

## TABLE OF CONTENTS

### VOLUME I. METEOROLOGY IN HISTORY

- Chapter I. METEOROLOGY IN EUROPEAN CULTURE* . . . . . *page 1*  
 The practical importance of weather.  
 Civilisation and the study of weather.  
 The contributions of meteorology to ancient culture.  
 Before and after the weather-map.  
     The place of forecasting in modern meteorology.  
 The earliest records.  
 The diversity of climates.
- Chapter II. WEATHER AND CLIMATE IN THE "WORLD AS KNOWN TO THE ANCIENTS"* . . . . . *page 12*  
 The climates of the Mediterranean region.  
 The numerical expression of the meteorological elements.  
     Observations without instruments.  
     Wind-vanes, the direction and force of the wind, the amount of cloud and visibility.  
     Beaufort scale of wind-force.  
     Instrumental observations.  
 Climatic summaries for Mediterranean stations.  
 Rainfall, pressure and winds.
- Chapter III. THE MEASUREMENT OF TIME: THE KALENDAR AND THE CYCLE OF THE SEASONS* . . . . . *page 44*  
 Specification of seasons by the stars.  
 Day and night. The hour.  
 Heliacal rising.  
 The moon as time-keeper.  
 The sun and moon as joint time-keepers.  
 The relation of the kalendar to the cycle of the seasons.  
     Egypt, Cyprus, Greece, Iraq, Sicily, Northern countries.  
 The present position of the kalendar.  
 The quarters of the May Year.
- Chapter IV. POETS AND HISTORIANS: THE APPLICATIONS OF METEOROLOGY TO AGRICULTURE AND NAVIGATION. HERODOTUS* *page 63*  
 The Greek and Hebrew poets.  
 The conflict between religion and science.  
 Historical notes of weather.  
 The relation of climate to the study of weather.

<i>Chapter V.</i>	METEOROLOGY IN THE TIME OF ARISTOTLE . . . . .	<i>page 73</i>
	Aristotle's <i>Meteorologica</i> .	
	"On dew and hoar-frost."	
	On the classification of winds.	
	The sculptures of the eight winds.	
<i>Chapter VI.</i>	VARIABILITY OF MEDITERRANEAN CLIMATES IN HIS- TORICAL TIMES . . . . .	<i>page 84</i>
	A survey of the position.	
	Syria.	
	Central Asia: Sin Kiang.	
	Baluchistan, Sistan, Afghanistan.	
	Central America.	
	Europe.	
	Northern Africa.	
	Palestine and California.	
	The general circulation of the atmosphere.	
	Variations and their causes.	
	Climate and civilisation.	
	Sand.	
	Soil.	
	Conclusion.	
<i>Chapter VII.</i>	FROM ARISTOTLE TO THE INVENTION OF THE BARO- METER. WEATHER-LORE, ASTROLOGY AND ALMANACS . . . . .	<i>page 98</i>
	Greek weather-lore.	
	Roman weather-lore.	
	Mediaeval and modern lore.	
	Astrology—the voices of the stars.	
	Almanacs.	
	Lunar weather-lore.	
	The acceptance of proverbial philosophy.	
	The popular appreciation of weather-signs.	
	The "cause" of abnormalities in weather.	
	A new astrology.	
<i>Chapter VIII.</i>	THE REIGN OF THE BAROMETER AS WEATHER-GLASS. PIONEERS IN THE SCIENCE OF WEATHER . . . . .	<i>page 115</i>
	Meteorology as a science.	
	Pioneers in the study of weather and of the physical processes of the atmosphere.	
	The barometer as weather-glass.	
	FitzRoy's instructions for the use of the barometer to foretell weather.	
	The threshold of modern meteorology.	
<i>Chapter IX.</i>	METEOROLOGY AS AN INTERNATIONAL SCIENCE. THE METEOROLOGICAL LIBRARY . . . . .	<i>page 156</i>
	The distinction between the sciences of meteorology and physics.	
	Limits of accuracy of meteorological measurements.	
	The purposes of meteorological observation.	
	The early appreciation of the meteorological problem.	
	Meteorology, a world-study. The <i>réseau mondial</i> .	

