total eclipse of unusual duration, which, at maximum, may amount to six minutes and fifty seconds.

The eclipse track is rather unfortunately situated. Beginning in the Pacific Ocean, just off the coast of Peru, it sweeps across South America, traversing the Bolivian Mountains, the forests of Brazil, and the higher lands of the eastern coast. Then it crosses the Atlantic, almost along the equator, just grazes the southern coast of the great western projection of Africa, passes temporarily out to sea again, and crosses the main part of the dark continent by way of the Congo basin and Lake Tanganyika—finally leaving the earth's surface at a point in the Indian Ocean not far from the African coast.

The region within which a partial eclipse is visible extends far northward and southward, including practically all of South America except the extreme southern trip, and all of Africa except the Mediterranean coast. The region where totality is longest lies in the Atlantic, and the maximum duration of eclipse observable from land stations is about four minutes, which is reached on the east coast of South America and the west coast of Africa. There is, to be sure, one small island in the Atlantic, lying almost in the central line of totality, where the eclipse lasts fully six minutes; but as this spot, known as St. Paul's Rocks, consists of a few jagged rocks rising to a height of 60 feet from deep water, with no anchorage and no fresh water, it is hardly an inviting station for even the hardiest astronomer, in spite of the fact that certain optimistic souls have nominated it as a way station for transatlantic airplane flights.

The climatic conditions along most of the track are unfavorable—the best chances of fine weather being on the high lands back of the eastern coast of Brazil, and in central Africa above Tanganyika. On account of the remoteness of these stations, and of the disorganization resulting from the war, few expeditions appear to be projected to view the eclipse. One English and one or two American parties, however, are likely to make the journey.

MAPPING FROM THE AIR

REQUESTS made to the United States Geological Survey, Department of the Interior, for information concerning the possibilities of photographic surveying from airplanes or other aircraft have recently become so numerous that it is deemed necessary to issue a statement on this subject. For two years the United States Geological Survey, which prepares and publishes more maps than any other organization in the world, has devoted much time and labor to the study of problems to be solved in photo-aerial surveying. The camera has long been used in surveys on the ground, and the Geological Survey has been making studies to determine the best methods of using it in aerial work. Before the war the panoramic camera was employed by the Geological Survey for mapping in Alaska, and it had been widely used for photographic surveying in Canada and in Europe. Aerial photographic surveying involves no new principles, yet it differs essentially from photographic surveying on the ground, for the line of view from a camera in a balloon or an airplane is vertical, not horizontal. A complete statement of the Geological Survey's investigations in photographic mapping from the air will later be prepared for publication.

The problem of photographic surveying from the air is dominantly an engineering problem. Photographic technique is of course an essential part of the work, but it is a subordinate part, for the best photographs are valueless as map-making material unless they are accompanied by the requisite engineering data. Projections, adjustments, and other details of map-making technique are as necessary in photo-aerial surveying as in other surveying, and all map-making work should therefore be the work of experienced engineers.

Photographic mapping from aircraft is entirely practicable but it has not yet been brought to the point where it can supersede ground surveying. The science of cartography will no doubt be greatly advanced when the aerial method is perfected, but fundamental problems remain to be solved, and this fact should be recognized and all possible energy should be devoted to the solution of those problems. It is hoped that solutions of the essential problems in photo-aerial surveying will soon be obtained, and that this method will be put to practical use in map-making.

FIFTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES

THE Fifth Annual National Exposition of Chemical Industries will be held this year in

Chicago at the Coliseum and First Regiment Armory during the week of September 22, and as usual there will be a number of society meetings held jointly with it.

The *Journal of Industrial and Engineering Chemistry* states that the movement to Chicago was decided unanimously last September at a meeting of the advisory committee of the exposition with the managers of the exposition for two reasons: The U. S. Army commandeered the Grand Central Palace immediately upon the close of the last exposition, to be converted into a receiving hospital, use for which has now, happily, nearly ceased. The Chicago Section of the American Chemical Society had been active in its interest in the exposition and was keenly interested in having it held in the city of Chicago; the Association of Commerce felt a keen interest in welcoming the exposition; it was the thought of all that the exposition would stimulate development along chemical lines in the Chicago district and the adjoining states.

The Advisory Committee of the Exposition consists of:

Charles H. Herty, *Chairman,* editor, *Journal of Industrial and Engineering Chemistry.*
Raymond F. Bacon, director, Mellon Institute.
L. H. Baekeland, member, Naval Consulting Board.
W. D. Bancroft, president, American Electrochemical Society.
Henry B. Faber, Industrial Filtration Corporation.
Ellwood Hendrick, president, The Chemists' Club.
Bernhard C. Hesse, General Chemical Company.
A. D. Little, president, Arthur D. Little, Inc.
Wm. H. Nichols, president, American Chemical Society.
R. P. Perry, vice-president, The Barrett Company.
H. C. Parmelee, editor, *Chemical and Metallurgical Engineering.*
G. W. Thompson, president, American Institute of Chemical Engineers.
T. B. Wagner, United States Food Products Corporation.
M. C. Whitaker, president, United States Industrial Alcohol Co.
Charles F. Roth.
Fred W. Payne.

