Righi, Bologna; Sir Ernest Rutherford, Cambridge; and Professor E. Van Aubel, Ghent.

UNIVERSITY AND EDUCATIONAL NEWS

YALE UNIVERSITY has received from an unnamed graduate a gift of $3,000,000 to the general endowment of the university, contingent upon additional gifts of $2,000,000 by next January, exclusive of those through the alumni university fund. The gift is made to meet increased faculty salaries.

CORNELL UNIVERSITY has received a gift of $500,000 from Mr. August Heckscher, of New York City, for the endowment of research. The income of the fund created by Mr. Heckscher's gift will be used to maintain research professorships and to provide facilities for scientific work.

PROFESSOR FRANKLIN MOON, who has held the chair of forest engineering since 1912, has been elected dean of the New York State College of Forestry at Syracuse.

DR. EDWARD BARTOW, chief of the Illinois State Water Survey Division, has been elected head of the department of chemistry of the Iowa State University.

DR. H. E. WELLS, formerly professor of chemistry at Washington and Jefferson College, has been appointed professor of chemistry at Smith College.

PROFESSOR HORACE GUNTHORP, of the department of zoology and physiology at Washburn College, has accepted an assistant professorship of zoology in the University of Washington, at Seattle.

DR. H. M. DAWSON has been selected to be the occupant of a newly established chair of physical chemistry at the University of Leeds.

DISCUSSION AND CORRESPONDENCE

ORTHOGENESIS AMONG FISHES

IN tracing successions of fishes, extinct and recent, we observe the outlines of a law or generalization, still vaguely understood, which seems to be in line with Eimer's conception of orthogenesis. This is defined as the doctrine that the phylogenetic evolution of organisms takes place systematically in a few definite directions, as contrasted with irregular divergence in many directions.

The facts in brief are these: In certain groups some particular structure will acquire a high degree of development and specialization; this being pursued along what might seem to be a definite determinative line; after which, the structure, being over-developed, undergoes again progressive degeneration, sometimes being altogether lost.

Two series of fishes may illustrate that point: the rock fishes (*Scorpænidæ*), in their most primitive forms are very much like the different types of bass, the chief difference lying in the presence of a peculiar backward extension of the bone under the eye, forming what is called the suborbital stay, and the fact that the skull has spines on its upper surface. We have the elaboration of spines on the head, the elaboration of scales, forming ultimately a series of bony plates, the extension over the head of a coat-of-mail, the elevation of fins, and other modifications. These gradually fading away through the different categories of sculpins (*Cottidæ*), until we come to the sea-snails (*Liparidæ*). These still retain the suborbital stay, but have lost all the hitherto specialized qualities: there are no scales, the body is covered with thin movable skin; there are no spines anywhere on the head or fins, and the fins themselves are very small in size, largly enveloped in the soft flaccid skin.

Quite as remarkable is the process of evolution and transformation of the butterfly fishes (*Chætodontidæ*). Beginning with forms like *Ephippus,* not very different from ordinary bass-like species, these fishes become specialized in very high fins, the reduction of the size of the gill opening and the development of brush-like teeth of the mouth. Passing on further we see the tail provided with bony structures, sometimes with a brush of spines like porcupine quills, sometimes with a sharp cutting lance in a sheath on either side. The scales grow smaller and rougher, the fins being however reduced in height and in