Future Developments and Challenges in Criminalistics as Part of Criminal Justice

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Abstract

Cryptocurrencies are designed as a secure form of financial transaction via the Internet. However, the development of information and communication technology has created new space for their misuse in criminal purposes, especially in the area of money laundering and terrorist financing. Bearing in mind the complexity in conducting financial transactions via the Internet, the paper in the first part deals with most important legal challenges regarding the misuse of cryptocurrencies through money laundering and terrorist financing. Furthermore, in the second part of the paper, the most relevant crime detection methods are considered. Finally, the practical challenges at the level of the protection of financial This study analysis the futuring theoretical and practical development possibilities of criminalistics – as universal factscience. It tries to sign the further tendencies of forensic sciences in the XXI. century as well. The author composes scientific fields where can be and need to real, intentional strengthening of recent criminalistical methods and writes about his future guessing, suggestions and challanges of criminalistics.

Keywords: *criminalistics, developmental suggestions, scentmap, brainreader, identification, FISH, mobile lab, digital data, technical improvements.*

I. Introduction about the concept of criminalistics

First of all it is useful to give a meaning to the subject of our thesis, criminalistics. In this field the literature appears unified, as can be read below in our explanation; criminalistics is the mostly practical (and in some cases) theoretical doctrine of criminal and general investigation, the part of criminal sciences, which opens up to creates the detection (and prevention) of crimes, and the means and modes of proof adopting in certain legislation across the world. Besides effective crime prevention as a by-product, the basic function of criminalistics is the detection and collection of the most and authentic evidence in order to get the final aim; a legal (criminal) impeachment – avoiding any miscarriages of justice.

In short, criminalistics is the science of the effective, professional, law enforcement, which serves to combat against crime and purposes to bring the delinquents to trial.

Our study attempts to label the stages of development corresponding with the tendencies of XXI century. We have drafted from the scientific fields, within which progress in forensic methods is expectable and necessary, and we resume our surmise, developmental suggestions or future challenges of criminalistics.

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II. The discovery of human scent

A) People believe as fact, due to the reality regarding actual experiments of natural science, that after a few years or decades, we can receive the answer to the main forensic question – "Who committed the crime?" – through the scent left behind by the perpetrator.

The detection of the perpetrator who fled the crime scene based on following their scent may be valuable – largely because it rarely succeeds – even more valuable is the scent connected to the crime, or the perpetrator that is attached by posterior identification.

Currently this special forensic field; the odorology knows only one "instrument" for the identification and detection of scents. It is known as a "biodetective", and is none other than the dog.

The source of many problems is the animal itself, because it has no moral or legal responsibility.

It cannot report about its methodology of identification, therefore the control of the signs cannot be positive and could cause false consequences. The "biodetective" can be wrong when you regard the technical practice of the applying countries (e.g. Belgium, South-Africa, Netherlands, Poland, Germany, Romania, Slovakia and France since 2003), just as was shown in Hungary as well[1].

The researches into miscarriages of justice and past cases show, as well, the danger of possibly incorrect consequences and failure.

We have to highlight – when examining our best research – that nowadays there are no responsible control-tests, so without these examinations you can only note the correspondence and the failure of the dog. We recommend, the possibility of a validity test, because we ourselves can create the test scent and complete the controlling scent-identification. Until a better method is created, whether it is an independent method of science or criminalistics, one stronger than the dog, then experts should control and improve this available method, discover its credibility value, and undertake widespread testing on individuals.

B) As a fact for a progress in the methodology of scent identification we need transparent, clear, verifiable examining methods and individuals who could be responsible for their results. It bases on a research result that we don't know yet and also could be honored by a prestigious international award (as the Nobel-prize for instance): and this result could be the description of the structure of the human scent. In other words the modelling of the molecular structure of human scent. Just as researchers are willing to make the human genome map complete, it could be also desired to create the „scentmap" about the internal components of the human scent.

What kind of advantages could we earn from inventing a „scentmap" about the internal components of the human scent?

We surely admit that in the criminalistics it could gain an important identification, which is typify only one individual („scentfingerprint");

We could describe the clear, plain ingredients of an individual's scentmap and could be understood by anyone;

By years becomes obvious that we can talk about permanance or variability (based on ages) in the case of human scent;

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[1] See more about it: Horváth, O. (2018), Kereső és azonosító kutyák kriminalisztikai alkalmazása. (Searching and identificating dogs in the criminalistcs.) Ph.D,-theses, Pécs, PTE ÁJK.

