

the theory of the general circulation of the atmosphere as put forward by Ferrel and Thomson, and as adopted in all the newer textbooks, that it seems well to give here a translation of Dr. Hildebrandsson's summary (pp. 47-48 of the report):

"By means of direct observations the following results have been obtained: (1) Above the heat equator and the equatorial calms there is, throughout the year, a current from the east which seems to have very high velocities at great altitudes. (2) Above the trades there is an anti-trade from S. W. in the northern, and from N. W. in the southern hemisphere. (3) This anti-trade does not extend beyond the polar limit of the trade; it is deflected more and more to the right in the northern, and more and more to the left in the southern hemisphere, and finally becomes a current from the west above the crest of the tropical high pressure belts, where it descends to supply the trades. (4) The districts at the equatorial margin of the trades are partly in the trades and partly in the equatorial calms, according to the season. Above them there is, therefore, an upper monsoon: the anti-trade in winter, and the equatorial current from the east in summer. (5) From the tropical high pressure belts the air pressure on the whole decreases continuously towards the poles, at least to beyond the polar circles. Further, the air of the temperate zone is drawn into a vast 'polar whirl' turning from west to east. This whirling movement seems to be of the same nature as that in an ordinary cyclone: the air of the lower strata approaches the center, while that of the higher strata tends out from the center, and this outward tendency increases with the altitude above sea level as far up as the greatest altitudes from which we have observations. (6) The upper currents of the atmosphere in the temperate zones extend over the tropical high pressure belts, and descend there. (7) The irregularities which are noted at the earth's surface, especially in the regions of the Asian monsoons, as a whole disappear at the lower or intermediate cloud levels. (8) We must entirely abandon the notion of a vertical circulation between tropics and poles which has

up to this time been accepted in accordance with the theories of Ferrel and Thomson."

This 'vertical circulation,' to which allusion is made, refers to the view that the air, ascending near the equator, flows as an upper current across the tropical high pressure belts to the circumpolar regions, and thence returns as an intermediate current from the poles towards the equator. It is in regard to this point that the conclusions of Dr. Hildebrandsson are most interesting. Dr. Hildebrandsson expressly states that he simply presents facts, and does not discuss theories. But he does say most emphatically (p. 44): "*Il faut donc abandonner une fois pour toutes cette idée d'une circulation verticale entre les tropiques et les poles*,—circulation qui semble du reste impossible pratiquement dans une couche dont l'épaisseur est très petite en comparaison avec les distances horizontales. Espérons que dès à présent ces 'courants polaires' et 'équatoriaux,' qui ont fait tant de confusion dans la météorologie dynamique, disparaîtront enfin complètement de la science météorologique, au moins dans le sens dans lequel on les a adoptés jusqu'ici." R. DEC. WARD.

THE LIGHT OF NOVA GEMMORUM.

THE light of Nova Gemmorum appears to be fluctuating like that of Nova Persei No. 2. On the evening of May 1 it appeared that its light had increased about half a magnitude during the preceding twenty-four hours. Since the measures described in the *Astronomical Bulletin* of April 22, similar measures were obtained on April 24, 25, 27, 28, 29, 30 and May 1, and gave the magnitudes 9.37, 9.67, 9.71, 9.81, 9.61, 9.76 and 9.26 respectively.

EDWARD C. PICKERING.

BRAIN-WEIGHT, CRANIAL CAPACITY AND THE FORM OF THE HEAD, AND THEIR RELATIONS TO THE MENTAL POWERS OF MAN.

DR. H. MATEJKA, in Part I. of his extensive studies on this subject,* has published some

* 'Ueber das Hirngewicht, die Schädelkapazität und die Kopfform, sowie deren Beziehungen zur psychischen Thätigkeit des Menschen,' *Sitzb. d. kön böhm. Ges. d. Wiss.*, II. Classe, Article XX., 1902.