ceived some extra aid and the output was increased. I, therefore, wish to insist that the ability exists. It awaits only the opportunity. At present, and undoubtedly formerly in individual cases, research is at a standstill for lack of time. But time costs money.

There has always existed one serious question in regard to the place of research in the colleges. They have prided themselves in doing better teaching than the larger units. In the past this idea has been based in part on statements by university men in regard to the percentage of students who have been led into graduate work from the university and from the small college. These statements appear to favor the latter. The small college fears that if research is greatly emphasized, teaching will be neglected—teachers will lose contact with students and the intellectual stimulus will be lost.

I feel, however, that common ground is in sight. For example, the present educational "urge" to stimulate the "gifted student" by special problem methods or by participation in research is a method in which only creative minds can be the effective teachers.

It is my opinion that for some of our smaller endowed colleges there exists an exceptional opportunity to experiment in intensive educational methods, provided that they will curtail further increase in student enrollment while their resources grow. The problem of salary scale is also involved. In my opinion the best criterion is that it should be such that a reasonable number of the best students will be attracted into the profession. This is not at present the case, although there are indications of improvement since the post-war depression period. One can not be blind to the fact that such an intensive program involves a serious financial problem. Funds are needed. Research time is expensive. This program, however, will yield more time for research without diminishing the amount of attention which the individual student receives from the faculty. There will be a more carefully selected group of students introduced into an atmosphere more charged with intellectual life. If, on the other hand, these colleges grow as in number of students their resources grow, the opportunity may be lost, never to return.

H. B. GOODRICH

WESLEYAN UNIVERSITY

Dr. George D. Olds, president of Amherst College, spoke of Amherst's past and present support of members of her faculty in research, endorsed the present movement for encouragement of college men in research and pledged Amherst's hearty cooperation.

Professor C. E. Seashore, dean of graduate studies in the University of Iowa, said that research is in the air in America to-day. He contrasted talent and creative ability in research, emphasizing the comparative rarity of creative ability. A man who has research in him will do research in spite of too heavy a teaching burden. The trend toward emphasis upon research is so strong in the whole life of the country that it will aid emphasis upon research in colleges, especially emphasis upon the research method in teaching.

Dr. Vernon Kellogg, permanent secretary of the National Research Council, said:

> I have been impressed by the fact that so many of the students in professional schools and graduate departments of the universities have come from the colleges rather than from the undergraduate departments of universities. I asked the dean of one of the greatest graduate schools in regard to this and he said, "We get 90 per cent. from the colleges." This means that the students already have had the spirit of research cultivated in them in college.
>
> I want to suggest that we pass a resolution at this meeting, as follows:
>
> *Resolved:* That we recommend to the council of the American Association for the Advancement of Science that they invite the National Research Council, the American Council on Education, the Social Science Research Council, and the American Council of Learned Societies each to name a representative to meet a representative of the association, the five representatives to consider and enter upon definite plans for encouraging and promoting research in American colleges.

Dr. Kellogg's motion was passed at the meeting and later was approved by the council and was adopted by the association.

The members of this committee are: Vernon Kellogg, for the National Research Council; C. R. Mann, for the American Council on Education; Edward C. Armstrong, for the American Council of Learned Societies; Knight Dunlap, for the Social Science Research Council (interim appointment), and Maynard M. Metcalf, for the American Association for the Advancement of Science.

WILLIAM HEALEY DALL

THE death of Dr. Dall on March 27, 1927, removes one of the last pillars from the fast disappearing class of systematic naturalists—a class whose roll of honor in America is adorned by the names of Audubon, Agassiz, Allen, Baird, Cassin, Cope, Coues, Dana, Gill, Hyatt, Kennicott, Leidy, Newberry, Packard, Richardson (Sir John) and Verrill. And it may be said with truth that in his chosen field no one of these labored more faithfully, or contributed more substantially to the advance of knowledge.

While Dall was primarily a conchologist, his interests were by no means confined to this specialty but reached out into many and divergent paths of scientific investigation. He was a student of nature in a broad sense—a naturalist in the full meaning of the term.

