INDIAN EARTHQUAKE CYCLES

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A 9/56 year cycle has been established in the timing of major earthquakes in various countries and regions around the world (McMinn, 2011a, 2011b, 2014a). The seismic history of India – Nepal – Bangladesh is assessed in relation to this cycle over the past 220 years. Both 9/56 year and 54/56 year grids yielded significance for these major earthquakes in these countries and thus were highly relevant in the timing of Indian earthquakes. The 54/56 year cycle for India also aligned with similar patterns established for large earthquakes around the Pacific Rim. Such outcomes added to the growing body of evidence to verifying the reality of the 9/56 year seismic cycle and the Moon Sun Hypothesis.

The 9/56 year cycle consists of a grid with intervals of 56 years on the vertical (called sequences) and multiples of 9 years on the horizontal (called subcycles). The 56 year sequences have been numbered in accordance with McMinn (1993), with 1817, 1873, 1929, 1985 being designated as Sequence 01; 1818, 1874, 1930, 1986 as Sequence 02 and so forth. McMinn (Appendix 2, 2002) presented the full numbering. The year of best fit has been adopted in the accompanying tables and appendices.

9/56 Year Cycle

A listing of major earthquakes (mag ≥ 6.9) in India, Nepal and Bangladesh was sourced from the data base of the National Centers for Environmental Information (NCEI) for the 1800 to 2015 era (see **Appendix 1**). However, this compilation was incomplete and several other notable events were inserted by the author. The additions have been asterisked and presented with accompanying references. This gave a total of 34 large quakes (mag ≥ 6.9) since 1800.

The complete 9/56 year grid has been divided into four equal sectors of 14 sequences each (see **Appendix 2**). Grids A & D contained a total of only 8 episodes, well below an expected figure of 17 (significant $p < .01$). Significance was boosted by the clustering of earthquakes in the 9/56 year layout in **Table 1**. Of the total 34 Indian quakes, some 20 appeared in this pattern (significant $p < .001$)

Table 1
9/56 YEAR CYCLE & INDIAN EARTHQUAKES
mag ≥ 6.9
Year ending August 31

Sq 08	Sq 17	Sq 26	Sq 35	Sq 44	Sq 53	Sq 06	Sq 15
				1804 **1803** 0901	1813	1822	1831
1824	**1833** 0530	1842	1851	1860	**1869** 0110	1878	1887

	1833 0826						
1880	1889	1898	1907	**1916** 0828	1925	**1934** 0115	1943
1936	1945	**1954** 0321	1963	1972	1981	1990	1999
1992 **1991** 1019	**2001** 0126	**2010** 0612	2019				
Continued…….							
Sq 24	**Sq 33**	**Sq 42**	**Sq 51**	**Sq 04**	**Sq 13**	**Sq 22**	**Sq 31**
		1802	1811	1820	1829	1838	1847 **1846** 1210
1840	1849	1858	1867	1876	**1885** 0530	1894	1903
1896	**1905** 0404	1914	1923	1932	**1941** 0626	**1950** 0815	1959
1952	**1961** 0204	1970	1979	**1988** 0806	1997	2006 **2005** 1028	**2015** 0425 **2015** 0512
2008	2017						

54/56 Year Cycle

Higher significance could be achieved by adopting a 54/56 year grid as shown in **Table 2**. Some 15 episodes appeared in this pattern, whereas 5.5 could have been expected by chance (significant $p < .001$). About 37% of all the years in the table experienced at least one major Indian earthquake (mag ≥ 6.9). However, since 1900 this figure has increased to 50%, probably reflecting improvements in seismic data collecting and thus the number of catalogued events.

Table 2
54/56 YEAR CYCLE & INDIAN EARTHQUAKES
Year ending October 31

Sq 33	**Sq 31**	**Sq 29**	**Sq 27**	**Sq 25**	**Sq 23**	**Sq 21**	**Sq 19**	**Sq 17**
								1833 0530 **1833** 0826
							1835	1889
						1837	1891	1945

					1839	1893	**1947** 0729	**2001** 0126
				1841	1895	1949	2003	
			1843	**1897** 0612	1951	**2005** 0724		
		1845	1899	1953	2007			
	1847 **1846** 1210	1901	**1955** 0517	**2009** 0810				
1849	1903	**1957** 0701	**2011** 0918					
1905 0404	1959	2013						
1961 0204	**2015** 0425 **2015** 0512							
2017								

World mega quakes (mag ≥ 8.6) occurred preferentially in the two 54/56 year grids (see **Appendix 3**). The two largest historic Indian quakes fall in these patterns:

* June 6, 1897 quake (mag 8.0 - 8.7). The estimated magnitude varied according to reference source, some giving this figure as high as 8.7 (eg: Kayal, 2011)
* August 15, 1950 (mag 8.6).

