CHAPTER 4

RESULTS

1st series. (Figs. 4-1., 4-2.)

The direction of vibration of the slider perpendicular
to the sliding surface in a plane at right angles. (Fig. 3-2.)

TABLE 9-1. COEFFICIENT OF FRICTION WITHOUT VIBRATION.

Speed (RPM)	Frequency (c/s)	Normal Force (lb)								1.2 lb Strain	Normal Force (W) lb	μ
		0	0.5	0.7	0.9	1.1	1.3	1.5	1.7			
		Strain (%)										
0	0	0237	0365	0490	0525	0650	0676	0755	0830	0.045	0.180	0.360
763	0	0465	0495	0550	0598	0642	0692	0732	0775	0.030	0.120	0.240
1140	0	0532	0582	0628	0677	0715	0770	0788	0815	0.029	0.116	0.232
1525	0	0530	0578	0602	0642	0675	0735	0789	0832	0.028	0.113	0.226
1910	0	0515	0600	0650	0670	0702	0771	0800	0842	0.024	0.096	0.192
2290	0	0547	0602	0625	0670	0700	0725	0775	0815	0.235	0.095	0.190

TABLE 9-2. COEFFICIENT OF FRICTION WITH A CONSTANT FREQUENCY OF VIBRATION.

Speed (RPM)	Frequency (c/s)	Normal Force (lb)								1.2 lb Strain	Normal Force (W) lb	μ
		0	0.5	0.7	0.9	1.1	1.3	1.5	1.7			
		Strain (%)										
0	1000	0321	0258	0306	0250	0418	0472	0532	0620	0.034	0.136	0.272
763	1000	0428	0492	0510	0550	0582	0615	0650	0690	0.026	0.104	0.204
1140	1000	0429	0478	0520	0545	0585	0630	0660	0697	0.025	0.100	0.200
1525	1000	0410	0455	0492	0522	0568	0610	0630	0662	0.024	0.096	0.192
1910	1000	0414	0485	0512	0555	0587	0612	0648	0675	0.022	0.089	0.178
2290	1000	0448	0461	0515	0551	0581	0607	0635	0668	0.021	0.080	0.170

TABLE 9-3. COEFFICIENT OF FRICTION WITH VARYING FREQUENCY OF VIBRATION AT A CONSTANT SPEED.

