possible in the present stage of physical chemistry. Why iron in the one combination reacts quickly, and in the other combination slowly, we can not explain any more than we can explain the velocity of any chemical reaction. The mechanism of chemical reactions is unknown.

XIV

If we ask ourselves in conclusion: "What is the respiration ferment?" the answer depends upon how far we carry the idea of respiration. If we confine it to the oxidation process, then the respiration ferment is the sum of all the catalytically active iron compounds which occur in the cell. If we consider as a part of respiration reactions in which, as in the reaction between fructose and phosphate, specific affinities for iron arise, then all substances which, by a splitting or condensation, allow iron to combine, are also constituents of the respiration ferment. Whether we comprehend the idea of respiration in a narrow or broad sense, iron will always maintain its central position as the oxygen-carrying component of the respiration ferment. For oxidation is that process by means of which respiration is differentiated from the other ferment-reactions and in which the purpose of respiration, the production of energy, is fulfilled.

OTTO WARBURG

BERLIN-DAHLEM
GERMANY

JOHN MUIR, NATURALIST AND POET

OF the naturalist-poets of our time, two stand out above the others, the writings of both permeated with a lofty optimism—Burroughs and Muir. John Burroughs "accepted the universe" with an eye on the unresting masses who, tormented by one another and with no time nor energy to look upward, find this world empty and meaningless like themselves.

John Muir went deeper than this, "treading the crust of the earth in adoration." He found "the love of wildness ever sounding in his ears," a world in which beauty, grandeur and fitness were always within the reach of men and where most of the disillusionment and misery of human kind were chiefly self-inflicted. "Freshness and beauty are everywhere," he writes; "flowers are born every hour, living sunlight is poured over all and every thing and creature is glad. Our world is indeed a beautiful one and . . . I would hardly accept a free ticket to the moon or to Venus or any other world for fear it might not be as fraught with the glory of the Creator as our own."

"The Life and Letters of John Muir," as prepared by his younger friend, Professor William Badé, gives an illuminating record of the thoughts and activities of one of the finest and rarest of men. Muir was great as an explorer and investigator. His studies of mountains and glaciers give him a high rank as an interpreter of phenomena. His sympathetic record of trees and beasts places him with the most intense of nature lovers. His exquisite choice of langauge, noticeable in letters and essays alike, has nowhere a touch of the artificiality of those who give nature their patronizing but ignorant approval. His warm friendships and freedom from bitterness display the fine mettle of his character.

In two plump volumes, as a labor of love, Professor Badé gives us a clear insight into Muir and his ways. Born at Dunbar, Scotland, on April 21, 1838, he came early to Wisconsin, where he entered the state university. He went thence to Indianapolis, intending to become a mechanical inventor. But his love for nature carried him out of the shops and set him on a thousand-mile tramp to the gulf. Still later he sought the greater wildness of the high Sierras. Here he became a shepherd in the foothills, but soon forsook the sheep, "hoofed locusts," he called them from their ruthless raids on forest vegetation. For years he devoted himself to the Yosemite Valley, its geology and its grandeur, modestly describing its scenery in letters to his friends, and later as his fame spread eastward, in many magazines. One of his finest essays, the best bird biography in existence, relates to the water-ouzel as seen at East Lake in the Kings' River Canyon. After emerging from the Yosemite, Muir retired to his farm at Martinez and devoted himself to writing. He interrupted this work with frequent rushes to the Sierras, Alaska, Australia and the ends of the earth. His later years were devoted to the efforts for the protection of the Yosemite and other like glacier-worn valleys which he called collectively "Yosemites," not forgetting their giant forests. "However man might slight these," he said, "God must be proud of them for they were the finest He ever planted."

In these efforts he was mainly successful, but not in the case of the noble Hetch-Hetchy Canyon of the Tuolumne, which he saw to his great grief condemned as a water supply to San Francisco.

Muir always refused to lecture, but to small circles he was a brilliant conversationalist. His general attitude appears in an answer to the assertion that "the world was made for man," a notion derived from "the huckster appraisement of Nature." "Certainly not," said Muir. "No dogma taught . . . forms so insuperable an obstacle to a right understanding of the relation which human culture shows to wildness. Every animal, plant or crystal controverts it in the plainest terms. Yet it is taught from century to century as something ever new and precious, and in the resulting darkness the enormous conceit is allowed to go unchallenged."

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