

our understanding of this process so fundamental to our well being and happiness and even to existence itself. The energy point of view is the keynote of modern investigations in plant physiology.

This method of thinking is proving beneficial not only in those biological problems upon which direct experimentation is possible but also in giving clearer notions of some processes that have taken place in the past and appear to be at the present time outside the realm of possible experimentation.

Thought as to the possible steps involved in the early stages of organic evolution furnishes a good example of this. We are now getting away from a consideration of merely the form of the possible organisms which represented the first stages in the evolution of higher plants and animals and are now considering what forms of energy they could have utilized. Since we can hardly suppose that the first step from the non living to the living involved the presence of chlorophyll we think about them in terms of the possible forms of energy that they could have found available. Progress is being made by this kind of thinking. The suggestion that it at present offers is that sulphur and iron bacteria being able to oxidize inorganic compounds and being thus free from the necessity of the presence of chlorophyll on the earth, probably represent very early stages in organic evolution.

The usefulness of the energy point of view is thus apparent. It is not profitable to think longer in terms of vital force, of corpuscular responsibility for inheritance, nor alone in terms of the chemical compounds involved. We think rather of the energy transformations as related to both physical and chemical conditions. Does it not seem evident that the line of future progress in many fields of botanical investi-

gation will be largely along the paths seen from the view point of energy transformations in the plant?

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EDUCATIONAL EVENTS

THE DEATH OF THORILD WULFF

A LETTER from Peter Freuchen, the Danish factor at Knud Rasmussen's Station at North Star Bay, Northwest Greenland, written in late February, gives a direct and definite account of the death of Dr. Thorild Wulff, Swedish botanist and ethnologist, who accompanied Knud Rasmussen on his recent trip to Peary Land and return across the Greenland ice-cap. Translated from the Danish, part of the letter is as follows:

The party, composed of Knud Rasmussen, leader; Lauge Koch, geologist and cartographer, and Dr. Thorild Wulff, botanist and ethnologist, left North Star Bay, as you probably know, early in April, 1917. They were accompanied by four Eskimo—Hendrik Olse, Inukitsok ("Harrigan"), Ajago ("Pingasut") and Boatsman.

They traveled without mishap as far as St. George Fjord, where difficulties began—no game at all, with the exception of a few hares and a seal or two; scarcely a trace of muskoxen. Hence they could go no farther than De Long's Fjord. Here they started homeward, exhausted, and much depressed by the loss of Hendrik, who was devoured by wolves while out hunting. Weak from lack of food, he had apparently lain down to sleep, and before he could defend himself, the wolves had overcome him.

The others talk of the return journey over the ice-cap as a bad dream. After incredible difficulties, they finally attained the west coast at Cape Agassiz near the Humboldt Glacier, just a short time after they had eaten their last dog.

Knud Rasmussen and Ajago at once started on a forced march to Etah to get aid. The others were to rest a little, and then follow slowly after, trying to kill enough game to sustain them. After a few days slow travel without any food, Dr. Wulff could go no farther, and laid himself down to die. He wrote messages to his children and his parents, and dictated to Koch a brief survey of the vegetation about Peabody Bay, for he had continued his observations to the last. He was so weak and ex-

hausted that he knew he could not last much longer.

Forced to abandon him if they were to survive, Koch, Inukitsok and Boatsman went slowly, on farther. Just as they were about to give up entirely, they killed two caribou that kept them alive until relief came from Etah.

Later in the fall, I went up to bury Dr. Wulff, but I could not find his body because of the darkness.

Dr. Wulff has done a very fine piece of work, both botanical and zoological, along the whole coast that he traversed. Koch has also done good work. He succeeded in mapping accurately the whole coast along which the party traveled, including several hitherto unknown fjords. He found the former maps inaccurate in many places. He has moreover brought back a few Silurian and Cambrian fossils from far north.

Koch is not yet (February 23, 1918) quite well, but now that we have brought him to Upernivik and the care of Dr. Bryder and the other good people here, he is fast regaining his strength and health.

This excerpt narrates without embellishment one more of the incidents that make the annals of the North so full of tragedy. The name of Dr. Thorild Wulff is one more added to the long list of heroes lost in Arctic service. Sweden may well be proud to claim him.

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RETIREMENT OF DEAN EDWARD H. BRADFORD OF THE HARVARD MEDICAL SCHOOL

AFTER thirty-eight years of service on the faculty of the Harvard Medical School, Dr. Edward H. Bradford, has tendered his resignation to take effect on September 1. At the Commencement exercises President Lowell announced a gift of \$25,000 from an anonymous source to found the Edward Hickling Bradford fellowship, which is to be used for research or instruction separately or in connection with any other foundation at the Harvard Medical School in such manner as the Harvard Corporation may from time to time prescribe. Dr. Frederick C. Shattuck, Jackson professor of clinical medicine emeritus, pays the following tribute to Dean Bradford in the current issue of the Harvard Alumni Bulletin:

It were unpardonable, even in these stressful days, to allow the resignation of Dr. Bradford as dean of the faculty of medicine to pass unnoticed.

Six years ago, just at the time he had freed himself from hospital work, and had also resigned the professorship of orthopedic surgery of which he was the first incumbent, putting aside the prospect of well-earned leisure and realizing that his private work was likely to suffer, he listened to the call and assumed the deanship. Almost year by year the work of the dean's office has increased with the growth of the medical school, with the expansion and complexity of its activities. It had been his intention not to hold office more than five years; but the exigencies growing out of the war, into which we had just entered, seemed to make it desirable for him to add another year.

Among the developments which have occurred during his tenure of office may be mentioned: the graduate school of medicine so ably headed by Dr. Arnold; the school of tropical medicine under Dr. Strong; the school for health officers under the joint charge of the department of preventive medicine and the Massachusetts Institute of Technology; the further extension of preventive medicine into the fertile field of industrial health and occupational disease, the plans for the opening of which in the coming September are now being laid out; entrance examinations have been revised so as to permit greater elasticity without letting down the bars. A new system of examinations leading to the M.D. degree has been applied.

The Harvard Infantile Paralysis Commission was appointed in September, 1916, following the epidemic of that summer, and is still active. As a member of the committee on education of the American Medical Association Dr. Bradford kept in close touch with nation-wide thought on this subject, and made Harvard influence felt.

It was due to Dr. Bradford's firmness that fourth-year teaching was carried on through the summer of 1917 in Harvard and Columbia, enabling students to graduate in March.

In these and many other matters, Dr. Bradford has taken initiative, or given sympathetic encouragement or guidance. There has been a notable increase in the number of students, both under graduate and graduate in the six years he has been dean. "Well done, good and faithful servant."

THE CHEMICAL WARFARE SERVICE

By order of the Secretary of War General Peyton C. March has issued under date of June 28, the following general orders: