KOSMOS
PROBLEMY NAUK BIOLOGICZNYCH
Tom 51, 2002
Numer 2 (255)
Strony 125–126
Polskie Towarzystwo Przyrodników im. Kopernika

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WASTE HEAPS — THE BIOLOGIST'S LABORATORY

Once upon a time...

Prof. Krystyna Grodzińska and Dr. Grażyna Szarek-Łukaszewska begin their article like a fairy-tale. The first text in this issue of "KOSMOS" leads the Reader into the world of old waste heaps, antiquated mines, artifacts worthy of museums, and surprisingly interesting research in the field of natural sciences.

A waste heap?! What in the world can be interesting about a waste heap? a Reader might ask. We usually think of a waste heap as a dump, a dusty pile of dirt contaminating everything around it, a place where the local hoodlums gather, in other words, a generally unsavory place.

Reality, however, can be completely different. Waste heaps (more precisely, post-industrial and post-mining deposits) can be the site of fascinating studies of nature. All one has to do is find areas exploited by the mining and smelting industries over 100 years ago and voila! A research laboratory is waiting!

Like a detective, here one can deduce answers to questions about the way Nature has coped with waste heaps over the last 100 years. Postindustrial waste heaps are usually characterized by extremely difficult conditions. It is possible to see if, after dozens of years, any species have begun to establish themselves in such uninviting places. Are these organisms capable of reproducing? Have they adapted in any way? Are these adaptations only physiological or have genetic modifications taken place leading to the development of new ecotypes or varieties? How fast are these processes occurring?

All of these questions can be answered by studies conducted on waste heaps. These exceptional places make it possible to observe the adaptation of various organisms (through microevolution) to conditions of extreme pollution. They enable the identification of chemical compounds that are particularly toxic (this is how thallium contamination of the Olkusz area was discovered). And, finally, they permit conclusions to be drawn about how to reclaim waste heaps and other polluted sites most effectively.

In the longer time-scale, studies like these will open the doors to reflection. What will happen to our planet if we cover it with waste heaps? How much can Nature stand? Is it true that cockroaches will be the last to die out? And on and on...

The number of new waste heaps is unfortunately growing fast. If we are able to identify the direction in which natural processes are going, we may be able to intensify and accelerate them. This is the best way to reclaim new waste heaps.

Up to now we have posed many fascinating questions, but answers to them still require more study.

This issue of "KOSMOS" presents the results of the work of specialists from various fields. Waste heaps are their main object of interest, but there is also an article about the

"concrete jungle" — where life is difficult (as every one of its inhabitants knows). We present the results of studies conducted (and continued) by specialists from various areas: zoologists, botanists, ecologists, physiologists, mycologists, specialists dealing with algae and with flowers.

An interdisciplinary meeting of specialists (the so-called waste-heap group) in fact did take place. We met for the first time on June 2, 2001 at the University of Warsaw's Faculty of Biology. A month later the session was continued in the field. We went on a "tour" of zinc-lead waste heaps, which are particularly toxic. They can be found in Upper and Lower Silesia. For a whole day we looked at various types of "biological deserts". This was no doubt a tour of the ugliest places in Poland. But this trip also showed us how much there is still to be done in this field in Poland. The tour was ironically dubbed "Under the Smokestacks".

The initiators and organizers of both of these meetings were the Warsaw and Silesian Branches of the Polish Botanical Society. The pictures of the waste heaps in the Katowice area shown in this issue were taken during the field session.

This year the waste-heap group is planning to meet again. We want to close ranks to bring together all of the research being done in this field in Poland with the aim of uncovering and understanding the laws of nature even better and using them more effectively in practice to save the increasingly polluted environment. Activities like these are very important at the local level since they are closely connected with the flora and fauna of a given country and region and its prevailing climatic conditions.