

Summary of the history and bibliography of the IAH Commission on Mineral and Thermal Waters (CMTW)

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Outlining the past work of the IAH Commission on Mineral and Thermal Waters and its members, Jan Dowgiałło, a former chairman of this Commission, encapsulates the central themes of their activities and points out some of their fascinating and lesser known publications.

In the second half of the twentieth century many countries have increasingly utilized mineral and thermal waters mainly for medicinal (balneological) purposes. As a consequence, hydrogeological methods have rapidly developed for exploration, exploitation and protection of such waters. International cooperation in the form of know-how and exchange of experience became essential. While there were opposing political blocks in the world at that time, the development of this cooperation was made possible by the International Association of Hydrogeologists (IAH), founded in 1956. The proposal to establish a new IAH commission was prepared by a group of interested hydrogeologists mostly from Central and Eastern European countries. Promptly accepted by IAH, the new Commission was set up on 24 August 1968. Its first members were: Vlastimil Myslíl (Czechoslovakia), elected Chairman; Gilbert Castany (France); Jan Dowgiałło (Poland); Karl Fricke (Germany); Valery Ivanov (Soviet Union); and Kostadin Shterev (Bulgaria). All this happened in Prague (capital of the then Czechoslovakia) during the 23rd Ses-

sion of the International Geological Congress (IGC). The Commission was conceived in a strained situation. Two days earlier Soviet troops invaded Prague and the IGC Session closed before its scheduled conclusion. Fortunately, CMTW survived these hard times and is continuing its work.

The Commission, whose activities spanned more than 44 years, has had its ups and downs. This is typical for a group of volunteers who are not always supported by their employers and who are driven by scientific and professional interests. Such motivation has been sufficient enough to keep the group alive even when its mother-organization, the IAH, sometimes had doubts about the sense of its existence and did not financially support its activities.

Although detailed records of CMTW's early activities are not readily accessible, these may perhaps be found in the archives of its members. The real chronicle of the CMTW started when Boudevijn Zuurdeeg became its Secretary. Between 1985 and 1997 he produced every year a volume entitled "*Internal Communications*" that compiled information about meetings, field trips and other activities of the CMTW. After his resignation, only two such volumes have been produced in 2001 and 2002. Activities in other years were recorded in meeting minutes and printed material supplied by organizers of particular events.

Officers and members of the CMTW (country code)

Chairmen: • 1968: V. Myslíl (CS) • 1969–1976: K. Fricke (DE) • 1976–1986: H. Schmassmann (CH) • 1986–2002: J. Dowgiałło (PL) • 2003–2007: P. Kralj (SI) • 2007–2011: W. Balderer (CH) • 2011–: J. LaMoreaux (US).

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Deputy Chairmen: • 1985–1986: J. Dowgiałło (PL) • 1986–1993: R. Langguth (DE) • 1994–2007: J. J. Risler (FR) • 1995–2013: H. Idris (EG).

Secretaries: • 1969–1983: E. Breuning (DE) • 1984–1999: B. Zuurdeeg (NL) • 2000–2007: K. v. Storch (DE) • 2008–: A. Porowski, (PL).

