FIG. 27  EFFECTS OF VISCOSITY ON RATE OF RELEASE OF PRESSURIZED
FLUID THROUGH 0.187-INCH DIAMETER ORIFICES

## SELECTION OF KNOCK-OFF TUBE

The first step involved in the selection of a suitable knock-off tube is to determine the bore diameter corresponding to the required pressure-release time. If the pressure-release time is in the range 15-50 msec, the bore diameter is determined by combining equations (5) and (62) to obtain an equation relating the pressure-release time $T_R$ and the bore radius $R_o$. For pressure-release times that are less than 15 msec, equation (5) must be used in conjuction with the postulated curves presented in Figures 26 and 27 to obtain an optimum bore diameter. For specific values of chamber volume, bore length, and the high-pressure fluid viscosity and compressibility data, the bore radius can be evaluated in terms of the pressure-release time. The outside diameter of the knock-off tube depends on the pressures to be encountered and the tube material. A numerical value of the O.D. can be found from the well-known Lame equations for thick-walled tubes.

Once the knock-off tube dimensions are known, the next step is to determine the notch size and configuration and the depth of casehardening. If the choice of the notch configuration and tube material coincides with that used in this program, then the curves appearing in Figures 18 through 24, shown previously, can be employed to determine the required notch-wall thickness and casehardened depth for a specific loading weight. The objective is to select the maximum notch-wall thickness (for safety reasons) that can be completely fractured with the available loading weight. The purpose of the casehardening is to enhance the prospect of obtaining complete instantaneous severage of the knock-off tube.

A sample calculation is presented next to illustrate the procedure for selecting a knock-off tube to serve as a quick pressure-release mechanism. To avoid duplication this sample