His early enthusiasm in the study of birds indicates the loss to ornithology when other work called him. For not only did he give us the first "List of Birds of Alaska" (1869), but his "Avifauna of the Aleutian Islands" (1873), still remains the authoritative source of published information on that extensive and then little known region. Similarly, his "Food Fishes of Alaska" (1871), his "List of the Mammals of Alaska with discussion of the Furbearing Animals" (1870), "Parasites of Cetaceans" (1872), and critical studies of the Cetecea with descriptions of new species (1873–1874) were marked contributions to the zoology of the time. His "Meteorology of Alaska" (1879) is a noteworthy volume, containing not only an elaborate summary of what was then known on the subject, but also maps showing the northern limit of tree growth and the distribution of plants and animals.

But the scope of his activities is by no means covered by the above enumeration, for in addition to his monumental contributions to conchology his publications enrich several other lines of research, notably anthropology, geography, tidal currents, geology and paleontology. Still other essays of which special mention should be made are those on evolution, on the geographic distribution of marine animals and on "Zoological Nomenclature"—the latter a painstaking and much needed work of timely service to systematic naturalists. And besides these Dall was the author of a number of monographic volumes and a multitude of lesser papers, chiefly on the Mollusca, and also of an appreciative biography of Spencer F. Baird—a volume of more than 450 pages, published in 1915. To one unacquainted with his indefatigable industry, the number, magnitude and quality of his published contributions to science is quite overpowering.

Dall, in common with most naturalists, developed an interest in natural history when so young that he was unable to recall the date. The accident that led him to become interested in shells was, he said, the possession when a boy of twelve of a copy of Dr. Gould's "Invertebrata of Massachusetts." Inspired by this work, and living near Boston, he undertook to make a complete collection of the shells of Massachusetts. Finding species that he was unable to name, he made bold to consult the author, Dr. Gould, who gave him much sound advice, and whom Dall characterized as "one of the best and most lovable of men."

A little later, when employed in an office on the India wharf in Boston, where he did boy's work for wages, he kept a book in his desk and at odd times when unoccupied with his regular task, copied scientific books which he then thought he would never be able to buy.

The next factor in shaping his zoological career was work in the museum at Cambridge, where he fell under the magnetic influence of Louis Agassiz. His third opportunity occurred in Chicago at the time of the Civil War, when, having failed to obtain a livelihood in Boston, he found employment in the Windy City. Although hard at work during the day, he spent his evenings studying at the Chicago Academy of Sciences.

It was there that he met William Stimpson and Robert Kennicott, both of whom became dear personal friends. It was there also that he determined, in the event of a choice of occupations, to accept irrespective of pay the one that promised most in the way of opportunity for continuing scientific studies. Acting on this resolve he more than once declined offers of higher salary and undertook harder work with less pay where there were better advantages for study.

In 1865 he visited Alaska as one of the scientific staff of the Western Union International Telegraph Expedition, and when his friend, Robert Kennicott, leader of the expedition, died on the ice of the Yukon, Dall, though only twenty-one years old, was unanimously chosen to succeed him. In 1867 he explored and mapped the mighty Yukon River from the coast up to Fort Yukon, then believed to be on or near the international boundary. On his return he published an illustrated volume on "Alaska and its Resources," (1870) comprising upwards of six hundred pages and a map, which for many years remained the standard authority on the territory. Professor Baird, appreciating his industry and talent, promptly took him into the fold of the Smithsonian Institution, which, except during absences on field expeditions, continued to be his headquarters until his recent fatal illness.

From 1871 to 1874 Dall was captain of a Coast Survey vessel and head of a scientific survey of the Aleutian Islands and adjacent coasts, the results of which, with much other material, were embodied in a quarto volume entitled the "Pacific Coast Pilot, Coasts and Islands of Alaska" (1879), prepared jointly by himself and his associate, Marcus Baker. The bibliography by Marcus Baker which accompanied it contains upwards of ninety titles of articles by Dall published prior to the year 1879.

From 1880 till his death he was an honorary curator in the National Museum; from 1884 to 1925 he was paleontologist of the United States Geological Survey; from 1893 till 1927 he held the chair of invertebrate paleontology in the Wagner Institute of Science; and from 1899 to 1915 was honorary curator of the Bishop Museum, Hawaii.

