

SEISMIC DISTURBANCES OBSERVED IN EUROPE AND AT TENERIFFE

BY

DR. E. VON REBEUR PASCHWITZ.

The observations were made with the horizontal pendulums of Dr. E. Von Rebeur-Paschwitz. In all cases Greenwich Mean Astronomical time is used. o.h = Noon.

- (1) P. Potsdam, Germany + 52.94' — 0 52.3 E. o. Greenwich.
- (2) W. Wilhelmshaven, Germany + 53.32' — 0 32.6 E. o. Greenwich.
- (3) T. Port Orotava, Teneriffe + 28.25' + 1 6.3 W. o. Greenwich.
- (4) S. Strasburg, Germany + 48.35 — 0 31.0 E. o. Greenwich.
- (5) N. Nicolaiew, Russia + 46.58 — 2 7.9 E. o. Greenwich.

Observations at S were made by Prof. Becker.

 " " N " " " " Prof. Kortanal.

S: signifies disturbance observed at S, no record at N.

S N (o): signifies disturbance observed at S but not at N though a record was obtained there.

S N: signifies disturbance observed at both places.

(?) instead of (o) signifies doubtful, when the disturbance is either small or covered by misseismic motion.

Only approximate times are here given, for detailed dates apply by letter to Dr. E. Von Rebeur-Paschwitz, Merseburg, Dom 2, Germany.

(+) In the Nr. of a disturbance refers to the following notes in which all cases are mentioned in which the cause of the earthquake was discovered with certainty or in which at least a singular coincidence of time exists.

(+) In the Observations at Teneriffe refers to disturbances probably of local origin.

Notes.

Zante Earthquakes.	Nr. 147, 148, 174, 186, 292.
Japan	Nr. 9, 25, 26, 94, 124, 128, 175
	doubtful cases 136, 150, 160, 159, 162.
Philippine Islands.	Nr. 75, 76.
Servia.	183.
Beluschistan.	140.
Greece.	30, 249, 261.
Italy.	190, 248, 283, 288
	doubtful cases 145, 171, 189, 193, 206, 207, 208, 245, 278.
Norway.	95.
Turkey.	153
	doubtful case 166.

LIST OF SEISMIC DISTURBANCES

OBSERVED WITH THE HORIZONTAL PENDULUM.

No.	Date.	Gr. M. T.	Place.	Notes.
1	1889 March 27	18.45	W.	Moderate.
2	" " 28	7.37	W.	"
3	" " 31	21.2	W.	"
4	" April 3	8.3	W.Po.	Small.
5	" " 5	9.0	P.W.	"
6	" " 5	10.15	P.W. (0)	"
7	" " 8	16.78	P.W.	Moderate.
8.	" " 15	7.10	P.W.	Very strong.
9*	" " 17	17.3-20	P.W.	"
10	" " 25	16.8-18.2	P.	Pretty strong.
11	" " 28	21.60	P.W.	A single shock.
12	" May 21	10.55-11.1	P.	Strong.
13	" " 25	7.15	P.	"
14	" " 25	10.70	P.	"
15	" " 26	9.40	P.	Moderate.
16*	" " 30	8.32	W.Po.	Small.
17*	" " 30	9.40	W.Po.	"
18	" " 31	8.80	P.W. (?)	Distinct.
19	" June 19	18.87	P.W.	A small shock.
20	" " 30	13.37	P.W.	A dist. shock.
21	" July 8	10-13	P.W.	Very strong.
22*	" " 11	10.38-14	P.W.	"
23	" " 18	17.08	P.W.	A dist. shock.
24	" " 15	12.42	W.	"
25*	" " 28	3.5	P.W.	Pretty strong.
26*	" " 28	6.0	P.W.	"
27	" August 3	16.7	P.W.	Moderate.
28	" " 4	10.8-12	P.W.	Strong.
29	" " 13	7.97	W.P. (?)	A single shock.
30*	" " 25	7.6	P.W.	Strong.
31	" " 29	18.4	P.W.	"
32	" September 5	22.6	P.W.	"
33	" " 6	1.3-4	P.	"
34	" " 6	11-13	P.	Moderate.
35	" " 9	9.08	P.Wo.	Small.
36	" " 9	10.55	P.W.	"
37	" " 13	5.6	P.W.	"
38	" " 18	6.9-9.3	P.W.	Strong.
39	" " 25	10.10	W.P. (?)	Small.
40	" " 30	9.8-10.5	W.	"
41	" October 1	13.72	W.	A dist. shock.
42	" " 5	15.2-18.0	W.	Strong.
43	1891 June 4	19.1-24.1	T.	*
44	" " 7	4.9	T.	Small.

