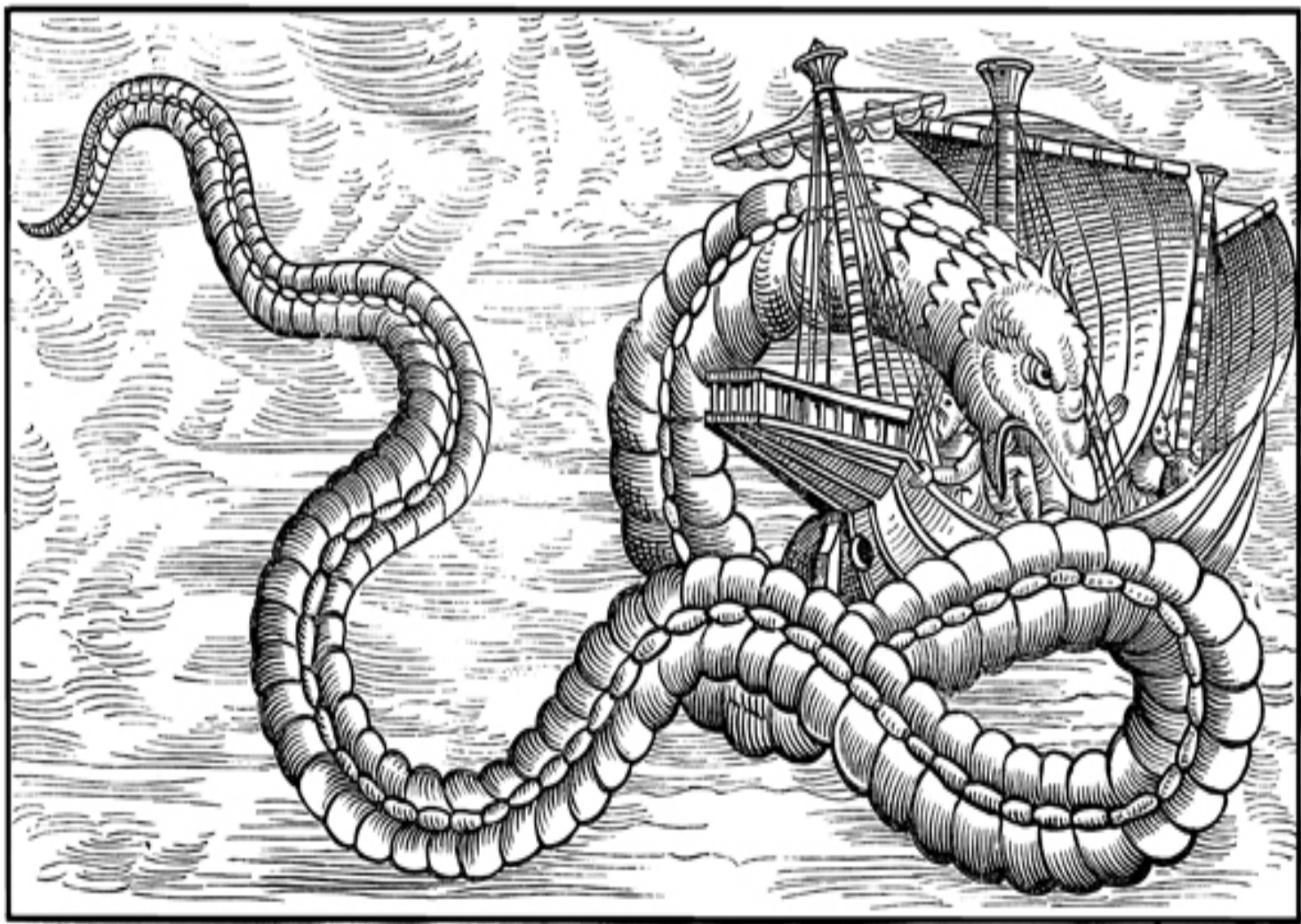


MARTELLI TIME SIGHT TABLES

RAPID CALCULATION
OF THE
LOCAL HOUR ANGLE
FOR
FINDING THE LONGITUDE
USING GREENWICH HOUR ANGLES



W. Robert Bernecky
2013

The following tables were devised to abbreviate long computations.

