In Memoriam : Martin Frey : 1940-2000

Autor(en): **Engi, Martin / Schmidt, Susanne Th. / Capitani, Christian de**

Objekttyp: **Obituary**

Zeitschrift: **Schweizerische mineralogische und petrographische Mitteilungen = Bulletin suisse de minéralogie et pétrographie**

Band (Jahr): **80 (2000)**

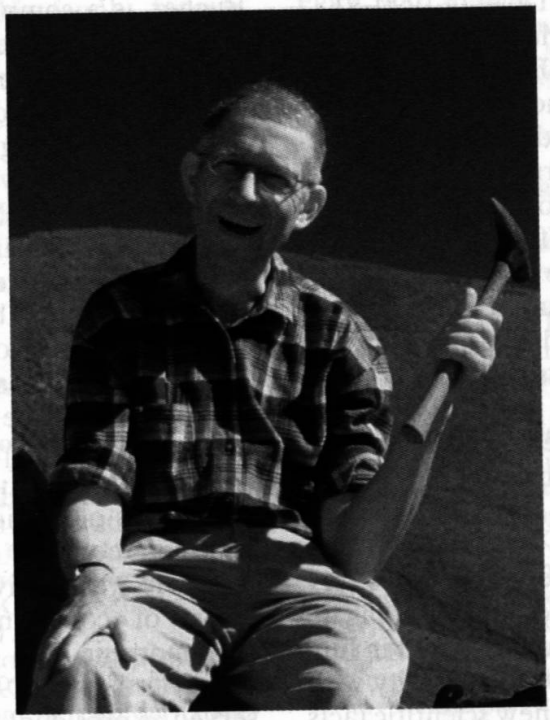
Heft 3

PDF erstellt am: **22.09.2024**

SCHWEIZ. MINERAL. PETROGR. MITT. 80, 351–355, 2000

In Memoriam

Martin Frey 1940–2000



Martin Frey, outstanding petrologist, tragically lost his life in a mountain accident on September 10, 2000. One fatal step on a hike in his beloved Grison Alps tore him out of his life, a life he had generously dedicated to science and to his family. Martin leaves behind his wife, their son and daughter, both adults. Numerous friends and students mourn Martin's untimely passing, as do many of his colleagues at the University of Basel and around the world.

Born on July 10, 1940 in Trubschachen, Martin Frey spent his childhood in this small town outside Bern, Switzerland. Following his gymnasium years in Burgdorf, he went to study Earth Sciences at the University of Bern. There he specialized in mineralogy and petrology, and he earned his doctoral degree in 1968 with his dissertation entitled "Die Metamorphose des Keupers vom Tafeljura bis zum Lukmanier-Gebiet". This study, guided by Professor Ernst Niggli, remains a classic both in metamorphic petrology and Alpine geology. In his thesis, Martin Frey revealed for a first time his talent and dedication to making small steps in pursuit of a larger vision: By combining meticulous documentation in the field and laboratory with careful interpretation of his observations and data, he aimed to identify fundamental metamorphic processes and to quantify these. His goal to understand metamorphic rocks and what they can tell us about the orogenic evolution of mountain belts became a life-long passion. His classical training never allowed him to ignore that petrological studies have most impact if done on the basis of systematic field work. Hence he set out to perfect his skills and to apply them, time and again.

In 1972, Martin Frey spent a year as a postdoc with Professor Philip M. Orville at Yale University, an exceptional and charismatic teacher. Martin became ever more convinced that the rock record can be and should be deciphered quantitatively by thermodynamic analysis of phase relations. On a personal side, the New England experience initiated a life-long bond to North America for Martin Frey. Scientifically, Yale broadened his horizon and made him aware of how open and

international science can and should be. In the course of his career, this led him to develop and maintain contacts with a very large number of colleagues, many of whom he collaborated with. His publication list eventually encompassed some one hundred scientists as co-authors!