* Probably only of local origin.

No.	Date.	Gr. M. T.	Place.	Notes.
45	1891 " 13	18.0	T.	Distinct.
46	" " 14	16.15	T.	A single shock.
47	" " 25	5.01	T.	Small.
48	" " 30	22.6-24.1	T.	*
49	" February 4	22.1-24.1	T.	*
50	" " 5	13.5	T.	Small.
51	" " 5	21.1-23.1	T.	*
52	" " 6	20.1-24.5	T.	*
53	" " 13	22.4-23.5	T.	*
54	" " 15	20.4	T.	* Large.
55	" " 17	20.1-23.1	T.	*
56	" " 19	3.88	T.	A shock.
57	" " 19	7.10	T.	" "
58	" " 21	19.6-24.6	T.	" "
59	" " 26	23.1	T.	Small.
60	" " 27	18.5-24.6	T.	*
61	" March 3	1.79	T.	A large shock.
62	" " 4	21.39	T.	Moderate.
63	" " 16	19.1-23.1	T.	*
64	" " 16	23.30	T.	Small.
65	" " 22	4.1	T.	"
66	" " 26	13.6-14.8	T.	Moderate.
67	" April 4	10.1-11.1	T.	Small.
68	" " 6	23.8-2.1	T.	*
69	" " 7	15.9-16.8	T.	Moderate.
70	" " 7	20.1-23.1	T.	*
71	" " 21	19.1-22.1	T.	**
72	" " 27	19.20	T.	A strong shock.
73	1892 February 23	18.6-21.1	N.	Strong.
74	" March 9	15.9-16.4	N.	Small.
75*	" " 16	1.4-2.4	N.	"
76*	" " 16	5.4-5.9	N.	"
77	" " 21	5.5	N.	"
78	" " 22	2.6-4.0	N.	"
79	" April 6	5.3	S.No.	"
80	" " 10	8.9-11.4	N.	Moderate.
81	" " 12	6.4-7.9	N.S.	Strong.
82	" " 12	13.9-15.9	N.S.	Strong N. small S.
83	" " 13	5.5	S.	Small.
84	" " 13	8.7	S.	"
85	" " 14	15.3	N.	"
86	" " 14	21.6-23.4	N.	"
87	" " 17	11.4-11.8	N.	"
88	" " 17	14.4-15.2	N.	Moderate.
89	" " 18	23.6	S.No.	Small.
90	" " 19	4.9	S.N.	"
91	" " 19	7.0	S.N.	Moderate.
92	" " 21	14.4-15.6	S.N.	Strong.
93	" May 3	21.3	N.	Short and small.

* Probably only of local origin.