| Speed (RPM)	Frequency (c/s)	Normal Force (lb)						1.1 lb Strain	Normal Force (W) lb	μ
		0	0.2	0.4	0.6	0.8	1.1			
		Strain (%)								
763	700	0145	0190	0225	0255	0275	0300	0.019	0.078	0.170
	900	0165	0216	0254	0284	0312	0333	0.020	0.080	0.174
	1100	0150	0210	0235	0273	0306	0328	0.021	0.085	0.185
	1300	0140	0180	0226	0265	0294	0322	0.022	0.089	0.194
	1500	0128	0165	0213	0247	0287	0305	0.022	0.089	0.194
	1700	0098	0138	0185	0220	0255	0278	0.022	0.089	0.194
	1900	0082	0142	0180	0203	0235	0264	0.022	0.089	0.194
	2100	0055	0103	0149	0198	0222	0250	0.023	0.092	0.200
	2300	0047	0094	0130	0116	0202	0240	0.023	0.092	0.200
	2500	0035	0078	0121	0157	0190	0220	0.023	0.092	0.200
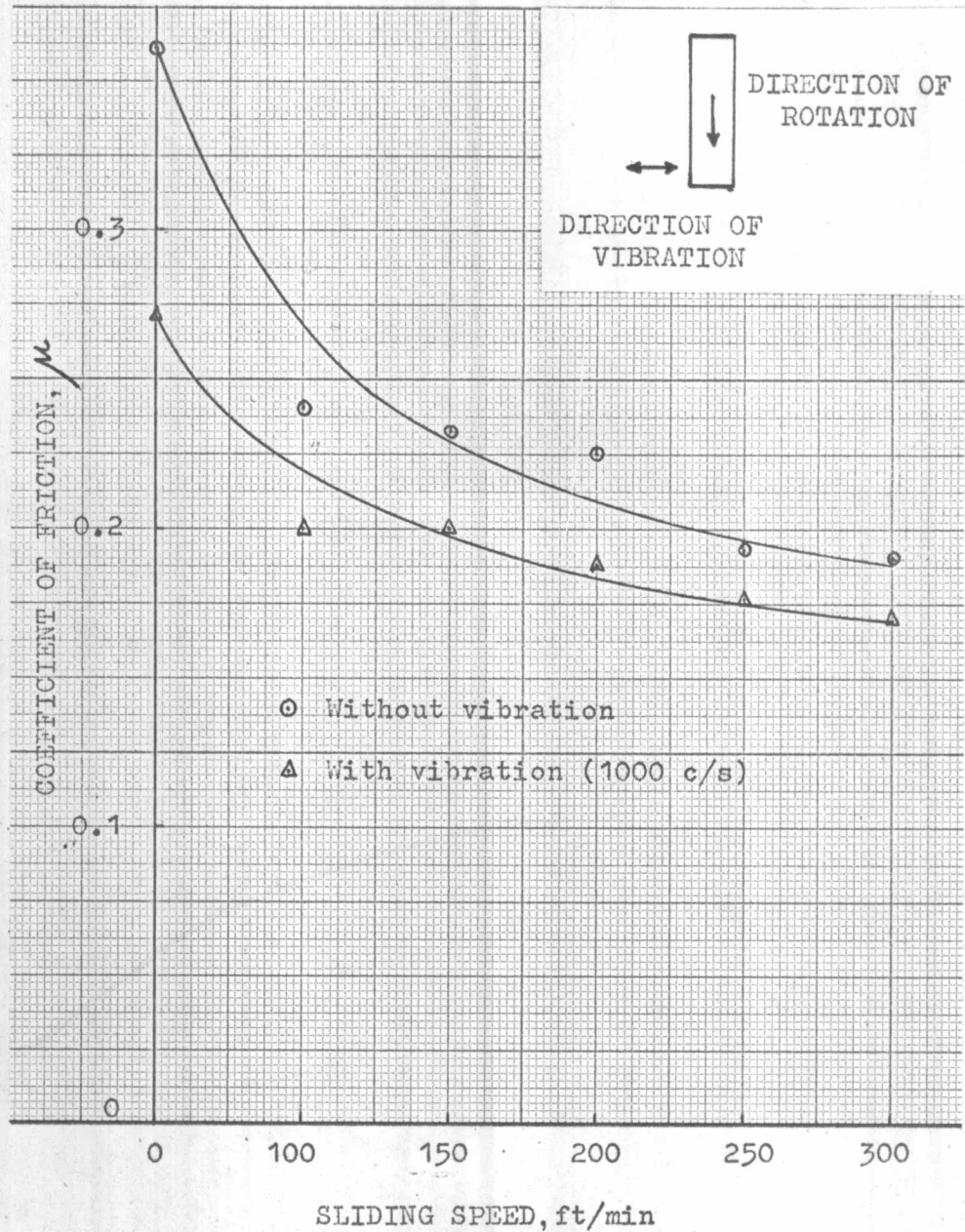
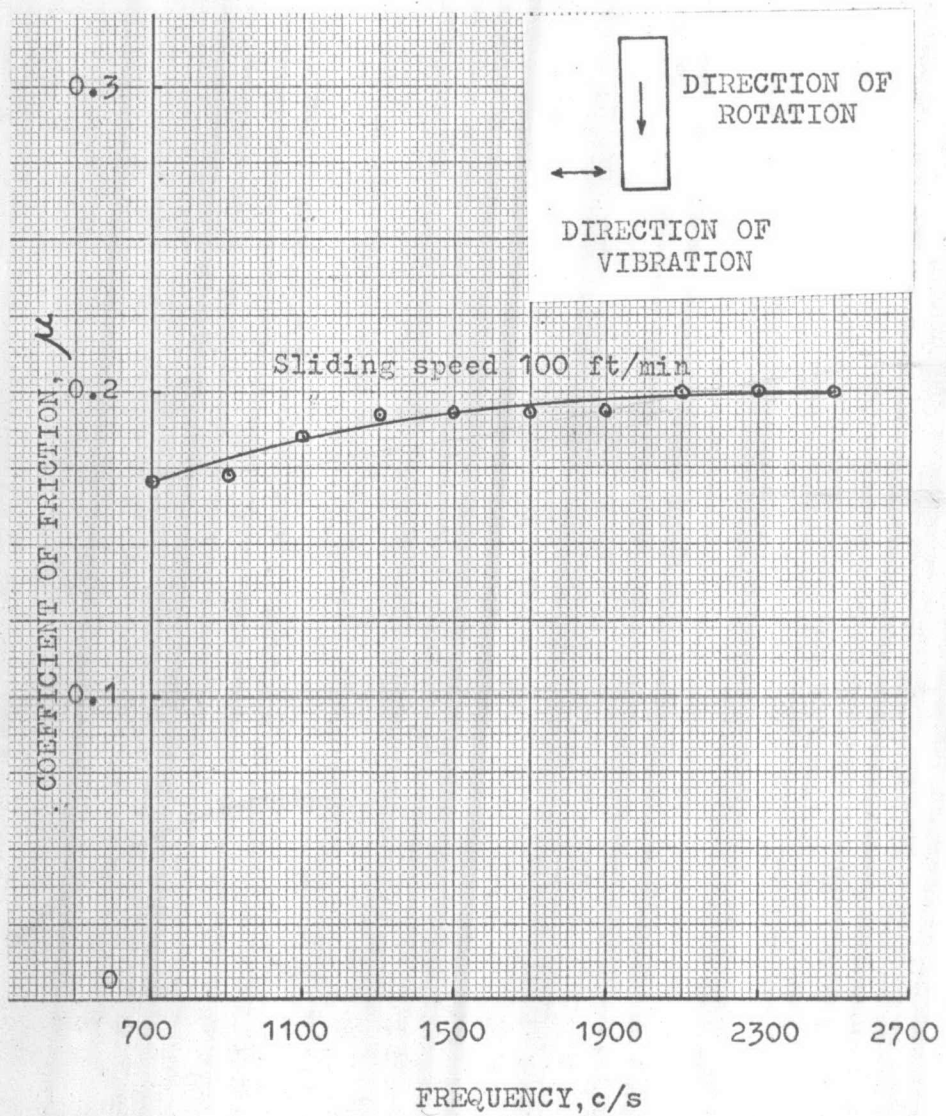Fig. 4-1. COEFFICIENT OF FRICTION AND SLIDING SPEED CURVES.