Members (former and present): L. Andersen (DK); A. Babayev (AZ); W. Balderer (CH); E. Bashkan (TR); A. Bath (GB); F. Boroviceny (AT); E. Braeuning (DE); D. Burdon (IR); C. Calado, P; B. Canik (TR); R. Carella (IT); G. Castany (FR); J. Cuchi (ES); M. Dall’Aglia (IT); J. Deak, H; Y. Eckstein (US); F. Derycke (BE); J. Dowgiałło (PL); O. Franko (CS, SK); R. Fernandez-Rubio, (ES); A. Feru (RO); K. Fricke (DE); M. Fricke (DE); C. Garagunis, (GR); E. Gosk (DK); R. Habermehl, (AU); A. Herch (DE); I. Ibragimova (AZ); H. Idris (EG); A. Issaadi (DZ); V. Ivanov (SU); A. Jellouli (TN); A. Kaszap (HU); D. Kellaway (GB); K. Korim (HU); V. Kononov (SU); P. Lachassagne (FR); P. Lahermo (FI); C. Laing (AU); R. Lesmo (IT); P. LaMoreaux (US); J. LaMoreaux (US); R. Langguth (DE); P. Liebe (HU); A. Lorberer (HU); D. Marcin (SK); L. Melioris (SK); G. Michel (DE); A. Monjoie (BE); V. Myslil (CS); Z. Pang (CN); P. Pouchan (F); A. Porowski (PL); M. Portugal Ferreira (P); A. Pricajan (RO); J.-J. Risler (F); E. Rosenthal (IL); L. Rybach (CH); H. Schmassmann (CH); H. Schoeller (FR); M. Schoeller (FR); A. Shahbeig (IR); A. Shpak (SU); K. Shterev (BG); A. Shugg (AU); S. Stankovich (YU); K. v. Storch (DE); P. Verdeil, (DZ/FR); V. Vingissar (EE); B. Vylita (CS,CZ); T. Vylita (CZ); N. Vinograd (RU); A. Voronov (RU); M. Zaki (ET); B. Zuurdeeg (NL).

Since its establishment, the CMTW has lost forever the following members and dear friends: Alekber Babayev, Gilbert Castany, Ondrej Franko, Karl Fricke, Michael Fricke, Kalman Korim, Hussein Idris, Valery Ivanov, Vladimir Kononov, Philip LaMoreaux, Ladislav Melioris, Artemiu Pricajan, Hansjoerg Schmassmann, Henri Schoeller, Marc Schoeller, Svetoslav Stankovich, and Arkady Voronov. Peace be with them.

CMTW regulations

Improved internal regulations for the IAH CMTW were adopted after discussion during the 32nd Meeting in Baku (AZ) in September 2003.

IAH Honorary membership

At the General Assembly held on 15th September 2005 at Belgrade, Serbia and Montenegro, Jan Dowgiałło was elected an honorary member of the IAH.

CMTW sessions

Since its establishment, the CMTW has held sessions in: (1) 1970: Sofia (BG); (2) 1972: Karlovy Vary (CS); (3) 1973: Bad Duisburg (DE); (4) 1974: Eforie Nord (RO); (5) 1975: Grenoble (FR); (6) 1976: Kamena Vourla (GR); (7) 1977: Birmingham (GB); (8) 1978: Cesme (TR); (9) 1979: Vilnius (SU); (10) 1980: Bad Lostorf (CH); (11) 1982: Prague (CS); (12) 1983: Budapest (HU); (13) 1984: Oran (DZ); (14) 1985: Albena (BG); (15) 1986: Appingedam-Nieuveschans (NL); (16) 1987: Bad Driburg (DE); (17) 1988: Łądek Zdrój (PL); (18) 1989: Clermont-Ferrand (FR); (19) 1990: Cairo (EG); (20) 1991: Kfar Shmaryahu (IL); (21) 1992: Arkansas Hot Springs (US); (22) 1993: São Pedro do Sul (PT); (23) 1994: Bojnice Spa (SK); (24) 1995: Dax (FR); (25) 1996: Espoo (FI); (26) 1997: Bath (GB); (27) 1998: Ballarat (AU); (28) 1999: Karlovy Vary (CZ); (29) 2000: Ponta Delgada, Azores (PT); (30) 2001: Sankt Petersburg (RU); (31) 2002: Terme Olimia (SI); (32) 2003: Baku (AZ); (33) 2004: Cairo (EG); (34) 2005: Huesca (ES); (35) 2006: Abano Terme (IT); (36) 2007: Stana de Vale (RO); (37) 2008: Istanbul (TR); (38) 2009: Cairo (EG); (39) 2010: Kraków (PL); (40) 2011: Evian (FR); and (41) 2012: Budapest (HU).