## TABLE OF CONTENTS

xv

International co-operation as a means of promoting meteorology as a world-study.	
The future of international meteorology.	
An international meteorological college.	
The next step.	
Survey of the surface air of the world.	
<i>Chapter X. THE METEOROLOGICAL OBSERVATORY. THE SURFACE</i>	
AIR . . . . .	<i>page 175</i>
Meteorological equipment.	
Time-keeping.	
Surveying instruments.	
The photographic camera.	
Instruments for the exploration of the elements of atmospheric structure and their changes.	
Wind.	
Pressure.	
Temperature. Screens.	
Humidity.	
Note on the density of atmospheric air.	
Rainfall.	
Evaporation.	
Reduction to sea-level.	
The duration of sunshine, and of clear sky at night.	
Pole-star recorder.	
Certificates of examination of common meteorological instruments.	
<i>Chapter XI. THE METEOROLOGICAL OBSERVATORY. THE UPPER AIR</i>	<i>page 207</i>
The varying atmosphere.	
Cloud-forms.	
Index of cloud-forms and cloud-groups	
Classification of clouds.	
Measurement of the height of clouds.	
Measurement of the motion of clouds.	
Meteorological optics.	
The winds of the free air by pilot-balloons.	
Pressure, temperature and humidity in the free air.	
Troposphere and stratosphere.	
Meteorographs for balloons and kites.	
Balloons.	
Kites.	
Kite-balloons, Drachen-ballons, Ballons-Caquot.	
<i>Chapter XII. THE METEOROLOGICAL LABORATORY. THE STUDY OF THE ATMOSPHERIC HEAT-ENGINE AND THE CYCLE OF PHYSICAL CHANGES IN THE GENERAL CIRCULATION</i>	<i>page 234</i>
The energy of the atmosphere, thermal and electrical.	
Instruments for the measurement of thermal radiation, solar and terrestrial.	
Solar maximum and grass minimum thermometers.	
Pyrheliometers.	
Radiometers.	
Wilson's radio-integrator.	
Pyranometers and pyrgeometers.	

## TABLE OF CONTENTS

The relation of energy to wave-length in solar and terrestrial radiation.	
The use of colour-screens in the measurement of radiation.	
Ultra-violet radiation: actinometers.	
Measurements of ozone.	
The absorption by the atmosphere and the solar constant.	
Instruments for the study of visibility.	
Dust-counters.	
Atmospherics and thunderstorm-recorders.	
Lightning conductors.	
Measurements of the earth's electric field and its changes. Ionisation and air-earth current.	
Magnetic forces in the atmosphere, absolute and recording instruments.	
Record of changes in the vertical force.	
<i>Chapter XIII. THE DEVELOPMENT OF ARITHMETICAL AND GRAPHICAL MANIPULATION</i> . . . . .	<i>page 254</i>
Graphic representation.	
Isograms.	
Projections.	
Representation by graphs—the Cartesian method.	
Polygraphs.	
Logarithmic scales.	
Isopleths.	
Climatic diagrams.	
The nomogram.	
The treatment of vector-quantities.	
Wind-roses and vector-diagrams.	
Continuous records.	
Periodicity.	
Fourier's theorem.	
Harmonic analysis.	
The analysis of a curve for unknown periodicities. Method of residuation.	
The periodogram.	
Curve-parallels.	
Regression equation and correlation.	
Partial correlation coefficients.	
<i>Chapter XIV. THE ANALYSIS OF AIR-MOVEMENT INTO THE GENERAL CIRCULATION AND THE CYCLONE</i> . . . . .	<i>page 287</i>
Early charts of the distribution of the meteorological elements.	
Tropical revolving storms.	
The centripetal theory.	
The weather-map.	
<i>Chapter XV. METEOROLOGICAL THEORY IN HISTORY</i> . . . . .	<i>page 316</i>
NOTES AND INDEX . . . . .	<i>page 323</i>