THE FRICTION COEFFICIENTS

The coefficient of friction corresponding to the separating force as measured, is easily obtained when the pressure at the bore is known. By assuming that the pressure is uniform over the contact surface and not seriously affected by any new distortions on the application of the force, and satisfying Lamé solution within the elastic range, the co-efficient of friction can be calculated from $\mu_f = \frac{F}{AP}$ where A = surface contact area. Although the co-efficient of friction so established was not too closely defined, it has to be presented as the best values obtainable for this data*. It was also assumed to be constant for both elastic and elasto-plastic portion.

TABLE 4

Average Co-efficient of Friction

Series No.	d.inch	D.inch	Co-efficient of Friction μ_f
1	$\frac{1}{2}$	1	0.24
2	$\frac{1}{2}$	1	0.212
3	$\frac{1}{2}$	1	0.225
4	$\frac{7}{16}$	0.96	0.427
5	$\frac{1}{2}$	1	0.314
6	$\frac{1}{2}$	1	0.0763
7	$\frac{1}{2}$	1	0.162
8	$\frac{1}{2}$	1	0.244

* Ref. 6 p.811

Main Error in the Experiment that caused Test Results to be Scattered.

(1) Material Properties

Since specimens were not all cut from the same bar, there would be a difference in material properties. The differences, as tested, were not much for Aluminium, Brass and Mild steel; the maximum was about 5% for UTS. and S_{us}. For Cast iron, which was cast in Thailand, the deviation reached 30% for UTS. and S_{us}.

(2) Due to Machining

The lathe tool was not a new one and might not be in alignment. These caused out-of-roundness and out-of- straightness effect to specimens. The minimum difference in diameter of $\frac{1}{2}$" shaft, 3" long that can be controlled was about 0.001". The shaking of the blunt reamer caused the out-of-roundness effect and longitudinal strips. The surface roughness depends on the angle of cut and the sharpness of cutting tool which could not be controlled. For soft material such as Aluminium, the surface roughness were nearly the same because the cutting tool was always sharp. However, care was taken so as to keep the surface roughness of each series as closely the same as possible.

(3) Due to Measurement

(a) Measurements of hub bore by using the Engineering Microscope

The measurements could be made only at the ends of the hub. The error; depends on the condition of the edge of the hole, the light on the specimens, the parallax and the fatigue of the eyes. The estimated accuracy was then about $\frac{2"}{10,000}$

(2) Measurements of shaft diameter by using the Vernier Micrometer

Although this type of micrometer can be read to $\frac{1}{100,000}$ inch, it is too sensitive to be used with accuracy less than $\frac{1}{10,000}$ inch. Only a small particle of dust or the remaining chips of material from turning can cause an error. In addition, the zero setting

frequently could not be kept constant. The estimated accuracy was then about $\frac{1}{10,000}$ inch.

Other errors were of less importance comparing with the first three mentioned.