poses. On the main floor is a well-selected library of about 4,000 volumes, which is operated on the open-shelf system. In the rear are reading tables, and on the second floor is a small reference library and a reading room furnished with newspapers and magazines.

AMONG the books recently sold from the Ashburnham library was a copy of Pliny's 'Historia Naturalis,' lib. xxxvii., printed upon vellum by Jenson at Venice in 1472, for £190.

THE Macmillan Company announce the early publication of a book on 'Animal Intelligence' by Professor Wesley Mills, of McGill University. Dr. F. S. Hoffman, professor of philosophy in Union College, has in the press of Messrs. G. P. Putnam's Sons a work entitled 'The Sphere of Science.'

A RAILWAY to extend entirely across Northern Sweden and Norway from the north end of the Gulf of Finland, northwest to Ofoten, on the Atlantic about 120 miles north of the Arctic circle, is proposed. The line will be about 300 miles long, and will, it is said, be farther north than any part of the new railroad to Archangel.

AT the meeting of the Institute of Civil Engineers on April 5th, Mr. A. H. Preece gave an account of the present state of electricity supply in London. According to an abstract in *Nature*, Mr. Preece said that there are now in London eleven important companies and five vestries supplying electricity, and three other companies and three vestries are taking steps to start works. Five companies and three vestries supply the alternating current, and the remainder use direct-current systems. The direct-current systems are divisible into two classes—the high-pressure and the low-pressure. In the former rotary transformers are used to reduce the high pressure to a low pressure, while the latter produces and distributes electricity at the same pressure at which it is supplied to consumers. The direct-current systems are applicable to compact areas, and, with the use of high pressure, to scattered or isolated compact areas. The chief advantages of the direct-current system are the possibility of using storage-batteries, which can not be employed with the alternating-current systems, greater efficiency in distribution and greater adaptability to motive power. The favorite methods of distributing electricity are to transmit current at a high pressure in heavily-insulated cables in iron pipes, and current at a low pressure in insulated cable in stoneware conduits, or in cables heavily armoured and laid direct in the ground. Rubber is now little used; paper and jute, impregnated with insulating compounds, having been extensively adopted. The electric-supply industry is rapidly growing, and no less than 40,000 h.p. is now being installed in London in order to meet the demand for electricity in the immediate future.

FROM a statement compiled by Statistician Parker, of the United States Geological Survey, it is shown that the total output of coal in the United States in 1897 amounted approximately to 198,250,000 short tons, with an aggregate value of $198,100,000, a fraction less than $1 a ton. Compared with 1896, this shows an increase in tonnage of 6,270,000 tons. The increase in the value of the product was only $1,700,000. The amount of coal produced in 1897 was the largest on record. The average value a ton was the lowest ever known, continuing the declining tendency which has been shown without any reaction.

VOLUME VI. of *Mineral Industry*, now in press, will show that the total value of the mineral production of the United States in 1897 was $746,230,982 (or, excluding duplication, $678,966,644), against $737,958,761 in 1896. The values given are generally at the mines or works; but with a few of the principal metals, such as lead, copper or zinc, this is not possible, and their values are taken at the leading markets. The total value of the output in 1896 exceeded that of the mineral and metal production of all Continental Europe, and nearly doubled that of the United Kingdom, the value of whose mineral output in 1896 was, in round figures, about $340,000,000, while that of Germany was about $300,000,000, that of France about $110,000,000, and that of Belgium $100,000,000.

UNIVERSITY AND EDUCATIONAL NEWS.

MR. PHILIP D. ARMOUR has given an additional endowment fund of $500,000 to the Ar-

mour Institute of Technology, Chicago. He had previously given the Institute an endowment of $1,500,000.

Mr. Washington Duke has given $100,000 to Trinity College, Durham, N. C., which makes the total amount of his gifts to the College $425,000.

Dr. D. K. Pearsons, who has assisted so many smaller colleges, has offered to give the Salt Lake College, of Salt Lake, Utah, $50,000, on condition that its officers raise $100,000 more within a year.

