causes others, and why certain variations are so persistent in their occurrence.

BIBLIOGRAPHY.

BATESON, W.
:02. 'Mendel's Principles of Heredity, a Defence.' With a Translation of Mendel's Original Papers on Hybridization. 12mo, 212 pp. Cambridge. [England. Contains bibliography and portrait of Mendel.]

BATESON, W., AND SAUNDERS, E. R.
:02. 'Experimental Studies in the Physiology of Heredity.' Reports to the Evolution Committee of the Royal Society. Report I., 160 pp. London.

CASTLE, W. E., AND ALLEN, GLOVER M.
:03. 'The Heredity of Albinism.' *Proc. Am. Acad. Arts Sci.*, Vol. 38, pp. 603–622.

CORRENS, C.
:00. 'G. Mendel's Regeln über das Verhalten der Nachkommenschaft der Rassenbastarde.' *Ber. deutsch. bot. Gesellsch.*, Jahrg. 18, pp. 158–168.

CUÉNOT, L.
:02. 'La loi de Mendel et l'hérédité, de la pigmentation chez les souris.' *Compt. Rend.*, Paris, Tom. 134, pp. 779–781.

DARBISHIRE, A. D.
:02. 'Notes on the Results of Crossing Japanese Waltzing Mice with European Albino Races.' *Biometrika*, Vol. 2, Pt. 1, pp. 101–104, 4 figs.

DARBISHIRE, A. D.
:03. 'Second Report on the Results of Crossing Japanese Waltzing Mice with European Albino Races.' *Biometrika*, Vol. 2, Pt. 2, pp. 165–173, 6 figs.

MENDEL, G.
:66. 'Versuche über Pflanzenhybriden. *Verh. Naturf.-Vereins in Brünn*, Bd. 4, Abh., pp. 3–47. (Translation in Bateson, :02.)

MENDEL, G.
:70. 'Ueber einige aus künstlicher Befruchtung entnomennen *Hieracium-Bastarde*.' *Verh. Naturf.-Vereins in Brünn*, Bd. 8, Abh., pp. 26–31. (Translation in Bateson, :02.)

TSCHERMAK, E.
:00. 'Ueber künstliche Kreuzung bei *Pisum sativum*.' *Zeitsch. f. landwirths. Versuchswesen in Oester.*, Jahrg. 3, pp. 465–555.

TSCHERMAK, E.
:01. 'Weitere Beiträge über Verschiedenwerthigkeit der Merkmale bei Kreuzung von Erbsen und Bohnen.' (Vorläufige Mittheilung.) *Ber. deutsch. bot. Gesellsch.*, Jahrg. 19; pp. 35–51.

VRIES, H. DE.
:00. 'Sur la loi de disjonction des hybrides.' *Compt. Rend.*, Paris, Tom. 130, pp. 845–847.

VRIES, H. DE.
:00. 'Das Spaltungsgesetz der Bastarden.' *Ber. deutsch. bot. Gesellsch.*, Jahrg. 18, pp. 83–90.

WELDON, W. F. R.
:02. 'Mendel's Laws of Alternative Inheritance in Peas.' *Biometrika*, Vol. 1, pp. 228–254, pl. 1, 2.

W. E. CASTLE.

HARVARD UNIVERSITY.

WILBUR CLINTON KNIGHT.

THE subject of this sketch was born on a farm at Rochelle, Illinois, December 13, 1858. Early in his boyhood his parents, Mr. and Mrs. David A. Knight, removed to a farm at no great distance from Lincoln, Nebraska. Here he grew to young manhood, gaining the strength of body and mind which is so often developed in unfettered country life. Self-reliance and strength of character came to him in the struggle that he, in common with the other members of the family, had put forth in what was then the new west, in order to wrest from nature the daily bread. Life in all of its forms, and the hills and rocks appealed strongly to him. By the time that he had secured such education as the country school afforded he had also become more than ordinarily familiar with the fauna, the flora and the geological formations of his neighborhood.

Being unusually fond of athletic sports, of fishing and of hunting, he led many a merry party in these pursuits, frequently to the complete exhaustion of most of his fellows. In more recent years, his many friends who at one time or another shared

camp life with him in the Rocky Mountains remember not only his skill with rod and gun but more particularly their dismay as they tried to follow those long swinging strides that carried him over mountain and plain. The restless energy of the naturalist-explorer was his, and day after day he urged himself from locality to locality in search of new finds. Even when loaded down (as he usually was) with collecting implements, specimen bag and camera he seemed never to tire.

As early as his means would allow, he entered the University of Nebraska, from which he graduated in 1886, receiving the degree B.Sc. As a student there he early demonstrated his scientific tendencies. The biological sciences and especially geology were his delight. Under the inspiration which Dr. Bessey always exercises upon his students, Mr. Knight seriously contemplated taking up botany as his life work, and while his inclination to study the rocks and the story that they reveal proved stronger, he never lost his interest in the flora of the great plains and the mountains where his life was spent.

