

oil, paper, and water analysis, in addition to general bacteriological and chemical apparatus. The volume will make a very useful addition to the laboratory library of working books; its numerous illustrations, concise descriptions of the more complicated instruments, and orderly arrangement will prove real aids to the selection of laboratory apparatus.

THE librarian of the Library of Congress, Washington, has issued two "Want Lists," each running to more than two hundred pages, one dealing with the publications of societies and the other with periodicals. In a prefatory note to each volume, librarians and secretaries of institutions receiving copies of the lists are asked to check them and to notify the Library of Congress of any duplicates at their disposal which may help to complete the files of the Washington library. We observe that certain copies of NATURE are in request; perhaps some of our readers may have duplicate copies of the following issues, now out of print, which the librarian of Congress would be glad to receive:—1899—May 4, June 15, 22, July 6 to August 10, September 14, and title and index; 1901—August 1, 16 to October 10, 24, 31, and title and index. Librarians are invited to send to the Library of Congress lists of their wants, as there is at Washington a stock of duplicates available for exchange.

OUR ASTRONOMICAL COLUMN.

ATMOSPHERIC REFRACTION.—The Rev. W. Hall, Chaplain Instructor, R.N., has circulated a typescript article on "Refraction in Relation to Astronomical Navigation." It is short and clearly expressed; nothing is assumed as already known, and yet the reader is taken to the furthest limits required for the writer's purpose. The article is therefore a model of what such articles should be.

For purposes of refraction, rays fall under three classes:—(1) a ray from a high star; (2) a ray from a low star; (3) a ray from the horizon finally reaching the observer's eye a few feet above sea-level, but ten miles from his horizon. The second ray is outside the scope of the article, as navigators ought not to observe low stars. The other two rays are considered in detail, and full advantage is taken of the simplifications rendered possible in one case by the altitude of the star and in the other by the thinness of the stratum of the atmosphere traversed. Proper warning is given that the state of the atmosphere at the horizon may not correspond to the barometer and thermometer readings on board ship.

THE SPECTRUM OF HALLEY'S COMET.—Using a slitless spectroscope, attached to the Crossley telescope, Mr. W. H. Wright succeeded in photographing the spectrum of Halley's comet on October 22, about 180 days before the computed perihelion passage.

Two hours' effective exposure was given, the guiding being effected by a movable micrometer attached to the telescope. The plate shows a faint continuous spectrum extending from about λ 3750 to λ 5000, and there is no evidence of the existence of any bright lines or bands characteristic of most cometary spectra; the spectrum is too faint to determine the presence, or absence, of dark lines (Lick Observatory Bulletin, No. 167).

SEASONAL CHANGE ON MARS.—Through the Kiel Central-stelle (Circular No. 115, November 18) Prof. Lowell announces that the first apparent Antarctic snowfall of the season has taken place on Mars. Two patches have appeared in latitude 65° , one in longitude 100° , the other in 190° .

Other changes and new features are announced by MM. Antoniadi, Quénesset, and J. Comas Sola, respectively, in the November number of the *Bulletin de la Société astronomique de France*. M. Antoniadi reproduces, on four plates, four drawings of the planet made during September and October, and gives several conclusions to which he has been led by his observations at this opposition. Among these we notice that he affirms the superiority of larger instruments in observations of Mars. He also finds that the grey areas are subject to great modifications

of contour, although the Syrtis Major now has the same aspect as in 1864. As regards the objective existence of "canals," M. Antoniadi urges that care should be taken in the nomenclature; some of these features are undoubtedly real and persistent, others have an undulated appearance and are more or less fugitive. He concludes by suggesting that with more powerful equipment the apparent geometrical arrangements would give place to irregularities both of form and tone.

Among other observations, M. Quénesset directs attention to the unusual dimensions of the Lacus Mœris and to the apparent periodicity of a canal to the south-west of Nectar.

M. Sola describes his observations of the Lacus Solis, and believes he has seen it triple, while he suggests that the two canals, Nectar and Bathys, are really made up by alignments of small "lakes" imperfectly seen, the latter canal being much more easily seen than in many previous oppositions. Fons Juventæ, seen in 1907, has remained absolutely invisible to him during the present opposition.

THE PERSEID METEORS IN 1909.—During July and August watch was kept, at the Lick Observatory, for the August meteors, and on nine nights 755 meteors were seen. A special watch was kept on August 10 and 11, and 220 meteors were seen. July Perseids were exceptionally scarce and faint, and the maximum of the shower occurred on August 11, the hourly rate, during a continuous watch, lasting from 11h. 17m to 14h. 41m., being 117. Mr. Oliver states that the radiant appeared to cover a large area, and there was difficulty in separating it from the radiants of the contemporaneous minor showers.

A DAYLIGHT METEOR.—Dr. Palisa records the telescopic appearance of a meteor on September 4 at 10.30 a.m. Whilst making a daylight observation of Castor he was looking through a 1.5-inch finder, having a field of 2° , and saw a bright object cross the field. The velocity was small, and the shape was rather square than circular; the direction was from east to west, and the object was surprisingly large, appearing at least as bright as Venus (*Astronomische Nachrichten*, No. 4367).

SPECTROSCOPIC BINARIES.—In No. 3, vol. xxx., of the *Astrophysical Journal*, Dr. S. A. Mitchell publishes particulars of seven spectroscopic binaries, determined from plates taken at the Yerkes Observatory and measured at the Columbia University. The stars dealt with are β Equulei, β Trianguli, γ Lyrae, θ Virginis, σ 78 Virginis, $24 \sigma^2$ Canis Majoris, and ζ Canis Majoris.

THE "ANNUAIRE" OF THE BUREAU DES LONGITUDES, 1910.—We have received a copy of this "Annuaire," which is too well known to require detailed description; but it should be remarked that, in accordance with the innovation of 1904, the chemical and physical data are given this year and geographical and statistical data omitted. Similarly, in the astronomical section, the tables of stellar parallaxes, double stars, proper motions, &c., are omitted, and a complete list of the elements of the minor planets is published; about 800 of these objects are now included. The "Annuaire" also contains articles on the reunion of the International Committee for the *Carte du Ciel*, and on tides.

CONFERENCE ON MALARIA IN INDIA.

A FURTHER stage in the campaign against malaria has been reached by the inauguration of a conference on malaria at Simla under Government auspices, a report of the proceedings of which appears in the *Pioneer Mail* of October 15 and 22.

The proceedings were opened with an address by the Viceroy, who, after welcoming the delegates on behalf of the Government, pointed out how grievously India has suffered from the scourge of malaria, which is probably responsible in an ordinary season for one million deaths in the year and for 100 million cases of fever that are not fatal. The prevention of malaria depended upon the extermination of the malaria-carrying mosquitoes, on the prevention of their bites, and on the prophylactic use of quinine. The extermination of the mosquito was largely a question of administration and finance and of the development of sanitation.

An address was then delivered by Colonel Leslie, I.M.S., Sanitary Commissioner with the Government of India. He