Fig. 4-2. COEFFICIENT OF FRICTION AND FREQUENCY CURVE.

2nd series. (Figs. 4-3., 4-4.)

The direction of vibration of the slider parallel to the sliding surface. (Fig. 3-3.)

TABLE 9-4. COEFFICIENT OF FRICTION WITHOUT VIBRATION.

Speed (RPM)	Frequency (c/s)	Normal Force (lb)						5 lb Strain	Normal Force (W) lb	μ
		0	1	2	3	4	5			
		Strain (%)								
0	0	0430	0555	1070	1440	1875	2125	0.194	0.75	0.362
763	0	0639	0720	0925	1150	1320	1523	0.099	0.43	0.206
1140	0	0692	0740	0928	1157	1342	1468	0.091	0.38	0.182
1525	0	0651	0735	0958	1194	1371	1500	0.095	0.40	0.192
1910	0	0683	0675	0875	1020	1205	1430	0.091	0.38	0.182
2290	0	0620	0680	0838	1055	1245	1410	0.091	0.38	0.182

TABLE 9-5. COEFFICIENT OF FRICTION WITH A CONSTANT FREQUENCY OF VIBRATION.

Speed (RPM)	Frequency (c/s)	Normal Force (lb)						5 lb Strain	Normal Force (W) lb	μ
		0	1	2	3	4	5			
		Strain (%)								
0	1000	0430	0700	0902	1228	1508	1670	0.124	0.52	0.250
763	1000	0615	0714	0952	1143	1395	1490	0.089	0.37	0.178
1140	1000	0630	0750	0945	1130	1295	1476	0.089	0.37	0.178
1512	1000	0692	0750	0922	1080	1330	1462	0.085	0.36	0.173
1910	1000	0743	0803	1000	1145	1288	1475	0.085	0.36	0.173
2290	1000	0620	0635	0838	0992	1158	1375	0.085	0.36	0.173

TABLE 9-6. COEFFICIENT OF FRICTION WITH VARYING OF FREQUENCY OF VIBRATION AT A CONSTANT SPEED.