No.	Date.	Gr. M. T.	Place.	Notes.
94*	1892 May 11	17.8-20.8	S.N.	Strong.
95*	" " 15	8.0	S.N.	Very small.
96	" " 17	1.7-4.7	S.N.	Strong.
97	" " 24	22.7	S.	Very small.
98	" July 2	14.9	N.	Small.
99	" " 5	1.9-2.6	N.	"
100	" " 5	19.1-19.9	N.	"
101	" " 12	11.6	N.	"
102	" " 21	19.8	S.	Very small.
108	" August 8	11.2-12.8	S.	Strong.
104	" " 8	18.8-19.1	S.	Very small.
105	" " 7	6.15	S.N. (0)	Small.
106	" " 21	2.5-8.9	N.S. (?)	Very small.
107	" " 21	22.6	N.S. (?)	Small.
108	" " 22	21.4	S.N.	"
108	" " 25	22.0-0.2	S.N.	Strong.
110	" " 26	8.0-4.0	S.N.	Small.
111	" September 4	2.4-2.9	S.	"
112	" " 5	6.4-7.1	S.	Very small.
118	" " 12	16.7	S.	"
114	" " 13	9.6-13.4	S.	Very strong.
115	" " 21	15.0-15.7	S.	Small.
116	" " 28	7.0-7.9	S.N.	Pretty strong.
117	" October 6	21.5-21.8	S.N. (0)	Small.
118	" " 9	2.6-2.9	S.N.	"
119	" " 13	17.2-17.9	S.	"
120	" " 17	12.0-13.8	S.N.	"
121	" " 17	21.4	N.S. (0)	Very small.
122	" " 17	28.8	N.S. (0)	"
123	" " 18	0.9	N.S. (0)	"
124*	" " 18	16.5-17.9	S.N.	Moderate.
125	" " 28	20.6-21.1	S.N. (0)	Small.
126	" " 30	13.9-14.5	S.N. (0)	"
127	" " 31	9.9-10.0	S.N. (0)	Very small.
128*	" November 4	5.1-6.6	S.N.	Moderate.
129	" " 9	19.7-20.7	S.N.	Small.
130	" " 10	22.9-0.2	S.N.	"
131	" " 17	6.1-7.4	S.N.	"
132	" " 27	5.7-8.4	S.N.	"
133	" " 30	17.0-18.3	S.N.	Moderate.
134	" December 2	14.4	S.N.	Very small.
135	" " 3	13.1	N.S. (?)	"
136*	" " 8	13.3-14.8	S.N.	Small.
137	" " 13	19.5-19.8	N.S. (0)	"
138	" " 17	13.6-18.5	S.N.	"
139	" " 19	5.9-6.9	S.N.	Very small.
140*	" " 19	12.6-14.6	S.N.	Strong.
141	" " 28	16.1	S.	Small.
142	" January 2	3.2-3.6	S.N. (0)	"

* Probably only of local origin.

No.	Date.	Gr. M. T.	Place.	Notes.
143	1892 January 11	1.2	S.	Short but strong.
144	" " 22	19.9-20.2	N.S. (?)	Small.
145	" " 28	11.9-13.8	S.N.	Small.
146	1898 " 28	17.2-17.9	S.N.	"
147*	" " 30	16.3	S.N.	Very Small,
148*	" " 31	12.7-12.9	S.N.	Moderate.
149	" February 1	4.5	S.N. (0)	Small.
150*	" " 6	5.3-5.7	S.N. (0)	"
151	" " 6	7.2-9.2	S.N. (0)	"
152	" " 6	12.2	S.N.	"
153*	" " 9	6.2-8.5	S.N.	Strong.
154	" " 9	9.7	N.S. (0)	Small.
155	" " 9	11.0	S.N.	"
156	" " 10	2.0	N.S. (0)	"
157	" " 12	6.1-6.3	S.	"
158	" " 13	5.1	S.	"
159*	" " 15	17.4	S.	Very Small.
160*	" " 16	0.2	S.	Small.
161	" " 20	19.4-19.9	S.N.	"
162*	" " 21	2.4	N.S. (0)	"
163	" " 22	11.4-11.9	S.N.	"
164	" " 23	9.9-10.9	S.	"
165	" March 1	17.3-18.1	S.	Moderate.
166*	" " 2	11.2-15.1	S.	Very strong.
167	" " 5	14.9-17.6	S.	Small.
168	" " 8	5.1-6.5	S.	Moderate.
169	" " 10	11.6-17.8	S.	Small.
170	" " 10	16.2-17.5	S.	Very strong.
171	" " 13	18.3-19.2	S.N.	"
172	" " 14	2.0-3.3	S.N.	Small.
173	" " 15	7.9-9.9	S.N.	"
174*	" " 20	5.3-5.7	S.N.	"
175*	" " 23	8.7-9.3	S.N.	"
176	" " 23	16.1-18.4	S.N.	"
177	" " 25	19.9-11.9	S.N.	"
178	" " 28	13.7-13.9	S.N.	Very small.
179	" " 31	9.8	S.N. (0)	"
180	" April 2	16.7-17.4	S.N.	Small.
181	" " 4	20.4-21.0	S.N.	"
182	" " 6	3.3-3.5	S.N.	Very small.
183*	" " 8	1.9-4.2	S.N.	Very strong.
184	" " 11	18.0-19.4	S.N.	Moderate.
185	" " 15	3.2-3.6	S.N. (0)	Very small.
186*	" " 16	17.8-18.2	S.N.	Small in S. strong.
187	" " 17	1.1-1.7	S.N.	Moderate.
188	" " 19	19.9-20.4	N.S. (0)	Very small.
189	" " 23	1.7-2.0	S.N. (0)	Small.
190*	" " 29	6.2	S.N. (0)	Very small.
191	" May 1	9.8-11.1	S.N.	Small.

