

**WHIRLWINDS AND DUST-STORMS OF INDIA:
AN INVESTIGATION INTO THE LAW OF WIND
AND REVOLVING STORMS AT SEA: WITH AN
ADDENDUM CONTAINING PRACTICAL HINTS
ON SANITARY MEASURES REQUIRED FOR
THE EUROPEAN SOLDIER IN INDIA**

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Whirlwinds and Dust-Storms of India: An Investigation into the Law of Wind and Revolving Storms at Sea: With an Addendum Containing Practical Hints on Sanitary Measures Required for the European Soldier in India by P. F. H. Baddeley

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P. F. H. BADDELEY

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ILLUSTRATED

*by numerous Diagrams and Sketches from Nature and a Wind Card for
the use of Sailors.*

By

H. F. D. Baddley,
SURGEON, BENGAL ARMY,
RETIRED LIST.

"Facts have special value: They are the data of all just reasoning, and the primary elements of all real knowledge."
Sir Richard Phillips.

"They that go down to the sea in ships, that do business in great waters: these see the works of the Lord,
and his wonders in the deep.
For he commandeth, and raiseth the stormy wind, which lifteth up the waves thereof."
Psa. 107. 23-25.

LONDON. 1860.
BELL & DALDY, 186. FLEET STREET.
COLOGNE
W. HASSEL 50. COMEDIEN STRASSE.

196. h. 13.

"Induction is a process of thought by which we rise from particular facts to general truths relating to whole classes of objects or events, and from these again to still higher and more comprehensive generalisations, when two or more classes are compared and found to resemble each other in certain respects — a process in which we are guided in every instance by the perception of *analogy* between the cases compared, and in which we must confine our conclusion strictly within the limits to which the analogy is known to extend. The conclusion may go far beyond the *particular facts* which have been actually observed, but it cannot go beyond their *known relations* and *ascertained analogies*; if it transcend those, it is no longer an inductive inference, but a fanciful and groundless imagination."

The North British Review. Aug. Numb. 1859.



The above representation of Storm Cards, Pl. 19, is drawn on the principle explained at



page 21; the Cards are similar in size to the Horn Cards invented by Colonel Sir W^m. Reid.

PART I.

CUR SPIRENT VENTI?

The present investigation is directed to the solution of a question which has attracted the notice of philosophers in all ages, "*Why the winds blow?*" Notwithstanding the attention and labour bestowed upon the subject, it must be acknowledged, that this particular branch of science is still in its infancy; and that much remains to be discovered, before we can arrive at any certain conclusion respecting the laws which regulate this complicated phenomenon.

The following remarks contain the result of a series of observations conducted between 1847 and 1853 in N. W. India, with the intention of elucidating the law of storms.

A selection has been made of the important and interesting details collected from actual observation during that period; and prominent parts seized upon to serve as data in reasoning. Numerous plates have also been introduced for the purpose of elucidating the Author's views, — and of affording an opportunity to lovers of science for studying the phenomena which he has observed.

Most persons residing in India, must have noticed with feelings of curiosity lofty pillars of dust traversing the surface during the day time, and thought to themselves, — What are they? From whence do they come? Whither do they go? By what laws are they influenced? Attempts have been made to answer these questions by saying generally, that the pillars thus seen are mere eddies of dust, caused by conflicting currents of air — effects of rarification — obstructions from terrestrial bodies; &c. &c. But such meagre explanations, so far from solving the difficulty, do but add to it, and must fail to satisfy any one who seeks to dive into the mysteries of nature, and refuses to take for granted what cannot be proved by a careful reference to cause and effect.

Ever since 1847, when I ascertained by experiment the electric origin of Dust Storms and Whirlwinds, my attention has been constantly directed to the phenomenon of wind; and I have been careful to note every circumstance likely to throw additional light on a subject imperfectly understood. In 1850 and 1851, when encamped with the Lahore Artillery Division on the extensive plain of Meanmeer, near Lahore, an opportunity was afforded for prosecuting the enquiry with some hope of success. Accordingly I erected before the door of my tent, a wind Vane and an Electrical Conductor, and watched the passage of the dust whirlwinds as they swept by; and when the sun's rays were not too overpowering, I followed them on foot, or on horseback, or in a buggy, at the risk of being accounted mad; (for who could see a man chasing the dust, and looking up towards the sky when nothing appeared to be there, without some such conclusion,) note-book and pencil in hand, noting and sketching as I went along, — by which means I shortly accumulated facts, which have enabled me to add to the store of knowledge already acquired and perhaps, to form a true theory respecting winds.

The most prominent facts then obtained, were published in the Bengal Asiatic Journal for 1850 — 51 and at Lahore, in an Essay to which the local governments of Calcutta, Agra, the Panjab and Bombay most liberally subscribed. But as the facts then brought out, are not generally known in Europe, I am induced after a lapse of nearly ten years to offer them again to notice in a more comprehensive form; feeling assured that the advances which science has made since then, will not militate against the admission of truths, however opposed they may be to long cherished theories.