After returning to Switzerland, Martin Frey spent a further three years at the University of Bern, before being appointed Full Professor of Mineralogy and Petrology at the University of Basel in 1976. He was then 36 years old, one of the youngest members of the Faculty of Natural Sciences; he would serve the Faculty as Dean in 1990–91.

For the next 24 years of Martin Frey's life he directed "his" Institute at the Bernoullianum. He managed the institute with the clear aim to perform excellent science. His leadership was characterized by competence and fairness. A typical staff meeting started with everybody except Martin expressing opinions on the different topics of the agenda. He would rarely make an important decision right away, but continue to analyze the problem for days, sometimes discussing it further with some colleagues, assistants or students. Striving for an optimal solution to a problem, he would become very quiet and reserved during such periods, and it was obvious that – while he enjoyed the responsibility – he suffered under its heavy burden.

Martin Frey took all of his responsibilities very seriously, with his foremost dedication going to teaching and research. His students found in him an absolutely fair, deeply sincere personality, with an unusual openness to accept new scientific facts and revise long-held views. He left his doctoral students ample room to formulate and pursue their scientific goals; he led them principally by example.

Together with his family he returned to North America for sabbatical leaves at Carleton University, Ottawa (in 1981) and at Stanford University (in 1989–90 and 1997). Scientifically, these visits invariably served as a source of new direction for Martin Frey's research. In the course of the years, the domain of low-grade metamorphism – already a central topic in his doctoral thesis – remained the pet subject of his scientific curiosity and work. He pioneered this field, both individually and as an active member of the International Geological Correlation Program (project 294 "Low-grade metamorphism") initiated in Budapest in 1989. Martin evidently enjoyed and profited from these IGCP meetings, leading him to study many of the now classical terrains in which the incipient stages of metamorphism were being investigated. The term "anchizone", incidentally, describing the transition from diagenesis to epizone, was introduced by Martin Frey (1969). Beyond the classical studies he undertook in external parts of the Alps, he also contributed to the understanding of low-grade metamorphism in the Camero Basin (NE Spain), the western Carpathians (Slovakia), the Diablo Range (California), in New Caledonia, Chile, and the MacKenzie district (Canada). Furthermore, of the three textbooks to which Martin Frey contributed very substantially, two concern exclusively low-grade metamorphism.

The third of them, written jointly with Kurt Bucher, is a completely revised version of Winkler's classic "Petrogenesis of Metamorphic Rocks". Martin Frey had a broad interest in metamorphic rocks and in the processes that shape them. His life-long love of the Central Alps and his excellent knowledge of the geological literature on them lead Martin Frey to direct much attention also to areas of higher metamorphic grade. Important contributions on several critical tectonic units, notably the Adula and Monte Rosa nappes, resulted from his own research as well as the 23 doctoral theses and many diploma projects he supervised. The wide spectrum of studies he directed in the Alps and his close collaboration with many colleagues furthered his interest in the relevance of regional metamorphism in this polymetamorphic orogen and other complex belts. He was a driving force in the monumental effort of compiling and publishing the new metamorphic map of the Alps (FREY, DESMONS and NEUBAUER, 1999), and since 1997 he also served as president of the UNESCO Subcommission for the Metamorphic Maps of the World.

To the scientific community, Martin Frey gave profusely of his experience and time; he served on uncounted committees. Among the long-term time intensive responsibilities Martin Frey accepted was his service (1987–96) as Scientific Advisor to the Swiss National Science Foundation, the granting agency supporting the majority of academic research in Switzerland. In this role, Martin's sound scientific judgment and broad perspective, paired with fairness and sincerity made him an impartial and widely accepted leading figure, despite – or because of – his personal modesty.

In the Swiss Society of Mineralogy and Petrology, Martin Frey acted as Council Member (1981–1998) and served as President 1989–91. He organized several of the Society's meetings and field trips, many of which attracted international participation. For the Swiss Bulletin of Mineralogy and Petrology he was on the Editorial Board since its inception in 1989 and took on the responsibility of Co-Editor in 1998.