The experts of scent identification could perform his researches based on global standards (supervised, submitted by the Daubert-test as well);

The tests and results could be checked by controltests/controlresearchs;

The person expertised in scent identification also has responsibility (just like in case of the identification of fingerprints or DNA) and could be controlled in cross examination in the context of jurisdiction/administration of justice;

There will be a good chance, that the result will show or at least will be close to reality;

Could creat a result with strong validity, which could be used as evidence in the procedure and could reach its main aim, to avoid miscarriages of justice and to identify the actual perpetrators.

C) There are experiments to invent „fake noses" to apply in the health system, but these cannot solve the real problem, they just use them instead of the animals (dogs). A huge step could be the discovery of the scent's internal structure just as a material remain in the terms of criminalistics because it refers to the internal – unique structure. We know what is it made of, it's sources (continuously peeling epithelials from the surface of the skin, sweat, phlegm of sebaceous glad with various components of fat acid, but we don't know the components of it's mixture. Does it exist or not or is it possible to examine or describe it at all? The experts who do the main researches have to give us the answers to the previous questions. If the answer is no, then unfortunately we have to count on the irreplacable animals (as dogs, pigs, wasps, rats, mice) or the „fake noses" which replace the below mentioned animals for a long term.

III. Monoscanner („brainreader") instead of polygraph

A) The polygraph in the investigation (as an orienting part) and in the control of the detecting versions is similar to the dogs' scent identification, which is usually called as „lie examiner" or „truth examiner" by others. The way it works is when an individual says a not true statement there will be physiological mutations, so the potential perpetrators could be spotted and mapped. Also in some cases with the right tactical questioning we could get to answer one of the seven main questions of criminalistics. (Questions as where could we find the stolen object, the instrument of the perpetration for instance.)

Essentially and in general we have the knowledge that the examined individual did not tell the truth to one of the questions. However the method does not give any explanations about the reasons. Thus the result could and will be deformed, because there are a ton of irrespective (or coherent) reasons from the felony, why the questioned person did not tell the truth. (Previous personal positive or negative experiences, other individuals or in order to cover another feasance for instance.)

B) With this end in view our theoretical model has two main aims:

B/1. Spot and cut out the unknown deformations.

B/2. Collect appraisable data and information for criminalistics.

It will serve both, if we will not test the physiological phenomena by the individual who's under prosecution, then the memories and real thoughts that appears in the brain. So a body polygraph is less useful, than a „monoreader", a scanner totally focused on the brain. Only with the permission of the person who's under procedure and in an no-secret procedure –just like in the case of the polygraph – the authorities would have the chance to resort experts to read the signs and images of the brain meanwhile the

authorities question the person about general and concrete aspects of the felony. To succeed this result, the „only" need is to identify and explore the technique of reading and picturing the thoughts of our mind. No exaggeration, it could defenitely win a Nobel prize, like Paul C. Lauterbur did in 2003 for the invention of the installations of the magnetic resonance tomograph – fMRI – which could separate a piece from the brain in the resolution of 1,5 mm x 1,5 mm x 4 mm (similar to the size of a piece of rice) from a volume of 150 thousand size of these one single rice.

The fMRI by realizing the brain's use of oxygen, the amount of streaming blood could track the human decision-making process, reasoning, emotions, thus the truth-telling as well. First of all it's extremely expensive, but the main problem is the functioning of the brain cannot be seen or sensible neither the mental pictures appearing inside the brain, which would have a useful knowledge about the offender for the law enforcement and which could not be hidden or limited by the examined individual. It claims the invention of another high-impact, scientific instrument.