He was at various times a graduate student at the University of Nebraska, his alma mater, from which he received the degree of M.A. in 1893 and the doctorate in philosophy, in 1901. He had also studied for a short time at the University of Chicago.

After all has been said about his work in the schools, those who knew him best understand that his degrees represent not what he carried *away* from the class-room and laboratory, but rather what he carried *to* these as he came fresh from the fields that he had explored. When he presented himself before academic faculties for examination the funds of knowledge that interested those faculties were not facts that he had gleaned from books but those that he had at first hand. He read widely and assimilated much, but he accepted little on mere 'authority.' True scientist that he was, he accepted statements cautiously, unless the facts upon which they were founded were apparent. If his own experience confirmed or if he were able to verify, he accepted all truth with joy. In the field he was a keen observer and he soon accumulated a store of facts upon which he based his hypotheses and later his more mature judgments. When he had reached a conclusion, he modestly yet firmly held to that conclusion unless it could be shown that he was in error about the underlying facts.

He had a wide acquaintance among scientific men, many of whom he had personally met. The great expedition to the fossil fields of Wyoming, in 1899, which he so successfully conducted, brought him into contact with scores of men who recall those weeks as a time of profit and delight and Professor Knight as a cherished personal friend.

Dr. Knight was great not merely from a scholastic point of view, but quite as much from the grasp he had upon economic questions. He was actively in touch with the industrial problems of his state, and his opinions were eagerly sought by corporate as well as private interests. This drew him into many and diverse fields, as the appended partial list of his publications will show.

To the University of Wyoming he had made himself indispensable. Elected to the chair of geology and mining engineering in 1893, he continued in that position, with the added duties of principal of the school of mines, until his death. Faculty and students alike recognized in him a successful teacher, a wise counselor and a true friend.

The other positions that he held at various times may only be mentioned: Assistant territorial geologist, 1886–7; as-

sayer at Cheyenne, 1887–8; superintendent of mines, Colorado and Wyoming, 1888–93; state geologist, 1898–9; for many years consulting expert to the Union Pacific Railroad Company upon mineral and oil lands and upon artesian basins; at the time of his death, on leave from the university, consulting expert for the Belgo-American Oil Company.

Among the honors that had come to him, membership in the following learned societies should be noted: Fellow of the Geological Society of America, member of the American Institute of Mining Engineers, member of the National Geographical Society.

Of his home relations it may be said that they illustrated the best in American domestic and social life. His parents survive him and are justly proud of the work that he had accomplished—for in his brief forty-four years he had more to his credit than most of the scientific men who are permitted to round out their three score years and ten.

He was married in 1889 to E. Emma Howell, a delightful and talented young woman whom he had known during his college career. The union proved a most happy one and the four promising children (one daughter and three sons) are the joy of the loving wife that mourns the loss of a tender and devoted husband.

The home of Mr. and Mrs. Knight was always open to their friends, and they took great pleasure in providing social occasions that should serve other purposes than merely that of killing time.

In the passing away of Professor Knight, on July 28, 1903, after a few days' illness from peritonitis, the family lost its hero, the community a choice citizen, the university an honored member, the state an important agent in its industrial development, the scientific world one who, having done much, was just on the threshold of greater things, and the church a member who lived the religion that he professed.

Aven Nelson.

University of Wyoming,
Laramie, Wyo.

A LIST OF PAPERS PUBLISHED BY WILBUR C. KNIGHT.

Bulletin No. 14, Wyoming Experiment Station, University of Wyoming; 'Geology of the Wyoming Experiment Farms, and Notes on the Mineral Resources of the State,' October, 1893.

'The Coal Mines of Wyoming,' *Mineral Industry*, 1894.

'Coal and Coal Measures of Wyoming,' 16th Annual Report, U. S. G. S., Part IV., 1894.

'A New Jurassic Plesiosaur from Wyoming,' Science, October 4, 1895.

'The Mining Industry of Wyoming,' *Mining Industry* (Denver), June, 1896.

Bulletin No. I., Petroleum Series, School of Mines University of Wyoming; 'The Petroleum of the Salt Creek Oil Field, its Technology and Geology,' June, 1896.

'The Salt Creek Oil Field,' *Engineering and Mining Journal*, January, 1896.

'The Petroleum Fields of Wyoming,' *Mineral Industry*, 1896.

'The Petroleum Industry of Wyoming,' *American Manufacturer and Iron World*, May 29, 1896.

Bulletin No. II., Petroleum Series, School of Mines, University of Wyoming; 'The Petroleum Oil Fields of the Shoshone Anticlinal, Geology of the Popo Agie, Lander and Shoshone Oil Fields,' January, 1897.

'The Wyoming Natural Soda Deposits,' *Mineral Industry*, 1897.

'The Origin of the Soda Deposits of Wyoming,' *Mining Industry* (Denver), November, 1898.

'Prehistoric Quartzite Quarries of Eastern Central Wyoming,' Science, March 4, 1898.

