manner, it can be easily shown that equation (64) of Ting's paper is a special case of equation (17) of [1].

Also, it should be noted that equation (43) of Ting's paper is equation (38) of [2] when taking the direction cosines to be $n_r = 1$ and $n_\theta = 0$. Reference [2] was listed in my manuscript. No reference was made, however, to these works and no new results are given in Ting's paper.

References

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Author's Closure

Professor Ziv said that his manuscript was first submitted on June 17, 1980, for publication to the JOURNAL OF APPLIED MECHANICS. As a matter of fact, the same manuscript was submitted one year earlier in June of 1979 to the JOURNAL OF APPLIED MECHANICS and was handled by another Associate Editor. That earlier manuscript was rejected. With little change he submitted the same manuscript on June 17, 1980, and I was assigned to handle the paper.

The paper was rejected because of the following two basic theoretical errors: (*i*) the direction of the bicharacteristic velocity b_i is assumed to be in the direction of the normal to the wave surface n_i, which is not true in general, and (*ii*) the wave speeds c are not determined from the eigenvalues of the acoustic tensor and hence not all equations of motion are satisfied. Point (*i*) was pointed out by me while point (*ii*) was pointed out by my reviewers as well as the reviewers of the earlier manuscript. Professor Ziv simply refused to acknowledge the errors and submitted his manuscript to the *Journal of the Acoustical Society of America*. Notice that he still writes $b_i = c\, n_i$ in his discussion which implies that b_i is in the direction of n_i.

The author did not refer to Professor Ziv's manuscript at the time of writing the paper because (*a*) Professor Ziv's manuscript has not appeared in print and (*b*) the analysis in the manuscript was theoretically incorrect. No purpose would be served by referring to the manuscript and stating that the unpublished manuscript was in error. Fortunately, the manuscript has now appeared in the *Journal of the Acoustical Society of America*. The public can see that the analyses in Ziv's paper and mine are quite different and can judge for themselves whether the analysis in Ziv's paper is sound, let alone his claim that his results are more general than mine.