ACTA PALAEONTOLOGICA POLONICA

Vol. 40, No. 4, pp. 427–428, Warszawa, 1995

Book review

JAN KOTEJA

Poinar, G. & Poinar, R. 1994. *The Quest for Life in Amber*, 219 pp. Addison-Wesley Publishing Company (series of Helix Books); Reading, Massachusetts.

Roberta Poinar is an expert in electron microscope techniques, George Poinar in all-biological sciences, including paleoentomology, and has published ca. 300 papers, books, articles and short stories; both were affiliated with the University of California, Berkeley.

The book is edited in a fine soft prewar style, with a couple of excellent colour photographs of amber inclusions; it includes 24 chapters, a bibliographic synopsis and index. Written for the 'general public, especially for young people' (G. Poinar), it presents the results of investigations already published in scientific periodicals.

Here arises the first question: is it reasonable to review and discuss a 'popular' book in a scientific journal? Traditionally we distinguish between 'original papers' and 'popular' articles or books; and quite rightly so, but there is no difference between original and common knowledge. This should be told not only to young people, but also (and particularly) to distinguished university professors. From *The Quest* Roberta and George Poinars appear to be devoted researchers and ... ordinary people (look at the pictures on p. 160 and 169). Do you suppose a professor, an amber specialist, would inform the public that he had bought for many hundred dollars 'amber' lumps which appeared to be... plastic, in the laboratory?

From *The Quest* you may learn how easy research and science are. It is enough to ask questions (certainly — correct questions) in due time. Anybody may ask scientific questions, not only professionals.

However, research, particularly of fossils, is really difficult because of the resistance and malice of 'inert matter'. The history of Poinars' studies on amber, inclusions, and fossil DNA could be used to corroborate Murphy's law — 'if anything can go wrong, it will'. Again, young students and advanced researchers working in well-equipped laboratories may wonder, reading *The Quest*, how often success in science depends on simple technical and incidental details.

Correct question is half of scientific success, the second one is ... the coworker. The Poinars many times emphasized this truth in their book: to find a proper and skilled specialist cooperator! Each chapter tells us about people who contributed to the success in solving the question of life in amber; thus the book may be considered as an extended acknowledgement. Again a surprise: a 'coworker' does not necessarily mean a researcher of another scientific laboratory; people met incidentally anywhere on the market in Africa or New Zealand also may be contributors. But first of all, do you suppose it would be possible to work out the problem of DNA preserved in amber, if not for the cooperation of Roberta and George, and then their son Hendrik? To answer this question you should read the book.

What may be, and certainly is, popular in *The Quest* is action; we learn science *in statu nascendi*. Each chapter leads us to another part of our world, once to the museum in St. Petersburg, then to the Danish coast or Dominican tropics; to return, eventually, to Berkeley in California. Obviously, amber and its possible ancient DNA constitute only a minute proportion of each adventure; but this is true for science and research in general.

The chapters are arranged chronologically, from 1962 till 1993. So, each chapter brings us to different epochs, countries, problems, customs and, obviously, scientific questions; but also different styles of writing. Sometimes it reminds us of a schoolbook or doctoral dissertation, sometimes a newspaper report, talk among researches, a crime story, philosophical meditation or romantic poetry: 'This had been dinosaur country 70 to 80 million years ago... here and there, scattered among the pieces of coal, lay bone and tendon fragments of large duck-billed dinosaurs that had fed on the vegetation comprising the subtropical-tropical forest that existed back then. I stood up and looked at the area now, wondering when the dark, rain-filled clouds overhead would begin to release their moisture. The tall silken stems of spear grass moved en masse like ocean waves under the winds that caressed the rounded hills. Their soft whisper was the music of this prairie...'

The main idea of the book is contained in its title. However, the quest is not a broad route leading directly to the successful end. It resembles rather a winding, sometimes vague, very narrow, dangerous and risky path — both for research and the researcher. It would be difficult to even list all the questions and problems, minute and crucial, touched on in the book, which have anything, or nothing, to do with the quest for life in amber. For example the bacteria: Can anybody be sure bacterial cultures reared from 'amber spores' actually are ancient bacteria, since these creatures exist everywhere? Will it be possible to answer this question in the future?

Concerning the main question: Is it, or will it, be possible to re-create ancient organisms from DNA preserved in amber inclusions? Poinars' answer is: Not. First, because DNA recovered from fossils is damaged and fragments extracted from inclusions are too small to direct complete development of an organism. Then, it should be an 'embryonic' DNA. But, extracting many inclusions we may find more complete fragments (my suggestion; J.K.). In addition, the DNA experiments have just started.

However, the Poinars strongly emphasize the possible and presumable consequences of such experiments. We now know the danger associated with artificial spatial translocation of plant and animal species. Who can guess the results of translocation in time? Thus such experiments are associated with ethical problems.

Obviously, it does not mean studies on ancient DNA are purposeless. The Poinars indicate several advantages, among others the possibility of tracing phylogeny by means of comparing even small DNA fragments of extinct and today creatures.

Well, and what about fossil insects? They occur in each chapter of the book which is not a surprise, simply because organic inclusions are associated, in any case by the public, with a 'fly' in amber. And insects actually constitute the absolute majority of amber inclusions.

Jan Koteja, Katedra Zoologii i Ekologii, Akademia Rolnicza, al. Mickiewicza 24, 30-059 Kraków, Poland.