Sqs 29, 27, 25, 23 and 21 in Grid A for world mega quakes also showed up for major Indian earthquakes in **Table 2**. Thus there was overlap between these two grids in the timing of major seismic events. Grids A & B in **Appendix 3** also appeared in 54/56 year patterns for large earthquakes in various countries around the Pacific Rim (see Table 3).

Table 3
SHARED 56 YEAR SEQUENCES IN THE 54/56 YEAR SEISMIC GRIDS

	Grid A Sequence Numbers	**Grid B Sequence Numbers**	**Source**
World Mega Quakes	29, 27, 25, 23, 21	36, 34, 32, 30, 28, 26	Appendix 3, McMinn (2011b)
India – Nepal – Bangladesh	29, 27, 25, 23, 21	na	Table 2 this paper
Japan - Kamchatka	29, 27, 25, 23, 21	na	Table 1, McMinn (2014a)
Alaska	29 27	36, 34, 32, 30, 28, 26	Table 2, McMinn (2014a)

Wn South America	na	34, 32, 30, 28, 26	Table 3 (McMinn (2014b)
World mega quakes had M ≥ 8.6, whereas all the other regions had quakes with M ≥ 7.8**.**			
Source: McMinn, 2015.			

Discussion & Conclusions

The 54/56 year grids are crucial in the timing of large earthquakes around the Pacific Rim. The same 56 year sequences show up in the various 54/56 year layouts that yielded significance – world mega quakes, Japan – Kamchatka, Alaska and Chile – Peru (see Table 3). The same pattern was also very important in the timing of major Indian earthquakes.

If another major Indian quake is going to happen, 2017 would be the most likely timing, as it appears in Tables 1 & 2. This approach relies on numerological assessment of past seismic trends, which is a very basic approach with limited predictability.

These 9/56 year cycles are believed to arise from Moon Sun harmonics as proposed by McMinn (2011a). How such weak tidal forces trigger massive earthquakes remained completely unknown and well outside prevailing paradigms in seismology. Hopefully this enigma will be solved, making it possible to predict windows when major earthquakes were most likely to happen. This has the potential to save many lives.

References

Bilham, R. 2004. Earthquakes in the India and the Himalaya: tectonics, geodesy and history. *Annals of Geophysics*. Vol 47. N 2/3. April/June.

Dasgupta, S & Mukhopadhyay, B. 2014. 1803 EARTHQUAKE IN GARHWAL HIMALAYA – ARCHIVAL MATERIALS WITH COMMENTARY. *Indian Journal of History of Science*. 49.1. p 21-33.

Global Historical Earthquake Archive (GHEA). May 30, 1885 Srinagar earthquake. http://emidius.eu/GEH/info/?en=1885.052902

Chakrabarti, G P D & Ghosh, C (editors). 2011. Institute of Disaster Management (NIDM). National Workshop on Earthquake Risk Mitigation in the North East. Background Papers. Great Earthquake Occurrences in the North East. February 24-25. http://nidm.gov.in/PDF/pubs/EQ%20North%20East.pdf

Kayal, J R. 2010. Himalayan tectonic model and the great earthquakes: an appraisal. *Geomatics, Natural Hazards & Risk.* Vol 1 No 1. p 51-67. March.

McMinn, D., 1993. US Financial Crises & The Number 56. *The Australian Technical Analyst Association Newsletter*. p 21-25. September.

McMinn, D., 2011a. 9/56 Year Cycle: Californian Earthquakes. *New Concepts in Global Tectonics Newsletter*. p 33-44. March.

McMinn, D., 2011b. 9/56 Year Cycle: Record Earthquakes. *New Concepts in Global. Tectonics Newsletter*. No 59. p 88-104. June.

McMinn, D., 2014a. 9/56 Year Cycle: Earthquakes in the Japan, Kamchatka and Alaska. *New Concepts in Global Tectonics Newsletter*. V 2, No 1. p 10-18. March.

McMinn, D., 2014b. 9/56 Year Cycle: Earthquakes in the Pacific Rim of South America. *New Concepts in Global Tectonics Newsletter*. V 2, No 3. p 10-18. September.
Wyss, M. 2008. Estimated Human Losses in Future Earthquakes in Central Myanmar. Seismological Research Letters. Vol 79, No 4. p 504-509. July/August.