C) The advantages of the „monoscanner" – as we named it, or also called monoreader, brainreader[2];

a) The examined individual's brain (thoughts) – compared to the low source of material remains – are available in every single case.

b) The images appearing in the examined individual's brain – regarding to the nature of cerebration – could be less or not manipulated, which means there will be real pictures appearing in the brain, related to the felony by the questions at the actual perpetrator.

c) No guilty people would be scanned easier, because there will not appear pictures in their brain related to the felony (absent information). Even by any application for retrial would be possibly used posteriorly, if the instrumental resource and the scientific method reaches reliability in general. (Just like nowadays at the post-DNA identification.)

d) In context of the real images, there are chances of other efficient, proper, investigative acts. For example authorities could have house search at the place that appears on the brain-image, other individuals (other perpetrators, plaintiffs etc), objects related to the felony could be traced as well.

e) The real (criminal) brain-images (information present) – according to our point of view – are displayed, so by chance it could be printed as well (by „monoprinter" or „monophoto"), which could be a part of the evidence or criminal investigation/procedure.

IV. Other "honesty controlling" methods

A) Not only the mono-scanner or fMRI are the possible sources of detecting dishonesty and false statements in the future. The researches about this topic opened up that there is a possibility in the examination of eye-temperature to detect false statements by using/adopting a special eye-thermometer. This method brings a relation between the increase of metabolism of the eye and false statement, assuming that more blood flows into the iris and due to this effect the temperature of the eye increases, when the person lies.

[2] See more details: Fenyvesi, Cs. (2017) A kriminalisztikai tendenciái. (Tendencies of Criminalistics) Budapest, Dialóg Campus Kiadó.

The other method/instrument was invented in the United States as well, named as Psychological Stress Evaluator (PSE), which measures and graphs the components of human voice related to stress. The procedure based on two tones of the human voice – one is audible, the other is not. At the existence of human stress (which could be based on a lie) the PSE shows the non-sensible tones for the human ear. The scientific evaluation and control of the efficiency of the instrument is yet not extensive enough, but it's supporters think, the use is way easier than the polygraph's, even though it could be used indirectly through telephone conversation or record.

As a second option we need to mention the "thermal-cam" method throughout you can conclude the existence of honesty or dishonesty by the changes of body temperature. Based on a Hungarian experimentation 1/3 Celsius (0,3 – 0,4) grades are the differences in general between the temperatures measured on the reference points – as the middle of the forehead, under the left eye, under the right eye in the middle, middle of the lips, middle of the neck – between these points the most irrelevant difference was the temperature on the middle of the forehead (0,37 Celsius) and the most relevant was at the lips (0,47 Celsius). At the evaluation of this experiment experts draw the inference, that at some of the reference points, the general maximum temperatures are higher when the person is dishonest than the average temperatures at honest responses and the same difference was shown by the minimum temperatures.

On third place we mention the Layered Voice Analysis (LVA), which gives results about the honesty of the said statement or denial. The LVA was invented in 1977 and can sense the person's mental state, level of stress and its changes by the human speech and shows the cognitive processes going through the speaker, so the mental process of – observation, – remembrance, – information conversion could be detected.

Among the possible methods of the searching for the truth or the exploration of lies you can find processes related to graphology. Tamás AGÁRDI reports one of these methods[3]. The main point is that the expert does various statements just like in the polygraph tests and the person has to reply with –yes or – no answers. But this time the person has to draw a circle by "yes" and a square by "no". Through these experiments the tests show what the kind of suspicious signs appeared as the result of psychic lie, how is the unfeatured presentation of reality – just as elongated reaction time, vague marks, fractions or hesitancy. By the expression of the dishonest contents seems;

a) Ordinary writing changes, automatism is taken over by a complex process controlled on purpose,

b) Reaction time elongates,

The spontaneous, harmonic writing skills come apart, the dynamic stereotypes are loosing their priority; intense control is noticeable.

E)In searching for the truth, as it is mentioned in the D) point, there are further refinements needed in the field of grapho-researches. In this context we have to highlight the future possibilities in grapho-comparison, grapho-analysis and grapho-linguistics. All three handwriting researches based on the same source, which is the fact that handwriting is a personal-specified, learnt for a long term, stereotype activity, practiced permanently, which is a projection of someone's personality and inner side. Especially because as it is known since a long time, that the brain writes and not the hand. Comparison means the identification of handwriting and it's future possibilities will be detailed in the next point.

[3] Agárdi, T.-Kármán, G. (1999), A hazugságvizsgálatról más szemmel. (Lying examination – from other aspect.) *Belügyi Szemle,* vol. 10. 99-105.

