SMITHSONIAN MISCELLANEOUS COLLECTIONS
VOLUME 98, NUMBER 21

Roebling Fund 1939
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CITY OF WASHINGTON
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The Lord Baltimore Press
BALTIMORE, MD., U. S. A.

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Golf and tennis players working in Washington, D. C., are sometimes disappointed by a succession of rainy Saturday afternoons. So insistently has this forced itself on our attention that we have examined the daily weather record at Washington for the years 1924 to 1939 to see if there is any real ground for supposing that there is a marked period of seven days in precipitation.

Other researches of this Institution have indicated that variations of the sun are important causes of weather changes. As the sun's rotation period is slightly less than 4 weeks, we were inclined to suppose that a period of one-fourth that of solar rotation or slightly less than 1 week, if found in weather, might be associated with the sun's rotation. If it were really caused by a solar variation, and related to the sun's rotation, then the weekly weather period, while nearly constant in length, would probably shift in phase occasionally. For it is well known that solar features, such as sunspots, while they may be nearly fixed on the sun's surface for several rotations, soon disappear and are succeeded by others at other solar longitudes.

Statistics soon persuaded us that, so far as there is evidence for this nearly weekly weather period, it seemed indeed to be a little less than 7 days. As a first approximation we assumed that the day of maximum precipitation shifts 1 day earlier in the week on each successive month. As a rough and ready index of precipitation we computed for each month separately the percentages of the total monthly precipitation which fell on the seven successive days of the week, Sunday to Saturday. We arranged these monthly percentages in a table in which the week-day names shifted to the left by 1 day each month.

Taking sums of the seven columns of our table we were then in a position to see whether the day of maximum precipitation did actually remain in the same column, or nearly so, for long intervals. To illustrate these procedures we give tables 1 and 2.

As is apparent from table 2, the same column contains the day of maximum precipitation for the yearly average for 4 successive years,

from 1926 to 1929 inclusive. The columns of maximum precipitation in 1924 and 1925 are shifted from this prevailing place only two columns and one column later than this in the week, respectively. In 1930 the highest maximum occurs several days later in the week, but a maximum only a very little lower than this occurs in the same column as for 1925. In 1931 the position of maximum returns to the column frequented from 1926 to 1929.

TABLE 1—*Percentages of Monthly Total Precipitation Falling on Successive Days of the Week, 1929*

Month	Day of the week at percentage precipitation						
Jan.	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.
	2	18	30	32	6	0	12
Feb.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.
	10	35	51	0	3	0	1
Mar.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
	16	43	7	0	0	34	0
Apr.	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
	34	10	38	1	14	3	0
May	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.
	0	29	29	8	19	13	2
June	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.
	26	27	2	20	15	9	1
July	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.	Wed.
	0	30	0	0	63	0	7
Aug.	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.	Tues.
	0	15	15	65	0	0	4
Sept.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.	Mon.
	38	0	25	0	14	19	5
Oct.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
	0	59	40	0	1	0	0
Nov.	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
	40	36	0	7	5	5	7
Dec.	Sat.	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.
	4	4	55	0	27	6	4
Sum, year	170	306	292	133	167	89	43
Percent, year	14	26	24	11	14	7	4

If, as suggested above, the cause of the weekly weather period is associated with solar rotation, and if the period is constant while the phase is subject to changes as features form and disappear on the sun, then there is no reason to expect the interval which we term the year to have any special relationship with the persistence of any particular phase. Accordingly we have sought to make a better arrangement by comparing from month to month the distribution of percentages of precipitation falling on the dates I to VII of table 2.

This study led to the arrangement shown in table 3, where sums are given of the monthly percentages in the dates I to VII through the intervals indicated. Maxima are printed in bold-face type, minima in italics.

TABLE 2—*Yearly Sums of Monthly Percentages of Total Precipitation Falling on Successive Days of the Week, 1924–1939*

	Successive Days						
Year	I	II	III	IV	V	VI	VII
1924	142	166	183	260	193	98	60
1925	198	75	248	205	100	231	142
1926	211	276	147	160	104	144	157
1927	105	322	118	167	131	140	217
1928	95	237	167	228	113	221	139
1929	170	306	292	133	167	89	43
1930	151	51	314	105	86	344	150
1931	193	243	161	96	183	106	224
1932	257	236	131	225	147	99	107
1933	154	127	169	168	107	178	297
1934	229	177	280	103	91	137	182
1935	126	101	232	334	181	103	124
1936	171	251	215	153	290	89	35
1937	137	88	161	186	237	226	165
1938	162	154	122	240	115	239	160
1939	50	124	25	105	93	48	66
Totals	2,551	2,934	2,965	2,868	2,338	2,492	2,268