Appendix 1
MAJOR EARTHQUAKES IN INDIA, NEPAL & BANGLADESH mag ≥ 6.9
1800 - 2015

YYYYY	MM	DD	Location	M
1803	09	01	* INDIA: GARWHAL HIMALAYA (Dasgupta & Mukhopadhyay, 2014)	>7.5
1819	06	16	INDIA: RANN OF KUTCH, AHMADABAD, POONAH, BHOOJ	7.7
1833	05	30	INDIA: LOHUGHAR	7.5
1846	12	10	INDIA	7.5
1869	01	10	* INDIA: ASSAM: CACHAR (Bilham, 2004)	7.4
1881	12	31	INDIA: ANDAMAN I, NICOBAR I	7.9
1885	05	30	* INDIA: SRINAGAR (a) (GHEA)	6.3 - 7.4
1897	06	12	INDIA: ASSAM (b) (GHEA)	8.0 – 8.7
1905	04	04	INDIA: KANGRA	7.8
1923	09	09	* INDIA: ASSAM (Chakrabarti & Ghosh, 2011)	7.1
1941	06	26	INDIA: ANDAMAN ISLANDS, MADRAS; SRI LANKA: COLOMBO	7.6
1943	10	28	* INDIA: ASSAM (Chakrabarti & Ghosh, 2011)	7.2
1947	07	29	INDIA - CHINA	7.9
1950	08	15	INDIA - CHINA BORDER	8.6
1954	03	21	* INDIA: ARUNACHAL PRADESH (Chakrabarti & Ghosh, 2011)	7.7
1955	05	17	INDIA: LITTLE NICOBAR ISLAND	7.3
1957	07	01	* INDIA: ARUNACHAL PRADESH (Chakrabarti & Ghosh, 2011)	7.0
1961	02	04	INDIA	7.6
1988	08	06	INDIA – MYANMAR BORDER	7.1
1991	10	19	INDIA: CHAMOLI, UTTARKASHI, NEW DELHI, CHANDIGARH	7.0
2001	01	26	INDIA: GUJARAT: BHUJ, AHMADABAD, RAJOKOT; PAKISTAN	7.7
2005	07	24	INDIA: ANDAMAN ISLANDS, NICOBAR ISLANDS	7.2
2005	10	8	PAKISTAN – INDIA BORDER	7.6
2009	08	10	INDIA: ANDAMAN I	7.5
2010	06	12	INDIA: LITTLE NICOBAR ISLAND	7.5
2011	09	18	INDIA: SIKKIM	6.9
1833	8	26	NEPAL: KATHMANDU; INDIA: BIHAR	8.0

1916	8	28	NEPAL; TIBET (XIZANG PROVINCE)	7.7
1934	1	15	NEPAL; INDIA: BIHAR	8.0
2015	4	25	NEPAL: KATHMANDU	7.8
2015	5	12	NEPAL: DOLAKHA	7.3
1868	6	30	BANGLADESH: SYLHET	7.5
1918	7	8	BANGLADESH: SRIMANGAL	7.6
1930	7	2	BANGLADESH: DHUBRI, ASSAM	7.1

* Events asterisked have been inserted by the author, together with the accompanying references.
Events denoted in **red** fall in Grids B & C in **Appendix 2**.
The estimated magnitude of the May 30, 1885 earthquake varied between 6.3 and 7.4, depending on source (GHEA).
Main Source: National Centers for Environmental Information.

Appendix 2
THE COMPLETE 9/56 YEAR CYCLE & MAJOR INDIAN EARTHQUAKES
mag ≥ 6.9
Year ending August 31

Grid A

Sq 52	Sq 05	Sq 14	Sq 23	Sq 32	Sq 41	Sq 50	Sq 03	Sq 12	Sq 21	Sq 30	Sq 39	Sq 48	Sq 01
												1808	1817
					1801	1810	**1819** 0616	1828	1837	1846	1855	1864	1873
1812	1821	1830	1839	1848	1857	1866	1875	1884	1893	1902	1911	1920	1929
1868 0630	1877	1886	1895	1904	1913	1922	1931	1940	1949	1958	1967	1976	1985
1924 **1923** 0909	1933	1942	1951	1960	1969	1978	1987	1996	**2005** 0724	2014			
1980	1989	1998	2007	2016									

Grid B

Sq 10	Sq 19	Sq 28	Sq 37	Sq 46	Sq 55	Sq 08	Sq 17	Sq 26	Sq 35	Sq 44	Sq 53	Sq 06	Sq 15
										1804 **1803** 0901	1813	1822	1831
				1806	1815	1824	**1833** 0530 **1833** 0826	1842	1851	1860	**1869** 0110	1878	1887

