will study is one of the most alluring of the many little-known areas of South America. Here on a vast plateau nearly 15,000 feet above the sea, within a hundred miles in an airline from the Pacific coast but separated from it by the lofty, snow-capped wall of the main range of the Andes, and within thirty miles of each other are the sources of three great tributaries of the Amazon—the Maranón, the Huallaga and the Mantaro.

It is a curious fact that, with all the explorations that have been made in the Amazon Basin in the past hundred years, the actual sources of the main tributary of the world's greatest river have never been carefully explored and from the standpoint of accurate mapping are practically unknown. The headwaters of the Maranón consist of a chain of glacier-fed lakes some thirty miles in length which lie close against the eastern edge of the cordillera of the Andes about fifty miles northwest of the famous American-owned copper mines at Cerro de Pasco. Although it it believed by many that in the towering crests of the Andes from whose melting snow-fields and glaciers this chain of lakes is fed, peaks will be found that will rival the highest altitudes so far determined in Peru, none of them have been accurately measured.

Of the lakes themselves little information is available. In 1909 Sievers, the German geographer, visited and described a group of small lakes which form the uppermost part of the chain. The survey made by the Intercontinental Railway Commission in the early nineties crossed the lowermost of them at the point where it empties into the Maranón. Between these two points there are only vague and conflicting descriptions by a few native travellers. A topographic survey of about 350 square miles will be made between the crest of the Andes and the secondary range which bounds the lake region on the east. This survey will be tied in to a base established at Cerro de Pasco and accurately located by astronomical observations. It is believed that the geological studies in this section will be especially interesting. North and south of the region the Andes are known to be highly mineralized. At Mina Ragra a short distance south of the point where the survey will begin are located the mines of the American Vanadium Corporation, from which comes the major portion of the world supply of vanadium.

From the lake region a reconnaissance traverse checked by frequent astronomical observations will be carried for about a hundred miles northward along the upper Maranón, thence eastward through the densely-forested montana to the Huallaga and Pachitea Rivers, and back to Cerro de Pasco. This part of the work will include about 400 miles of reconnaissance surveys. Topographic surveys will be made of small areas at critical points along the route, meteorological records will be kept and observations on the plant and animal life recorded as a basis for distributional maps now in process of construction by the American Geographical Society.

The cartographic work of the expedition will be of great interest to geographers and kindred scientists because it will fill with accurate surveys one of the largest blanks which still exists in the map of South America. In general, maps of Hispanic America are highly inaccurate and scientists have been, for that reason, greatly hampered in their work all over this great realm. For the past six years the American Geographical Society has had a large staff of expert cartographers engaged in assembling material for a great map of Hispanic America. This map is on the scale of 1:1,000,000 and conforms to the standards of the International Map of the World. It is being compiled from original surveys and will represent, when completed, the total present knowledge of the cartography of Hispanic America. The Hispanic American governments as well as American and European explorers and development companies have shown enthusiastic interest in the task of assembling material for the map. The society's collection now numbers thousands of original surveys. There still remain many gaps, however, in areas in which no surveys have been made. The region selected for the present expedition is one of the most critical of these areas. The society hopes by future expeditions to be able to fill many other important blanks on the map.

From the standpoint of the surveyor the expedition will be highly important in that it will afford an opportunity to test out in the field the methods of rapid mapping which the society has been developing during the past seven years. The expedition will be equipped with a set of instruments which represent a maximum of accuracy and speed of work with a minimum of bulk and weight. They include the new Weld theodolite, the Barr and Stroud range finder, and an extremely small and light wireless receiving set for obtaining time signals for longitude.

The expedition, which is in charge of O. M. Miller, of the society's School of Surveying, will leave New York on June 23 on the steamer *Santa Teresa* of the Grace Line. Kaspar Hodgson, son of C. W. Hodgson, of Yonkers, will be a member of the party. The party will also include, beside assistants, a geologist who will study the mineral resources of the region.