In the first period of CMTW’s existence (1970–1985), meetings were held mostly alongside large hydrogeological conferences and congresses organized by IAH. This type of organization, however, had its disadvantages (high participation cost, lack of time to work on CMTW’s own projects etc.). Since 1986 Commission meetings have been organized separately from congresses and conferences by Commission members in their respective countries (with the exception of the 2010 meeting in Kraków during the XXXVIII International IAH Congress).

Bibliography

Publications of Commission members are numerous and may be found in many national and international journals and books. The following list reflects the gamut of published papers that are a result of the Commission’s common projects, reports concerning its activity or presentations at meetings. This review includes presently available publications and is certainly not complete.

Balderer W, Porowski A, Idris H, LaMoreaux J (eds) (2012) Thermal and mineral waters: origin, properties and applications. Presentations at the 38th IAH CMTW Meeting, Cairo, Egypt, 2009. Springer. 250 pp.

Buachidze G (ed) (1988) Terminologic vocabulary on mineral and thermal waters. “Mecniereva”, Tbilisi, Georgia, Soviet Union. 150 pp.

Dowgiałło J (2012) Book review: Deutsches Baederbuch, II-nd Edition 2008, Werner, Hanna Kaess (eds). Carbonates and evaporates 27, 2:207–209.

Dowgiałło J (2012) Occurrence and use of thermal waters in Poland. Environmental Earth Sciences. 67, 8:2251–2529.

Dowgiałło J, Langguth R, Schmasssmann H (1989) Problems of mineral and thermal waters mapping. Memoirs of the International Symposium on Hydrogeological Maps as Tools for Economic and Social Development. Hannover, Federal Republic of Germany. Heise, Hannover. pp 175–183.

Environmental Geology (2000) Special issue on mineral and thermal waters research. March issue, 39, 5:431–516.

Environmental Geology (2004) Special topic: IAH-CMTW Congress, Terme Olimia, Podcetrtek, Slovenia. 46, 5:615–682.

Environmental Geology (2009) Special issue: IAH commission on mineral and thermal waters (CMTW), part 1, 58, 8:1627–1701.

Idris H. Annotated bibliography on mineral and thermal waters (ca. 1500 references).

Langguth R (ed) (1984) List of terms of hydrogeology, geochemistry and geothermal of mineral and thermal waters. IAH, International Contributions to Hydrogeology Vol. 3. Publ. H. Heyse, Hannover, 91 pp.

Risler J–J, Simmers I (eds) (1995) Hydrogeothermics. IAH. International Contributions to Hydrogeology. H. Heise, Hannover. 15:136.

Schmasssmann H (1985) Commission for mineral and thermal waters. Annual Report 1984. In: Jones GP (ed) IAH Bulletin 1983–1985, 23:63–66. Publ. H. Heise, Hannover.

Schmasssmann H (1985) Commission for mineral and thermal waters. Annual Report 1983. In: Jones GP (ed) IAH Bulletin 1983–1985, 23:61–62. Publ. H. Heyse, Hannover.

Schmasssmann K (1979) Report on activities of IAH commission for mineral and thermal waters. Memoirs of the IAH Congress in Vilnius (Lithuanian SSR), part 2, pp. 83–84.

CMTW reports are mostly presented in the form of “Internal Communications (IC)” initiated by CMTW Secretary Boudevijn Zuurdeeg (volumes 1–13) and continued by his successor Kurt v. Storch (volumes 14–15). They concern particular Commission meetings, and contain the following: a list of participating CMTW members, main discussion items, important decisions made during the meetings, papers presented (often enclosed), and descriptions of sites visited during field trips, etc. Volumes prepared by Zuurdeeg often contain “literary”, humorous descriptions of places visited and events experienced. As bound photocopied typescripts, with black and white

illustrations, about 20 copies of IC from each meeting were made for the use of CMTW members and IAH authorities. Notwithstanding their modest aspect, the content is in most cases highly informative and instructive. As particular volumes are not readily accessible, the following lists selected scientific and reference papers contained within the ICs.