The data required are: Latitude of the observer, the Declination of the body, and its observed Altitude Ho. Put down the greater of the Latitude or the Declination, and beneath it, the other. If they are of the same name, both N or both S, subtract the lesser from the greater; but if they are of different names, add them. Label the result Sum/Diff. Put the observed altitude Ho below the Sum/Diff.

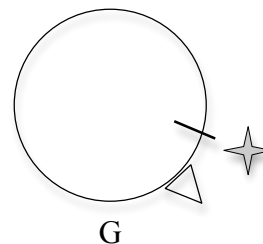
Take from Table I, **LATITUDE AND DECLINATION**, the logarithms for Latitude and for Declination. Put these logarithms to the right of each, respectively.

Take from Table II, **SUM OR DIFFERENCE**, the minutes, seconds and tenths of seconds that correspond to the Sum/Diff. Take from Table III, **ANGLE OF ALTITUDE**, the minutes, seconds, and tenths corresponding to Ho. Add the entries extracted from Tables II and III together, and with their sum enter Table IV, **AUXILIARY LOGARITHM**, and take out the logarithm recorded there. Add the three logarithms of Latitude, Declination and Auxiliary Logarithm. With this sum, enter Table V, **LOCAL HOUR ANGLE**, and extract the *local hour angle*, to which must be applied the *Greenwich Hour Angle* to find the longitude of the ship.

EXAMPLE I

On the evening of 1898 Aug 20, D.R. position N 41° 44', E 39° 00' at 16:22:13 GMT, a time sight is taken of Vega to the east, with true Altitude 71° 00.4'. Required is the ship's longitude. From the Almanac, Vega GHA 296° 12', Dec N 38° 42'.

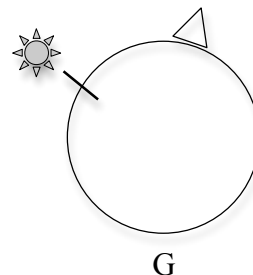
Table I		Lat N 41 44	3729		
Table I		Dec N 38 42	3923		
Table II	19 58.6	+/- 03 02	1.6094		
Table III	0 54.5	Ho 71 00	2.3746	24 39	
	20 53.1	Table IV		296 12	
				320 51	
				Longitude	39 09 E



EXAMPLE II

On the morning of 2014 Apr 11, D.R. position S 09° 21', E 177° 00' at 19:33:56 Z, a time sight is taken of the Sun to the east, with true Altitude 18° 29.1'. Required is the ship's longitude. From the Almanac, Sun GHA 113° 14', Dec N 08° 30'.

Table I		Lat S 09 21	4942		
Table I		Dec N 08 30	4952		
Table II	19 11.9	+/- 17 51	5317		
Table III	11 23.0	Ho 18 29	1.5211	69 33	
	30 34.9	Table IV		113 14	
				182 47	
				Longitude	177 13 E