1826	1835	1844	1853	1862	1871	1880	1889	1898	1907	**1916** 0828	1925	**1934** 0115	1943
1882 **1881** 1231	1891	1900	1909	**1918** 0708	1927	1936	1945	**1954** 0321	1963	1972	1981	1990	1999
1938	**1947** 0729	1956	1965	1974	1983	1992 **1991** 1019	**2001** 0126	**2010** 0612	2019				
1994	2003	2012 **2011** 0918											
Grid C													
Sq 24	**Sq 33**	**Sq 42**	**Sq 51**	**Sq 04**	**Sq 13**	**Sq 22**	**Sq 31**	**Sq 40**	**Sq 49**	**Sq 02**	**Sq 11**	**Sq 20**	**Sq 29**
								1800	1809	1818	1827	1836	1845
1784	1793	1802	1811	1820	1829	1838	1847 **1846** 1210	1856	1865	1874	1883	1892	1901
1840	1849	1858	1867	1876	**1885** 0530	1894	1903	1912	1921	**1930** 0702	1939	1948	**1957** 0701
1896	**1905** 0404	1914	1923	1932	**1941** 0626	**1950** 0815	1959	1968	1977	1986	1995	2004	2013
1952	**1961** 0204	1970	1979	**1988** 0806	1997	2006 **2005** 1028	**2015** 0425 **2015** 0512						
2008	2017												
Grid D													
Sq 38	**Sq 47**	**Sq 56**	**Sq 09**	**Sq 18**	**Sq 27**	**Sq 36**	**Sq 45**	**Sq 54**	**Sq 07**	**Sq 16**	**Sq 25**	**Sq 34**	**Sq 43**
													1803
							1805	1814	1823	1832	1841	1850	1859
1798	1807	1816	1825	1834	1843	1852	1861	1870	1879	1888	**1897** 0612	1906	1915
1854	1863	1872	1881	1890	1899	1908	1917	1926	1935	1944 **1943** 1028	1953	1962	1971
1910	1919	1928	1937	1946	**1955** 0517	1964	1973	1982	1991	2000	**2009** 0810	2018	
1966	1975	1984	1993	2002	2011								

Appendix 3 **54/56 YEAR CYCLE: WORLD MEGA QUAKES Post 1870 M ≥ 8.6**					
Grid A **7.5 months ending March 31**					
Sq 29	**Sq 27**	**Sq 25**	**Sq 23**	**Sq 21**	

				1893	
			1895	1949	
		1897	1951 **1950** Aug15	**2005** Mar28 **2004** Dec26	
	1899	1953 **1952** Nov04	2007		
1901	1955	2009			
1957 Mar09	**2011** Mar11				
2013					

Grid B
9 months ending June 10

Sq 36	Sq 34	Sq 32	Sq 30	Sq 28	Sq 26
					1898 Jun05 **1897** Sep20 **1897** Sep21
				1900	1954
			1902	1956	**2010** Feb27
		1904	1958	**2012** Apr11	
	1906 Jan31	**1960** May22	2014		
1908	1962	2016			
1964 Mar28	2018				
2020					

WORLD MEGA QUAKES: 1870–2013 M ≥ 8.6
National Centers for Environmental Information

Date	Country	Mag
1897 Sep 20	Philippines: North west Mindanao, Dapitan	8.6
1897 Sep 21	Philippines: Mindanao, Zamboanga, Sulu	8.7
1898 Jun 05	Japan: Offshore east coast Honshu	8.7
1906 Jan 31	Ecuador: Offshore	8.6
1922 Nov 11	Chile: Atacama	8.7
1946 Apr 01	Alaska: Unimak Island	8.6
1950 Aug 15	India-China	8.6
1952 Nov 04	Russia: Kamchatka	9.0

1957 Mar 09	Alaska	8.6
1960 May 22	Chile: Puerto Montt, Valdiva	9.5
1964 Mar 28	Alaska	9.2
1965 Feb 04	Alaska: Aleutian Islands, Rat Islands	8.7
2004 Dec 26	Indonesia: Offshore west coast Sumatra	9.1
2005 Mar 28	Indonesia: Offshore south west Sumatra	8.6
2010 Feb 27	Chile: Maule, Concepcion, Talcahuano	8.8
2011 Mar 11	Japan: Honshu	9.0
2012 Apr11	Indonesia: Offshore north west coast Sumatra	8.6

In Grids A & B, the 56 year sequences are separated by intervals of 54 years on the horizontal.
World mega quakes M ≥ 8.6 falling in Grids A and B are highlighted in **red**.
The NGDC listed some 17 world mega quakes (M ≥ 8.6) since 1870, of which 14 showed up in Grids A & B compared with an expected 3.3.
Source of Raw Data: National Centers for Environmental Information.
Source: McMinn, 2011b.