

Photographs from an Earthquake in Turkey:

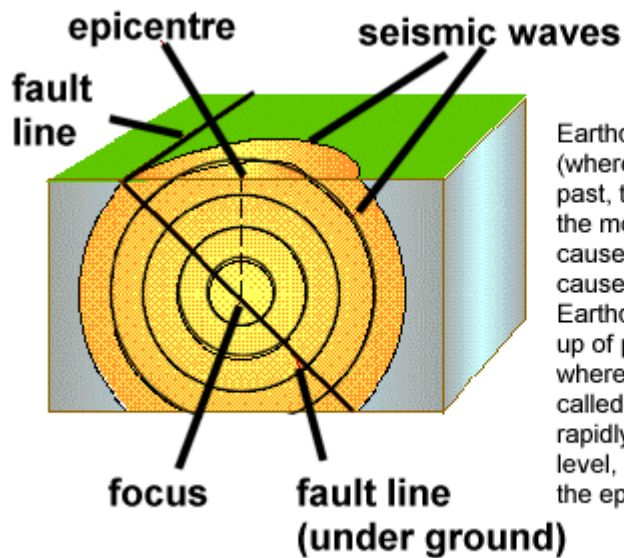
The quake measured 7.2 on the Richter scale.

Its epicentre was in the town of Duzce.

See the website:

<http://news.bbc.co.uk/1/hi/world/europe/518597.stm>





### **Earthquakes**

Earthquakes occur along plate margins (where plates meet). When plates move past, towards or away from each other the movement is not smooth. Friction causes the plates to get stuck. This causes pressure to build up. Earthquakes occur when this build up of pressure is released. The point where the earthquake starts is called the focus. Energy waves race rapidly from this point. The point at ground level, directly above the focus, is called the epicentre.

Reference: <http://www.bennett.karoo.net/topics/earthquakes.html>

## OS3

## Earthquake Damage Scales

| Richter scale number | Number of earthquakes per year | Typical effects of this magnitude                                     |
|----------------------|--------------------------------|---|
| < 3.4                | 800 000                        | detected only by seismometers   |
| 3.5 – 4.2            | 30 000                         | Just about noticeable indoors   |
| 4.3 – 4.8            | 4 800                          | most people notice them, windows rattle                               |
| 4.9 – 5.4            | 1400                           | everyone notices them, dishes may break, open doors swing             |
| 5.5 – 6.1            | 500                            | slight damage to buildings, plaster cracks, bricks fall               |
| 6.2 – 6.9            | 100                            | much damage to buildings, chimneys fall, houses move on foundations   |
| 7.0 – 7.3            | 15                             | serious damage, bridges twist, walls fracture, buildings may collapse |
| 7.4 – 7.9            | 4                              | great damage, most buildings collapse                                 |
| > 8.0                | one every 5 to 10 years        | total damage, surface waves seen, objects thrown in the air           |

Reference: <http://www.bennett.karoo.net/topics/earthquakes.html>

## OS4

## pH values for liquids

| Liquid              | pH  | Concentration of positive ions<br>(Moles / litre) |
|---------------------|-----|---|
| Sulphuric Acid      | 0   | 1   |
| Vinegar             | 2.5 | $0.03 = 3 \times 10^{-2}$                         |
| Tomato Juice        | 4   | $0.0001 = 1 \times 10^{-4}$                       |
| Milk                | 6.5 | $0.0000003 = 3 \times 10^{-7}$                    |
| Pure Water          | 7   | $0.0000001 = 1 \times 10^{-7}$                    |
| Blood               | 7.5 | $0.00000003 = 3 \times 10^{-8}$                   |
| Detergent           | 9.5 | $0.0000000003 = 3 \times 10^{-10}$                |
| Ammonia             | 11  | $0.00000000001 = 1 \times 10^{-11}$               |
| Potassium Hydroxide | 14  | $0.000000000000001 = 1 \times 10^{-14}$           |

| <b>Source</b>                  | <b>Intensity<br/>in <math>\text{W/m}^2</math></b> | <b>Intensity<br/>Level</b> | <b>Number of<br/>times<br/>greater than<br/>TOH</b> |
|--------------------------------|---|----------------------------|---|
| Threshold of hearing(TOH)      | $1 \times 10^{-12}$                               | 0 dB                       | $10^0$  |
| Rustling leaves                | $1 \times 10^{-11}$                               | 10 dB                      | $10^1$  |
| Whisper                        | $1 \times 10^{-10}$                               | 20 dB                      | $10^2$  |
| Normal conversation            | $1 \times 10^{-6}$                                | 60 dB                      | $10^6$  |
| Busy street traffic            | $1 \times 10^{-5}$                                | 70 dB                      | $10^7$  |
| Vacuum cleaner                 | $1 \times 10^{-4}$                                | 80 dB                      | $10^8$  |
| Large orchestra                | $6.3 \times 10^{-3}$                              | 98 dB                      | $10^{9.8}$  |
| Walkman at maximum level       | $1 \times 10^{-2}$                                | 100 dB                     | $10^{10}$   |
| Front rows of rock concert     | $1 \times 10^{-1}$                                | 110 dB                     | $10^{11}$   |
| Threshold of pain              | $1 \times 10^1$                                   | 130 dB                     | $10^{13}$   |
| Military jet takeoff           | $1 \times 10^2$                                   | 140 dB                     | $10^{14}$   |
| Instant perforation of eardrum | $1 \times 10^4$                                   | 160 dB                     | $10^{16}$   |