

A STUDY OF THE ANNUAL COMPONENTS OF THE SEA-LEVEL IN THE ASIATIC ARCHIPELAGO

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A study has been made of the monthly mean sea-level in the Asiatic Archipelago, means which have been kindly communicated to us by Professor PROUDMAN. Based on this data we have extracted the annual component of the sea-level by the method of harmonic analysis of M. and M^{me} H. LABROUSTE, as many times as the number of the data allowed.

The results have been summarized in the table (on the opposite page), which gives, for each tidal station, the maximum amplitude of the component in centimeters (col. I) and the dates on which these maxima occurred (col. II). The signs A, SA, QA of Col. III indicate respectively the preponderance of the components of 12, 6 or 3 months; the sign E, signifies equality of these components. When the date is shown between parenthesis it has been evaluated directly from the graph of the data.

The stations under investigation have been assembled in six groups according to their orientation or their location on the coasts to which they belong.

Group I comprises the tidal stations on the south-west coast of the Peninsula of Malacca and of Sumatra in the Indian Ocean, those of the west coast of Borneo on the Java Sea, and those of the east coast of Celebes. Group II comprises the stations on the south coast of Java on the Indian Ocean, and those of the south coast of Malaya and Borneo on the Java Sea. In group III are comprised the stations on the north-east coast of Sumatra and in group IV those of the north coast of Java. In group V are placed the stations located on the arm of the sea between the two islands, while group VI contains the stations located on the east of the archipelago.

The following observations are made :—

1°. On the stations situated on the side of the Ocean, the amplitude of the components of 6 months and 3 months surpasses that of the annual component, which is preponderant. These facts disclose the existence of two distinct systems of annual components : one the oceanic system and the other a system pertaining to the Sea of Java proper.

2°. In a general manner the annual components are in phase opposition on the exposed coasts on the opposite sides of an island, or located in one part or the other of the same arm of the sea, except in the Madoera Passage.

3°. A propagation of the annual component has been established. On the coast of Sumatra the propagation takes place from West towards the East. Very rapid on the west coast, it is much slower between the Peninsula of Malacca and this island. On the coasts of Java the propagation takes place from East to West and is very slow. The stations in group V form an exception owing to their special location in a very narrow passage.

The totality of these notes seems to indicate the existence of a periodic phenomenon with an East-West orientation.



	1927			1928			1929			1930		
	I	II	III	I	II	III	I	II	III	I	II	III
I. Bass Harbour	—	—	—	—	—	—	—	—	—	—	—	—
Sibolga	—	—	—	—	—	—	—	—	—	—	(August)	SA
Emmahaven	4,8	15 Aug.	SA	4,1	15 Aug.	SA	4,2	10 Aug.	SA	—	(August)	SA
Benkoelen	4	20 Aug.	SA	5,6	15 Aug.	SA	5,8	15 Aug.	SA	—	(August)	SA
Kroé	—	—	—	—	—	—	—	—	—	—	(Sept.)	SA
Orsthaven	—	—	—	—	(July)	A	—	—	—	—	(Oct.)	SA
Pontianak	—	—	—	—	15 Aug.	A	39	1st July	A	40	1st July	A
Makassar	11,5	15 Aug.	A	12,5	15 Aug.	A	11,5	15 Aug.	A	—	(August)	A
II. Plaboean Raboe ..	—	—	—	—	—	—	—	(March)	SA	—	(March)	SA
Tjilatjap	11,6	20 Feb.	QA	9,4	20 Feb.	QA	9	20 Feb.	QA	—	(Feb.)	QA
Padjitan	—	—	—	—	(Jan.)	QA	—	(Jan.)	QA	—	(Jan.)	QA
Moesangketjil	—	—	—	—	—	—	—	—	—	—	(Jan.)	A
Bandjermasin	—	(Feb.)	A	—	(Feb.)	A	22	15 Feb.	A	20	20 Feb.	A
Johore Bahru	—	—	—	—	—	—	—	—	—	—	(Jan.)	A
III. Belawan	9	1st Aug.	A	12	10 Aug.	A	11,6	10 Aug.	A	10,8	1st Aug.	A
Bengkalis	—	—	—	—	—	—	—	—	—	—	(Nov.)	SA
Prigi Radja	—	—	—	—	—	—	—	—	—	—	(Dec.)	SA
Tambilahan	—	—	—	—	(Jan.)	A	—	(Jan.)	A	—	(Jan.)	A
Soensang	—	—	—	—	(Jan.)	A	14,8	25 Jan.	A	13,3	5 Feb.	A
Oepang	—	—	—	—	(Jan.)	A	—	(Feb.)	A	—	(Feb.)	A
IV. Batavia	—	—	—	—	(July)	A	6,4	15 July	A	6,7	10 July	A
Tandjong Priok ..	—	(July)	A	6,7	10 July	A	6,8	10 July	A	—	(July)	A
Cheribon	5,4	25 June	A	5,3	25 June	A	5	20 June	A	—	(June)	A
Tegal	9	20 June	A	8,3	20 June	A	8,4	20 June	A	—	(June)	A
Pekalongan	—	(June)	A	4,6	5 June	A	5	5 June	A	—	(June)	A
Semarang	3,6	1st June	A	3,5	1st June	A	3,7	5 June	A	—	(June)	A
Toeban	—	—	—	—	—	—	—	—	—	—	(May)	A
V. Soerabaya	3,8	20 Nov.	A	3,8	20 Nov.	A	4	20 Nov.	A	—	(Nov.)	A
Sambilangan	4,3	25 Nov.	A	4,4	25 Nov.	A	4,7	25 Nov.	A	—	(Nov.)	A
Djameanrif	4,4	15 Nov.	A	3,8	15 Nov.	A	4,1	15 Nov.	A	—	(Nov.)	A
VI. Menado	—	(March)	A	—	(March)	A	2,4	15 March	A	—	—	—
Amboina	—	—	—	—	—	—	—	—	—	—	(March)	A