sion of the Illinois Legislature an appropriation was made for the erection and equipment of an Observatory for the State University at Champaign. The designs for the building were made, under direction of Prof. Ira O. Baker, by the Architectural Department of the University. The instrumental equipment, consisting of a 12-inch equatorial, a 3-inch combined transit and zenith telescope and a chronograph, will be made by Warner & Swasey, the optical parts being made by Brashear. This makes four universities which have established observatories within the past year, all of which have ordered telescopes from Warner & Swasey, with optical parts by Brashear. The list is as follows: University of Pennsylvania, Philadelphia (18-inch aperture); University of Ohio, Columbus (12-inch aperture); University of Minnesota, Minneapolis (10½-inch aperture); University of Illinois, Champaign (12-inch aperture).

A CATALOGUE of the types and figured specimens of fossil animals in the United States National Museum has been recently completed, and comprises type material representing 3,644 species, distributed as follows: Invertebrates, Palæozoic, 1,155; Mesozoic, 1,024; Cenozoic, 1,312; Vertebrates, 163. The fossil plants are not yet fully catalogued, but it is known that they represent more than 2,000 species, over 500 of them being contained in the 'Lacoe Collection' alone. There are in round numbers 500 Palæozoic, and 1,500 Mesozoic and Cenozoic species. Every type or figured specimen is made conspicuous by attaching to it a small, green, diamond-shaped ticket, or a white ticket bearing the word type. Should any specimen be separated from its label this ticket will draw attention to the fact that the specimen is a type and must be cared for.

UNIVERSITY AND EDUCATIONAL NEWS.

JOHNS HOPKINS UNIVERSITY has published on the occasion of its twentieth anniversary statements concerning the university which bear witness to the important part it has taken in the advancement of higher education and research in America. The University has conferred 358 degrees of Doctor of Philosophy, and of these graduates 175 hold college professorships. Eight hundred students of the University have engaged in teaching, and nearly every university and college in America numbers among its faculty a student of Johns Hopkins University. The following institutions have had in their faculties ten or more of its students: Chicago, 23; Wisconsin, 19; Bryn Mawr, 18; Stanford, 17; Michigan, 17; Pennsylvania, 16; Cornell, 14; Columbia, 13; Massachusetts Institute of Technology, 11; Nebraska, 11; Northwestern, 11; Harvard, 10; Woman's College of Baltimore, 10. There are now in the University 403 graduate students of which 150 are candidates for the degree of M. D. or physicians attending special courses.

THE catalogue of the University of Minnesota for 1895–96 shows the following enrollment for the year:

Graduate Students, all departments,	137
Undergraduates:	
College Science, Literature and Arts,	822
College Engineering, Metallurgy and the Mechanic Arts,	192
College of Agriculture:	
Collegiate Course in Agriculture,	10
School of Agriculture,	223
School of Dairying,	97
School for Women,	46
College of Law,	369
Department of Medicine:	
College of Medicine and Surgery,	243
College Homœopathic Medicine and Surgery,	31
College of Dentistry,	90
College of Pharmacy,	33
Summer School,	234
	2527
Students enrolled in more than one department,	38
Total,	2489

THE Massachusetts Institute of Technology has issued a circular calling attention to the opportunities it offers to college graduates. There are this year 80 such students in the Institute, 69 of whom are from other institutions. The summer courses offered by the Institute are especially planned for advanced students.

AT the celebration of Founder's Day of New

York University on April 22d the corner stone of the first residence hall was laid. The building, which will be ready for use in September, will contain, in addition to rooms for 112 students, a music room, editorial rooms for the college periodicals, etc.

PROF. GEORGE S. FULLERTON, Vice-Provost of the University of Pennsylvania and Dean of the College, will retire from the latter office and will be succeeded by Prof. W. A. Lamberton, who in turn will be succeeded in the deanship of the School of Philosophy by Prof. W. R. Newbold.

DR. ERNEST B. SANGREE, of Philadelphia, has been elected professor of pathology and bacteriology in the Vanderbilt University, Nashville, Tenn.

DISCUSSION AND CORRESPONDENCE.

ON ROOD'S DEMONSTRATION OF THE REGULAR OR SPECULAR REFLECTION OF THE RÖNTGEN RAYS BY A PLATINUM MIRROR.

ON March 27th Prof. Rood published in this JOURNAL a short account of certain experiments which he claimed 'pointed strongly to the conclusion that in the act of reflection from a metallic surface the Röntgen Rays behaved like ordinary light.' If this sentence means anything, it means that the X-rays underwent regular or specular reflection. On April 10th, however, Dr. M. I. Pupin published in this JOURNAL an article in which he says, "If I understand Prof. Rood's words correctly, no claim is made by him of a discovery of regular or specular reflection;" and he then quotes from Rood the sentence given above. The remainder of Dr. Pupin's article is largely devoted to showing that with the methods employed by him no regular or specular reflection could be observed. This last conclusion we are ready to accept. Prof. Rood's experiments, however, were conducted in an entirely different manner, as follows:

Before reaching the sensitive plate the X-rays were obliged to traverse two aluminium plates, each having a thickness of .17mm., and behind them was a drawslide that had proved to be impervious to the sun's light falling on it during two hours. Over these shields was placed a wire netting with openings of $\frac{1}{8}$ inch. The reflecting surface was a large piece of bright platinum foil, seven inches square. This last was necessarily so arranged that a diffused reflection from it would have reached all parts of the sensitive plate. In point of fact, however, an image of the wire netting was obtained only on a strip of the plate, viz., on that portion that would be reached by the Röntgen rays in case of their regular or specular reflection.

The proof that the image of the wire netting on the sensitive plate was really produced by the *specular reflection* of the X-rays from the platinum was obtained in the following manner. The plate which had received the image of the netting made by the X-rays was removed from the plateholder and replaced by a fresh plate; this plate was not screened at all, but its sensitive surface was freely exposed in the dark at night.

Everything else in the arrangement of the experiment, including the position of the netting in front of the plate, remained as it was during the experiment with the X-rays. One flash from the inductorium was sent into the Crookes tube and the experiment was ended. On developing the plate it was found that *the light* from the Crookes tube had exactly reproduced in a fraction of a second what had required ten hours of action of the X-rays. There was the same portion of the plate acted on by the light as had been acted on by the X-rays, and the image of the netting given by the X-rays was reproduced by the light, not generally reproproduced but minutely so; all the deformations of the image of the netting resulting from the reflection from the uneven surface of the platinum foil were alike in the photograph obtained by the X-rays and in the photograph obtained by the light.

I paid repeated visits to Rood's laboratory during the progress of these experiments, and after a careful examination of his negatives no doubt remained in my mind of the fact that he had demonstrated the regular or specular reflection of the Röntgen rays.

Prof. Rood carried these and other similar negatives to Washington, where he read a paper on the reflection of the X-rays before the National Academy of Science on April 23d.