HONORARY DEGREES CONFERRED BY YALE UNIVERSITY

HONORARY degrees were conferred by Yale University on the occasion of the two hundred and twenty-

sixth commencement exercises on June 22, when Professor William Lyon Phelps, public orator, presented the candidates and President James Rowland Angell conferred the degrees. Those conferred on scientific men are as follows:

Charles Value Chapin

PROFESSOR PHELPS: A graduate of Brown and of the Bellevue Medical College in New York, Dr. Chapin has a magnificent record as a promoter of health and foe of disease. He has been health officer of the city of Providence since 1884 and city registrar since 1889. He is the leading figure in the development and standardization of public health practice in the United States. To him we owe the formulation of the entire modern viewpoint in the control of communicable disease. His book on "Sources and Modes of Infection" (1910) is highly important. In 1906 the American Medical Association had voted that Dr. Chapin's method would do "infinite harm"; to-day the whole world follows his lead. Dr. Chapin has no talent for publicity; but those who are familiar with the history of the movement for public health look back, and at, and up to him.

PRESIDENT ANGELL: To have been instrumental in materially improving the health and happiness of untold millions is a noble achievement. This fact Yale would publicly recognize by conferring upon you the degree of doctor of laws and admitting you to all its rights and privileges.

John Jacob Abel

PROFESSOR PHELPS: Dr. Abel was this year awarded the Willard Gibbs Medal, for having done more than any other living scientist, without pecuniary advantage to himself, "to promote enjoyment of life." He is a graduate of the University of Michigan and of Johns Hopkins. For seven years he studied at various European universities, since 1893 has held the chair of pharmacology at Johns Hopkins and in 1920 received the degree of doctor of laws from Cambridge. He is the foremost pharmacologist in the United States. He has in large measure determined the trend and character of this science in America. Some twenty years ago he discovered epinephrine, the active principle of the suprarenal gland. Then he rested and in 1910 got his second wind. His recent activities and discoveries have been remarkable, all the more so because he has been a lone worker. His discovery of amino acids in the circulating blood was the foundation for our modern conception of protein metabolism. His investigation of the active principle of the pituitary gland promises to yield significant results. In 1926 he announced the preparation of a pure crystalline insulin, which is going to be of the highest importance in the cure of diabetes. He is truly a great discoverer and a great benefactor, though he is too busy to know it.

PRESIDENT ANGELL: It is a peculiar pleasure to me, who have known you from boyhood, to be the agent through whom, in recognition of your extraordinary contribution to the understanding of the conditions of health and of disease and thus to the relief of human suffering, Yale herewith confers upon you the degree of doctor of science, admitting you to all its rights and privileges.

Alfred North Whitehead

PROFESSOR PHELPS: Mathematician and philosopher. Born in England, a graduate of Trinity College, Cambridge, and later fellow and senior mathematical lecturer, since 1924 he has been professor of philosophy at Harvard. In 1925 he was given the Sylvester Medal by the Royal Society, for his work *Principia Mathematica*. He is one of the leading authorities in the sphere of mathematical physics and his publications exhibit one of the greatest excursions in pure reason in the history of thought. For sheer intellectual effort in the most abstract yet fundamental regions of thought there are very few things comparable to the work he has already accomplished. The scientific foundation of metaphysical speculation is his especial field; and in many domains his knowledge begins where that of other experts leaves off. He is an intellectual pioneer, dwelling on the farthest unexplored frontiers of thought; and of late he has been irresistibly drawn to the philosophy of religion, bringing to these problems a mind filled with scientific knowledge and fresh as the morning. Every subject that he treats he touches with new life; he has in the highest degree learning, originality and intellectual charity. America is proud of the presence of such a man.

PRESIDENT ANGELL: Because she desires to honor great learning and extraordinary insight, and not less to recognize a rare ability to render significant and interesting to the intelligent layman scientific and philosophical issues ordinarily regarded as hopelessly abstruse, Yale confers upon you the degree of doctor of science and admits you to all its rights and privileges.

Sir James Colquhoun Irvine

PROFESSOR PHELPS: Principal of St. Andrews. Born in Glasgow, he took his bachelor's degree at St. Andrews with special distinction in chemistry and zoology; his doctorate he took at Leipzig. He became professor of chemistry and later dean of the faculty of science at St. Andrews, and in 1921 principal and vice-chancellor. In 1925 he was knighted; the list of his honors, degrees and decorations need not be given in detail. In the chemistry of the sugars he is one of the foremost living authorities; but nothing human is strange to him. He restored to its original condition the university chapel, where services were held before the time of Columbus. He is beloved by the leading men of letters of Great Britain, and was the only man in the world who could have persuaded Sir James Barrie to make a speech. He secured the great dramatist to deliver a baccalaureate address at St. Andrews, his first appearance on the platform. Principal Irvine's interests and sympathies extend as far as humanity; he is a first-class amateur

actor, a lover of music and the fine arts, a Scottish humorist and a conversationalist *summa cum laude*. Such a personality can not be defined or even known by any special learning; for research is simply one of his natural activities. We are happy to number him among the sons of Yale.

