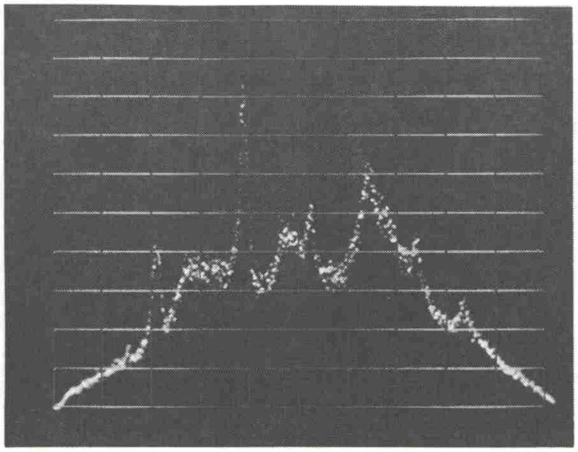

Fig. 7. Oscilloscope output of NaCl pattern, same data as Figure 6.

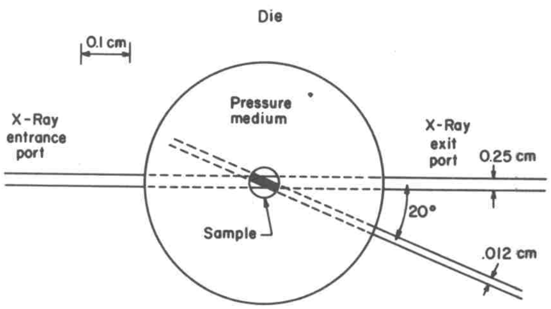

Fig. 8. Enlarged view of die bore showing the effect of double collimation.

seen. Thus, the scattered background resulting from the pressure medium can be reduced to nearly zero, enhancing the signal to noise ratio.

The Fe and NaCl patterns shown above did not use this system but just had a narrow slit at the end of the fan slot. So, for those examples, the counter saw almost all of the irradiated pressure medium which most likely made the major contribution to the background intensity.

Another advantage that could accrue from this double collimation would be the removal of the restriction on the non-crystallinity of the pressure medium. Since the counter doesn't see the medium, no interferring patterns will result. The use of boron nitride as a pressure medium would enhance the pressure transmittance to the sample over amorphous boron and would also be advantageous because of its high temperature stability and ease of fabrication.

Finally the fabrication of the die for non-dispersive use is much simpler since only single collimating grooves are needed instead of entire fan slots. Because less material has to be removed from a groove as opposed to a fan, the die strength will be enhanced and the high pressure limit increased.

Non-dispersive analysis used in conjunction with the geometrically stable split-die high pressure system offers unique capabilities for high pressure, high temperature diffraction studies. The capabilities should be applicable to other high pressure X-ray diffraction systems.

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