| Speed (RPM)	Frequency (c/s)	Normal Force (lb)						4.4 lb Strain	Normal Force (W) lb	μ
		0	0.88	1.76	2.64	3.52	4.40			
		Strain (%)								
1525	700	1624	1772	1912	2038	2190	2398	0.077	0.325	0.173
	900	1531	1606	1722	1952	2053	2235	0.077	0.325	0.173
	1100	1408	1526	1687	1890	1995	2210	0.077	0.325	0.173
	1300	1282	1484	1615	1840	1978	2116	0.080	0.335	0.178
	1500	1342	1460	1587	1798	1880	2068	0.080	0.335	0.178
	1700	1277	1392	1535	1672	1892	2037	0.080	0.335	0.178
	1900	1300	1425	1590	1706	1988	2120	0.081	0.340	0.181
	2100	1345	1530	1692	1763	1956	2170	0.083	0.350	0.186
	2300	1302	1403	1556	1737	1835	2056	0.086	0.360	0.192
	2500	1220	1415	1546	1753	1886	2087	0.086	0.360	0.192
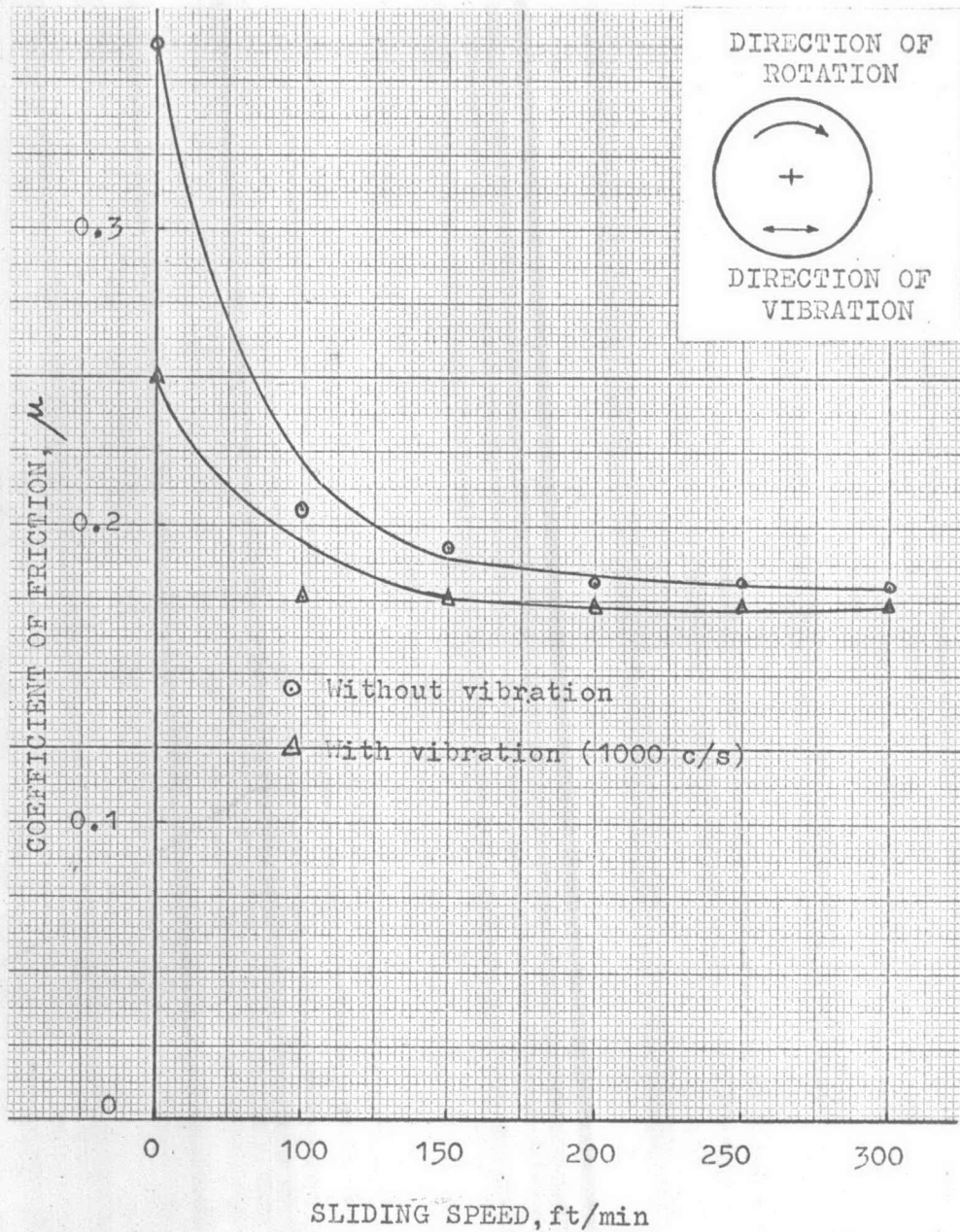
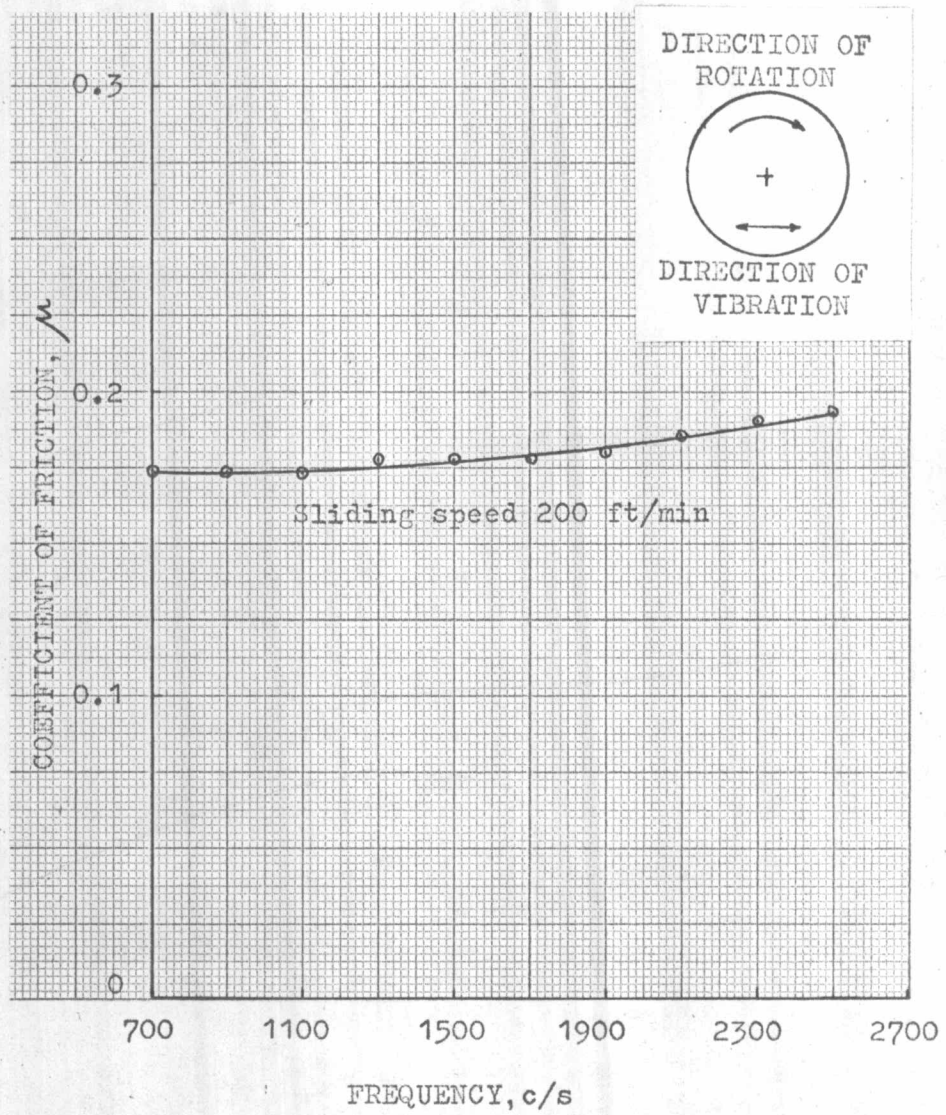Fig. 4-3. COEFFICIENT OF FRICTION AND SLIDING SPEED CURVES.