PRESIDENT ANGELL: In recognition of your striking accomplishments as an executive, your well-earned renown as an unofficial ambassador from Scotland to other lands less bonnie, including England, but primarily by reason of your brilliant and solid achievements as a chemist, Yale confers upon you the degree of doctor of science and admits you to all its rights and privileges.

George Hoyt Whipple

PROFESSOR PHELPS: Dr. Whipple was born in New Hampshire, took his B.A. at Yale in 1900, his doctor's degree at the Johns Hopkins Medical School and became a member of the faculty. Research professor in the University of California, his work attracted such attention that when the new medical school was established at Rochester he was called as director. He designed the buildings, selected the faculty and has brought the institution into deserved distinction. His own special field of research is pathological anatomy. His Puritan inheritance has been tempered by Baltimore, Charleston and California, so that he has lost its angularities without losing its grit.

PRESIDENT ANGELL: Because she wishes honorably to recognize your outstanding career in the field of your profession and to voice her confident expectation of further high service from you in your present responsible post, your alma mater confers upon you the degree of master of arts and admits you to all its rights and privileges.

William Buckhout Greeley

PROFESSOR PHELPS: A graduate of the University of California in 1901 and of the Yale School of Forestry in 1904, he is chief forester in the U. S. Forest Service. He was attached to the Corps of Engineers in the world war, serving in France two years. He was promoted to be lieutenant-colonel of the 20th Engineers and chief of the Forestry Section. He received the award of the Distinguished Service Medal of the U. S., the Legion of Honor of France and the Distinguished Service Order from Great Britain. His judgment of men is as good as his professional knowledge; it can never be said of him that he can not see the forest for the trees.

PRESIDENT ANGELL: Latest of the distinguished line of graduates of the Yale School of Forestry who have acted as chief forester of the United States, in recognition of your distinguished services to your profession and to your country, your alma mater desires to honor you by conferring upon you the degree of master of arts and admits you to all its rights and privileges.

GRANTS FOR SCIENTIFIC RESEARCH OF THE AMERICAN MEDICAL ASSOCIATION

THE Committee on Scientific Research of the American Medical Association has made grants for research which include the following:

Dr. Victor C. Jacobsen, professor of pathology in Albany Medical College, to study the effects on living tissues of high voltage cathode rays. ($1,200.)

Mr. Charles V. Green, of the Michigan State College of Agriculture and Applied Science, to study the inheritance of hemophilia and color blindness in man. Mr. Green will work under the immediate direction of Dr. Charles B. Davenport. ($750.)

Dr. W. H. Manwaring, Stanford University, California, to continue work on the physiological relationship of anaphylaxis to immunity, studied by means of blood transfusions and organ transplantations. ($500.)

Dr. Arthur M. Yudkin, assistant clinical professor of ophthalmology, to be used in the section of ophthalmology at Yale University to investigate the chemical and physical composition of the intra-ocular fluids in experimental animals and also the changes which may take place as a result of cataract formation produced experimentally. ($500.)

Dr. O. Larsell, of the University of Oregon Medical School, to aid in his research on the hemopoietic effects of nuclear extractives. The fund will be applied toward determining which ingredients of the nuclear material are responsible for the stimulation of blood formation which has been observed in experimental and human anemias. ($500.)

Dr. Harold Cummins, associate professor of anatomy to Tulane University, who will be a guest worker for a part of the summer in the Carnegie Laboratory of Embryology, to study with the aid of the extensive material assembled in this laboratory, the history of the contours of the fetal hand and foot, with particular reference to individual variation and the correlated development of skin patterns.

Dr. J. Earl Else, of the Else Dudman Nelson Clinic of Portland, Oregon, to study the reconstruction of the lower end of the esophagus.

Roy L. Moodie, of Santa Monica, California, to enable him to prepare for publication the illustrations for a discussion of surgery in pre-Columbian Peru.

SCIENTIFIC NOTES AND NEWS

DR. VICTOR C. VAUGHAN, formerly dean of the Medical School of the University of Michigan, has been awarded the Kober Medal, given by the Association of American Physicians for distinguished work in preventive medicine and public health.

THE French Society of Electricians has presented its Mascart Medal to Sir Joseph Thomson.

DR. LUDWIG PRANDTL, director of the Kaiser Wil-