

Revolution in forensic science

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In Estonia and the United States, work has been going on for years on a device called NarTest, which is set to truly revolutionize forensic science, primarily in the USA, but also elsewhere. In the past, when US police discovered drugs somewhere, weeks or even a whole year could go by while they waited for analyses from a narcotics lab. This used to slow down criminal investigations and, often, instead of being prosecuted, drug-dealers had to be released from custody.

The laptop-sized NarTest NTX2000 is an easily portable mini-lab, which makes it possible to identify cocaine, heroin, marijuana and amphetamines in the field within a few minutes. A three-dimensional profile of the substance being analysed is constructed using the fluorescence method, which the computer then compares to the profiles of well-known narcotics.

The main financier of NarTest Technologies, Endel Siff, deems the potential of the device to be great. "It contributes greatly to the fight against drug dealing, which has an annual turnover of 600 billion dollars worldwide. NarTest makes it possible to control trade routes; it can be used in police cars, deserts and uninhabited border areas, where enormous amounts of drugs are on the move," Siff explains.

It is true that the technology of the device dates back a couple of decades, but new outlets and new energy have been given to it. Neivelt believes that NarTest has a real chance of being sold all over the world, because drugs are a universal problem.

The Estonian device on "CSI: Crime Scene Investigation"

NarTest is able to detect illegal substances even in compounds where the share of drugs is just one per cent. The result is fast and reliable, making it possible for dealers and drug-addicts to be taken into custody on the street and to

The days of drug dealers are over, as the identification of narcotics has become a piece of cake, announces the US company NarTest Technologies. The company is led by Estonian scientists Sergei Babitšenko and Larissa Porõvkina and is co-financed by well-known Estonian businessmen Endel Siff and Indrek Neivelt. All four are shareholders in the company.

be prosecuted quickly on the basis of convincing evidence. There is much talk in the USA about this new worry for drugs barons. Millions of Americans learned about NarTest last January through the hit TV series CSI, which is viewed by half a billion people around the world. In one episode, NarTest plays an essential role in helping Brass and Catherine to solve the murders of a politician who was involved in drug prevention and a woman who took an overdose. For example NarTest helps to determine that the substances found on the different murder scenes derived from the same drug lot. Of course, the murderer is expertly caught in the end.

Within the last year and a half, NarTest has been tested in several laboratories and police departments in North Carolina. Men in uniform usually only say good things about it, noting that the device eases the enormous workload of the drug labs of state bureaus of investigation (SBIs).

To date, the Estonian company has provided about ten NarTest devices for testing or use. The first institution to buy the device was the High Point Police Department, which paid approximately 45,000 USD for the device a year ago. The price of one test is estimated to be five or six dollars.

Winning trust from the US Supreme Court

In April, the Police Department of Halifax County initiated a programme called TimeOut. As part of the programme, parents can bring in samples to the department, which are tested using NarTest in order to ascertain whether underage children are using illegal substances. The whole process is anonymous, so parents do not have to fear that the police will arrest their children.

The only downside is that the new technology still has to win trust. In the old days, a qualified chemist had to sign a

narcotics test, but even a person without such qualifications can work with NarTest. Consequently, it has been questioned whether the results are admissible in court.

Siff claims that a few hundred people have already been prosecuted in the USA with the help of NarTest. But, in order for the device to become used more generally, it is necessary to receive a relevant decision from the US Supreme Court recognizing the measurement results as appropriate evidence. This will take some time. However, investigators, judges and prosecutors agree that crime proceedings will become faster and more efficient.

Some compare NarTest results to DNA samples, which courts were also leery of in the early days, but which have become commonplace in contemporary crime prevention. Siff draws a parallel with the breathalyser – this too had to be recognised by the Supreme Court before the readings could be considered as evidence in prosecutions.

Although the main market for NarTest is in the USA, the device has also been tested elsewhere. For example, officials on the border of Bulgaria are already using it, and there have been tests carried out in Africa. Along with sales efforts, work is in progress to develop the device in cooperation with Estonian and American scientists and software specialists. Next there are plans to start taking rapid samples from saliva.

Five doctorates, eight masters' degrees

The most famous enterprise of Siff, Neivelt, Babitšenko and their business partners is the Laser Diagnostic Instruments (LDI) development centre, which this year was acknowledged by Enterprise Estonia for outstanding innovation. NarTest Technologies, with an office and laboratory in Morrisville, North Carolina, and Nartest International, which was recently registered in Estonia, are companies linked to LDI which mostly belong to LDI owners.

In Estonia, LDI is a company with great scientific potential, employing five people with PhDs and eight with MA degrees. "In our field, we are probably closer to the leading players in the world than anywhere else. NarTest is the result of the hard work of our great scientists, and similar technology can be used, for example, in the food- and chemical industries," says Indrek Neivelt.

US NarTest includes experts with American juridical backgrounds as small shareholders and company board members: for example, Wayne Baird, who more than a decade ago created the "ballistic identification system", the database which enables investigators to compare ammunition found on crime scenes.

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A LiDAR makes it possible to determine, from an airplane or a helicopter, the various substances in and the spread of environmental contamination.

LiDARs created by LDI have been used for environmental monitoring or research in Poland, Canada, Romania, Germany, Russia and, from next year, in Estonia



MIRACLE MACHINE: NarTest is made up of a shoe-box-sized appliance and a computer monitor, which receives the image of the profile of a substance being analysed using the fluorescence method.



Laser company LDI

Laser Diagnostic Instruments (LDI) creates and sells various applications based on the newest electrical-, optical- laser- and spectral technologies. Those applications are used in solving various tasks in the fields of the natural environment, agriculture, industry and biomedicine. LDI, with its subsidiaries, has issued licenses for the use of its technology in Canada, Russia, Holland and the United States to companies which produce and sell its applications in many countries worldwide.

On the basis of LDI product development and creation, various partners are bringing high-tech products onto the market. For example, LDI International in Canada is engaged in discovering oil fields on the basis of the license. LDI has sold an airborne LiDAR (Light Detection and Ranging System) model to Canada. The appliance, fitted onto an aircraft, was also successfully used in discovering oil pollution in Estonian waters and, therefore, one LiDAR will be sold to the Border Guard in the near future. As part of national procurement, a ship-borne LiDAR was sold to Romania.

In cooperation with scientists from the Tallinn University of Technology and with financing from Enterprise Estonia, LDI has developed a medical appliance called *Diamon*, which monitors dialysis. In addition the company has collaborated with Russian and Canadian medical scientists in developing a laser treatment appliance called *Maria* for the treatment of tuberculosis, gynaecological and skin diseases, wounds etc.

Together with the Food- and Fermentation Technology Development Centre, and again financed by Enterprise Estonia, work is ongoing on a project called "Drinking Water". This project is about quality control in the production and sales process of different beverages.