

of accurately reproducing plates from the original negative. Prof. Barnard is in every case very careful to point out the defects in each reproduction, for sometimes some inequalities of illumination, looking like nebulosities, are really defects of reproduction, even in these plates after so much care has been taken. The nebulous region of 15 Monocerotis is a wonderful photograph, and the reproduction is described as "beautiful." It shows most distinctly the great nearly vacant region beginning near the nebula and running for two or three degrees to the west and then turning north for even a greater distance. The plate illustrating the small star cloud and black holes in Sagittarius is one of numerous other fine specimens of Prof. Barnard's skill, but of which space forbids one to more than mention. No less beautiful than the Milky Way photographs are those showing comets. Among the many illustrated, most instructive are the changes of the forms of Comet I. 1892 (Swift), Comet IV. 1893 (Brooks), and Comet II. 1894 (Gale), series of photographs of which are given. Plate 101 records an interesting picture displaying the trail of the first comet (Comet V. 1892) discovered by the aid of photography.

While Prof. Barnard has brought still more to perfection his collection of astronomical photographs by using lenses more effective than the old "Willard" lens, yet this record of pioneer work is one to be thoroughly proud of, and astronomical literature is greatly enriched by the permanent record contained in this fine volume.

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CEREBRO-SPINAL FEVER.

CEREBRO-SPINAL fever is a disease which occurs sporadically, *i.e.*, as occasional isolated cases, or in epidemic form. The first authenticated epidemic seems to have been in Geneva in 1805. In 1806 it appeared in the United States, and continued to prevail there for ten years, and again in 1861 to 1864. During this period, and indeed throughout the first half of last century, it was observed in different towns of France and of Italy, in Algeria, Spain, Denmark, etc. In 1854 and for seven years afterwards it raged in Sweden, destroying more than 4000 persons in that country. In 1863 it broke out in Germany and spread from north-eastern Prussia to the south German towns. In 1846 it appeared in many of the workhouses in Ireland, and in 1866-68 a very fatal type of it prevailed in Dublin, and to some extent in other parts of the country. The disease never seems to have established itself in London, or indeed in England, but during the last ten years epidemics of some severity have prevailed in Belfast, Glasgow, and Edinburgh, and during the past year a number of cases have occurred in different parts of the country, particularly in connection with military camps.

Cerebro-spinal fever is also termed *epidemic*

meningitis, or *epidemic cerebro-spinal meningitis*, from the fact that the prominent lesion is inflammation of the membranes (meninges) of the brain and spinal-cord. Another name is *spotted fever*, owing to the occurrence of an eruption of hæmorrhagic spots, particularly on the abdomen, which, however, is often absent.

The incubation period varies, but is frequently not more than four or five days, and the onset of the disease is usually sudden and ushered in by headache and vomiting. Stiffness and pain in the neck and retraction of the head are frequent, and twitching of the limbs and muscular tremor are often observed. Mental enfeeblement, stupor, or insensibility may occur, fever is present with prostration and wasting, and weakness or paralysis of various groups of muscles may ensue.

Cases show considerable variation in severity and duration; some are acute, others chronic, some are mild, others severe, and others again very acute and fulminating, so that death may result within twenty-four hours of the onset.

The causative micro-organism is a micrococcus, the "meningococcus" (*Diplococcus intracellularis*), a small spherical microbe measuring about $1/25,000$ in. in diameter. It occurs in pairs in groups principally within the cells of the exudation which forms on the membranes; it may also sometimes be found in the blood by culture. The meningococcus, when treated by the Gram staining process, remains uncoloured; it is readily cultivated on media containing serum, and by its cultural reactions can be distinguished from other similar micro-organisms, and does not develop at a temperature below about 75° F. The examination of the cerebro-spinal fluid for the presence of the meningococcus is now practised for purpose of diagnosis of the disease. No drug exerts any specific action upon the disease, but an "anti-meningococcic serum" is unquestionably sometimes a valuable curative agent, though at other times it fails. This variation in effect probably depends upon the fact that varieties of the meningococcus exist, and unless the serum has been prepared with the variety for which it is to be employed it is likely to fail.

The disease is undoubtedly spread by contact and possibly in other ways. The meningococcus is sometimes found located at the back of the throat, and may so exist not only in persons who have had the disease, but also in those who are seemingly healthy and have not suffered from the disease; such individuals constitute "carriers" and are sources of infection, and attempts have of late been made to detect such carriers by bacteriological examination, so that they may be isolated. Of preventive measures little of value is known, but recently a trial has been made of vaccinating with killed cultures of the meningococcus, with what result remains to be seen. The presence of the meningococcus in the throat has suggested that the organism enters the body and central nervous system *viâ* the nasal passages.

R. T. H.