While during his early professional career, he was primarily concerned with excellence in science, he realized over the years that human qualities also count in the professional environment. Thus we knew and appreciated him as an open-minded and tolerant person. He never was a man of many words, but what he said counted. His unassuming way was not just charming, it was convincing.

In Martin Frey, the community of science lost a highly respected researcher and an integrating authority. What remains is his extensive published work and his memory – to his family, friends, former students, and colleagues. We all miss him greatly, his competence and his kind smile.

November 9, 2000

Martin Engi, Bern
Susanne Th. Schmidt, Basel
Christian de Capitani, Basel

List of Publications by Martin Frey

1. Journal Articles and Book Chapters

FREY, M. (1968): Quartenschiefer, Equisetenschiefer und germanischer Keuper – ein lithostratigraphischer Vergleich. Eclogae geol. Helv. 61, 141–156.

FREY, M. (1968): Zur Metamorphose des Keupers vom Tafeljura bis zum Lukmanier-Gebiet. Schweiz. Mineral. Petrogr. Mitt. 48, 829–831.

Frey, M. (1969): Die Metamorphose des Keupers vom Tafeljura bis zum Lukmanier-Gebiet (Veränderung tonig-mergeliger Gesteine vom Bereich der Diagenese bis zur Staurolith-Zone). Beitr. geol. Karte Schweiz, N.F. 137, 160 S.

FREY, M. (1969): A mixed-layer paragonite/phengite of low-grade metamorphic origin. Contrib. Mineral. Petrol. 24, 63–65.

FREY, M. (1970): The step from diagenesis to metamorphism in pelitic rocks during Alpine orogenesis. Sedimentology 15, 261–279.

FREY, M. and NIGGLI, E. (1971): Untersuchungen über die Metamorphose mesozoischer Sedimentgesteine der Schweiz. Verh. Geol. Bundesanstalt Wien Jg. 1971, 255–256.

FREY, M. and NIGGLI, E. (1971): Illite-Kristallinität, Mineralfazien und Inkohlungsgrad. Schweiz. Mineral. Petrogr. Mitt. 51, 229–234.

FREY, M. (1972): Margarite, an important rock-forming mineral in regionally metamorphosed low-grade rocks. Naturwissenschaften 59, 214–215.

WAGNER, A., FREY, M., QUADRIO, F., SCHWARTZKOPFF, J. and STALDER, H.A. (1972): Die Mineralfundstellen von Camperio und Campo Blenio, Kanton Tessin. Jb. Naturhist. Mus. Stadt Bern 1969–1971, 277–360.

FREY, M., HUNZIKER, J.C., ROGGWILLER, P. and SCHINDLER, C. (1973): Progressive niedriggradige Metamorphose glaukonitführender Horizonte in den helvetischen Alpen der Ostschweiz. Contrib. Mineral. Petrol. 39, 185–218.

FREY, M. and ORVILLE, P.M. (1973): Plagioclase in margarite-bearing rocks. Amer. J. Sci. 274, 31–47.

FREY, M. (1974): Alpine metamorphism of pelitic and marly rocks of the Central Alps. Schweiz. Mineral. Petrogr. Mitt. 54, 489–506.

FREY, M., HUNZIKER, J.C., FRANK, W., BOCQUET, J., DAL PIAZ, G.V., JÄGER, E. and NIGGLI, E. (1974): Alpine metamorphism of the Alps – A review. Schweiz. Mineral. Petrogr. Mitt. 54, 247–290.

FREY, M. and WIELAND, B. (1975): Chloritoid in autochthon-parautochthonen Sedimenten des Aarmassivs. Schweiz. Mineral. Petrogr. Mitt. 55, 407–418.

FREY, M., HUNZIKER, J.C., O'NEIL, J.R. and SCHWANDER, H. (1976): Equilibrium-disequilibrium relations in the Monte Rosa granite, Western Alps: Petrological, Rb–Sr and stable isotope data. Contrib. Mineral. Petrol. 55, 147–179.