Dr. George W. Hill has been appointed lecturer in celestial mechanics in Columbia University, Miss Catherine W. Bruce having given $5,000 for this purpose.

Professor I. J. Macomber, of Cornell University, has been appointed professor of electrical engineering in the Armour Institute of Technology, Chicago.

Dr. C. E. Bessey, of the University of Nebraska, will give a course of fifteen lectures on botany in the Texas-Colorado Chautauqua, Boulder, Col., in July and August.

Of the twenty fellowships annually awarded at Johns Hopkins University, the following were in science: Joseph Scudder Chamberlain, of Ames, Ia., S.B., Iowa Agricultural College, 1890, *chemistry*; Percy Millard Dawson, of Montreal, Canada, A.B., Johns Hopkins University, 1894, and M.D., 1898, *physiology*; George Stronach Fraps, of Raleigh, N. C., S.B., North Carolina Agricultural College, 1896, *chemistry*; Leonidas Chalmers Glenn, of Crowder's Creek, N. C., A.B., University of South Carolina, 1891, *geology*; Caswell Grave, of Monrovia, Ind., S.B., Earlham College, 1895, *zoology*; George Oscar James, of Bowers Hill, Va., A.B., Johns Hopkins University, 1895, *mathematics*; Joseph Francis Merrill, of Richmond, Utah, S.B., University of Michigan, 1893, *physics*; Eugene Lindsay Opie, of Baltimore, A.B., Johns Hopkins University, 1893, and M.D., 1897, *pathology*; Frederick Albert Saunders, of Ottawa, Canada, A.B., University of Toronto, 1895, *physics*.

The following are among the twenty-four University fellowships awarded in Columbia University: E. L. Firth, C. E., Cornell University, 1895; Columbia University, 1898, *sanitary engineering*; G. B. German, A.B., Columbia College, 1895, assistant in mathematics, 1895–98, *education*; E. Hagen, University of Vermont, 1897, Columbia University Scholar in Botany 1897–98, *botany*; O. B. Huntsman, A.B., Harvard University, 1897–98; *philosophy*; J. D. Irving, A.B., Columbia College 1896, Columbia University Fellow in Geology 1897–98, *geology*; E. Kasner, B.S., College of the City of New York 1896, A.M., Columbia University 1897, University Fellow in Mathematics 1897–98, *mathematics*; W. C. Kretz, A.B., Columbia College 1896, A.M., Columbia University 1897, University Scholar in Astronomy 1897–98, *astronomy*; J. W. Miller, Jr. B.S., Pennsylvania State College, 1897, *mechanics*; F. C. Paulmier, B.S., Princeton University 1894, M.S. 1896, Graduate Student at Columbia University 1896–98, *zoology*; F. J. Poyse, A.M., Queen's University, Kingstown, Canada 1898, Graduate Student at Columbia University 1897–98, *chemistry*; R. S. Woodworth, A.B., Amherst College, 1891; A.B., Harvard University 1896 and A.M. 1897; Assistant in the Physiological Laboratory of Harvard University 1897–98, *psychology*.

DISCUSSION AND CORRESPONDENCE.

COLOR VISION.

There are certain points in Mrs. Ladd Franklin's letter of June 3d that call for comment.

1. Mrs. Ladd Franklin sharply criticises me for having termed the Helmholtz theory a 'three-fibre' theory. The offence, if committed, would not be heinous. The phrase 'Dreifasertheorie' is current in German monographs, and is a convenient, if not strictly accurate, designation of the tricomponent theory. As a matter of fact, however, there is no single passage in my letter in which I characterize that theory as a three-fibre theory!

In mentioning von Kries' double-white process I added, in explanatory parenthesis, the words 'one-fibre white and three-fibre white.' I did this because I supposed that the lay reader might be troubled by the preceding phrase, and because I had found the terms valuable in my