'Some New Jurassic Vertebrates from Wyoming,' *American Journal of Science*, Vol. V., 1898. First and second papers.

'Description of Bentonite, a new variety of Clay,' *Engineering and Mining Journal*, LXIII. and LXVI.

Bulletin No. III., Petroleum Series, School of Mines, University of Wyoming; 'The Geology of the Oil Fields of Crook and Uinta Counties,' November, 1899.

'Some New Data for Converting Geological Time into Years,' Science, October 4, 1899.

'The Permian of Nebraska,' *Journal of Geology*, May–June, 1899.

'Jurassic Rocks of Southeastern Wyoming,' Bulletin of the Geological Society of America, Vol. XI., 1900.

'The Present Outlook of the Coal Industry in Wyoming,' *Wyoming Industrial Journal*, June, 1900.

'Some New Jurassic Vertebrates from Wyoming,' Third Paper, *American Journal of Science*, August, 1900.

Bulletin No. 45, Wyoming Experiment Station, University of Wyoming; 'A Preliminary Report of the Artesian Basins of Wyoming, June, 1900.'

'The Fossil Field Expedition of 1899,' *National Geographical Magazine*, December, 1900.

'Potassium Nitrate in Wyoming,' SCIENCE, January 25, 1901.

'Geology of Bates's Hole,' *Bulletin Geological Society of America*, Vol. XII., 1901.

Special Bulletin, School of Mines, University of Wyoming; 'The Swetwater Mining District.'

Bulletin No. IV., Petroleum Series, School of Mines, University of Wyoming, 'Geology of the Oil Fields of the Natrona Country, excepting Salt Creek.'

'The Laramie Plains Red Beds and Their Age,' *Journal of Geology*, Vol. X., No. 4, 1902.

Bulletin No. 49, Wyoming Experiment Station, University of Wyoming; 'Alkali Lakes and Deposits (Alkali Series IV.).' Experiment Station.

'The Coal Fields of Southern Uinta County,' *Bulletin of the Geological Society of America*, Vol. XIII.

'The Petroleum Industry of Wyoming,' 22d Annual Report of the Director of the Geological Survey.

'Wyoming Copper Development,' *Mineral Industry*, 1901.

'Wyoming Gold Outlook,' *Mineral Industry*, 1902.

Bulletin No. V., Petroleum Series, School of Mines, University of Wyoming; 'The Newcastle Oil Field.'

'Discovery of Platinum in Wyoming,' *Engineering and Mining Journal*, LXII., 845.

'Petroleum Fields of Wyoming,' *Engineering and Mining Journal*, LXII., 358 and 628.

'Wyoming Oil,' *Petroleum Review*, London.

'Rare Metals in the Ore from The Rambler Mine, Wyoming,' *Engineering and Mining Journal*, LXIII., No. 2.

'Epsom Salts Deposits of Wyoming,' *Engineering and Mining Journal*, February 14, 1903.

'Petroleum Fields of Wyoming,' *Engineering and Mining Journal*, May 24, 1902.

'Mining in Wyoming in 1902,' *Engineering and Mining Journal*, January 3, 1903.

Bulletin No. 55, Wyoming Experiment Station, University of Wyoming; 'The Birds of Wyoming.'

'The Geology of the Leucite Hills of Wyoming.' (In collaboration with Dr. J. F. Kemp.) *Bulletin of the Geological Society of America*, 1903.

'Fossil Elephants in Wyoming,' SCIENCE, 1903.

'Notes on *Baptanadon marshi*, n. s.,' *American Journal of Science*, July, 1903.

Bulletin No. VI., Petroleum Series, School of Mines, University of Wyoming; 'The Bonanza, Cottonwood and Douglas Oil Fields,' July, 1903.

SCIENTIFIC BOOKS.

Lehrbuch der vergleichenden Histologie der Tiere. Von Dr. KARL CAMILLO SCHNEIDER, Privatdozent an der Univ. Wien, mit 691 Abbildungen im Text. Jena, Verlag von Gustav Fischer. 1902.

This comparative histology is another instance of the astonishingly brief time in which, in Vienna, a great work may be brought to completion. The heavy volume of 939 pages contains also a bibliography of 36 pages and an index.

The work is divided into a general and a special part. The plan has been to bring together in the general part the weightiest results for comparison by a presentation of the leading points of view, while in the special part leading groups are treated by taking up typical representatives in detail.

This plan has not been carried out completely, however. A number of groups, especially the Tunicata, and still further the Trematoda, Acanthocephala, Rotatoria, Siphunculoidea, Cephalopoda, Myriapoda, Arachnoidea, Scyphomedusa, Ophiuroidea, Echinoidea, Bryozoa, Brachiopoda, typical fishes, reptiles and birds, have not been considered at all or only superficially. Even the remaining types have not been worked up with the completeness one might wish. Still the work is a remarkable and valuable one. The text, to a considerable extent, is based on the researches of the author, while the literature, to which extensive reference is made, has served chiefly as control. Wherever the author has been dependent on literature