FREY, M., JÄGER, E. and NIGGLI, E. (1976): Gesteinsmetamorphose im Bereich der Geotraverse Basel–Chiasso. Schweiz. Mineral. Petrogr. Mitt. 56, 649–659.

HOEFS, J. and FREY, M. (1976): The isotopic composition of carbonaceous matter in a metamorphic profile from the Swiss Alps. Geochim. Cosmochim. Acta 40, 945–951.

ZINGG, A., HUNZIKER, J.C., FREY, M. and AHRENDT, H. (1976): Age and degree of metamorphism of the Canavese Zone and of the sedimentary cover of the Sesia Zone. Schweiz. Mineral. Petrogr. Mitt. 56, 361–375.

VENTURELLI, G. and FREY, M. (1977): Anchizone metamorphism in sedimentary sequences of the Northern Apennines. Rend. Soc. It. Mineral. Petrol. 33, 109–123.

FREY M. (1978): Progressive low-grade metamorphism of a black shale formation, Central Swiss Alps, with special reference to pyrophyllite and margarite bearing assemblages. J. Petrol. 19, 93–135.

FREY, M., BUCHER, K., FRANK, E. and MULLIS, J. (1980): Alpine metamorphism along the Geotraverse Basel–Chiasso – a review. Eclogae geol. Helv. 73, 527–546.

FREY, M., TEICHMÜLLER, M., TEICHMÜLLER, R., MULLIS, J., KÜNZI, B., BREITSCHMID, A., GRUNER, U. and SCHWIZER, B. (1980): Very low-grade metamorphism in external parts of the Central Alps: Illite crystallinity, coal rank and fluid inclusion data. Eclogae geol. Helv. 73, 173–203.

FREY, M., TROMMSDORFF, V. and WENK, E. (1980): Alpine metamorphism of the Central Alps. Excursion. No. VI, Geol. of Switzerland, Wepf Basel, 295–316.

RYBACH, L., MÜLLER, S., MILNES, A., ANSORGE, J., BERNOULLI, D. and FREY, M. (1980): The Swiss Geotraverse Basel–Chiasso – a review. Eclogae geol. Helv. 73, 437–462.

FREY, M., BUCHER, K., FRANK, E. and SCHWANDER, H. (1982): Margarite in the Central Alps. Schweiz. Mineral. Petrogr. Mitt. 62, 21–45.

BUCHER-NURMINEN, K., FRANK, E. and FREY, M. (1983): A model for the progressive regional metamorphism of margarite-bearing rocks in the Central Alps. Amer. J. Sci. 283-A, 370–395.

FREY, M., HUNZIKER, J.C., JÄGER, E. and STERN, W.B. (1983): Regional distribution of white K-mica polymorphs and their phengite content in the Central Alps. Contrib. Mineral. Petrol. 83, 185–197.

THOMPSON, P.H. and FREY, M. (1984): Illite "crystallinity" in the Western River Formation and its significance regarding the regional metamorphism of the early Proterozoic Goulburgn Group, district of MacKenzie. Current Research, Part A. Geol. Survey Canada, Pap. 84-1A, 409–414.

HUNZIKER, J.C., FREY, M., CLAUER, N., DALLMEYER, R.D., FRIEDRICHSEN, H., FLEHMIG, W., HOCHSTRASSER, K., ROGGWILER, P. and SCHWANDER, H. (1986):

The evolution of illite to muscovite: mineralogical and isotopic data from the Glarus Alps, Switzerland. Contrib. Mineral. Petrol. 92, 157–180.

FREY, M. (1986): Very low-grade metamorphism of the Alps – an introduction. Schweiz. Mineral. Petrogr. Mitt. 66, 13–27.

FREY, M. (1987): Very low-grade metamorphism of clastic sedimentary rocks. In: FREY, M. (ed.): Low Temperature Metamorphism. Blackie, Glasgow and London, 9–58.