LOCAL HOUR ANGLE

100°	101°	102°	103°	104°	105°	106°	107°	108°	109°	Mn	110°	111°	112°	113°	114°	115°	116°	117°	118°	119°
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2649	2586	2524	2463	2404	2345	2287	2231	2175	2121	0	2067	2014	1963	1912	1862	1814	1766	1719	1673	1628
2648	2585	2523	2462	2403	2344	2286	2230	2174	2120	1	2066	2013	1962	1911	1862	1813	1765	1718	1672	1627
2647	2584	2522	2461	2402	2343	2285	2229	2173	2119	2	2065	2013	1961	1910	1861	1812	1764	1717	1671	1626
2646	2583	2521	2460	2401	2342	2284	2228	2172	2118	3	2064	2012	1960	1910	1860	1811	1763	1717	1671	1626
2645	2582	2520	2459	2400	2341	2283	2227	2171	2117	4	2063	2011	1959	1909	1859	1810	1763	1716	1670	1625
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2644	2581	2519	2458	2399	2340	2283	2226	2170	2116	5	2063	2010	1958	1908	1858	1810	1762	1715	1669	1624
2643	2580	2518	2457	2398	2339	2282	2225	2170	2115	6	2062	2009	1958	1907	1857	1809	1761	1714	1668	1623
2642	2579	2517	2456	2397	2338	2281	2224	2169	2114	7	2061	2008	1957	1906	1857	1808	1760	1714	1668	1623
2641	2578	2516	2455	2396	2337	2280	2223	2168	2113	8	2060	2007	1956	1905	1856	1807	1760	1713	1667	1622
2640	2577	2515	2454	2395	2336	2279	2222	2167	2112	9	2059	2007	1955	1905	1855	1806	1759	1712	1666	1621
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2639	2576	2514	2453	2394	2335	2278	2221	2166	2112	10	2058	2006	1954	1904	1854	1806	1758	1711	1665	1620
2638	2575	2513	2452	2393	2334	2277	2220	2165	2111	11	2057	2005	1953	1903	1853	1805	1757	1710	1665	1620
2636	2574	2512	2451	2392	2333	2276	2219	2164	2110	12	2056	2004	1953	1902	1853	1804	1756	1710	1664	1619
2635	2573	2511	2450	2391	2332	2275	2219	2163	2109	13	2055	2003	1952	1901	1852	1803	1756	1709	1663	1618
2634	2572	2510	2449	2390	2331	2274	2218	2162	2108	14	2055	2002	1951	1900	1851	1802	1755	1708	1662	1617
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2633	2571	2509	2448	2389	2330	2273	2217	2161	2107	15	2054	2001	1950	1900	1850	1802	1754	1707	1662	1617
2632	2569	2508	2447	2388	2329	2272	2216	2160	2106	16	2053	2001	1949	1899	1849	1801	1753	1707	1661	1616
2631	2568	2507	2446	2387	2328	2271	2215	2160	2105	17	2052	2000	1948	1898	1849	1800	1752	1706	1660	1615
2630	2567	2506	2445	2386	2328	2270	2214	2159	2104	18	2051	1999	1947	1897	1848	1799	1752	1705	1659	1614
2629	2566	2505	2444	2385	2327	2269	2213	2158	2103	19	2050	1998	1947	1896	1847	1798	1751	1704	1659	1614
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2628	2565	2504	2443	2384	2326	2268	2212	2157	2103	20	2049	1997	1946	1895	1846	1798	1750	1703	1658	1613
2627	2564	2503	2442	2383	2325	2267	2211	2156	2102	21	2048	1996	1945	1895	1845	1797	1749	1703	1657	1612
2626	2563	2502	2441	2382	2324	2266	2210	2155	2101	22	2048	1995	1944	1894	1844	1796	1749	1702	1656	1612
2625	2562	2501	2440	2381	2323	2265	2209	2154	2100	23	2047	1994	1943	1893	1844	1795	1748	1701	1656	1611
2624	2561	2500	2439	2380	2322	2265	2208	2153	2099	24	2046	1994	1942	1892	1843	1794	1747	1700	1655	1610
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2623	2560	2499	2438	2379	2321	2264	2207	2152	2098	25	2045	1993	1942	1891	1842	1794	1746	1700	1654	1609
