yet spent so much of his time in teaching to others what he knew perfectly.

Here is the kernel of what I am trying to say. Nature-knowledge, whatever you call it, must be brought back into the home—and this ought to be through the kindergarten and the primary school. Teachers in these schools ought to be helped in high school to "know" the plants and the birds and the common insects and other denizens of field and forest.

A high school teacher of biology—under any name—who can not help the forming grade teachers to get this knowledge really is not fitted for the place he holds: but college too rarely can or does fit him. Until what we call our educational system is reformed through evolution or revolution, I fear that we must look for the beginnings of this knowledge where they lay several generations ago—among the self-helped and self-taught fathers and mothers to whom little children turn—at first—in the confidence that they know or have or will learn or will get what is asked for whenever it is neither unreasonable nor harmful. My heart is very warm for the person groping for such self-help: and for the simple-minded apostle of a real nature-knowledge, who in the complexity of our specializations and prerequisite requirements can not reasonably hope to get or hold a teacher's place, whatever he may know, unless he produce some sort of academic sealed and be-ribboned open-sesame.

If ever we can get back to this common possession of our modestly educated forefathers—and the means of self-education are myriad now where they were few for our ancestors—no college class will smile at the thought that it may contain a potential Hales, or Hofmeister, a Gray, or Mendel. Self-evidently it will contain the fundamental of inherent acquaintanceship with the great makers of food concerning which it is acquiring knowledge; and the fact that this knowledge is oscillating and vacillating in its progress toward the real and the full truth will stimulate its every alert member (if this perfection of college classes may be expected) to thinking for himself on the problems and the means of solving them. Then, as formerly, we shall rely on such self-guidance rather than on mimeographed mechanical outlines of work.

Here, in the class-room—even without laboratories, greenhouses or herbaria or gardens—lies our own personal point of contact with the relation of botany or of any science to agriculture—or to anything else. The inspiration of an enthusiastic teacher, an indefatigable investigator, an aging man who never can become encysted by age but whose horizon increases with the years is the contribution of college and university that develop it. These are the men who make laboratories, who devise means to ends—whom others follow.

WILLIAM TRELEASE
UNIVERSITY OF ILLINOIS

ON THE AVIFAUNA OF THE CAPE VERDE ISLANDS[1]

RECENT field work for the American Museum of Natural History has supplied specimens and data for a study of the bird life of the Cape Verde Islands. Water birds, in particular, are so well represented in the collection that it has been possible to employ statistical methods in determining the range of individual variation in certain species, and to contrast, by means of frequency graphs, variation of this kind with geographic variation, *i. e.*, true specific or subspecific variation.

The avifauna of the Cape Verde group comprises 75 forms, of which 37 are seasonal or casual visitants from breeding grounds elsewhere, and three are introduced species. Of the 35 native resident birds, 9 are oceanic, while 8 may be considered Palearctic, 7 Ethiopian and 11 neutral.

The last and largest of these assemblages includes birds of five classes, namely: (1) Those whose breeding ranges extend from areas north of the Mediterranean southward into Africa (*e. g.*, the flamingo and the Egyptian vulture); (2) those which range even south of the forest belt in parts of Africa, but which breed also from southern Europe eastward into Asia (*e. g.*, the white egret, which is resident in India and Ceylon); (3) those which are alike related to representative forms to northward and to southward (*e. g.*, the endemic courser and barn owl, the latter of which is a member of an almost cosmopolitan species); (4) those characteristic of the northerly part of the desert zone, some of which have close relatives in Egypt, Arabia or southwestern Asia (*e. g.*, a lark, *Alaemon*, and a raven, *Corvus ruficollis*); (5) those which have a large proportion of their congeners in South Africa, but which, nevertheless, show closest affinity with species found at the northern edge of the Sahara (*e. g.*, a lark, *Ammomanes*, etc.).

The avifauna is therefore neither prevailingly Palearctic, as Wallace believed, nor distinctly Ethiopian, as has been held by more recent naturalists.[2] It is rather a transition fauna, with numerous desert types akin to birds found along the northern border

[1] Abstract of a paper read before the New York Academy of Sciences on December 10, 1923.

[2] Wallace, A. R., 1876. "The Geographical Distribution of Animals," I, pp. 214, 215. Neumann, O., 1918. *Journal für Ornithologie*, LXVI, pp. 235, 236. Bannerman, D. A., 1920, *Ibis*, pp. 560, 561.

of the Sahara, and with a high proportion of endemism—more than 40 per cent.

