

A few examples may make the subject more clear.

If $\phi = 72^\circ$, $\alpha = 36^\circ$; then $p = 2$, $r = 2$, $k = 4$, and all the images are visible to an eye anywhere between the two mirrors.

If $\phi = 72^\circ$, $\alpha = 10^\circ$; $p = 3$, $r = 2$, $k = 5$, but only three of the five images will be visible to an eye placed within 25° of the mirror furthest from P_0 .

If $\phi = 55^\circ$, $\alpha = 25^\circ$; $p = 3$, $r = 3$, $k = 6$.

If $\phi = 55^\circ$, $\alpha = 10^\circ$; $p = 4$, $r = 3$, $k = 7$.

If the eye be placed within the angle β only five of the seven images are visible. This is the case shown in the figure.

It is interesting to observe the results experimentally and see one of the images disappear or merge into another at critical angles. For $\phi = 55^\circ$, a critical case is given by $\alpha = 15^\circ$.

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THE PLANET EROS.

THE planet Eros, as we noted last week, was rediscovered on the morning of August 2 by Dr. Chas. J. Ling with the twenty inch refractor of the Chamberlin Observatory at University Park, Colo. It was found pretty close to the place derived from an ephemeris computed by Miss Mary Clark Traylor. But it was estimated to be considerably brighter than had been expected. In view of the fact that the law of its variability is unknown the results of photometric measures will be awaited with interest. As Eros is now low in the east when the morning twilight begins, and is advancing in right ascension nearly as fast as the sun, it will not be an easy object for some months to come. The position on August 11 at 15^h 25^m 19^s Univ. Park M. T. was

AR 5^h 36^m 35.03^s.

Decl. + 31° 56' 17.7".

THE MARINE BIOLOGICAL LABORATORY AND THE CARNEGIE INSTITUTION.

At a meeting of the corporation of the Marine Biological Laboratory held at Woods

Hole on August 12, it was voted to transfer the laboratory and its equipment to the Carnegie Institution. This action was taken after it had been stated to the members of the corporation that the executive committee of the Carnegie Institution would recommend to the trustees that the laboratory should be accepted, that its debts should be paid, that new buildings should be erected, that \$20,000 a year should be allowed for maintenance and that the scientific management should rest as heretofore with the naturalists of the country. A motion that a three fourths vote of the members present be required for the transfer of the property of the corporation was defeated by a vote of 32 to 19. It was voted without dissent that an account of the action of the corporation be made public.

SCIENTIFIC NOTES AND NEWS.

DR. N. L. BRITTON sailed for England on August 16, where he will complete some investigations upon American *Carices* and *Crasulaceæ* which will be issued as the first parts of the 'Systematic Botany of North America' to be published by the New York Botanical Garden. Dr. MacDougal will be acting director of the garden during his absence.

PROFESSOR J. E. WOLFF, of the U. S. Geological Survey, is continuing the investigation of the areal and structural geology in the crystalline areas of New Jersey, in cooperation with the state geologist.

DR. ROBERT BELL, of the Geological Survey of Canada, has been engaged in the geological survey of Baffin Land, which he finds to have an area of about 300,000 square miles, making it the largest island with the exception of Australia and Greenland. The results of Dr. Bell's explorations are to be presented to the Royal Geographical Society.

MR. BORCHGREVINK, the Norwegian explorer, has taken out naturalization papers, so as to Americanize the Antarctic expedition he is planning under the auspices of the National Geographical Society.

MEDICAL exchanges state that the committee of the Liverpool School of Tropical Medicine is making arrangements to enable Major Ron-

ald Ross to proceed to Ismailia next September, to start an organized campaign against malaria, in consequence of an urgent request from the president of the Suez Canal Company that the Liverpool School of Tropical Medicine assist in a concerted effort to cope with the prevalence of malaria.

THE Bisset Hawkins gold medal of the Royal College of Physicians of London, conferred triennially for advancing sanitary science, has been awarded to Dr. W. H. Power, F.R.S., principal medical officer to the local government board.

PROFESSOR A. W. EVANS, of Yale University, and Mr. Percy Wilson, of the New York Botanical Garden, have returned from a tour of exploration of the mountains of Porto Rico carried out under the auspices of the New York Botanical Garden. A large quantity of valuable material, including living and preserved specimens, was secured.

MR. WILLIAM C. MILLS, curator and librarian of the Ohio State Archeological Society, is at present directing field explorations near Chillicothe, Ohio. The party has completed the exploration of the noted Baum village site and is now exploring the Gairdner mound, which is situated near the Cedar Bank Works. Many skeletons are being found and they are close together. Bone implements and ornaments are also numerous.