Vol. 1. Internal Communications 1985. CMTW Meeting No 14, Albena, Bulgaria: Schmasssmann H (1984) CMTW Annual report; Verdeil P (1980) Rapport sur les conditions d’apparition des appellations: Eaux thermales, Eaux medicinales, Eaux minerales dans l’histoire du thermalisme et les legislations qui les codifient (28 p); Verdeil P (1985) Les eaux minerales, thermales, thermominerales dans le cadre de la tectonique globale: I. implications geologiques et geochimiques (40 pp); Verdeil P, Issaadi A (1985) Le thermalisme de l’Ouest Algerien dans le cadre de la tectonique globale (13 pp); Verdeil P, Lacas JL (1985) Contribution a l’etude du thermalisme du littoral Oranais (13 pp); CMTW (1958) Common hydrogeological principles for mineral and thermal water protection (16 pp).

Vol. 2. Internal Communication 1986. CMTW Meeting No 15, Appingedem/Nieuveschans, The Netherlands: Schmasssmann H (1985) CMTW annual report (1 p); Verdeil P Les eaux minerales, thermales, thermominerales dans le cadre de la tectonique globale. II. Le cadre structural du thermalisme (52 pp); Zuurdeeg B (1986) Preliminary definitions of mineral, thermal and medicinal waters (2 pp); Schmasssmann H (1986) Propositions de termes (11 pp); Franko O (1986) Principles of protection of mineral and thermal waters in various hydrogeologic structures (11 pp); Zuurdeeg B, Coenegracht Y (1986) Genesis of the mineral water of Nieuveschans; Zuurdeeg B (1986) The mineral water tradition in The Netherlands; a preliminary study (10 pp); CMTW (1986) List of catalogues on mineral and thermal waters analyses.

Vol. 3. Internal Communications 1987. CMTW Meeting No 16, Bad Driburg, Federal Republic of Germany (201 pp): Dowgiałło J. (1986) CMTW Annual report (4 pp); Dowgiałło J (1987) Preliminary proposal concerning the implementation of the item “Hydrogeothermics”—comments by Bath A, Franko O, Shterev K, Shpak A (15 pp); Fricke K, Fricke M (1987) Proposal for a project on carbon dioxide—comments by Shterev K (4 pp); Schoeller H (1987) L’environnement du gaz carbonique du Massif Central francais (3 pp); Franko O, Vylita B (1987) Guideline for protection of mineral and thermal waters (19 pp); Verdeil P (1987) Donnees nouvelles sur le cadre structural du thermalisme et ses implications geochimiques (24 pp); Idris H (1987) Thermal and chemical characteristics of groundwater from the Nubian Sandstone aquifers in Egypt (33 pp); d’Arcy D, Desoignies J, Risler J (1975) Documentation sur le thermalisme et les eaux minerales en

France (2 pp); Burdon D (1987) Definitions of mineral, thermal and medicinal waters (2 pp); Anger H (1987) Prospecting for mineral water without polluting the groundwater (6 pp); Michel G (1974) Die Kuranstalt Inselbad bei Paderborn—ein vergangenes und vergessenes Heilbad (9 pp); Geyh A, Michel G (1979) Hydrochemische und isotopephysikalische Entwicklung des Grundwassers im Paderborner Aquifer (15 pp); Michel G (1984) Die Paderquellen und ihr Einzugsgebiet (11 pp); Dowgiało J (1987) Hydrogeothermics—selected references 1979–1987 (21 pp); Burdon D (1987) Annotated bibliography of the warm springs of Ireland (14 pp).

