beams also showed the same tint, but most of them were of a faint silvery whiteness. They lasted from a few seconds to several minutes.

The arch gradually spread along the horizon until it covered 120 degrees or more, and at the same time ascended the meridian to the height of 15 or 20 degrees.

Then there were two parallel arches separated by a dark space, each arch and the dark space being about five degrees wide. Stars of the first three magnitudes could be seen equally through the bright and dark portions. Even in the group of the Hyades about Aldebaran the stars could be seen through one of the brightest portions of the display.

The upper arch then gradually broke up, its detached pieces appearing like floating clouds. They slowly drifted higher in the sky, until they seemd to be parts of a broken arch which extended from the west to the east points of the horizon. While these detached portions floated away, there seemed to be no streamers, as if streamers and broken arches could not exist together, but of this the writer is not certain, although he wrote down his observations at the first opportunity that presented itself the following morning. He himself observed the aurora for an hour until its gradual return to its first appearance, the dying out of its beams and the drifting of the luminous remnants of the arches gave him the idea that the display was nearing its end. A friend of his, however, kept up the watch for a second hour, and reports that the various stages described above repeated themselves after various intervals, and that some of the luminous clouds drifted as high as the zenith. How long the display lasted is not known, but the next morning at five o'clock the sky was completely overcast and there was no sign of an aurora.

On the following night there was another display of the aurora. It was noticed as early as 7:15 P.M., about an hour after sunset. The sky was not as transparent as on the preceding night, because the wind had been from the south all day. The arch was about the same, except that it had shifted bodily 20 degrees to the east. There were a few streamers of various lengths, but they died out quickly. Clouds began to form, and by 9:30 the whole sky was obscured. The aurora could, however, be seen to some extent through the clouds, and appeared like the lights of a distant city reflected from the clouds. It was still visible after ten o'clock. But there was no sign of it the next morning nor on the following night, although the sky was perfectly clear.

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QUOTATIONS

STATE SUPPORT OF MEDICAL EDUCATION

THE wave of reform in medical education moves steadily on, and of much significance is the part which state universities are taking in this reform. Slowly but surely colleges organized and conducted on the stock corporation basis are either obtaining connection with privately endowed universities or are giving way to the state supported university medical school. In the latter instance, the medical school is conducted as an integral part of the state's educational system. The latest instance is in Arkansas, where two independent medical schools, the College of Physicians and Surgeons and the University of Arkansas medical department, both of Little Rock, have been united. The school formed by this consolidation is to be controlled and financed by the University of Arkansas. This is but a repetition of what has already taken place in Indiana, Minnesota, Colorado, and the other states, where only one medical school remains in each instance, that being the medical department of the state university. In several other states, generous appropriations have been made for state university medical schools. This larger state support of medical education has another significance, however. It means that since the state is endeavoring to provide a good training for medical students it will not tolerate the turning out of poorly trained doctors by low-grade institutions. In fact, the inferior medical colleges even now are reading the handwriting on the wall. This accounts for the opposition, direct

or indirect, which they are making toward state endowments for medical education in Nebraska, Illinois and elsewhere. This opposition, however, will not be misunderstood and the progress for better standards of medical education has received too much impetus to be stopped by obstructions prompted by selfish interests. It is not only the right, but also the duty, of each state to provide a good training for those who are to have in charge the health of the people of that commonwealth as is the case in nearly all other countries.—*Journal of the American Medical Association.*

SCIENTIFIC BOOKS

Some Neglected Factors in Evolution. An Essay in Constructive Biology. By HENRY M. BERNARD, edited by MATILDA BERNARD. New York and London, G. P. Putnam's Sons. 1911.

The late Mr. H. M. Bernard has written several works which testify to a painstaking industry and a desire to take a broad view of the problems which arose in connection with his line of work. His more important contributions to zoology were volumes on the Apodidæ, the "Catalogue of the Madreporarian Corals in the British Museum" and his studies on the retina, and it was these last, especially, that were responsible for the ideas expressed in the volume under review, which has been edited from unpublished manuscripts by Mrs. Bernard. Bernard's studies of the retina led him to regard it as a syncytial network, and this conception rendered him skeptical as to the cell as the ultimate structural unit; it seemed to him to demand the postulation of a simpler unit, which might stand in the same relation to the cell as this does to a metazoan. This unit he termed a chromidium and described it as a particle of chromatin from which delicate linin filaments radiate, the stellate linin-chromatin mass being "embedded in a minute drop of some fluid albuminous matrix to the surface of which the filaments extend." By the growth and frequent partial division of such a unit a cell is formed, a unit of a higher grade and capable of being regarded as a synchromidium in which the chromatin material has become aggregated mainly at the center of the mass, the linin-filaments of the various component chromidia uniting to form a network and felting together to form the nuclear membrane. By this conception of the cell the author imagined that he had succeeded in reconciling two very divergent theories of cell structure, the chromatin particles being identical with Altmann's granules, while the linin-network produces the appearance which Bütschli had attributed to a foam structure. Just as the chromidium by imperfect division gives rise to the cell person represented by the protozoa, so this gives rise to individuals of a higher grade, the gastræal unit, represented by the cœlentera and the platyhelminths, and this to an annelidan unit, represented by the remaining groups of animals with the exception of man, who constitutes the final grade. And throughout each of these units there is continuity of structure, the linin-filaments forming a continuum throughout the entire organism to whatever grade it may belong, and the chromatin aggregating at the nodes of the linin-reticulum to form nuclei. Special condensations of the linin-filaments occur to form such structures as the cœlenterate mesoglœa and basement membranes in general, on the surface of which the nuclear nodes arrange themselves to form epithelia. Skeletal structures, from the radiolarian shell, the sponge spicule and the cœlenterate corallum to the vertebrate supportive tissues, also form in connection with it, and it gives rise to such structures as the nematocysts, cilia and nerve- and muscle-fibers.

This is, in brief, a statement of the first of the two main theses which the book seeks to establish. It is, however, difficult to perceive the necessity for such a unit as the chromidium. It stands in quite a different plane than the other infracellular units, such as biophores, gemmules, etc., that have from time to time been suggested, in that it is an independent unit of such a great complexity that the distinction between it and a cell, except