FREY, M. (1987): The reaction isograd kaolinite + quartz = pyrophyllite + H_2O, Helvetic Alps, Switzerland. Schweiz. Mineral. Petrogr. Mitt. 65, 1–11.

FREY, M. and KISCH, H.J. (1987): Scope of subject. In: FREY, M. (ed.): Low Temperature Metamorphism. Blackie, Glasgow and London, 1–8.

HUNZIKER, J.C., FREY, M., CLAUER, N. and DALLMEYER, R.D. (1987): Reply to the comments on the evolution of illite to muscovite by J.R. Glasmann. Contrib. Mineral. Petrol. 96, 75–77.

FREY, M. (1988): Discontinuous inverse metamorphic zonation, Glarus Alps, Switzerland: evidence from illite "crystallinity" data. Schweiz. Mineral. Petrogr. Mitt. 68, 171–183.

FREY, M., SAUNDERS, J. and SCHWANDER, H. (1988): The mineralogy and metamorphic geology of low-grade metasediments. Northern Range, Trinidad. J. Geol. Soc. London 145, 563–575.

SARTORI, M., BUGNON, P.C., FREY, M., GANGUIN, J., MASSON, H., STECK, A. and THÉLIN, PH. (1989): Compte-rendu de l'excursion commune de la SSMP et de la SGS: le profil Rawil–Zermatt 9/10/11 octobre 1988. Schweiz. Mineral. Petrogr. Mitt. 69, 261–282.

FREY, M., DE CAPITANI, C. and LIOU, J.G. (1991): A new petrogenetic grid for low-grade metabasites. J. metamorphic Geol. 9, 497–509.

LIOU, J.G., DE CAPITANI, C. and FREY, M. (1991): Zeolite equilibria in the system $CaAl_2Si_2O_8$–$NaAlSi_3O_8$–SiO_2–H_2O. New Zealand J. Geol. and Geophys. 34, 293–301.

STERN, W.B., MULLIS, J., RAHN, M. and FREY, M. (1991): Deconvolution of the first "illite" basal reflection. Schweiz. Mineral. Petrogr. Mitt. 71, 453–462.

FREY, M. and BURKHARD, M. (1992): Mineralogisch-petrologische Exkursion zur progressiven alpinen Metamorphose der Zentralalpen. Beih. z. Eur. J. Mineral. 4/2, 103–122.

FREY, M., HUNZIKER, J.C., SCHMID, S.M., THOENEN, T. and TROMMSDORFF, V. (1992): Bericht über die Exkursion der Schweizerischen Mineralogischen und Petrographischen Gesellschaft zum Thema "Hochdruck-Metamorphose in der Adula-Decke" (29. September bis 5. Oktober 1991). Schweiz. Mineral. Petrogr. Mitt. 72, 271–279.

FREY, M., SCHMID, S.M. and STAHEL, A. (1993): Symposium metamorphism and deformation: introduction. Schweiz. Mineral Petrogr. Mitt. 73, 175–176.

DALLA TORRE, M., STERN, W.B. and FREY, M. (1994): Determination of white K-mica polytype ratios: comparison of different XRD methods. Clay Minerals 29, 717–726.

RAHN, M., MULLIS, J., ERDELBROCK, K. and FREY, M. (1994): Very low-grade metamorphism of the Taveyanne greywacke, Glarus Alps, Switzerland. J. metamorphic Geol. 12, 625–641.

RAHN, M., MULLIS, J., ERDELBROCK, K. and FREY, M. (1995): Alpine metamorphism in the North Helvetic Flysch of the Glarus Alps, Switzerland. Eclogae geol. Helv. 88, 157–178.

RAHN, M., STERN, W.B. and FREY, M. (1995): The origin of the Taveyannaz sandstone: arguments from whole-rock and clinopyroxene composition. Schweiz. Mineral. Petrogr. Mitt. 75, 213–224.