In the aspect of the exploration of reality-untruth, we have to highlight that with the combination of these techniques could come into existence the so-called "three-probe procedure". It bases on once experts map out the handwriting criterias and system of specialities connected to the untruth, then they confer the questioned handwriting from the exact same person to a surely false and to a surely true handwriting sample and then they value by quantity and quality the matching/corresponding or distinct writing specialities. Through this procedure another type of polygraph (the known one based on speech and hearing) and this one would be based on handwriting, as the grapho-polygraph.

Besides the polygraph nature, the profiler nature could be discovered and used, because the grapho-linguistics and grapho-analysis could draw a conclusion about the writer's/author's sex, age, education (profession), illnesses (mental state) or deviance, but only as a possibility, not as a fact.

In a wide/broad meaning you will receive a profile, so it could be a so-called profiling, so grapho-profiling is basically a profile made out of handwriting. Its importance is mainly in the detection; in the identification of the possible suspects and in this context in the fomentation of setting up various possible versions, efficient investigation and in planning of secret service operations. Based on researches, the grapho-linguistics and grapho-analysis also aspire to hedge in with the most efficiency and possibility. In this endeavor in gracious cases they can count on special handwriting characteristics.

Besides the mentioned methods, a "double grapho-profiling" could be useful, when the results of grapho-linguistics and grapho-analysis show a coincidence. This type of "double-profiling" could be lead to a personal identification supplemented by any other technical featured handwriting research, not only by grapho-comparison. This is the reason why you can reckon on the development and refinement of this type of modus. In this pursuit the science of psychology has a major role by giving potent help to improve this field of criminalistics.

V. Techniques and possibilities in writing-identification

A) The grapho-cpmparison is more valuable than the grapho-analysis or grapho-linguistics because it gives specific/personal identification. This is the reason why these type of experiments and investigations need to receive more attention in the forensic detection. These are mostly techniques finished by criminalistics itself, therefore we can likely trust in them in the future as well. We find the most enticing the ones build on computers, special softwares and digital data. From these we see future opportunities and chances for development in the German FISH (Forensische Information-System Handschriften), which was started in 1988 and it works as a sorter and library system. There is a strong chance that having various on-going and intensive achievements in computer techniques and with its graduation the program will put on more minim information on the map and compare them in the writing identification, therefore the validity, possibility and credibility of modus will approach an even more closer level to reality.

B) Another similar computer based method is called graphometry. The computer based graphometry procedure starts with the digitalizing of the writing. It happens with the use of a scanner, camera or digitalizing tablet and continues with the screening of the "noises". The program registers static features (as figure, shape, extensity, position) and dynamic parameters (as pressure, speed, the position of the pen etc.) and measures through previously defined settings and resolution. After follows the processing by statistic methods, evaluation and decision-making. Its

greatest advantage is that the "text probability scales" can be changed by the level of significance and the certitude showed in numbers. The personal identification characteristics are definable and the possibility of matching with the incriminated writing is numerically expressive. Other progress could be the measurement and analysis of the frequency of some writing-characteristics/features in the population. With this method the strength of the value of each writing parameter could be definable. Regarding to this subject the authors, AGÁRDI – KÁRMÁN highlight the future chance to establish databases by the help of computerized graphometrial procedures, which opens up an automatic way by generating huge amount of data. By this method the establishment of computerized database based on handwriting will be in reachable proximity, which – with adequate searching and identifying functions – could be a new addition to the automatized personal identification systems[4].

C) From literature we know other promising experiments about the fields of writing-identification, so we have to point out the American CEDAR for first, which deals with the exploration and comparison and mostly diversion and not identification of handwritings objective, reproducible characteristics. Between the characteristics tested by forensic experts 21 was processed as algorithm and thru tests based on 1.500 people's handwriting sample, identified the source of the handwriting with a 98% efficiency and security, even though the program was invented to distinct handwritings and not for identification.

The Dutch development, the TRIGRAPH is the next one which based on pattern recognition and image processing. The modus tests some characteristics of the handwritten documents as the automatics, the writing hand-measured geometric characteristics and in the end the variants of letters.

VI. The future of mobile labs and DNA tests

A) Inspections are so called inevitable investigation actions in general, which expression refers to the "periculum in mora" situation; to the requirement of essential velocity. How could it be even more increased, how could make faster the quest, fixing and researches of traces and material remains? The answer is, you have to make shorter the way of "scene-lab-court" triangle in the future. The way how it is reachable, is we have to locate the lab into the scene. Bringing there the most important, mostly basic trace and material remain "searcher" tools. What are we thinking of: what options are close to reality in the near and further future?