Even more indicative of the desert affinities of the insular bird life is the fact that most of the distinctly Ethiopian types have their nearest continental relatives not in the neighboring Congo forest toward the southeast, but rather in an encircling belt of territory which forms a loop around the forest in East Africa and extends into South Africa. Thus, an endemic finch of the Cape Verdes (*Passer jagoensis*) is closely related to *Passer cordofanicus* of the upper White Nile, *Passer ruficinctus* of East Africa, and *Passer motitensis* of the arid parts of South Africa, while no representative occurs in the Congo.

In both relative position and zoogeographic aspects, the Cape Verde Islands are somewhat analogous to the Galapagos Islands, situated westward of South America, in a lower latitude and in a different meteorological environment.

The Cape Verdes owe their prevailing aridity chiefly to the fact that they are tropical islands which lie to leeward of relatively cool ocean waters. The group is truly oceanic, with a flora and fauna derived from elsewhere after the volcanic formation of the islands.

Meteorological and oceanographic conditions resulting from the northeast trade wind cause the mean temperature of the surface of the ocean about the Cape Verde Islands to be lower than that of the atmosphere. This is at variance with conditions in the western tropical and north temperate Atlantic, and is correlated with significant features of sea bird distribution. Thus the islands are the northernmost outpost in the eastern Atlantic of the breeding range of tropical Steganopodes (booby, tropic bird, and frigate bird), whereas all these birds reach higher latitudes in the western Atlantic. In like manner, the tropical species of terns penetrate much farther north in the western than in the eastern part of this ocean. To express the difference by an example, it may be said that the hiatus between the breeding ranges of a tropical tern, *Anous stolidus*, and a Holarctic tern, *Sterna hirundo*, is fifteen hundred miles wide in the eastern Atlantic, and less than six hundred miles wide in the western Atlantic. At the Cape Verdes there are no native terns or other Laridae.

These circumstances undoubtedly have to do with marine ecology, for the limits in the breeding range of both tropical and north temperate sea birds prove to be closely correlated with certain isotherms of ocean temperature.

ROBERT CUSHMAN MURPHY
AMERICAN MUSEUM OF
NATURAL HISTORY

SCIENTIFIC EVENTS

THE TORONTO MEETING OF THE BRITISH ASSOCIATION

OVERSEA members of the British Association for the Advancement of Science coming to the Toronto meeting, beginning on August 6, include the following:

Section G—Engineering

President—G. W. O. Howe, James Watt professor of electrical engineering, University of Glasgow, and editor of the *Radio Review*. His presidential address will deal with "A hundred years of electrical engineering."

Vice-president—Sir Henry Fowler, chief mechanical engineer of the Midland Railway, will speak on "Metallurgy and its influence on social life."

Recorder—F. C. Lee, professor of civil engineering, University of Birmingham.

Secretary—A. Robertson, professor of mechanical and mining engineering, University of Bristol.

Secretary—J. S. Wilson.

T. Hudson Beare, Regius professor of engineering and dean of the faculty of science of Edinburgh University.

Henry Borns.

Ernest J. Coker, professor of civil and mechanical engineering, University of London.

G. Cook, professor of mechanical engineering, King's College, University of London.

George Forbes, late electrical engineer for the works at Niagara Falls.

B. P. Haigh, professor at Royal Naval College, Greenwich.

Sir James B. Henderson, adviser in gyroscopic equipment to the Admiralty, and professor of applied mechanics, Royal Naval College, Greenwich.

Charles Frewin Jenkins, professor of engineering science in the University of Oxford.

Sir William John Jones.

Edgar Waldorf Marchant, professor of electrical engineering, University of Liverpool.

Hon. Sir C. A. Parsons, chairman of the C. A. Parsons Company, Newcastle-on-Tyne, and the Parsons Marine Steam Turbine Company. Past president of the British Association.

H. P. Philpot, professor of civil and mechanical engineering in the City and Guilds Technical College, London.

Section M—Agriculture

President—Sir John E. Russell, director of the Rothamsted Experiment Station, England, will deliver his presidential address on the subject of "Combination in attacking farmers' problems" and will discuss "Diminishing returns in agriculture."

Vice-president—Charles Crowther, director of research, Olympia Agricultural Company; formerly professor of agricultural chemistry, and head of the Institute for Research on Animal Nutrition in the University of Leeds.

Recorder—C. J. T. Morison, School of Rural Economy, Oxford.