SHARP, Z.D., FREY, M. and LIVI, K.J.T. (1995): Stable isotope variations (H, C, O) in a prograde metamorphic Triassic red bed formation, Central Swiss Alps. Schweiz. Mineral. Petrogr. Mitt. 75, 147–161.

STERN, W.B., MULLIS, J., RAHN, M., SUN, M. and FREY, M. (1995): On the shape of the first 'illite' X-ray diffraction-reflection, crystallinity, and incipient metamorphism. Revista Geol. Chile 22, 127–135.

WANG, H., STERN, W.B. and FREY, M. (1995): Deconvolution of the X-ray "illite" 10 Å complex: a case study of Helvetic sediments from eastern Switzerland. Schweiz. Mineral. Petrogr. Mitt. 75, 187–199.

DALLA TORRE, M., DE CAPITANI, C., FREY, M., UNDERWOOD, M., MULLIS, J. and COX, R. (1996): Very low-temperature metamorphism of shales from the Diablo Range, Franciscan Complex, California: new constraints on the exhumation path. Geol. Soc. Amer. Bull. 108, 578–601.

DALLA TORRE, M., LIVI, K.J.T., VEBLEN, D.R. and FREY, M. (1996): White K-mica evolution from phengite to muscovite in shales and shale matrix mélange, Diablo Range, California. Contrib. Mineral. Petrol. 123, 390–405.

DALLA TORRE, M., LIVI, K.J.T. and FREY, M. (1996): Chlorite textures and compositions from high-pressure/low-temperature metashales and metagraywackes, Diablo Range, California, USA. Eur. J. Mineral. 8, 825–846.

FROITZHEIM, N., SCHMID, S.M. and FREY, M. (1996): Mesozoic paleogeography and the timing of eclogite facies metamorphism in the Alps: A working hypothesis. Eclogae geol. Helv. 89, 81–110.

KAHR, G., FREY, M. and MADSEN, F.T. (1996): Determination of metamorphic grade by thermoanalytical dehydroxylation of clays and combustion of accompanied organic compounds and pyrite. Schweiz. Mineral. Petrogr. Mitt. 76, 165–173.

SCHMID, S., FROITZHEIM, N., HEILBRONNER, R., STÜNITZ, H. and FREY, M. (1996): Second Workshop on Alpine Geology: Editorial remarks and results of a round-table discussion about perspectives of geological research in the Alps. Ecloge geol. Helv. 89, 1–6.

SPERLICH, R., GIERÉ, R. and FREY, M. (1996): Evolution of compositional polarity and zoning in tourmaline during prograde metamorphism of sedimentary rocks in the Swiss Central Alps. Amer. Mineralogist 81, 1222–1236.

WANG, H., FREY, M. and STERN, W.B. (1996): Diagenesis and metamorphism of clay minerals in the Helvetic Alps of eastern Switzerland. Clay and Clay Minerals 44, 96–112.

ARKAI, P., BALOGH, K. and FREY, M. (1997): The effects of tectonic stress on crystallinity, mean crystallite size and lattice strain of phyllosilicates in low-temperature metamorphic rocks. A case study from the Glarus overthrust, Switzerland. Schweiz. Mineral. Petrogr. Mitt. 77, 27–40.

DALLA TORRE, M. and FREY, M. (1997): The evolution from disordered Ad to ordered 2M1 white K-mica polytype in low-temperature sedimentary rocks. Schweiz. Mineral. Petrogr. Mitt. 77, 149–159.

LIVI, K.J.T., VEBLEN, D.R., FERRY, J.M. and FREY, M. (1997): Evolution of 2:1 layered silicates in low-grade metamorphosed Liassic shales of Central Switzerland. J. metamorphic Geol. 15, 323–344.

RAHN, M., HURFORD, A.J. and FREY, M. (1997): Rotation and exhumation of a thrust plane: Apatite fission track data from the Glarus thrust, Switzerland. Geology, 25, 599–602.