Fig. 4-4. COEFFICIENT OF FRICTION AND FREQUENCY CURVE.

3rd series. (Figs. 4-5., 4-6.)

The direction of vibration of the slider perpendicular to the direction of sliding in the same plane. (Fig. 3-5.)

TABLE 9-7. COEFFICIENT OF FRICTION WITHOUT VIBRATION.

| Speed (RPM) | Frequency (c/s) | Normal Force (lb) | | | | | | 2 lb Strain | Normal Force (W) lb | μ |
| | | 0.5 | 0.9 | 1.3 | 1.7 | 2.1 | 2.5 | | | |
		Strain (%)								
0	0	0949	1062	1153	1245	1364	1603	0.110	0.230	0.276
763	0	1237	1391	1518	1696	1911	2057	0.080	0.171	0.205
1140	0	1271	1483	1670	1736	1912	2037	0.076	0.163	0.187
1525	0	0966	1200	1370	1529	1639	1853	0.078	0.156	0.180
1910	0	1182	1276	1415	1550	1611	1853	0.073	0.156	0.180
2290	0	1079	1180	1340	1445	1564	1760	0.073	0.156	0.180

TABLE 9-8. COEFFICIENT OF FRICTION WITH A CONSTANT FREQUENCY OF VIBRATION.

Speed (RPM)	Frequency (c/s)	Normal Force (lb)						2.5 lb Strain	Normal Force (W) lb	μ
		0.5	1.0	1.5	2.0	2.5	3.0			
		Strain (%)								
0	1000	1005	1181	1362	1622	1818	2005	0.110	0.234	0.225
763	1000	1039	1223	1377	1566	1712	1913	0.086	0.184	0.177
1140	1000	0940	1150	1317	1496	1660	1934	0.085	0.182	0.175
1525	1000	1027	1237	1367	1653	1769	1912	0.085	0.182	0.175
1910	1000	0986	1105	1320	1425	1672	1790	0.081	0.174	0.167
2290	1000	1028	1130	1353	1416	1613	1780	0.081	0.174	0.167

TABLE 9-9. COEFFICIENT OF FRICTION WITH VARYING FREQUENCY OF VIBRATION AT A CONSTANT SPEED.

Speed (RPM)	Frequency (c/s)	Normal Force (lb)						2.2 lb Strain	Normal Force (W) lb	μ
		0.50	0.94	1.38	1.82	2.26	2.70			
		Strain (%)								
1140	700	1170	1324	1447	1586	1722	1916	0.073	0.156	0.170
	900	1047	1132	1327	1474	1617	1820	0.073	0.156	0.170
	1100	1227	1402	1553	1695	1886	1952	0.075	0.160	0.175
	1300	1133	1275	1430	1584	1716	1897	0.076	0.162	0.177
	1500	1045	1140	1292	1443	1592	1792	0.077	0.165	0.180
	1700	1132	1353	1485	1588	1732	1897	0.077	0.165	0.180
	1900	1036	1231	1414	1630	1672	1822	0.080	0.171	0.186
	2100	1037	1173	1358	1555	1778	1835	0.080	0.171	0.186
	2300	1010	1183	1265	1416	1613	1780	0.087	0.186	0.203
	2500	0967	1155	1355	1567	1673	1857	0.090	0.192	0.210
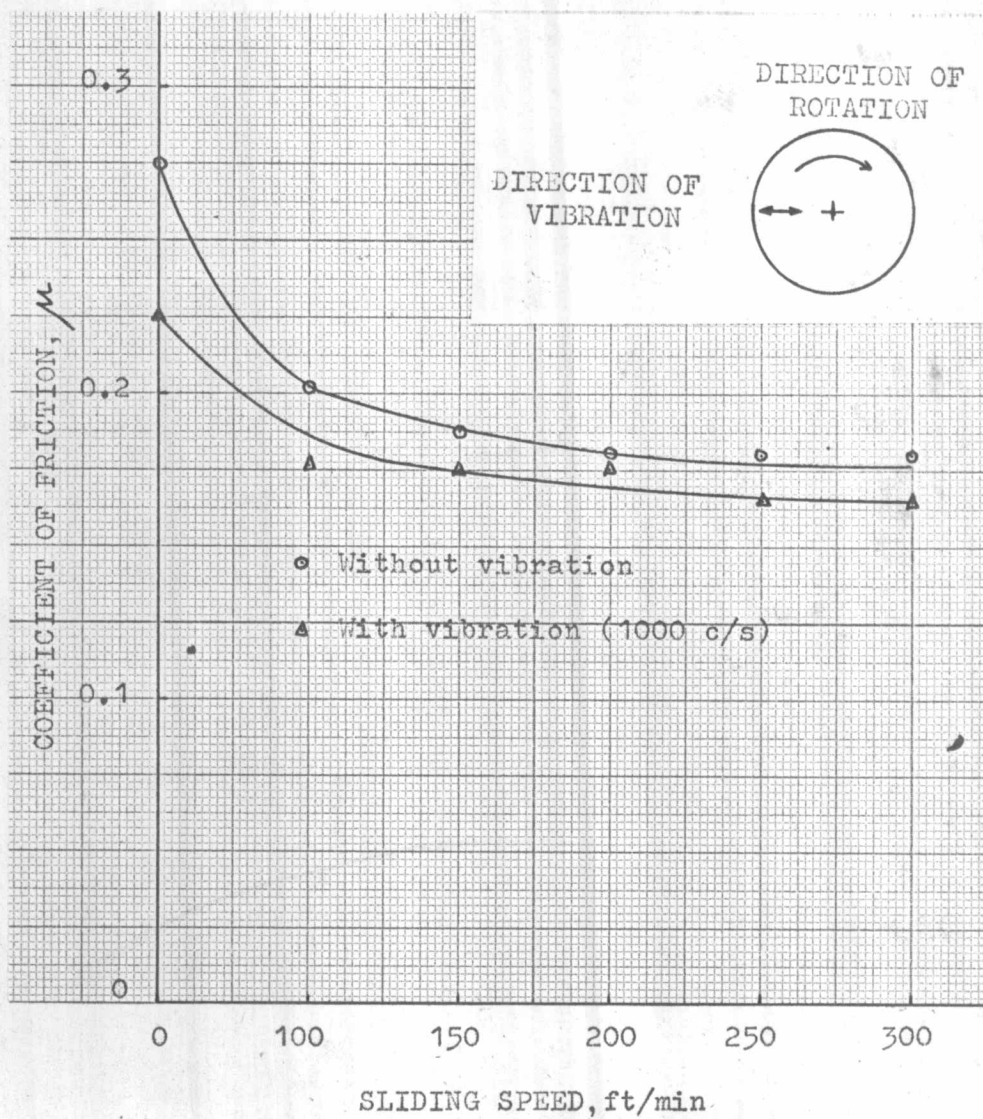
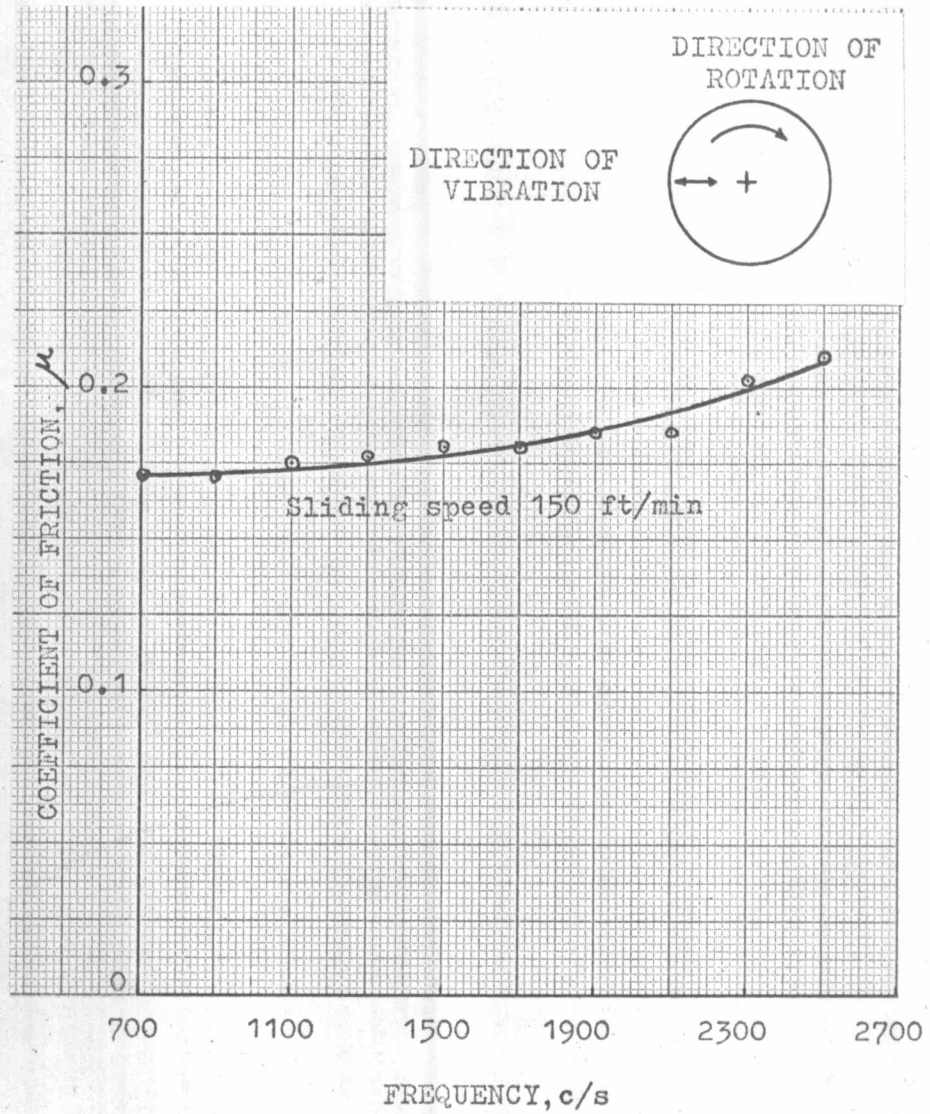Fig. 4-5. COEFFICIENT OF FRICTION AND SLIDING SPEED CURVES.