He was the recipient of several medals and honorary degrees, including that of LL.D.

In 1899 Dall was one of the most eminent of the scientific guests of the late E. H. Harriman on the famous and unique Harriman Alaska Expedition. It is well within the truth to say that in view of the vast amount of work done by Dall during his thirteen previous visits to Alaska and in the preparation of his publications on the geography, geology, meteorology, anthropology and natural history of the territory, his knowledge was of the greatest service; while his genial disposition and readiness to answer multitudes of questions, both to individual members and at the evening gatherings in the cabin, made him the most beloved member of the expedition. To the series of thirteen volumes on the results of the research work of the voyage, he contributed a valued article on the "Discovery and Exploration of Alaska" and a beautiful and touching poem on the Innuit People.

Like Baird, under whose kindly influence many years of his life were spent, his mind was a treasure house of information in various fields of science, geography, exploration and other subjects, and although one of the busiest men in the world, he gladly gave the benefit of his wide knowledge to earnest seekers for truth. To young men and women who had chosen some branch of zoology or kindred science for their life work, he was always willing to lend a helping hand and was always patient, kind, helpful and generous.

His own views as to the attributes and qualities that go to make up a naturalist were expressed in an address on "Some American Conchologists" delivered in Washington more than forty years ago, in which he states, "The only lesson which may be said to be absolutely clear is, that naturalists are born, and not made; that the sacred fire can not be extinguished by poverty nor lighted from a college taper. That the men whose work is now classical, and whose devotion it is our privilege to honor, owed less to education in any sense than they did to self-denial, steadfastness, energy, a passion for seeking out the truth, and an innate love of nature. These are the qualities which enabled them to gather fruit of the tree of knowledge." And it is obvious from the character of his own work that he believed that "what is worth doing is worth doing well."

My acquaintance with Dall dates back more than half a century, for it began in 1875 in the laboratory of the U. S. Fish Commission at Woods Hole, a favorite meeting-place for scientific men, then under the capable and friendly management of Professor Baird. Professor Verrill was in charge of the invertebrate studies, while among the laboratory assistants were Sidney I. Smith, Samuel F. Clarke, E. B. Wilson (then a mere lad), Tarleton H. Bean, and myself. William H. Dall, Alpheus Hyatt and David Starr Jordan were among the many who visited the laboratory or worked there for short periods.

It was the possession of such sterling qualities as intellectual capacity, patience, industry and thirst for knowledge, coupled with high ideals of integrity and obligation, that enabled Dall to attain the position he so long held among the eminent scientists of the world. The closing words of his appreciation of his friend William Stimpson may well be applied to himself: "Those who had the privilege of his companionship will carry an abiding memory of his abilities as a naturalist and his noble and lovable characteristics as a man."

C. HART MERRIAM

SCIENTIFIC EVENTS

PROFESSOR EINSTEIN ON NEWTON

ON the occasion of the recent Newton bicentenary celebration Professor Einstein sent a letter to Dr. Jeans, secretary of the Royal Society, which in the English translation printed in *Nature* reads:

More than any other people you Englishmen have carefully cultivated the bond of tradition and preserved the living and conscious continuity of successive generations. You have in this way endowed with vitality and reality the distinctive soul of your people and the soaring soul of humanity. You have now assembled in Grantham in order to stretch out a hand to transcendent genius across the chasm of time, and to breathe the air of the precincts where he conceived the fundamental notions of mechanics and of physical causality. All who share humbly in pondering over the secrets of physical events are with you in spirit, and join in the admiration and love that bind us to Newton. What has happened since Newton in theoretical physics is the organic development of his ideas. Force became independent reality to Faraday, Maxwell and Lorentz, and then went over into the conception of the field. The partial differential equation has taken the place of the ordinary differential equation used by Newton to express causality. Newton's absolute and fixed space has been converted by the theory of relativity into a physically vital frame. It is only in the quantum theory that Newton's differential method becomes inadequate, and indeed strict causality fails us. But the last word has not yet been said. May the spirit of Newton's method give us the power to restore unison