Vol. 4. Internal Communications 1988. CMTW Meeting No 17, Łądek Zdrój, Poland: Dowgiało J (1988) CMTW annual report for 1987 (2 pp); Rosenthal E (1988) Study group on Ca–Mg–Cl brines: report of activities (5 pp); Fricke K., Fricke M. Annotations sur la genese du gaz carbonique, CO₂ (19 pp); Leśniak P (1988) Selected bibliography on CO₂ deposits and CO₂-containing waters in Poland (3 pp); Dowgiało J (1988) Revised proposal concerning the implementation of the project “Hydrogeothermics” (4 pp); Idris H (1988) A contribution to the hydrogeothermics of the Western Desert Nubian System in Egypt (19 pp); Risler J (1988) Hydrogeothermics—French chapter (11 pp); Korim K (1988) A general review of the low-enthalpy geothermal resources and their utilization in Hungary (11 pp); Dowgiało J (1988) Hydrogeothermics, Poland—a preliminary outline (21 pp); Franko O (1988) Geothermal maps of the world (13 pp); Shahbeig A (1987) Map of mineral and thermal waters of Iran, Azerbaidjan Region, textual part (13 pp); Dowgiało J (1987) A supposed geothermal anomaly in the Duszynki-Kudowa area, Polish Western Sudetes (11 pp); Fistic J (1977) Acidulous springs of the Kłodzko Basin and Bystrzyckie Mts (8 pp); Dowgiało J (1978) Mineral and thermal waters of the Sudetes against the geological background (7 pp); Ciężkowki W. (1978) Hydrochemical types of fissure waters at Łądek (7 pp); Leśniak P (1978) Some ionic equilibria of Sudetic thermal waters (6 pp).

Vol. 5. Internal Communications 1989. CMTW Meeting No 18, Clermont-Ferrand, France: Risler J (1980) Signification structurale des emergences d’eaux thermominerales dans le secteur de Royat, Chamalieres et Clermont Ferrand (5 pp); Decros P (1963) Etude des eaux minerales dans la region de la region de Saint-Yorre dans le Bassin de Vichy (18 pp); Batard F et al. (1988) La province hydrominerales des eaux carbogazeuses d’Auvergne (13 pp); Batard F et al. (1979) Les gaz rares, une caracteristique des sources thermominerales du nord du Massif Central francais (5 pp); Batard F, Billet C, Risler J (1979) Prospection de CO₂ d’origine profonde dans le Massif Central francais (7 pp); Batard F et al. (1980) Determination de l’origine du carbone par etude isotopique du systeme CO₂-HCO₃ dans

les sources thermonerales du Massif Central francais (4 pp); Derycke F (1989) Les puits geothermiques belges—perspectives d’utilization (4 pp); Bouckaert B (1988) Energie geothermique en Belgique (4 pp); Fan L, Vandenberghe N (1989) Geothermal demonstration activities in Belgium (6 pp); Franko O, Kral M (1989) Hydrogeothermics of Czechoslovakia (20 pp); Idris H (1989) A contribution to the hydrogeothermics of groundwater systems in Egypt (14 pp); Korim K (1989) Reservoir geology and problems of thermal water exploitation in Hungary (4 pp); Liebe P (1989) Thermal karst systems in Hungary: exploration and problems thereof (7 pp); Rosenthal E (1989) The hydrogeothermal provinces of Israel (21 pp); Vylita B (1989) Occurrence of CO₂ in Czechoslovakia: A Bohemian Massif (7 pp); Schoeller M (1989) Une methode de determination de l’origine du CO₂ par la voie hydrogeochimique (8 pp); Shahbeig A (1989) Mineral and thermal waters around the Damavand Mt. (20 pp).

Vol. 6. Internal Communications 1990. CMTW Meeting No 19, Egypt: Idris H (1990) Possibility of recharging the uppermost horizon of the Western Desert Nubian Aquifer (22 pp); Baerton K (1990) Geothermal resources in Ireland: preliminary notes (20 pp); Gosk E (1982) Geothermal resources assessment (4 pp); Rosenthal E (1988) CMTW Study Group on Ca–Na–Cl brines: report of activities (5 pp).