DR. FREDERICK H. BAETJER, assistant resident physician at the Johns Hopkins Hospital, has been sent to Europe by that institution to study for one year the x-ray treatment of cancer.

LIEUTENANT RICHARD STRONG, of the Army Medical Corps, is studying the cholera bacillus in the laboratories established by the Bureau of Insular Affairs in the Philippines.

DR. T. O. JAGGAR, of Harvard University, who has recently returned from investigating the volcanic eruptions at Martinique and St. Vincent, has given a lecture on the subject at Harvard University.

DR. J. F. NEWSOM, professor of mining in Stanford University, goes to Europe in September and will return to his university work

in January next. He expects to visit the principal mining districts and mining schools of Great Britain and the continent during his absence.

DR. FREDERICK BEDELL, assistant professor of physics in Cornell University, returns early in September after a Sabbatical year in Europe.

GEORGE F. SEVER, adjunct professor of electrical engineering at Columbia University, has been appointed a consulting electrical engineer in the New York City Department of Water Supply, Gas and Electricity.

PROFESSOR D. J. CUNNINGHAM, F.R.S., will give before the Anthropological Institute of Great Britain and Ireland the third annual Huxley memorial lecture on October 21, his subject being 'Right-Handedness and Left-Brainedness.'

DR. DAVID FERRIER, F.R.S., will deliver the Harveian oration before the College of Physicians, London, on October 18. The Bradshaw lecture will be delivered in November by Dr. C. J. Cullingworth. Dr. A. S. F. Grünbaum has been appointed Goulstonian lecturer and Dr. T. R. Glynn Lumleian lecturer for 1903, and Dr. J. R. Bradford the Croonian lecturer for 1904.

THOSE interested in hydrotherapeutics are asked to contribute toward a monument to Priessnitz, the father of hydrotherapy, to be erected at Vienna. Contributions can be sent to Professor Chrobak.

CHARLES W. M. BLACK, assistant professor of mathematics in the University of Oregon, has died in La Grange, Oregon, of consumption. He was on his way to Colorado, where he hoped his health would be benefited.

THE death is also announced of Dr. Cesare Taruffi, professor of pathological anatomy at Bologna.

It is announced that Professor Joseph Seegen proposes to offer a prize under the auspices of the mathematical and natural science class of the Imperial Academy of Sciences, in Vienna, for the best answer to the following question, 'Is any part of the nitrogen of the albuminates which have undergone metabolism in

the animal body eliminated either by the lungs or by the skin in the gaseous form?' The value of the prize is 6,000 kronen, about \$1,000. The essays may be written in German, French or English, and must be sent in before February 1, 1904.

MEDICAL journals state that a prize of 500 lire is offered by the Societa Medico-Chirurgica of Bologna for the best work received before 1903 on the subject of 'Serum Diagnosis of Tuberculosis.' All competing communications must be addressed to the secretary of the society, and be written in Latin, French or Italian.

THE daily papers report that patents on eleven different parts of wireless telegraphic apparatus were granted on August 12 by the Patent Office to Professor Reginald A. Fessenden of the Weather Bureau.

DEEDS were filed on July 26, at Saranac Lake, transferring 514 acres of land at Ray Brook to the State Hospital Commission. This is for the state sanatorium for the treatment of incipient tuberculosis.

THE *Journal of the American Medical Association* states that the New South Wales branch of the British Medical Association gave a conversazione at the University of Sydney, June 24, including among the guests government officials and members of parliament, foreign consuls and ministers. An exhibit included pathologic models and specimens, old books, electric devices with demonstrations, chemical and biologic apparatus.

THE first international conference to discuss uniform standards for the stronger drugs of the Pharmacopeia will meet at Brussels on September 15.

A LETTER received on August 14 by the secretary of the Peary Arctic Club from Captain Samuel W. Bartlett of the steamer *Windward*, dated Domino Run, Labrador, July 26, says: "Everything works smoothly, and am in hopes of reaching Etah Aug. 5, and that we shall have no difficulty in crossing Smith Sound and finding Peary. Hope to see you in New York Sept. 20 with the best of news."

THE University of Illinois Biological Station at Winona Lake is closing after a very

successful season. The total enrollment is 79, as compared with 58 last summer.

THE topographic survey of North Carolina is being actively pushed during the present season by the United States Geological Survey in cooperation with the state, the state board of agriculture providing half the funds for this work and the federal organization the remainder. The work is under the charge of Topographer Albert Pike, who has several parties now in the field.

