

Stringham and Fernando Sanford, *Vice-Presidents*; M. W. Haskell, *Secretary*; R. L. Green, *Treasurer*; John D. Parker, *Custodian*. These, with the former Presidents, Joseph Le Conte and David Starr Jordan, constitute the Executive Committee.

The next meeting will be held at the State University in Berkeley.

M. W. HASKELL,  
*Secretary.*

#### CURRENT NOTES ON PHYSIOGRAPHY.

##### ANNUAL RANGE OF TEMPERATURE OF THE OCEAN SURFACE.

THE annual range of temperature in the lower atmosphere, first clearly charted by Supan (*Zeitschr. für wissensch. Geogr.*, 1880) and more recently by Conolly (see my *Elementary Meteorology*, fig. 18), is recognized as an important climatic factor, and the distribution of its larger and smaller values brings forward several interesting physiographical generalizations. Dr. G. Schott now presents a similar chart for the annual range of temperature of the ocean surface (*Pet. Mitt.*, July, 1895,) from which it appears that the maximum range,  $15^{\circ}$  to  $20^{\circ}$  C., occurs on latitude  $40^{\circ}$  N., next east of the continents. Belts of large range,  $5^{\circ}$  to  $7^{\circ}$  in the southern hemisphere,  $8^{\circ}$  to  $12^{\circ}$  in the northern hemisphere, run around the oceanic world about  $38^{\circ}$  north and south, that is, under the belt of high atmosphere pressure and prevailing clear skies; and small ranges are generally found around the equator,  $1^{\circ}$  to  $3^{\circ}$ , and in high latitudes,  $2^{\circ}$  in the far southern ocean,  $4^{\circ}$  to  $6^{\circ}$  in the far north. Dr. Schott ascribes the maximum ranges to the oscillation of cold and warm currents; and to this the contrast between the off-shore winds of summer and winter, by Nova Scotia and Corea, may fairly be added. Locally increased ranges on the equator, up to  $5^{\circ}$  or  $6^{\circ}$ , west of Africa and South America, are explained by the weaker and stronger flow of the

South Atlantic and South Pacific eddies in the southern summer and winter.

##### WINDS OF THE PACIFIC OCEAN.

THE mean strength of the winds over the Pacific Ocean is discussed by Köppen in the *Annalen der Hydrographie* (July and August, 1895), in preparation for the publication of a *Segelhandbuch*. The velocities, without regard to directions, are presented in tabular form and in charts for the opposite seasons of January–February and July–August. Apart from the practical value of these results to navigation, they present interesting features characteristic of the planetary and terrestrial schemes of atmospheric circulation. Where the material is most plentiful, one may easily recognize the weak winds and calms of the planetary system around the equator, between the steady trades on either side; the frequency of calms again, but also of stronger winds in the horse latitudes, about  $30^{\circ}$  north and south; and the rapid increase of strong winds in the higher latitudes of the prevailing westerlies. Terrestrial features appear in the annual migration of these wind belts, not however symmetrically about the equator, but about a medial line in perhaps  $5^{\circ}$  north latitude; and also in the seasonal variation of the strength of the westerlies, from over 4 (Beaufort scale) in summer to over 5 in winter in the northern temperate zone, from over 5 to over 6 in the far southern zone. The irregularities of the planetary belts and of the terrestrial migrations may, in great part, be plausibly referred to cyclonic disturbances, but need much further investigation. The light equatorial winds shift south of the equator only near Australia, where monsoon winds and a seasonal counter current may be searched for.

##### ABNORMAL AND SOLITARY WAVES.

REPORTS are not infrequently made of waves or 'seas' of exceptional size, erro-

neously called 'tidal waves,' by which vessels are overwhelmed on the open ocean. C. E. Stromeyer gives brief account of some examples in *Nature* (li., 1895, 437), describing them as strong enough to carry masts and funnels by the board, and to smash bulwarks, lifeboats and deck houses. He suggests that the waves may be due to volcanic action in the submarine bank known as the Faraday reef, northeast of Newfoundland, for in a number of cases the course of the waves is away from the reef. The same subject is continued by W. Alingham in the (London) *Nautical Magazine* (lxiv., 1895, 539-545), many examples being given. The *Vancouver*, of the Dominion line, was badly mauled by a solitary sea while crossing the North Atlantic in 1890. The *Holyrood*, in June, 1892, 20°N, 35°W, encountered a solitary sea which looked like a wall of water as it approached; it flooded the decks, but before and after this sea broke, the water was comparatively smooth under a light northeast trade wind. The *St. Denis*, New York to Yokohama, in September, 1893, 28° S, 8° E, was boarded by a solitary sea which swept her decks and carried away three seamen. The *Normannia*, 750 miles out from New York, January, 1894, suddenly encountered a sea 'running masthead high,' submerging the vessel up to her bridge, and doing great damage.

Similar phenomena of smaller dimensions are reported on our great lakes. So little is known of them that no satisfactory explanation of their occurrence can be at present adopted.

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#### TYPES OF LOWLAND COASTS.

As the opening paper to the Richthofen Jubilee volume (*Festschrift Ferdinand Freiherrn von Richthofen, von seinen Schülern*. Berlin, 1893), Dr. Alfred Philippson, of Bonn, contributed a discussion of

type forms of coasts, particularly of alluvial coasts (*Über die Typen der Küstenformen, insbesondere der Schwemmlandküsten*).

Under 'die cüste' he includes a zone on either side of the shoreline. He describes as 'Isohypsensküsten' those coastal forms which have been produced by the various constructional processes, such as deformation, depression of land, uplift of sea bottom, volcanic and glacial aggradation. These forms vary so greatly that one can make of them as many types as one pleases.

The present writer prefers to call this class of shore forms 'Constructional,' for in cases of tilted or warped crustal movement the new shoreline does not coincide with a former contour (Isophypse). Philippson recognizes that development must follow the constructional stage, and coastal irregularity from differential marine erosion is therefore explained, and the minute forms of beach profile are illustrated with five diagrams. He amplifies with illustrations his terms, potamogenous or river-made and thalassogenous or sea-made coasts, first introduced in connection with his work on Greece.\* Though he introduces the idea of systematic change in the geographic form of coasts, as in 'incompletely potamogenous' and 'completely potamogenous' alluvial coasts, he does not fully carry out this idea and make a systematic account of all successive stages of development. It would make the comprehension of the various forms of coasts much easier to introduce the terms already applied to land forms and speak of a coast as young, adolescent or mature.

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#### CURRENT NOTES ON ANTHROPOLOGY.

##### SKIN PAINTING IN SOUTH AMERICA.

At the last session of the Italian Geographical Congress, an interesting paper was read by Guido Boggiani, on the supposed tattoo marks on Peruvian mummies.

\* Peloponnes, Berlin, 1892, p. 509.