Vol. 7. Internal Communications 1991. CMTW Meeting No 20, Kfar Shmaryahu, Israel: Ilani S et al. (1988) Epigenetic dolomitization and iron mineralization along faults and their possible relation to the peolehydrogeology of southern Israel (12 pp); Vengosh A (1991) The brines of Israel (7 pp); Lahermo P (1990) Application of regional geochemical maps in environmental studies (6 pp); Risler J (1991) Contribution of radon gas analyses in soils to the capture of thermomineral waters (25 pp); Franko O (1991) Method of compilation of geothermal map of Czechoslovakia 1:1500000 (15 pp); Franko O, Bodish D (1989) Paleohydrogeology of mineral waters of the inner west Carpathians (11 pp); Franko O et al. (1990) Outline of geothermal activity in Czechoslovakia (10 pp); Shterev K, Penev I (1991) Overview of geo-thermal resources and activities in Bulgaria (5 pp); Shahbeig A (1989) Map of mineral and thermal waters of Iran (25 pp).

Vol. 8. Internal Communications 1992. CMTW Meeting No 21, Arkansas Hot Springs, US: Bedinger M et al. (1979) The waters of Hot Springs National Park, Arkansas—their nature and origin (20 pp) Portugal Ferreira M (1991) Thermal and mineral waters of Portugal (8 pp); Rybach L (1992) Hydrogeothermics of Switzerland with special emphasis on the geothermal potential of the Swiss Molasse Basin (6 pp); Laing A (1992) Mineral water in Australia and its development (15 pp).

Vol. 9. Internal Communications 1993. CMTW Meeting No 22, Sao Pedro do Sul, Portugal: Rybach L (1993) Thermal waters in deep Alpine tunnels (5 pp); Canto Machado M (1993) Portuguese mineral and thermal waters: main chemical characteristics (10 pp); Korim K, Liebe P (1992) Producing history of the low-enthalpy thermal water in the Szentes geothermal field (8 pp); Aires Barros L et al. (1993) Elemental and isotopic geochemistry in the hydrothermal area of Chaves-Vila Pouca de Aguiar (9 pp); Zuurdeeg B et al. (1993) Hydrochemical survey of the schist-granite complex east of Vila Pouca de Aguiar, N Portugal (13 pp); Eggenkamp H (1994) Delta ^{37}Cl : the geochemistry of chlorine isotopes: example from N Portugal (2 pp); Portugal Ferreira M (1993) Thermal and mineral waters: the case of Central Portugal (21 pp); de Andrade Afonso A (1993) Geophysical methods in the evaluation of geothermal resources: Application to Chaves (Portugal) geothermal field (13 pp); Ferreira Morais M (1993) The Sangemil Spa and the Dao fault system (9 pp); Carvalho J. (1993) Mineral water exploration and exploitation at the Portuguese Hercynian Massif (8 pp); Kellaway G (1993) The hot springs of Bath and Bristol (7 pp); Almeida C, Calado C (1993) Chemical components of deep origin in sulphide waters of the Portuguese sector of the Hesperian Massif (9 pp); Calado C (1993) Aguas sulfureas alcalinas e gasocarbonicas na Peninsula Iberica: distribuicao e control geotectonico (6 pp); Shterev K (1993) Mineral waters and hydrothermal provinces on the Balkan Peninsula and the adjacent regions (21 pp); Lesmo R, Sommaruga C (1989) Deposition of solids from salt waters and brines in the Italian geothermal systems (6 pp).

Vol. 10. Internal Communications 1994. CMTW Meeting No 23, Bojnice Spa, Slovakia: Melioris L (1994) Estimation of optimum mineral water utilization in Santovka (4 pp); Hyankova K (1993) The unusual chemism of mineral waters at Dudince (9 pp); Vylita B, Vylita T (1994) New mineral water structure in West Bohemia, Czech Republic (4 pp); Fricke M (1993) Natural mineral waters, curative-medicinal waters and their protection (10 pp); Zuurdeeg B (1994) Mineral and thermal waters in the NW-part of the Pannonian Basin (5 pp); Lorberer-Szentesz et al. (1994) Hydrogeological research of karstic aquifers in Hungary (16 pp); Ravnik D et al. (1994) Geological structures: resources of mineral and thermal waters in Slovenia (6 pp); Kralj P et al. (1994) Present status of geothermal energy exploration and exploitation in Slovenia (7 pp); Langguth R, Pommerening J (1994) Untersuchungen zur natuerlichen Hydrodynamik einer Thermalquelle in Aachen/Deutschland (5 pp); Goldbrunner J (1994) Geologische und hydrogeologische Ergebnisse der Tiefen Grundwasser-Erchiessungen in oberoesterreichischen Molassebecken und im Steirischen Becken, Oesterreich (10 pp).