* Probably only of local origin.

No.	Date.	Gr. M. T.	Place.	Notes.
192	1895 May 1	15.9-17.7	S.N.	Small.
193	" " 1	22.1-23.8	S.N. (0)	"
194	" " 4	16.1	S.N.	"
195	" " 5	8.4	S.N. (0)	"
196	" " 5	11.3	S.N. (0)	"
197	" " 13	18.1	S.N.	Strong.
198	" " 14	10.3	S.N. (0)	Very small.
199	" " 14	10.8	S.N. (0)	"
200	" " 15	19.4	S.N. (0)	"
201	" " 15	23.1	S.N. (0)	"
202	" " 17	2.9	S.N. (0)	Pretty large.
203	" " 17	6.7	S.N. (0)	Small.
204	" " 17	7.9	S.N. (0)	Very small.
205	" " 17	21.4	S.N. (0)	"
206	" " 18	2.6	S.N. (0)	Small.
207	" " 18	13.0	S.N. (0)	Very small.
208	" " 18	13.3	S.N.	Small.
209	" " 19	1.8	S.N.	Very large.
210	" " 19	6.6	N.S. (0)	Very small.
211	" " 20	17.4	S.N.	Moderate.
212	" " 21	12.7	S.N.	Small.
213	" " 23	4.0	N.S. (0)	Very small.
214	" " 23	8.6	S.N.	"
215	" " 23	10.8	S.N.	Small.
216	" " 23	18.9	S.N. (0)	Very small.
217	" " 24	0.7	N.S. (0)	"
218	" " 24	2.0	S.N. (0)	"
219	" " 24	2.4	S.N. (0)	"
220	" " 29	4.3	S.N.	Moderate.
221	" June 2	11.5	S.N.	Very small.
222	" " 2	22.3	S.N.	"
223	" " 3	4.4	S.N.	} at N one single dis- turbance very con- siderable.
224	" " 3	5.6	S.N.	
225	" " 3	11.2	S.N.	
226	" " 3	12.3	S.N.	} Very small.
227	" " 3	16.1	N.S. (0)	
228	" " 3	20.9	N.S. (?)	"
229	" " 4	2.6	N.S. (?)	Small.
230	" " 4	3.4	S.N.	Large.
231	" " 4	8.4	S.N. (0)	Small.
232	" " 4	12.8	S.N.	Very small.
233	" " 4	15.2	S.N.	Small.
234	" " 5	18.9	S.N.	Very Strong.
235	" " 6	5.3	S.N.	Small.
236	" " 6	9.0	S.N. (0)	"
237	" " 6	10.4	S.N.	Strong.
238	" " 7	10.2	N.S. (0)	Small.
239	" " 8	6.2	S.N.	} Strong) at N. one Small) single dis- Small) turbance.
240	" " 8	8.9	S.N.	
241	" " 8	12.9	S.N.	
242	" " 9	19.6	N.S. (?)	Very small.

