degree of master of science will be registered upon recommendation of the department in which his work is to be done.

The requirements for the degree of master of science are:

A period of study after the internship of not less than three years in the university or in hospitals and laboratories recognized by it, at least one calendar year of which must be spent in this university.

Such intensive graduate training in the basic medical sciences of anatomy, embryology, physiology, biochemistry, pharmacology, pathology, bacteriology, and in other fields of science as shall be recommended by the departments concerned and approved by the Administrative Board on Postgraduate Studies in Medicine.

An active experience during the three-year period of not less than eighteen months in the hospital, clinics and diagnostic laboratories of the specialty elected.

Written, oral and practical examinations and a dissertation may be prescribed in the specialty elected and in clinical, laboratory and public health fields to which the specialty is related.

A student admitted to the university for postgraduate medical training may become a candidate for the degree of doctor of philosophy if he meets the requirements for that degree that are prescribed by the faculties of political science, philosophy and pure science.

FURTHER INVESTIGATION OF COSMIC RAYS

PLANS for a concerted effort to discover the source and nature of cosmic rays, involving the measurement of these radiations at eighteen widely scattered sites on the earth's surface, are disclosed by Dr. Arthur H. Compton, professor of physics at the University of Chicago.

During the spring and summer of 1932 more than a dozen physicists, working in several parties under the direction of Dr. Compton, will test the intensity of the rays at thirteen sites. Electrometer readings, taken largely in mountain ranges, will be made in Panama, Peru, New Zealand, Australia, Hawaii, Alaska, the Argentine, Chile, Kashmir, Ceylon, Singapore, Java and South Africa. The Carnegie Foundation and the University of Chicago will share the expense of the study.

The present expeditions continue the work which Professor Compton and his collaborators carried on last September and October on Mount Evans, Colorado, and on the Jungfrau in the Swiss Alps. The projected measurements will be made at widely distributed stations and at different altitudes on mountains ranging in height from 7,000 feet to 26,000 feet.

The objective of the expeditions, according to Dr. Compton, is "more complete knowledge of the nature and place of origin of the cosmic rays. A survey such as this should give the most adequate test that has yet been devised to distinguish whether the cosmic rays are photons, such as light and x-rays are, or electrons, such as give rays to the earth's aurora. Because of the effect of the earth's magnetic field, electrons should give less intense rays near the equator than near the poles. Likewise, if the cosmic rays have their origin in the earth's atmosphere there should presumably be variations with the geographical location."

Dr. Compton, who for several years has been measuring the rays in Eckhart Hall on the campus of the University of Chicago, will himself do a considerable share of the proposed work. Accompanied by his wife and his 14-year old son, Arthur Alan, who assisted him in the work on Mt. Evans, Dr. Compton will leave for Panama in March, to make tests on Mt. Chico, fifty miles from the Canal. His next stop will be Peru, where he will work in cooperation with the Carnegie station at Huancayo, making measurements over as wide a range of altitudes as possible and especially at very high altitudes.

Mt. Cook in New Zealand will be the next objective of the party, and the fourth point of observation will be Mt. Kosciusko between Sydney and Melbourne in Australia. From there Dr. Compton will proceed to Hawaii to set up his apparatus on Mauna Kea in Hawaii, and will then go on to Alaska, where Mt. McKinley has been chosen as the experimental site. Late in the summer Dr. Compton will return to America to join Dr. J. C. Stearns, of Denver University, and Dr. R. D. Bennett, of the Massachusetts Institute of Technology, both of whom have cooperated with him in previous cosmic ray studies, and will have spent the summer of 1932 in making further measurements in Colorado.

Three other cooperating parties will report to Dr. Compton at the end of the summer. One will take measurements on the Volcano Lanin in Patagonia and at Punta Arenas in Chile. A second, in charge of Professor S. N. Naude, recently a research fellow at the University of Chicago and now on the faculty of the University of Cape Town, will climb Mt. Winterhoek in South Africa, and will probably measure also the cosmic rays at Mt. Brukkaros.

In India, Professor J. N. Benade, of Punjab University, Lahore, will go to Mt. Nunga Purbat in Kashmir, the third highest peak in the world, and will, if possible, make tests at several altitudes ranging as high as 20,000 feet or more. Professor Benade will then proceed to Kandy, Ceylon, Singapore, Straits Settlement and Mt. Tjerimai, Java, for further measurements.

