APPLICATION OF THE COMPUTER SEARCHING SYSTEM "SOIL-RAILWAY" IN PRACTICE OF THE RAILWAY POLICE

George OMELYANYUK, Aleksey ALEKSEEV

Forensic Science Centre, Ministry of Internal Affairs of Russia, Moscow, Russia

ABSTRACT: Computer searching system "SOIL-RAILWAY" with appropriate data bases is intended for definition of territory of the railway station on which the criminal penetration of the people in the train took place. The application of similar date bases for a solution of other problems will allow to speed up searching of sites from which sampled soil materials from the place of crime originate.

KEY WORDS: Computer searching system; Thefts of cargoes; Railway; Oil materials.

Problems of Forensic Sciences, vol. XLVII, 2001, 17–19
Received 21 May 2001; accepted 15 September 2001

The majority of crimes on railway are thefts of cargoes from the rolling-stock. Disclosure of crimes of this category extremely low. The fact of theft, as a rule, registered far from a place were it took place and the place of a crime remains unknown, that hampers investigation.

At a survey of a place of crime frequently soil materials found, which formation is related to the event and place of theft. These materials are sampled seldom and the effectiveness of this research is small because of a lack of the soil examination experts in the railway police [1].

For determination of places of thefts from the rolling-stock, it is necessary to create the computer searching system with appropriate data bases. Our information searching system "SOIL-RAILWAY" is intended for definition of territory of the railway station on which the penetration of the people in the train took place [2, 3].

The principle of the system is searching for coincidences or greatest likeness of properties and composition of soil material with analogue in a data base. In an outcome of work of the program the file a data base containing recommended list of railway stations satisfying to a condition of searching is formed.

The system is based on the fact that the railway consists of parts, each being characterised by specific combination of properties of soils. The proper-

ties are: morphological properties, element, texture, mineralogical, pollen, microbiological structure and also magnetic properties.

The basic information properties are: the quantitative element structure (Si, Al, Fe, Mn, Ca, K, Ti, Zn, Cu, Ni, Cr), magnetic properties and the ratio of minerals (quartz, feldspars, micas et al.). The are determined by standard techniques of X-ray fluorescence analysis, magnetic measurements and microscopy methods. These can be detected in soils from each concrete site of district, properties then processed with the help of mathematical methods and used for creation of a data base. The sample from the place of crime is analysed following the same scheme, the data are transferred to the searching system and compared with data base.

Now data base of the computer searching system "SOIL-RAILWAY" is used in practice of practice on the railway from Archangelsk to Yaroslavl. This railway is located in several natural zones, characterised by the different vegetation and soils and the contrast activity anthropogenic factors.

1858 soil samples from the territory near to 256 railway stations within 3 years were sampled. The are determined by standard techniques of analyses. Distinctions between stations on the soil properties complex are established.

The following example illustrates the possibilities of this computer system in the expert practice. In the Danilov station during parking a train two unknown persons penetrated in the rolling-stock, connected the post-baggage car chief, stolen the big sum of money from the safe. After the train arriving on the station Yaroslavl in 1.5 hours, criminals send from the car on the platform and have disappeared. The important search information is received as a result of examination. The soil materials sampled during the survey of a train, have a general source of the origin with two soils samples selected on the path along the railway, and have not a general source of the origin with others 28 samples from the data base selected at the Danilov station.

The results of examinations testify that area of the application of the computer searching system "SOIL-RAILWAY" should not be limit by establishment of places of thefts from the rolling-stock on a railway. In railway police this system can be used for the disclosure of all crime categories, including crimes against the person.

The application of similar date bases for a solution of other problems will allow to speed up searching of sites from which sampled soil materials from the place of crime originate.

References:

1. Alekseev A. A., Astapovitch G. P., Ojegov K. S. [et al.], Soil criminalistic investigation on criminal cases of thefts from trains: The methodical recommendations, Forensic Science Centre, Moscow 1996.
2. Alekseev A. A., Omelyanyuk G. G., Mataruev A. N., The use of computer searching system "SOIL-RAILWAY" for determination of places of thefts from trains, The proceedings of Conference "The use of a modern criminalistic methods and special knowledge in crime control", Saratov 1997.
3. Omelyanyuk G. G., Alekseev A. A., The determination of places of thefts from the rolling-stock on railway, The proceedings of Conference "Informatization of forensic systems", Moscow 1998.