No.	Date.	Gr. M. T.	Place.	Notes.
243	1893 June 9	21.9	S.N. (?)	Moderate.
244	" " 10	14.7	N.S. (0)	Very small.
245	" " 11	9.2	S.N.	"
246	" " 11	20.4	S.N.	Small.
247	" " 12	21.1	S.N.	Very small.
248*	" " 12	23.1	S.N.	Moderate.
249*	" " 13	18.8	S.N.	Small.
250	" " 15	6.0	S.N.	Large.
251	" " 16	18.6	S.N.	Very small.
252	" " 17	8.3	S.N.	Small.
253	" " 17	10.9	S.N.	Very small.
254	" " 17	15.3	S.N.	"
255	" " 20	18.8	S.N.	Very large.
256	" " 22	21.4	S.N. (0)	Small.
257	" " 24	1.3	S.N. (0)	Small (?)
258	" " 24	23.9	N.S. (?)	Small.
259	" " 25	17.0	S.N.	Moderate.
260	" " 29	16.1	S.N.	Small.
261*	" July 2	22.1	S.N.	"
262	" " 4	5.4	S.N. (0)	Very small.
263	" " 4	23.4	S.N. (0)	"
264	" " 8	2.5	S.N. (0)	Small.
265	" " 9	15.7	S.N. (0)	Very small.
266	" " 9	21.9	S.N. (0)	"
267	" " 10	0.2	S.N. (0)	"
268	" " 11	22.7	S.N. (0)	Small.
269	" " 14	7.0	S.N. (0)	Very Small.
270	" " 16	7.5	S.N. (0)	Small.
271	" " 18	3.9	S.N. (0)	"
272	" " 21	8.4	S.N.	"
273	" " 24	2.9	S.N.	"
274	" " 27	11.0	S.N. (0)	Very small.
275	" " 27	23.5	S. (?) N. (0)	"
276	" " 28	9.5	S.N.	"
277	" " 29	18.4	S.N.	Very strong.
278	" August 1	13.7	S.N.	Very small.
279	" " 1	18.2	S.N. (0)	"
280	" " 2	14.7	S.N. (0)	"
281	" " 3	12.9	S.N.	"
282*	" " 4	8.7	S.N. (0)	"
283*	" " 6	7.7	S.N.	Moderate.
284	" " 6	16.2	S.N.	Small.
285	" " 7	0.9	S.N.	Small } at N. one single
286	" " 7	2.5	S.N.	Small } disturbance.
287	" " 9	17.8	S.	Moderate.
288*	" " 10	9.2	S.	Very small.
289	" " 14	7.8	S.	Small.
290	" " 17	2.6	N.S. (0)	Strong at N.
291	" " 17	6.0	S.N.	Very small.

* Probably only of local origin.

No.	Date.		Gr. M. T.	Place.	Notes.
292	1893	August 18	9.3	S.N.	Small.
293	"	" 20	9.9	S.N. (0)	Very small.
294	"	" 21	1.5	S.N. (0)	Small.
295	"	" 21	13.0	S.N.	Moderate.
296	"	" 22	17.5	S.N.	Small.
297	"	" 23	9.9	S.N.	Very small.
298	"	" 27	3.1	S. (?) N. (0)	Small.
299	"	" 27	8.6	S.N. (0)	"
300	"	" 28	13.8	S.N.	Very large.
301	"	" 31	22.1	S.N. (0)	Small.