There is also added a special Chicago advisory committee consisting of L. V. Redman, W. D. Richardson, A. V. H. Mory, Carl S. Minor, F. W. Willard and Wm. Hoskins. The managers, as in the past, are Charles F. Roth and Fred W. Payne, and the general office is at 417 South Dearborn St., Chicago, Ill.

When the move to Chicago was first planned it was decided to use the largest available exposition building there, the Coliseum, which is conveniently located for the business, hotel, residence and industrial centers of the city. It soon developed that the space in the building was inadequate and shortly after the signing of the armistice when government property again became accessible, the management made arrangements to engage the First Regiment Armory for exhibits and meetings of some of the societies. The armory faces the next parallel street, which is Michigan Boulevard, and is separated from the Coliseum by only a narrow alleyway. The managers report that a considerable part of this space is already engaged, much of it by Chicago concerns, promising a creditable showing for Chicago industrial progressives.

The number of exhibitors is already larger than at the same time last year and includes many new companies who have not formerly exhibited. There are also on the list the names of regular exhibitors who have become inseparably connected with the exposition and who have become established as the bulwarks of the American chemical industry.

Of the meetings to be held in connection with the exposition a program is in preparation which includes the general meetings of the American Electrochemical Society, the American Institute of Mining Engineers and the American Ceramic Society. The Technical Association of the Pulp and Paper Industry is planning to meet with the exposition in several technical sessions. The Chicago Section of the American Chemical Society will have headquarters at the exposition

where it is probable that a meeting will be held. There are already indications that these meetings will be interesting ones. The Mining Institute is arranging a pyrometry symposium which will consider such questions as: Methods of pyrometry, industrial pyrometry, pyrometry and its relation to science. Special stress will also be laid upon the iron and steel industry by the institute. The American Electrochemical Society is planning an interesting program; so, too, is the Ceramic Society.

SCIENTIFIC NOTES AND NEWS

DR. WILLIAM GILSON FARLOW, professor of cryptogamic botany in Harvard University, died at his home in Cambridge on the third instant, in the seventy-fifth year of his age.

THE American Medical Association is meeting this week in Atlantic City under the presidency of Dr. Alexander Lambert, of New York City. The Congress of American Physicians and Surgeons meets in the same place next week under the presidency of Dr. Simon Flexner, director of the laboratories of the Rockefeller Institute for Medical Research.

PROFESSOR THOMAS C. CHAMBERLIN, head of the department of geology and paleontology of the University of Chicago, retires at the end of the present academic year.

THE French minister of education, acting on representations made by the Bureau of Longitudes, has named the following correspondents: George Ellery Hale, director of the observatory, Mt. Wilson, Calif.; William Wallace Campbell, director of the observatory, Mt. Hamilton, Calif.; William Snyder Eichelberger, director of the United States Naval Observatory, Washington, to replace Professor M. Foerster, disbarred from the list of correspondents as being a German subject; and Senator Righi, professor at the University of Bologna, Italy. The late Professor E. C. Pickering was for many years the only American correspondent of the Bureau of Longitudes.

SIR NAPIER SHAW has resumed the administrative duties of the directorship of the British Meteorological Office, from which he was relieved in May of last year by the appointment of Colonel H. G. Lyons to be acting director for the period of the war.

A COMMITTEE has been formed consisting of colleagues, students and friends of Professor Landouzy to secure funds by subscription with which to establish a Landouzy Museum at the Paris School of Medicine and to strike off a medal in his honor.

IN view of the retirement of Professor F. P. Dunnington, of the school of analytical and industrial chemistry of the University of Virginia, the following resolution has been passed by the visitors: "Resolved, that the rector and visitors of the University of Virginia accept the resignation of Professor Francis Perry Dunnington with very sincere acknowledgment of his long, capable and faithful service to the university. The rector and visitors assure him of their confidence and good will, and wish for him a long life of continued usefulness in his career."

DR. J. C. MARTIN, assistant curator in the division of economic geology of the National Museum, has accepted a position with the U. S. Geological Survey. Mr. Earl V. Shannon has been appointed assistant curator in the department of geology of the museum.

LIEUTENANT COLONEL ALFRED H. BROOKS, geologist in charge of Alaskan Mineral Resources, U. S. Geological Survey, who has been with the American Army in France since the summer of 1917, has returned to Washington and is again taking up his geological work with the survey.

DR. ARTHUR W. DOX, after nineteen months' military service as captain in the Sanitary Corps, has returned to his former position as chief of the chemistry section of the Iowa Agricultural Experiment Station.

DR. DAVID KLEIN, formerly state chemist of Illinois, who has been serving in the Sanitary Corps with the American Expeditionary Forces in France, has been promoted from the rank of captain to that of major. He will spend part of the summer in Serbia with the American Relief Administration. Major Klein has just been appointed associate pro-