Vol. 11 Internal Communications 1995. CMTW Meeting No 24, Dax, France: Pouchan P et al. (1995) Hydrothermalism of Foreland Pyrenean Mts.: Dax—a typical example (7 pp); Ohayon-Courtes C (1995) Les eaux sulfurees: problematique generale (7 pp); Zuurdeeg B et al. (1995) Behaviour of CO_2 in the subsurface: consequences for CO_2 disposal (7 pp); Laing A (1995) Carbon dioxide and sodium bicarbonate in Australia (11 pp); Korim K, Lorberer A (1995) Hydrogeological characteristics of the Devonian thermal water reservoir of Sarvar-Rabasoemien and Buk Spa (34 pp); Rosenthal E (1955) True and false geochemical signals indicating the presence of CaCl_2 brines (4 pp); Schoeller M (1955) Le problem de l'origine des sulfures presents dans les eaux thermominerales situees dans la zone axiale des Pyrenees, France (2 pp); Verdeil P (1955) Le couplage electromagnetique ionosphere-manteau: role des flux de protons et d'ions positifs en geologie dynamique interne (9 pp); Herch A, Langguth R (1994) Ressource et classification des eaux minerales et thermales en Allemagne (8 pp); Dowgiało J (1955) Rethinking the role and activities of IAH-CMTW: Introduction to discussion (3 pp); Langguth R (1987) History of the CMTW as per 12.10.1987 (8 pp); Dazy J et al. (1995?) Donnees nouvelles sur quelques sources carbogazeuses du Sud-Est de la France: Ardeche, Drome, Isere (16 pp).

Vol. 12. Internal Communications 1996. CMTW Meeting No 25, Espoo (Otaniemi), Finland: Rybach L (1996) Active heat and mass transfer in Hercynian basement (4 pp); Melioris M (1996) Trace and side elements in mineral waters of Slovakia (8 pp); Melioris L (1996) Mineral waters of high High Tatras and Western Tatras (11 pp); Marcin D (1996) Hydrogeological structure of mineral waters in Cigelka, Outer Flysch Belt of NE Slovakia (11 pp); Vylita T, Vylita B (1996) Contemporary problems of prospective protection of Karlsbad (Czech Republic) thermal water structure (4 pp); Franko O (1996) Compilation of Geothermal Atlas in Slovakia (4 pp); Franko O (1995) Geothermal energy exploration in Slovakia (6 pp); Korim K, Lorberer A (1996) Hydrogeologic patterns of regional thermal water occurrences in the Little Hungarian Plain and possibilities of their further development (12 pp).

Vol. 13. Internal Communications 1997. CMTW Meeting No 26, Bath, United Kingdom: Kellaway G (1997) Bath Spa: a world heritage site (16 pp); Korim K, Lorberer A (1997) Hydrogeological characteristics of the “Buda Thermal Line”, Budapest (25 pp); Marcin D (1997) Hydrogeological structures of mineral waters in the Smilno tectonic window, Paleogene flysch of NE Slovakia; Laing A (1997) Further carbon dioxide studies (13 pp); Herch A (1997) Untersuchungen zur hydrogeochemischen Charakteristik der Spurenelemente und Schwefelspezies im Aachener Thermalwasser (30 pp); Cuchi J et al. (1997)

Overview on the hydrogeothermics in Spain (11 pp); Issaadi A, Bouchareb-Haouchine F (1997) Estimation du flux de chaleur en Algérie du Nord à partir de la thermométrie silice (12 pp); Shahbeig A (1997) Polluting agents of the underground water resources of Shiraz area (13 pp); Michel G (1997) Karl Fricke, 1915–1990 (12 pp).