TABLE 3

Interval	I	II	III	IV	V	VI	VII
Jan. 1924–Oct. 1924	103	157	71	**252**	190	73	*55*
Nov. 1924–Sept. 1925	203	*46*	**342**	196	74	135	105
Oct. 1925–Nov. 1927	349	**632**	279	305	*258*	361	415
Dec. 1927–Oct. 1928	*64*	148	148	231	112	**258**	138
Nov. 1928–Dec. 1929	202	**399**	315	169	174	96	*45*
Jan. 1930–Mar. 1931	165	196	**402**	141	*92*	351	155
Apr. 1931–Dec. 1931	179	98	73	*60*	177	99	**219**
Jan. 1932–Nov. 1932	**257**	193	128	225	129	*63*	107
Dec. 1932–Nov. 1933	149	165	132	*125*	*125*	214	**290**
Dec. 1933–Mar. 1935	265	232	**416**	203	*115*	156	214
Apr. 1935–Dec. 1935	95	*51*	136	**277**	157	84	99
Jan. 1936–Dec. 1936	171	251	215	153	**290**	89	*35*
Jan. 1937–June 1937	*38*	57	40	93	133	**154**	85
July 1937–Dec. 1937	99	*31*	**121**	93	104	72	80
Jan. 1938–May 1939	212	278	*147*	**345**	208	287	226

By reduction of table 3 to percentages there results table 4.

From table 4 we conclude that, assuming a periodicity of 6 days 18 hours in precipitation at Washington, a day of maximum precipi-

tation persists in the averages for many months, on which day from 2 to 8 times as much precipitation falls as on neighboring days of minimum precipitation usually 1 day earlier and 2 days later. At intervals ranging from 40 to 100 weeks the day of maximum precipitation shifts a little within the period, and at times, though rarely, a pronounced double maximum persists.

TABLE 4—*Percentages of Precipitation on Selected Days*

Interval	I	II	III	IV	V	VI	VII	Total	Max./Min.
Jan. 1924–Oct. 1924...	11.4	17.4	7.9	**28.0**	21.1	8.1	*6.1*	100	4.6
Nov. 1924–Sept. 1925...	18.4	*4.2*	**31.1**	17.8	6.7	12.3	9.5	100	7.4
Oct. 1925–Nov. 1927...	13.4	**24.3**	10.7	11.7	*9.9*	13.9	16.0	100	2.5
Dec. 1927–Oct. 1928...	*5.8*	13.5	13.5	21.0	10.2	**23.5**	12.6	100	4.0
Nov. 1928–Dec. 1929...	14.4	**28.5**	22.5	12.1	12.4	6.9	*3.2*	100	8.9
Jan. 1930–Mar. 1931...	11.0	13.0	**26.8**	9.4	*6.1*	23.4	10.3	100	4.4
Apr. 1931–Dec. 1931...	19.8	10.8	8.1	*6.6*	19.6	10.9	**24.2**	100	3.7
Jan. 1932–Nov. 1932...	**23.3**	17.5	11.6	20.4	11.7	*5.7*	9.7	100	4.1
Dec. 1932–Nov. 1933...	12.4	13.8	11.0	*10.4*	*10.4*	17.8	**24.2**	100	2.3
Dec. 1933–Mar. 1935...	16.6	14.5	**26.0**	12.7	*7.2*	9.7	13.4	100	3.6
Apr. 1935–Dec. 1935...	10.6	*5.7*	15.1	**30.8**	17.5	9.3	11.0	100	5.4
Jan. 1936–Dec. 1936...	14.2	20.8	17.9	12.7	**24.1**	7.4	*2.9*	100	8.3
Jan. 1937–June 1937...	*6.3*	9.5	6.7	15.5	22.2	**25.7**	14.2	100	4.1
July 1937–Dec. 1937...	16.5	*5.2*	**20.2**	15.5	17.3	12.0	13.3	100	3.9
Jan. 1938–May 1939...	12.4	16.3	*8.6*	**20.3**	12.2	16.9	13.3	100	2.4

In May 1939, an exceptionally dry month, maxima of precipitation occurred on Saturday and Monday. According to table 4 maximum precipitation should have occurred between them on Sunday. In reality zero precipitation occurred on Sunday, Wednesday, Thursday, and Friday. If we use the average position of maxima and minima in the interval from January 1938 to the present time, the maxima for June 1939 should fall on Sunday and Tuesday, the minimum on Saturday, and these features should come 1 day earlier in the week successively in subsequent months.