Lithology 95

in the lake), while maximum was at ca. 5900–5600 cal BP (Goslar, Chapter 6).

This correlates with the beginning of accumulation of sands and wood on the alluvial fans. The increases in the content of Fe_2O_3 in the deposits, which occurred after these episodes, document periodic stability and much lower contribution of the water of the aeration zone to the lake. The rapid decrease in the content of $CaCO_3$ in the sediments around AD 1130 coincides with the period of intensified human impact. Later during the "Little Ice Age" (16–19th century) the reduction in the amount of $CaCO_3$ was slower, and simultaneously the accumulation of Fe_2O_3 in the bottom sediments of Lake Gościąż increased.

REFERENCES

- Anthony R. S. 1977. Iron-rich rhytmical laminated sediments in Lake of Clouds, N-W Minnesota. *Limnology and Oceanography* 22: 45– 54.
- Demske D. 1993. Preliminary results of investigations on the development of the shore vegetation of Lake Gościąż based on pollen analysis of profile GTO 1/89 from an adjacent mire. *Polish Botanical Studies, Guidebook Series* 8: 93–104 (in Polish with English summary).
- Demske D. 1995. Development of the local environment at Lake Gościąż (central Poland) during Late Vistulian and Holocene: vegetation, hydrological changes and influence of man. Ph. D. Thesis, W. Szafer Institute of Botany, Polish Academy of Sciences, Cracow.
- Goslar T. 1993. The varve chronology of the late glacial and early Holocene parts of laminated sediments of Lake Gościąż. *Polish Botanical Studies, Guidebook Series* 8: 145–155 (in Polish with English summary).
- Olsson I. 1986. Radiometric methods. In: B. Berglund (ed.), Handbook

- of Holocene Palaeoecology and Palaeohydrology, pp. 273–312. Wiley & Sons, Chichester.
- Pazdur A., Fontugne M. R., Goslar T. & Pazdur M. F. 1994a. Late glacial and Holocene water-level changes of the Gościąż Lake, central Poland, derived from carbon isotope studies of laminated sediment. *Quaternary Science Reviews* 14: 125–135.
- Pazdur A., Pazdur M. F., Goslar T., Wicik B. & Arnold M. 1994b. Radiocarbon chronology of Late Glacial and Holocene sedimentation and water-level changes in the area of the Gościąż Lake basin. *Radiocarbon* 36: 187–202.
- Pazdur A., Pazdur M. F., Wicik B. & Więckowski K. 1987. Radiocarbon chronology of annually laminated sediments from the Gościąż. Bulletin of Polish Academy of Sciences, Earth Sciences 35: 135–145.
- Ralska-Jasiewiczowa M., Wicik B. & Więckowski K. 1987. Lake Gościąż – a site of annually laminated sediments covering 12000 years. Bulletin of Polish Academy of Sciences, Earth Sciences 35: 127–137.
- Starkel L., Pazdur A., Pazdur M. F., Wicik B. & Więckowski K. 1996. Lake-level and groundwater-level changes in the Lake Gościąż area, Poland: palaeoclimatic implications. *The Holocene* 6(2): 213– 224.
- Wicik B. 1993. Some chemical properties of waters and sediments of the "Na Jazach" lake complex in the Płock Basin. *Polish Botanical Studies*, *Guidebook Series* 8: 93–104 (in Polish with English summary).
- Wicik B. & Więckowski K. 1991. Sediments of the "Na Jazach" Lakes in the Plock Valley conditions of their accumulation and their role in reconstruction and forecasting of transformations of the natural environment. *Przegląd Geograficzny* 63(1–2): 57–76 (in Polish with English summary).
- Więckowski K. 1978. Bottom deposits in lakes of different regions of Poland – their characteristic, thicknesses and rates of accumulation. Polskie Archiwum Hydrobiologii 25: 483–489.
- Więckowski K. 1993. The up-to-date state of recognition of bottom sediments in the "Na Jazach" lakes according to their macroscopic features. *Polish Botanical Studies, Guidebook Series* 8: 77–92 (in Polish with English summary).