In these days there are only a few crime-investigations that need no special expertise. In this way we can freely think and organize equipment (experts and special techniques) at the well-modeled crime scenes, just as homicides. The logistics of criminalistics could help to direct the powers, objects, tools and vehicles (vans and trucks e.g.) to the scene of special "mini-labs". In these mini-labs you could already find digital scanners, which could make the digital image of the trace, fixed at the scene and a high-efficiency computer could execute the database-comparison right there as well. The exact same procedure would happen to the DNA content of the material-remains (mostly blood, spit, sweat, sperm) – collected from the crime scene –

[4] Agárdi, T. (2003), Grafológia a nyomozásban, grafológiai hazugságvizsgálat. (Graphology in the investigation.) *Grafológia,* vol. 4. pp. 7-11.; Agárdi, T.-Kovács, Zs.-Hamperger A.-Holéczy, Zs.-Nemes, A. (2009), Alternatív hazugságvizsgálati módszer kifejlesztése. (Development of alternative polygraph.) Budapest, Közép-magyarországi Regionális Innovációs Ügynökség Innovációs Nagydíj pályázata

and after its examination the record-comparison could be accomplished. The inspection is not even done yet – all these examinations run during the procedure – and the perpetrator could be identified right at the crime scene. The identification of inner identity at the scene could be also useful, for example if different material remains belong to one person, or the distinction of the blood (material remain) of the victim and perpetrator. It could give a clear sight, helps to build up the right versions and to choose the adequate investigation action. Especially efficient in the detection of "white-powder" bio-weapons, when a possible virus could jeopardize not only the forensic investigator but the wider environment as well. In case of these types of public danger, the immediate bio-exam and the actuation of these mentioned "mini-labs" at the scene is almost inevitable[5].

B) Obviously there is a continuous development in the 1985 elaboration of DNA identification. This process will not stop and it is not hard to predict that other refinements are expected in the subsidiary utilization of genetic systems and technologies. The next generation technologies will fundamentally change the nature of DNA tests and not only with the localization to the scene – as mentioned in A).

We will discuss only a few from these.

B.a) The actual DNA "interrogating" materials apply automated gel tests (e.g. Hitachi FMBio, Molecular Dynamic Fluor-Imager, BioRad Multi-Imager) including tabular gel electrophoresis and the capillary electrophoresis systems as well. The further, new instruments would be expended to offer a way wider capacity than the actual ones.

B.b) The matrix-helped laser-absorbing mass spectrometria (MALDI-TOF MS) is an existing technology, which can finish genetic analysis in seconds. Thousands of analyses are done in one single day with the robotic sample-product and sample-loading. It could examine extremely small samples as well, with low expenses under its highly qualified leading.

The development of this technology leads to a possible chance of assaying bigger and bigger samples.

B.c) The nowadays used drained-capillary electrophoresis instruments (PE Biosystems 3700, Molecular Dynamics Mega BASE 1000) in the expensive cases with a wide database are based on the successive sample dosage, in which's number of channels an improvement is definitely expected.

B.d) The DNA identification and its significance/importance will be even more improved, because it will be possible to search for material remains – and its structure – inside traces. E.g. a blurred fingerprint could be perfectly able to fix material remains in it and to detect/determine the DNA content in the end.

To achieve this level we have to improve the making samples, pay special attention to the elaboration of cleaning techniques and the optimization of some type of material remains (male-female, animal-vegetal).

VII. The future of digital exploration/discovery

A) We can surely say, this field has a dynamic, bright future. Basically, there are no technical tools/materials in our environment, which have not been touched by any digital technology in some point, and this fact will not change. Contrarily, law enforcement have to permanently count on the fact that criminals will also use up the

[5] Belgrader, P.-Bennett, W.-Hadley, SD.-Richards, J.-Stratton, P.-Mariella, R.-Milanovichh, CH F (1999), PCR detection of bacteria in seven minutes. *Science,* volume, 284. 449-450.

advantages of digital technology, this involves to be aware of a "cyber war", so you have to unremittingly work on preceding, preventive, exploratory and evidentiary materials and credit the advantages of digital data (as second generation evidence).