WE learn from Symons' *Meteorological Magazine* that Mr. W. H. Dines has been carrying on experiments with his rhomboidal kites at Crinan, in the west of Scotland, during the month of June, and has, it seems, succeeded in obtaining satisfactory meteorological records from heights up to 4,800 feet or more. Mr. John Anderson has been making similar experiments with a bamboo box-kite at Millport.

THE Civil Service Commission announces that on September 9 an examination will be held for the positions of pathologist and bacteriologist in the government laboratories at Manila, P. I. The salaries of these positions are \$1,800 and \$1,500 respectively. On October 21, 22 and 23 an examination will be held for the positions of civil and electrical engineers in the Philippine service, the salaries being \$1,400 and \$1,600. Appointees will be required to pay their traveling expenses to San Francisco, but the government furnishes them transportation free of charge on its transports from that point to Manila, but exacts a charge of \$1.50 a day for meals while en route, which is returned to the appointee upon his arrival at Manila. Employees who are residents of the United States at the time of their appointment shall, after six months' satisfactory service, be reimbursed for their traveling expenses from the place of their residence to the point of embarkation for Manila. Thirty days' leave of absence is granted each year, exclusive of Sundays and holidays, and those employees who are promoted to \$1,800 per annum are entitled to thirty-five days, or about forty days, including Sundays and holidays. Leave is also cumulative, and at the end of

three years those who have to their credit cumulative leave for two years may visit the United States without having the time in going to and returning from San Francisco charged against their leave.

UNIVERSITY AND EDUCATIONAL NEWS.

RUTGERS COLLEGE receives \$10,000 by the will of the late William Clark.

MR. GEORGE F. McCULLOCH, president of the Union Traction Company of Indiana, has given \$10,000 to the National Technical Institute to be located on the arsenal grounds at Indianapolis.

THE corner stone of the new women's building of the University of Texas was laid by Mrs. Sayers, wife of Governor Sayers, on Monday, August 11, in the presence of representatives of the board of regents, the faculty and other prominent citizens. The building is of Austin cream-colored pressed brick with white limestone trimmings. The portion now in the process of erection, about one half, will cost \$75,000.

MR. J. K. CAIRD, of Dundee, has offered to the council of Dundee University College £13,000 to provide and equip a new physical laboratory.

THE University of North Wales has received £2,500 for scientific and technical scholarships to perpetuate the memory of the late Sir G. Osborne Morgan.

It is reported from London that the executors of the will of the late Cecil Rhodes expect that the first scholarships under the terms of the will will be awarded in 1904.

THE Czar has ordered the liberation of all the students who were imprisoned at Smolensk in connection with the student disturbances in Moscow last February.

AFTER consultation with Mr. Astor, and in accordance with his wish, the council of University College, London, has resolved to endow the chair of pure mathematics and to name it the 'Astor chair.'

THE fifth annual session of the University of Texas summer school opened on July 12, the day following commencement, and closed

on July 26. There were courses offered in mathematics, physics, physiography, chemistry, botany, education, history and the languages. The attendance reached 262, the largest of any summer session to date. The management of the school was in the hands of an executive committee consisting of President Prather, Dean Sutton and Professors Garrison, Simonds and Battle.

THE south wing of the main building at Iowa State College of Agriculture and Mechanic Arts at Ames was burned on August 14. The wing was to have been torn down to make room for a new building. The valuable botanical collection and equipment were saved.

PRESIDENT ERNEST R. NICHOLS, of the Kansas State Agricultural College, has been elected president of the Rhode Island College of Agricultural and Mechanic Arts at Kingston.

DR. T. N. LEWIS, of Western Maryland College, has been elected president of Adrian College, at Adrian, Mich.

E. W. RETTGER, Ph.D. (Clark), and G. O. James, Ph.D. (Johns Hopkins), have been appointed instructors in the department of mathematics and astronomy of Lehigh University.

MR. JOHN ADAMS, rector of the United Free Church Training College, Glasgow, and lecturer on education in Glasgow University, has been appointed professor of education in the University of London. The senate of the University has also appointed Dr. Samuel Smiles assistant teacher in organic chemistry at University College and Dr. F. G. Donnon, assistant teacher in general chemistry. The staff of the reorganized department of chemistry of the college, London, will be as follows: General and inorganic chemistry; professor Sir William Ramsay, K.C.B., F.R.S.; assistant professors, Dr. F. G. Donnan, Dr. Morris Travers and Mr. E. C. C. Baly; organic chemistry; professor, Dr. J. Norman Collie, F.R.S.; assistant professor, Dr. S. Smiles.

DR. CARL GUSSENBAUER, professor of surgery, has been appointed rector, and Dr. Ernest Ludwig, professor of chemistry, dean of the University of Vienna.