Negotiations are also being made with several independent groups, which are planning expeditions to

the north and south polar regions within the next two years for the inclusion of physicists in the parties, to make still further cosmic ray measurements.

PRESENTATION OF THE PERKIN MEDAL TO DR. BURGESS

THE Perkin Medal, bestowed annually on "the American chemist who has most distinguished himself by his services to applied chemistry," has been awarded for 1932 to Dr. Charles Frederick Burgess, president of C. F. Burgess Laboratories, Inc., for "a lifetime of accomplishment" in this field.

The medal will be presented at a joint meeting of the Society of Chemical Industry, the American Chemical Society, the Electrochemical Society, and the Société de Chimie Industrielle at 8:30 P. M. on January 8, at the Hotel New Yorker.

Dr. Burgess will speak on "Research 'for Pleasure or for Gold.'" Howard F. Weiss, of New York, will describe the achievement of the medalist, and Professor Marston T. Bogert, of Columbia University, will present the medal. Dr. Allen Rogers, of Pratt Institute, Brooklyn, chairman of the American Section of the Society of Chemical Industry, which awards the medal, will preside.

The work of Dr. Burgess in applied chemistry and electrochemistry, done chiefly at Madison, Wisconsin, embraces for the most part the fields of electrolysis, electrolytic iron and its alloys, the metallurgy of zinc, the corrosion of iron and other metals, and the development of the dry cell.

He devised a method and apparatus for sterilizing liquids with nascent chlorine which has been used in Madison hospitals to treat badly infected wounds and gangrene, and by explorers for sterilizing drinking water. This method bears some relation to the successful chlorine sterilization treatments later used during the war.

Dr. Burgess was born June 5, 1873, in Oshkosh, Wisconsin. In 1895 he was graduated in electrical engineering from the University of Wisconsin, where he served as instructor and assistant professor for five years following his graduation. There he established a course in applied electrochemistry, the first in the United States and later he established the chemical engineering course. In this academic atmosphere he demonstrated that scientific research was of the highest value to industry. In 1910 he established the C. F. Burgess Laboratories to demonstrate the marketability of chemical research.

Dr. Burgess's early work in applied electrochemistry became of industrial importance. He devised a simple electrochemical method for removing the surplus brazing metal from the brazed iron bicycle frame. He demonstrated the commercial utility of the electrolytic cleaner, universally adopted for cleaning metals preparatory to electroplating, and perfected the fused salt aluminum electrolytic rectifier, since manufactured extensively.

In 1904 Burgess and Hambuechen presented their paper on "Electrolytic Iron" which has been the basis for the commercial production of electrolytic iron both in the United States and France. Shortly afterward Dr. Burgess was given a grant of $10,000 by the Carnegie Institution to continue this work. This grant resulted in an extensive research on electrolytic iron and its alloys, several thousand of which were made and investigated.

The work of Dr. Burgess in corrosion has been of importance in its commercial aspects. He applied the principle of over-voltage to dry cell construction when the price of zinc mounted rapidly during the war. He substituted terne and tin plate for the zinc bottoms in dry cells at a considerable saving in cost.

He did a large amount of work on stray current electrolysis and made surveys in many cities in the United States. Dr. Burgess has done a considerable amount of work in improving hot galvanizing and electrogalvanizing. He was granted a patent in 1908 for separating articles in the electric furnace to prevent their fritting together in the intense heat of the reaction zone. This method is now used extensively in electric furnace practice.

Other achievements of Dr. Burgess are the electrochemical production of white lead and chrome yellow, electroplating on aluminum, and a method for soldering aluminum. He devised methods of roasting zinc ores and then concentrating magnetically. He succeeded in having gas put on a heating value basis in Wisconsin, the first state to adopt this standard. During the war, he was instrumental in devising on a large scale successful methods for producing and purifying silicon and titanium tetrachlorides. In the dry battery field he has made many contributions.

Dr. Burgess is also president of the Burgess Battery Company, the Burgess Building Company, the Burgess-Parr Company and the Burgess Dry Cells, Limited, of Winnipeg. The five companies of which he is the head are the outgrowth of his effort to carry chemical engineering research to industry. They employ more than 1,000 workers and turn out about $6,000,000 of products annually.

The Perkin Medal was founded in 1906 at the time of the Perkin semi-centennial celebration of the coal-tar discoveries, the first medal being awarded to Sir William H. Perkin himself.

OFFICERS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

A FULL account of the New Orleans meeting of the American Association for the Advancement of Sci-