For this general purpose, there is a need for unremitting digital data collection and updated/timely, wide registration where the data collection, ("Rasterfahndung" – in Germain), induction takes place with maximum output computers and programs by trained "digit-commando" and special subunits.

These systems have to be connected to other law enforcement officers' notebook stores as well. As an example, the British Police (PITO – Police Information Technology Organization) together with the NPIA developmental agency (National Policing Improvement Agency) works on the development of a monitoring system for the entire subway system in London, which could identify wanted persons by their faces. The base of this idea is establishing a huge multifunctional database. The cameras would have a direct contact with the police registration, so an immediate identification would be possible in this way.

The photos and it's criminal database/information for the identification would be available in mobile formats, so the police and detectives in service/on duty in the streets could reach the entire information, furthermore they would be provided by portable fingerprint-recognizers.

B) To reflect the past, digital-visual recording of accidents could be a perfect material in the exploration of the circumstances of traffic accidents, through a miniature video-camera, fixed in the margin of the upper windshield for example, in vehicles (automobiles, trucks or in any other hydraulic, aeronautic or vehicular vehicle), which after the electronic ignition records continuously – just like nowadays' lane-follower distronic system. The situation could be even luckier and more accurate/exact, if every single vehicle which were involved in the accident had this automatically or post-built in "eye-witness" systems and also "ear-witness" system as well, because voice/noise recording is possible too with these digital cameras, so the reconstruction of scenes would be more accurate and evident.

C) The never-ending international fight against 3D printers started in 2013 and it probably will not stop at its beginning. Law enforcement have to be aware of and be prepared against this way of weapon or explosive transportation. They have to work out the preventive, exploratory opportunities and special know-hows.

In this context we have to highlight the future requirement and challenge that the criminalists need to participate in effective, fast and on-going education (with priority) and in training, because there is no chance for a relief in cyber-crimes in the near future; they have to compete in knowledge against the other side; against the well-prepared criminals, who feel themselves home in the cyber-field. Only special rained expert groups will not be enough (certified forensic computer examiner) in the digital internet-war (network forensics), each "fighter" have to learn with accelerated "knowledge-transportation" the basic and most important cognitions about hardware – software – internet – media/data carries – PC properties and the preventive, – monitoring, – seizure, – investigational, – security materials and modus (computer aided investigative environment). In our point of view, these will be the main challenges in the next years and decades for the World's criminalist.

D) Beyond that criminalistics needs those highly certified computer hacking forensic investigators, who could do digital entering/invasion; who could help to map, detect the "digit" criminals, organizations, systems and at the same time are able to paralyse and stop their field.

We can prognosticate breach or at least further development and excursion in the way of personal categorized identification in the method of digital voice/sound identification. Nowadays, in spite of the unbelievably developed acoustic materials and technologies – will not be able to ensure number – "1"-value personal sound-identification. Following our presumption, the forensic acoustic "sound works" – using sound engineers scientific results – will configure a comforting, reassuring technique related to some records (just as phone messages, tape-dictaphone records and other digital messages).

E) A growth in the data of digital networks, which was not seen before is probable in the future, on one part because of the junction of international network and on the other part because of the flare of the applying of informatics – analytics systems and its international dissipation.

In the framework of cross-border police and forensic collaboration in favor of fighting against crimes, the junction of national data networks already exist in many fields. The junction is under a continuous and intensive expansion in some continents; let us just think about Interpol, Europol, Eurojust, OLAF, Eurodac and Schengen – System. This process will continue in the future – even if homogenization is not probable – by trying to build up standards on criteria in data-comparison.

We assume, that in the application of Geographical Information and Analysis System (GIS) the future center of the so called "crime – mapping" digital mapping will move to the side of totally computerized, almost automatically run, prognostic "hot spots" data analysis.

F) The use of higher level of digital technique is a requirement not only with the scenes related to computers, but also with traditional (classic) crimes (attack upon life and physical integrity of a person, robbery, sexual assaults) as well. It is necessary to have a strong quality camera – and tape records, which are able to reconstruct the scene by any competent criminalist or any other law enforcement personnel in the future and any other viewer could digitally imagine him or herself at the scene and observe. They can monitor/control sizes, distances, colors, the spatial position of traces and material remains and the finished exploration actions.