2622	2559	2498	2437	2378	2320	2263	2206	2151	2097	26	2044	1992	1941	1890	1841	1793	1745	1699	1653	1609
2621	2558	2497	2436	2377	2319	2262	2206	2150	2096	27	2043	1991	1940	1890	1840	1792	1745	1698	1653	1608
2620	2557	2496	2435	2376	2318	2261	2205	2149	2095	28	2042	1990	1939	1889	1840	1791	1744	1697	1652	1607
2619	2556	2495	2434	2375	2317	2260	2204	2149	2095	29	2041	1989	1938	1888	1839	1790	1743	1697	1651	1606
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2617	2555	2494	2433	2374	2316	2259	2203	2148	2094	30	2041	1988	1937	1887	1838	1790	1742	1696	1650	1606
2616	2554	2493	2432	2373	2315	2258	2202	2147	2093	31	2040	1988	1936	1886	1837	1789	1741	1695	1650	1605
2615	2553	2492	2431	2372	2314	2257	2201	2146	2092	32	2039	1987	1936	1885	1836	1788	1741	1694	1649	1604
2614	2552	2491	2430	2371	2313	2256	2200	2145	2091	33	2038	1986	1935	1885	1835	1787	1740	1694	1648	1603
2613	2551	2490	2429	2370	2312	2255	2199	2144	2090	34	2037	1985	1934	1884	1835	1786	1739	1693	1647	1603
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2612	2550	2489	2428	2369	2311	2254	2198	2143	2089	35	2036	1984	1933	1883	1834	1786	1738	1692	1647	1602
2611	2549	2488	2427	2368	2310	2253	2197	2142	2088	36	2035	1983	1932	1882	1833	1785	1738	1691	1646	1601
2610	2548	2487	2426	2367	2309	2252	2196	2141	2087	37	2034	1982	1931	1881	1832	1784	1737	1690	1645	1600
2609	2547	2486	2425	2366	2308	2251	2195	2140	2086	38	2034	1982	1931	1881	1831	1783	1736	1690	1644	1600
2608	2546	2485	2424	2365	2307	2250	2194	2140	2086	39	2033	1981	1930	1880	1831	1782	1735	1689	1644	1599
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2607	2545	2484	2423	2364	2306	2249	2193	2139	2085	40	2032	1980	1929	1879	1830	1782	1734	1688	1643	1598
2606	2544	2482	2422	2363	2305	2248	2193	2138	2084	41	2031	1979	1928	1878	1829	1781	1734	1687	1642	1598
2605	2543	2481	2421	2362	2304	2248	2192	2137	2083	42	2030	1978	1927	1877	1828	1780	1733	1687	1641	1597
2604	2542	2480	2420	2361	2303	2247	2191	2136	2082	43	2029	1977	1926	1876	1827	1779	1732	1686	1641	1596
2603	2541	2479	2419	2360	2303	2246	2190	2135	2081	44	2028	1976	1926	1876	1827	1778	1731	1685	1640	1595
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2602	2540	2478	2418	2359	2302	2245	2189	2134	2080	45	2027	1976	1925	1875	1826	1778	1731	1684	1639	1595
2601	2539	2477	2417	2359	2301	2244	2188	2133	2079	46	2027	1975	1924	1874	1825	1777	1730	1684	1638	1594
2600	2538	2476	2416	2358	2300	2243	2187	2132	2078	47	2026	1974	1923	1873	1824	1776	1729	1683	1638	1593
2599	2536	2475	2415	2357	2299	2242	2186	2131	2078	48	2025	1973	1922	1872	1823	1775	1728	1682	1637	1592
2598	2535	2474	2414	2356	2298	2241	2185	2130	2077	49	2024	1972	1921	1871	1823	1775	1727	1681	1636	1592
1•	1•	1•	1•	1•	1•	1•	1•	1•	1•		1•	1•	1•	1•	1•	1•	1•	1•	1•	1•
2597	2534	2473	2413	2355	2297	2240	2184	2130	2076	50	2023	1971	1920	1871	1822	1774	1727	1681	1635	1591
2596	2533	2472	2412	2354	2296	2239	2183	2129	2075	51	2022	1970	1920	1870	1821	1773	1726	1680	1635	1590
2594	2532	2471	2412	2353	2295	2238	2182	2128	2074	52	2021	1970	1919	1869	1820	1772	1725	1679	1634	1589
2593	2531	2470	2411	2352	2294	2237	2182	2127	2073	53	2020	1969	1918	1868	1819	1771	1724	1678	1633	1589
2592	2530	2469	2410	2351	229															

