

tude in Africa the Kalahari Desert extended over the whole western half of the continent, and even beyond. In our continent the dry zone passed from west to east, through the very centre, between the summer rains of the tropics and the winter rains of the more southern latitude, with the exception of a narrow strip of the eastern coast, which was watered by the winds from the sea, condensing rather scanty and irregular rains on the Blue Mountains and the Australian Alps. Among the causes which governed the fall of rain the course of the prevailing winds occupied the first place, and a due consideration of the normal movements of the atmosphere in the latitudes of the dry zone would account for the scarcity of rain in it. These winds belonged to two classes—Firstly, those which formed a part of the general circulation of the atmosphere, resulting from the spherical form of the globe and its rotation on its axis. To the influence of these must be attributed the low rainfall in the dry zones. Secondly, those mainly due to the relative distribution of continents and oceans, and participating, therefore, in the nature of monsoons. To these the abundant rains in the well-watered eastern portions of the same zone, which interrupt the continuity of the dry lands, must be attributed. The operation of these causes was as follows:—Primary circulation of the atmosphere, which arose from difference of temperature between the tropics and cold regions of the globe, had its origin in the broad ascending current, which under the influence of a powerful equatorial sun, started from the belt of calms. The vast ascending masses of air overflowed on both sides towards the temperate zones, causing an accumulation of air at about 30 degrees latitude, enhanced still more by the decrease of pressure over the areas polewards. Here existed a belt of high barometric pressure—the highest on the earth's surface—and from this belt the air divided, flowing downwards both ways. A portion returned to the tropics, became a part of the trade-winds, and reascended in the belt of calms, making a complete circuit. The second part flowed polewards, and became the anti-trades—the north-west winds characteristic of our region. At first sight the occurrence of north winds, especially during our summer months, seemed a meteorological paradox, as in accordance with elementary mechanical laws the wind blows from where the air is cold to where it is warm. But a disturbing effect was produced by inequality of atmospheric pressure: thus winds would blow in over a region of low barometer, while flows of air proceeded from a region of high barometer. The first of the descending currents from the equatorial flow brought drought; the second was the principal source of the rains in the temperate latitudes. Singular it was that these two branches of the same air-current should have so different an effect or aqueous condensation. Both were dry winds, for a descending wind forced into a region of greater pressure would contract, and in doing so the latent heat which it had absorbed in ascending reappeared and increased its tem-

moisture thus ren-

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The Lecture room at the University was moderately filled on Monday evening by teachers and others to hear Professor Tate, F.G.S., F.L.S., deliver the first of a course of lectures on "The Climate and Distribution of Life in Australia." After a lengthy prelude, in which he indulged a merciless criticism of a new manual on Australian geography, the Professor proceeded to state that in the course of lectures he proposed giving he would place before them the necessary data with which to correct the erroneous statements contained in the manual alluded to, and would enable them, he hoped, to form a proper estimate of the geographic and climatic conditions which prevailed in the Australian regions. Starting with the observation that temperature and moisture were indispensable to animal and vegetable life, the Professor proceeded to point out that the distribution of moisture on the globe was subject to the greatest irregularities, the general law being that the quantity of rain on the whole decreased with the temperature—that was, from the equatorial towards the poles, because the warmer the air the greater was its capacity for holding vapour. This general law experienced a remarkable interruption in Australia a little beyond the tropics, where the quantity of the rain was suddenly reduced to a minimum, while on the equatorial side of that belt we found the abundant summer rains of the tropical climate and on the polar side the copious winter rains of the warm temperate regions. Australia, however, presented no exception to other lands similarly situated, inasmuch as there existed in both hemispheres a dry zone. The northern zone of dry lands extended in width from about 24° to 32° N. lat. In the New World it began at the west with the Peninsula of Lower California, thence passing through Arizona, New Mexico, and North Texas, 1,000 miles west to east; average rainfall 10 inches, going down to 2 inches, and 3 inches, while in some years the rains failed entirely. Further east in the same latitudes local causes gave abundant rains to the valley of the Mississippi and Florida. In the Old World the dry zone occupied the very centre of the great Sahara, where the absence of rain was nearly complete for a length of 3,200 miles, and was considerably increased in width. Thence it crossed the central part of Arabia in a line of about 1,300 miles, passed through the dry plateau of East Persia and Beloochistan, and reached beyond the Indies the desert of Thur, after a course of a thousand miles, making together a tract of 5,500 miles of dry land. Further east, in the New World, local causes brought from the same latitudes abundant rains which marked the influence of the general cause of dryness. In the Southern Hemisphere the dry zone was strongly marked on the western slope of the Andes; all the coast of Peru from Pinta Parina 6° S. to North Chili, 30° S. was a rainless region. In the latitude of the dry zone, however, from 20° to 30° in the desert of Atacama, about the Tropic of Capricorn, the atmosphere was not only rainless but perfectly dry. Even on the coast of Chili, Copiapo received only 0.32 inches; La Serena, in Chili, 0.5 inches. In the same latitude on the east of the Andes, the plains of the Pampas were subject to great droughts. In the same latitude in Africa, the Kalahari Desert extended over the whole western half of the continent and beyond. In Australia the dry zone passed from west to east through the very centre—between the summer rains of the tropics and the winter rains of the more southern latitudes, with the exception of a narrow strip of the east coast, which was watered by the winds from the sea, condensing rather scanty and irregular rains on the Blue Mountains and the Australian Alps. The notable interruptions to the dry zones, in fact, were all on the eastern side of the continent. Among the causes of the dry zones, the course of the prevailing winds occupied the first place, and a due consideration of the normal movements of