The innovation will not stop in the process of super-projection with having more precise digital scanners, cameras; the Forensic Face Reconstruction (FFR) will develop as well. The anatomy knowledge and data from autopsies and successful identifications gives a chance to make the FFR become a scientifically acceptable technique. For this aim, an objective method need to be processed, which always bring adequate, same results tested by other experts. Therefore materials as the computerized tomography, the magnetic resonance image, photogrammetry and leaser exams – which lead face-forming to another meticulous level – for example at the definition, modelling of eye-hair colors or chin-ear-lip shape will help a lot. Also, the computerized animation procedures will be extended to the face-reconstruction, therefore the model will be able to smile, laugh or talk on the screen in the future by changing the face's features. We believe also, that the brave idea of recognizing a face only by DNA in the future will be possible thanks to the fast-changing/developing science of DNA mapping.

VIII. Development of secret techniques

In our point of view, nowadays sensible valorization tendency in between secret powers-materials-methods will moreover continue, you can expect the broadening of applications and entering of methods. This forecast based on the development of

digital data – mentioned in point 6 – because the technical knowledge and material /base/ system behind it is in continuous progress; there are more sophisticated, more sensitive and even smaller micro-nano materials/tools available for secret monitoring and for making sound-and-photo records in stable-fixed places (as public – or private properties) or even in moving vehicles (just as in cars, trucks, airplanes, helicopters, ships etc.), and articles.

It is also true about materials of secret operations, which are under a continuous pressure of digital and online improvement in the virtual field of operative crime – interventional, crime –response and exploration activities. For example, new version of "spy-programs" with a positive aim need to be invented, produced to get with the powers against it[6].

IX. Further future developmental possibilities and suggestions

The most important parts were point 1-7, but now we sum up some fields where less change is expected, but improvements would be needed.

A) The institutional introduction of a forensic nursing – forensic nurse system (which works well in the English-speaking/anglo/common law countries) could be one of the changes, in the continent, especially in the Hungarian practice. It would be needed on one side for the interest of the plaintiffs, for the prevention and avoidance of secondary victimization, and on the other side because of criminal-tactical interests of fast and silent acquisition of testimonies.

The Bayes-analysis (which is also based on English speaking/anglo/common law countries' theoretical and practical results) supposes to have more attention, that gives an objective solution-model for handling insecurity in the valoration of mathematical feasibility in the continental – especially in the Hungarian law enforcement and jurisdiction – evidence, mainly the expert's opinions (and the guiltiness of the accused). It is time, that after Biology (in prediction of virus-spread, DNA-profile analysis, reconstructional eye-color modelling); Physics (in gravitational waves); Economics (in game-theory, in marketing as in the separation of products); Computer Science (as Google uses Bayes-filters for the unwanted letters); to appear in this field as well and be used/applied efficiently[7].

B) Profiling – also with English (American) origins, theory and praxis is used in a smaller circle, but with success – which is a person-identifying (better explained as a person-constrictor method) has to be developed as well. Profiling system needs to be deepen by giving more help and feedback to the criminalists to identify/constrict the circle of possible perpetrators. Knowing more data, details about the perpetrator/s, criminalists could set up a smaller group of possible perpetrators – and finally in the end – the one person, who actually committed the crime.

Forensic advices are also the technical improvement, the deeper, wider application of cognitive interviews. Especially for the clarification of testimonies. We cannot give up on the improvement, discovery and testing of further, new interrogation methods (just as PEACE, SUE, SAI).

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[6] Mészáros, B. (2019) Fedett nyomozó alkalmazása a bűnüldözésben. (The covered agent during investigation.) Dialóg Campus Kiadó, Budapest.

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X. Conclusion

As being at the end of our study, we cannot finish without mentioning a noteworthy thought, that even if all of our prognosis become facts and if technique, digitalization, computer,-natural,-and social sciences get together, not even then could be exchangeable or replaceable the real key of the future's successful criminalistics; the criminalist him/herself.

He/she is the other focus besides identification. The expert, the explorer, the data collector, the effective detective, who takes risk and danger, who stands against continuous challenges, the crime-fighter in the never-ending real and virtual battlefield, where he/she only has one weapon in their hands: the criminalistics, as an "international treasure"[8].

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