Christian Heinrich Pander (1794–1865).

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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?

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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 μm 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

comparable with inarticulate brachiopods. Not only are the latter composed of calcium phosphate but the protegula (= larval shells) of acrotretids show cross-cutting and discrete circular pits that have been interpreted to be the result of internal resorption. The formation of circular resorption pits in juvenile acrotretid brachiopods would have permitted them to retain a covering of calcium phosphate that was strong on one hand but light and porous on the other, and would have permitted the juvenile acrotretid brachiopod to remain afloat before being ready to settle down. Resorption of calcium phosphate in the possibly related conodontophorids may have served a similar purpose.

Conodont Faunas from Devonian and Carboniferous Conglomerates of the Western Mediterranean and their Paleogeographic Implications.

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Limestone boulders of conglomerate horizons from 3 localities on the island of Menorca (Baleares) and 3 localities in the Betic Cordillera (Southern Spain) yielded conodonts of mostly excellent preservation. The specimens from Ferragut Vell and Escollo del Frances (northern Menorca) throughout indicate an age of Upper Devonian I, those from Cala Murta (east cost of Menorca) show a temporal distribution from Upper Devonian I to lowermost Namurian. At Velez Rubio (near Murcia) in the eastern Betic Cordillera the „Polymict Conglomerate Member" yielded conodonts of Givetian, Upper Devonian and Lower Carboniferous ages. A second clastic horizon, the „Marbella Conglomerate Member", could be dated Upper Visean to Lower Westphalian. At La Peluca and at Ardales (NW of Malaga) conglomerate layers show the same age as the Marbella Conglomerate.

The rich microfauna of the Upper Devonian I samples from Menorca allow the establishment of a paleoenvironmental model for a differentiated carbonate shelf. A comparison of the distribution of different groups of conodonts and other microfossils with the various microfacies types shows a remarkable correspondence. Apart from indications by typical environmental index microfossils some obvious trends can be noticed with the conodonts: maxima of icriodiniform elements from the outer shelf to the lower shelf slope and at subtidal ridges; maxima of palmatolepiform elements at subtidal ridges; minima of polygnathiform elements at the back-reef, at the outer shelf, and at subtidal ridges; maxima of ramiform elements in lagoons and at the back-reef. – The faunas contain 3 new species of the genera *Bisphathodus, Caenodontus* and *Falcodus.*

The conglomerates are interpreted as deep-sea deposits within submarin canyons. A reconstruction of the paleogeographic setting permits to postulate the existence of a pre-Variscan continental margin of the Atlantic type which included the North African Meseta, the Moroccan Variscan orogenic belt and the Alboran-Balearic flysch trough. The source area of the Devonian boulders is probably the Moroccan Variscan orogenic belt.

The Value of Icriodontidae in Stratigraphic Correlation.

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Refinement of systematics of Icriodontidae in the late 1960's and early 1970's supported the idea that this group could be used in Devonian biostratigraphy as successfully as most of the Polygnathidae. Since that time most conodont research has dealt with biofacies and paleoecology and on the whole the Icriodontidae are now considered to have been particularly adapted to shallow water shelf environment whereas many Polygnathidae had a deeper, pelagic habitat. Consequently, the stratigraphic value of Icriodontidae, especially in intercontinental correlations is strongly questioned because of this biofacies generalisation and on the base of more concrete and more local observations as in the following quotations: „highly irregular vertical distribution of *Icriodus* in most sequences", „*Icriodus* and other Icriodontids, which developed endemic species . . . were probably not capable of distribution and survival via major oceanic currents". More definite is the very recent opinion that in the Middle Devonian *Icriodus* is extremely dependent on local facies factors („ecophenotypic groups"). As a partial alternative to these hypotheses attention is drawn to the fact that in the late Lower Devonian, the Middle Devon-