Fig. 4-6. COEFFICIENT OF FRICTION AND FREQUENCY CURVE.

4th series. (Figs. 4-7., 4-8., 4-9., 4-10.)

The direction of vibration of the slider perpendicular to the sliding surface in a plane at right angles. (Fig. 3-2.) Light and heavy vibration was applied to the slider under both static and dynamic conditions.
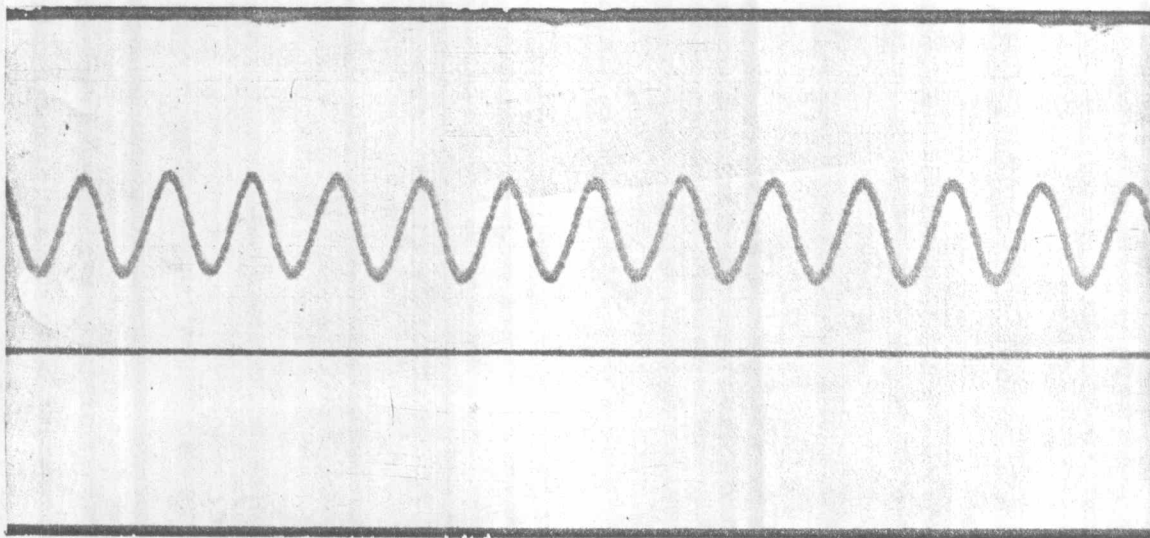
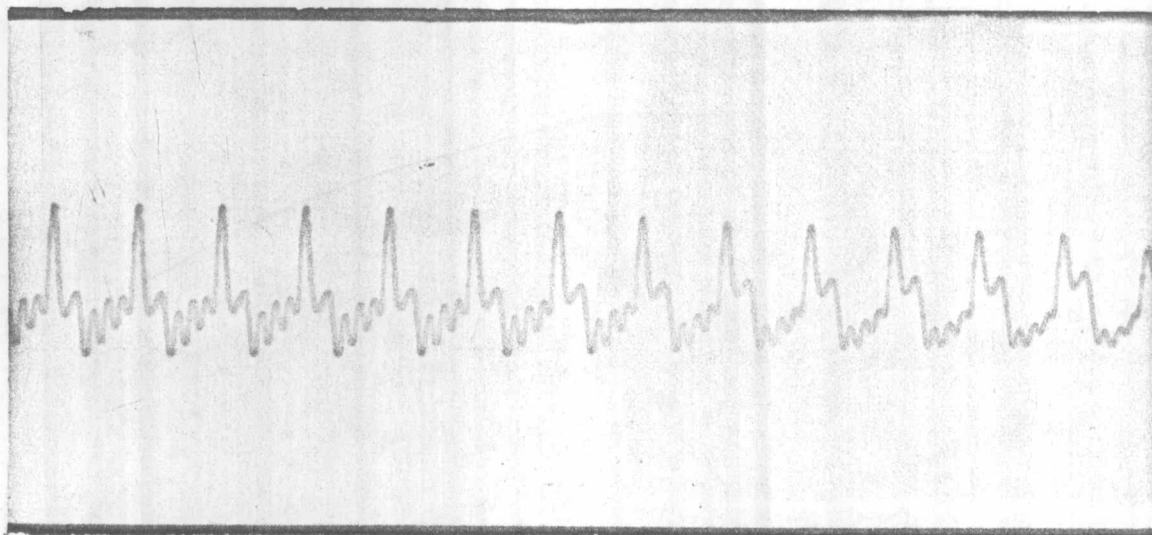Fig. 4-7. WAVE FORM OF ALTERNATING FORCE APPLIED AT THE
TRANSDUCER. THE STEEL RING IS KEPT STATIONARY.

