

## Christian Heinrich Pander (1794–1865).

By P. H. v. BITTER and W. v. HERTZENBERG

Royal Ontario Museum and University of Toronto, Toronto, Canada; Pickering, Ontario, Canada.

Christian Heinrich PANDER was born of German-speaking parents on July 23, 1794 in Riga, in the Russian province of Livland. After graduating from a „high school“ for German-speaking students in Riga in 1812 he began medical studies at the University of Dorpat (= Tartu), moving to Berlin in 1814 and continuing at Göttingen. Upon leaving Göttingen in 1816 he studied at Würzburg where he received his doctoral degree in medicine in 1817 for his research in chicken embryology, a subject suggested to him by his close friend Karl Ernst v. BAER.

PANDER travelled throughout Europe during 1818 and 1819 doing research at various museums after which he returned to Dorpat, since he wanted to serve Russia and to apply his talents and training there. In 1819 and 1820 he served as editor of a short-lived natural history publication. In 1820 PANDER was elected an assistant in zoology of the Russian Academy of Sciences in St. Petersburg (= Leningrad) and received a promotion in the Academy in 1823 subsequent to his return from an expedition to Turkestan. During this trip PANDER contracted malaria, the effects of which were to seriously hinder him for the rest of his life.

PANDER was elected a full member of the Academy in 1826 but resigned this position in 1827. His resignation, caused by dissatisfaction with the Academy's rules and practices, was to have far reaching professional results. Between 1827 and 1833 PANDER endeavoured to work as a free-lance scientist in St. Petersburg, but in 1833 moved to his country estate near Riga where he worked scientifically until 1844. With the death of PANDER's father in 1842, financial support from that source stopped. This, plus the lack of an inheritance, forced PANDER to take up outside employment. In 1844 he began work as a scientist for special tasks and research with the Department of Mines in St. Petersburg. His main palaeontological work was published subsequent to 1844 and included the important description of conodonts (1856), the remains of which he had discovered while living on his country estate and travelling in the area between Riga and St. Petersburg (1833–1844).

PANDER published in embryology, comparative anatomy, vertebrate and invertebrate palaeontology, and geology. The diversity of his research interests, his chosen life style, and the fact that PANDER published almost exclusively in German explains why knowledge of PANDER's life and work has remained so fragmented that even Russian biographers have remained unaware of key events in PANDER's life.

## Resorption of Calcium Phosphate in Conodontophorids: A Body Weight Control Mechanism?

By P. H. v. BITTER and G. K. MERRILL

Royal Ontario Museum und University of Toronto, Toronto, Canada; College of Charleston, South Carolina, USA.

Lamellar or horizontal resorption of calcium phosphate, the probable cause of much or most of the under-representation of non-platform conodont elements documented in the literature, is one mechanism by which conodontophorids removed phosphate from the phosphate store „bank“. Another method of removing calcium phosphate was apparently through the formation of interlamellar spaces, or white matter, by intralamellar resorption. Selective resorption and removal of small groups of crystallites perpendicular to the lamellae was probably a third such mechanism. „Honeycombs“ or groups of hexagonal pits in the size range of about .5 to 1  $\mu\text{m}$  have been found irregularly distributed on the elements of some species of *Gondolella* and *Idiognathoides*. These are apparently the result of such vertical resorption.

The resorption of calcium phosphate by any or all of three ways may have been for a variety of biological reasons. The chief of these would probably have been weight control – a „lightening“ of body weight during a part of the life cycle would presumably have been advantageous to a swimming of floating conodontophorid. At times when a lighter body weight would have been an advantage partial or incomplete resorption of some or all conodont elements would have represented a first, less drastic, attempt to solve a weight problem than would the shedding or discarding of elements.

Conodonts are thought by some authorities to have been lophophorates that were related to and