SUCHY, V., FREY, M. and WOLF, M. (1997): Vitrinite reflectance and shear-induced graphitization in orogenic belts: a case study from the Kandersteg area, Helvetic Alps, Switzerland. Internat. J. Coal Geol., 34, 1–20.

SCHMIDT, D., SCHMIDT, S.TH., MULLIS, J., FERREIRO MÄHLMANN, R. and FREY, M. (1997): Very low-grade metamorphism of the Taveyanne formation of western Switzerland. Contrib. Mineral. Petrol. 129, 385–403.

MEYRE, C. and FREY, M. (1998): Eclogite facies metamorphism and deformation of the middle Adula nappe (Central Alps, Switzerland): Excursion to Trescolmen. Schweiz. Mineral. Petrogr. Mitt. 78, 355–362.

DESMONS, J., APRAHAMIAN, J., COMPAGNONI, R., CORTESOGNO, L. and FREY, M. (1999): Alpine metamorphism of the Western Alps: I. Middle to high T/P metamorphism. Schweiz. Mineral. Petrogr. Mitt. 79, 89–110.

DESMONS, J., COMPAGNONI, R., CORTESOGNO, L., FREY, M. and GAGGERO, L. (1999): Pre-Alpine metamorphism of the Internal zones of the Western Alps. Schweiz. Mineral. Petrogr. Mitt. 79, 23–39.

FREY, M., DESMONS, J. and NEUBAUER, F. (1999): The new metamorphic map of the Alps: Introduction. Schweiz. Mineral. Petrogr. Mitt. 79, 1–4.

FREY, M. and FERREIRO MÄHLMANN, R. (1999): Alpine metamorphism of the Central Alps. Schweiz. Mineral. Petrogr. Mitt. 79, 135–154.

MERRIMAN, R.J. and FREY, M. (1999): Patterns of very low-grade metamorphism in metapelitic rocks. In: FREY, M. and ROBINSON, D. (eds): Low-Grade Metamorphism. Blackwell Science, Oxford, 61–107.

MEYRE, C., DE CAPITANI, C., ZACH, T. and FREY, M. (1999): Petrology of high-pressure metapelites from the Adula nappe (Central Alps, Switzerland). J. Petrol. 40, 199–213.

SCHMIDT, D., LIVI, K.J.T. and FREY, M. (1999): Reaction progress in chloritic material: an electron microbeam study of the Taveyanne greywacke, Switzerland. J. metamorphic Geol. 17, 229–241.

ENGI, M. and FREY, M. (2000) Arnold Stahel, journal editor (1986–2000). Schweiz. Mineral. Petrogr. Mitt. 80, 107–108.

LUPTAK, B., JANAK, M., PLASIENKA, D., SCHMIDT, S.TH. and FREY, M. (2000): Chloritoid-kyanite schists from the Veporic unit, Western Carpathians, Slovakia: implications for Alpine (Cretaceous) metamorphism. Schweiz. Mineral. Petrogr. Mitt. 80, 213–223.

PLASIENKA, D., JANAK, M., LUPTAK, B., MILOVSKY, R. and FREY, M. (2000): Kinematics and metamorphism of a Cretaceous core complex: the Veporic Unit of the Western Carpathians. Physics and Chemistry of the Earth, in press.

2. Textbooks and Topical Maps

BUCHER, K. and FREY, M. (1994): Petrogenesis of Metamorphic Rocks. Completely Revised 6th Edition of Winkler's Textbook. Springer, Berlin, 318 pp.

FREY, M. (ed.) (1987): Low Temperature Metamorphism. Blackie, Glasgow and London, 351 pp.

FREY, M. and ROBINSON, D. (eds) (1999): Low-Grade Metamorphism. Blackwell Science, Oxford, 313 pp.

FREY, M., DESMONS, J. and NEUBAUER, F. (eds) (1999): Metamorphic Maps of the Alps. Published by the editors and as an enclosure to Schweiz. Mineral. Petrogr. Mitt. 79/1.