Vol. 14. Internal Communications 2001. CMTW Meeting No 30, Sestrieck and Sankt Petersburg, RUS: Voronov A (2001) Mineral and thermal water resources of platform artesian basins of Russia (3 pp); Vinograd N (2001) Mineral medical and industrially valuable water of Leningrad Artesian Basin (4 pp); Dowgiałło J (2001) The Sudetic Geothermal Region of Poland (15 pp); Kralj P, Hydrogeochemistry of mineral and thermal waters in Slovenia (8 pp); Porowski A (2001) On the origin of mineralized waters in flysch formation of the Central Carpathian Synclinorium (9 pp); Shterev K (2001) Mineral waters and hydrogeothermal resources in Bulgaria (7 pp); Kralj P (2001) Upper Pliocene hydrogeothermal activity at Grad, Northwestern Slovenia, evidenced by authigenic mineralization (6 pp); Carella R (2001) Examples of complementary uses of spa resources in Italy: Abano Terme and Bagno di Romagna (7 pp); Bruck P (2001) Geothermal research in Ireland (15 pp).

Vol. 15. Internal Communications 2002. CMTW Meeting No 31, Terme Olimia/Podcertrek, Slovenia: Kralj P (2002) Geology of the Kozjansko area (4 pp); Dowgiałło J (2002) Therapeutic waters in the Polish geological and mining law (5 pp); Vinograd N (2002) Formation of mineral and thermal waters of some artesian basins in Russia (10 pp); Shterev K (2002) Mineral waters and geothermal resources of Sofia Graben basin, Bulgaria (2 pp); Babayev A, Ibragimova I (2002) Structural-tectonic features of accommodation deposits of mineral waters of Azerbaijan and way of their complex development (4 pp); Voronov A (2002) Radon-rich waters in Russia (7 pp); Fricke M (2002) Investigations of an old and deep curative water well, St. Martinus Quelle, Bad Lippspringe (13 pp); Lorberer A (2002) Hydrogeological characteristics of thermal water-bearing Plio-Pleistocene basin sediments in Hungary (25 pp); Porowski A (2002) Isotopic evidence of the origin of mineralized water from the Central Carpathian Synclinorium (12 pp); Marcin D (2002) Hydrogeological structures in Sharishski Shtiavnik and Radoma (9 pp); Shugg A, Brumley J (2002) Environmental, hydrogeological and economic conflict as elements determining the long term

viable development of carbonated mineral waters of Hepburn, Victoria (17 pp); Shugg A, Knight M (2002) Hydrogeology of the mineral springs of Central Victoria (9 pp); Franko O (2002) Local meteoric water line of mineral and thermal waters in Slovakia (9 pp); Issaadi A (2002) Les eaux minérales et thermales liées au bassin sédimentaire de la Mitidja, Algérie (11 pp).

Conclusions

Although output of the CMTW over its 44-year history has been modest, a number of proposed projects have been initiated and are in various phases of completion. The methodology of establishing mineral and thermal water (MTW) maps has been developed and requires application in broad practice; the international glossary on MTW exploration, exploitation and protection has been prepared in draft form and requires updating prior to being published as a book; the international comparative analysis of regulations concerning MTW has been proposed and requires establishment of a committee to follow up on the project. The launch of its new website: <http://www.cmtw.c0.pl> will allow CMTW to report on its working groups and its challenging projects that are now in the works.

The CMTW has not been asked as a group to provide advice concerning exploration for or management of MTW hydrogeological systems; however, many members of the Commission have provided advice on an individual basis. It is hoped that as interest in MTW becomes more widespread, the Commission as a whole can be called upon for its collective expertise. Some other ways that the CMTW interacts with the public includes organizing its meetings in various countries like other IAH Commissions. These meetings are attended not only by CMTW members, but also by local specialists who take the opportunity to learn something about new trends in the sciences (mainly hydrogeology) concerning MTW. The exchange of experience is one of the greatest advantages of such events.

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