Fig. 4-8. BOUNCING OF THE SLIDER DUE TO A LARGE AMPLITUDE
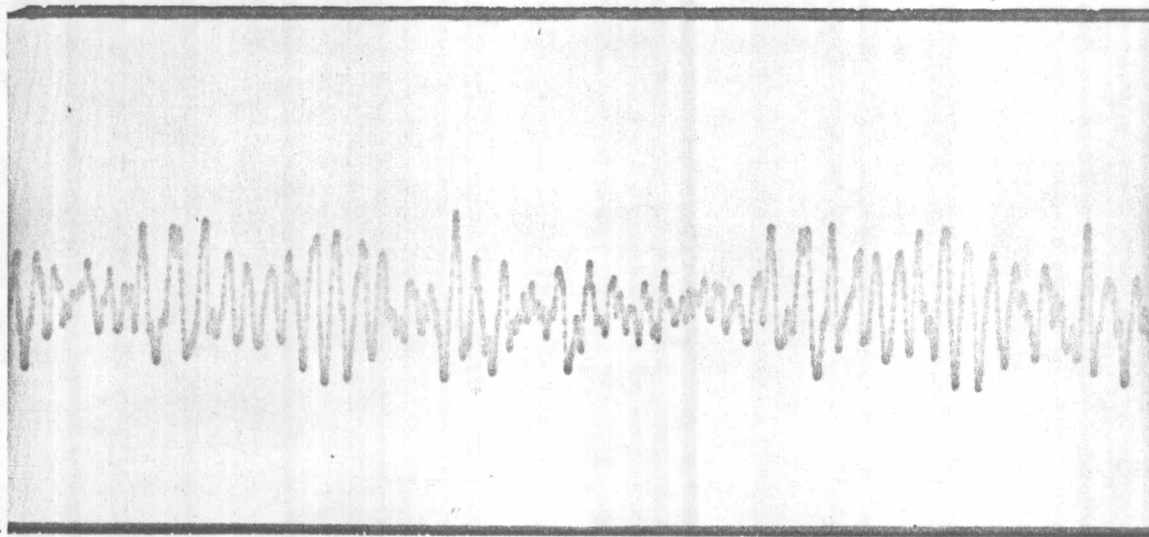OF VIBRATION.

Fig. 4-9. SHOWS THE INFLUENCE OF SURFACE ROUGHNESS ON THE
TRANSDUCER WHEN NO VIBRATION IS APPLIED. THE
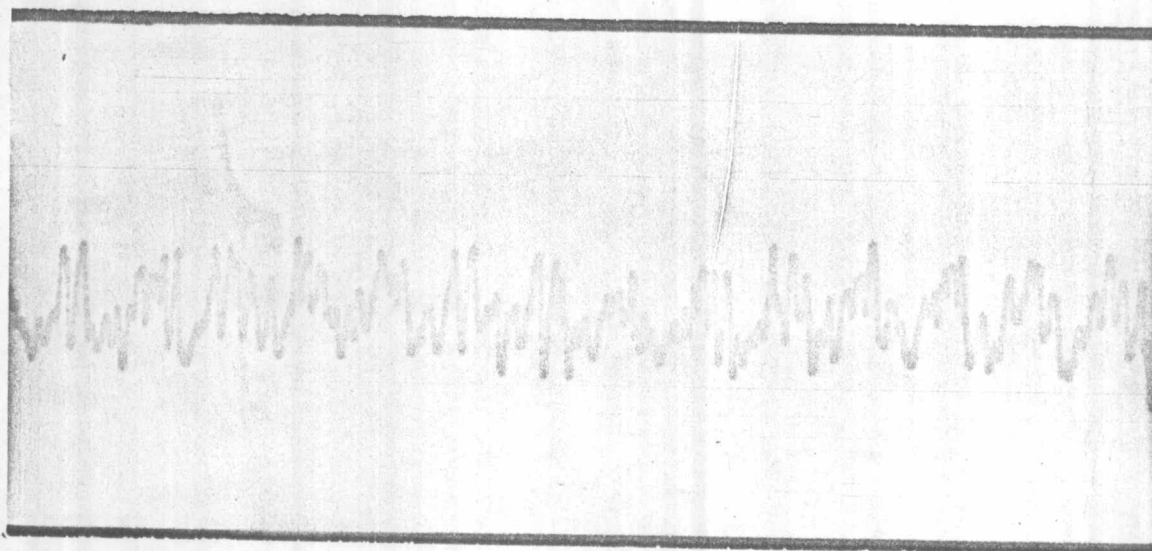ROTATION OF THE STEEL RING IS 100 FT/MIN.

Fig. 4-10. THE WAVE FORM OF THE TRANSDUCER WHEN A VIBRATION
OF 100 C/S IS APPLIED. THE STEEL RING ROTATES
AT 100 FT/MIN.