A NOTE ON THE EARTHQUAKES OF THE SOUTH AFRICAN TABLE-LAND.

By J. R. SUTTON, Sc.D., F.R.S.S.Af.

(Read July 17, 1912.)

Occasional shocks of earthquake are felt on the South African Table-land. As a rule, although they extend over vast areas at a time, they are too slight to do much harm; but they may at times attain to some violence, and cause damage and loss of life. One, felt last February, was sufficiently severe to be recorded by seismographs in Europe. They seem to have some sort of relationship to barometric disturbances, and therefore in this respect are akin to the mud-rushes which were common in the Kimberley mines some years ago. Since the establishment of the observatory at Kenilworth there have been four earthquakes of sufficient intensity to be plainly felt. The following are the daily average values of the barometric pressure (from hourly readings) for a few days before and after these shocks :—

1. EARTHQUAKE AT 10.13 P.M., JULY 31, 1903.

	Barometer.
July 28.....	26·332 inches.
29.....	·299
30.....	·278
31.....	·274
Aug. 1.....	·323
2.....	·300
3.....	·276

2. EARTHQUAKE AT 10.35 P.M., SEPT. 26, 1908.

	Barometer.
Sept. 21.....	26·278 inches.
22.....	·241
23.....	·212
24.....	·150
25.....	·164
26.....	·092
27.....	·003
28.....	·065
29.....	·104
30.....	·130

3. EARTHQUAKE AT 8.10 P.M., OCT. 21, 1910.

	Barometer.
Oct. 18.....	26·134 inches.
19.....	·105
20.....	·074
21.....	·151
22.....	·046
23.....	25·991
24.....	26·014
25.....	·079
26.....	·133

Coincident with this earthquake there was also a small but rapid variation of atmospheric pressure not shown in the hourly numbers.

4. EARTHQUAKE (TWO SHOCKS) AT 3.5 P.M., AND JUST BEFORE 4 P.M.,
FEB. 20, 1912.

	Barometer.
Feb. 16.....	26·083 inches.
17.....	·146
18.....	·136
19.....	·070
20.....	·022
21.....	·052
22.....	·052
23.....	·079
24.....	·128
25.....	·223
26.....	·280

Of course the diurnal oscillation of barometric pressure is superimposed on these daily averages, accentuating the disturbances very largely. For example, the hourly pressures on Feb. 20, 1912, were:—

	Barometer.
Feb. 20, IX.....	26·063 inches.
X.	·061
XI.....	·053
Noon.....	·041
XIII.....	·028
XIV.....	·004
XV.	25·987
XVI.	·967
XVII.	·965
XVIII.	·979
XIX.....	·997
XX.	26·019
XXI.....	·028
XXII.	·051
XXIII.	·059

From which it appears that the two shocks of this day not only came when the barometer was at its lowest on the days' averages, but nearly at the time when it was lowest for the day itself.

It would be unsafe to argue from these few cases that an earthquake can only occur in South Africa when there is some amount of barometric disturbance. But it is not unlikely that when other conditions (say the flow of underground water carrying away lime in solution, and so making the support of the earth's crust at the spot unstable) are favourable to earth-movement, the passage of a barometric disturbance across the continent may decide the time when the movement shall take place. The idea that barometric disturbances have some influence over earth-movements is by no means a new one. The fact, *e.g.*, that the earthquakes of China are most frequent in summer, Mr. N. F. Drake explains as due to the rapid and strong variations of atmospheric pressure, assisted by the heavy rain-storms, which occur in summer. [See the *Bulletin* of the Seismological Society of America for March, 1912.]

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