ISSUES OF RECULATORY, LEGAL, SCIENTIFIC AND METHODOLOGICAL SUPPORT OF DIFFERENT CLASSES AND KINDS, SPECIES OF FORENSIC SCIENCE

Research Article

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Topical issues of handwriting analysis of signatures performed with a significant gap in time

At the present stage, the objects of forensic handwriting analysis are signatures performed with a significant gap in time. In this case, such objects are both signatures in studied documents, made at different intervals and studied signatures performed in relation to the comparative material with a time gap.

Establishing stability of signature signs depending on performing time is possible taking into account characteristic signs of the stages of the signature handwriting formation. Since the factors causing changes in signatures are a lengthy process of forming the signature skill and the amount of signature practice (that is how often a person has to sign). While research on signatures that are at the formation stage, different signs, established together with significant coinciding signs can indicate a further improvement of movements. In persons

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of middle age (30-60 years old) who have a formed signature handwriting, significant changes do not occur over time until they stop practicing writing. While research on elderly people signatures along with the established coinciding signs, differing ones appear: signs of ataxia, decreased coordination of movements, low coherence of written signs, etc. These signs indicate degradation of movements due to physiological changes in the body in old age and a decrease in writing practice including practice of performing signature.

Considering the above, research on signatures performed with a significant time gap is a rather complicated process that often causes difficulties when forensic expert evaluates revealed signs. Within the framework of this research paper, the authors focused on some topical issues existing in modern forensic expert practice of handwriting analyses of signatures performed with a significant time gap.

The state of development of modern practical handwriting studies requires improvement of methodological approaches to this type of research. Currently, forensic experts are conducting R&D on the topic: "Improving research methods of signatures performed with a significant gap in time" which relevance is due to the need to improve forensic expert algorithm while handwriting research on signatures performed with a significant gap in time, as well as requirements of modern scientific standards.

Keywords: identification handwriting signs; signature; signature strength; stages of signature handwriting formation; handwriting analysis of signatures performed with significant time gap

Formulation of Research Problem. At the present stage, the forensic handwriting analysis objects are often signatures performed with a significant gap in time. Such handwriting objects are found in various notarial and banking documents, wills, contracts, power of attorney, statements and other documents. Currently, the Register of Methods of Forensic Examinations of the Ministry of Justice of Ukraine has Methods for research on signatures performed with a significant gap in time, however, it lacks an algorithm for forensic expert sequence of actions while handwriting analysis of these objects. Taking into account urgent needs of methodological forensic science support, this Methodology needs to be updated in order to be further used in forensic expert practice.

Analysis of current practice of conducting forensic examinations indicates that judicial and investigative bodies quite often have a need to address issues related to research on signatures performed with a significant gap in time. We believe that improving research methods of such handwriting objects is one of the urgent current needs.

Lack of modern methodological approaches to identification research on signatures performed with a significant gap in time causes some difficulties for handwriting experts. This is due to peculiarities of comparative material preparation and subsequent separate and comparative research including explanation of nature of differences and coincidences of common and individual signs in signatures performed with a significant time gap, determining detection frequency of established signs, differences explanation. The latter makes it possible to identify the most stable signs in signatures performed with a significant gap in time; characteristic signs of particular person signature.

Improving methodological approaches to the research on signatures performed with a significant gap in time, requires consideration of research on these rather complex graphic objects taking into account generalization of forensic expert practice at the present stage of handwriting analysis that will use methodological principles for identifying identification issues of such graphic objects and create an up-to-date algorithm of consecutive forensic expert actions for handwriting analysis of signatures performed with a significant gap in time and for their further application in forensic expert practice and while training of new professionals in forensic handwriting analysis.

Analysis of Essential Researches and Publications. Many scientists have paid attention to the topical issue of research on signatures performed with a significant gap in time. Here are some of the names of those who have made significant contributions to research on handwriting objects.

V. V. Tomilin, Honored Worker of Science and Technology of Ukraine, Doctor of Medicine, Professor studying anatomical and physiological foundations of writing ¹ considers the issues of formation mechanisms of writing skills taking into account psychophysiological analysis of basic properties of formed writing skills, specifics of changes in writing and motor skills of different age groups (in particular, changes due to certain diseases, general intoxications and mechanical injuries) ²-

Among research papers in handwriting field should be noted the dissertation of I. M. Mozhar, PhD in Law, where the researcher carefully considers the peculiarities of research methods of manuscripts and signatures performed with a significant gap in time³. In other research papers, she develops methodological approaches to research on this type of objects ⁴: In particular, performed with

 $^{^1}$ Томилин В. В. Основы судебно-медицинской экспертизы письма. Москва, 1974. Р. 67—85.

 $^{^2}$ Іdem. Физиология, патология и судебно-медицинская экспертиза письма. Москва, 1963. Р. 20—52, 52—84.

³ Можар И. М. Криминалистическая экспертиза рукописей и подписей, выполненных с разрывом во времени, в уголовном и гражданском судопроизводстве: дис. . . . канд. юрид. наук. Харьков, 1966.

⁴ Іdет. Исследование рукописных текстов, выполненных с разрывом во времени / Судебно-почерковедческая експертиза : пособ. для экспертов-почерковед. и судеб.-следств. работников ; отв. ред.: А. И. Манцветова, В. Ф. Орлова, Е. Е. Доброславская. Москва, 1971. Р. 97—116, 313—323.

a significant time gap by elderly ¹, theoretical issues of stability of handwriting signs depending on performing time ², etc.

V. V. Lipovskyi considered the issue of individuality of signatures ³ and important issues of forensic examination of signatures performed with a gap in time ⁴, in particular, on behalf of elderly and old age people ⁵.

In research papers, handwriting experts, such as V. G. Abrosimova, L. G. Grinenko, O. I. Suetnova, developing methodological principles for research on such objects⁶, clarified nature of stability and regularity of changes in handwriting features, considered the use of comparative material, performed with a gap in time⁷.

The **Article Purpose**: analyze theoretical aspects and literature sources on research on signatures performed with a significant gap in time; consider stability concept of signature signs depending on performing time (taking into account the formation stages of signature handwriting); reveal topical issues arising against forensic experts while research on signatures performed with a significant gap in time (by summarizing expert practice of forensic science institutions of the Ministry of Justice of Ukraine); determine modern methodological approaches to possibilities of handwriting research of signatures performed with a significant gap in time.

Main Content Presentation. Handwriting analyses of signatures performed with a significant gap in time are carried out quite often. In this case, such objects are both signatures performed at different intervals of time and signatures performed relative to comparative material with a gap in time.

¹ Idem. Криминалистическое исследование подписей, выполненных с большим разрывом во времени, лицами преклонного возраста. *Вопросы криминалистики и судебной экспертизы*: мат-лы науч. конф. Душанбе, 1962. Р. 172—174.

² Idem. Устойчивость признаков почерка в зависимости от времени. Рефераты докладов объединенной науч. конф. Киев, 1956. Р. 14—16.

³ Липовский В. В. О некоторых вопросах проблемы индивидуальности подписи. Рефераты докладов второй науч. конф. Ташкент. НИИСЭ, посвящ. вопросам судебн. экспертизы. Ташкент, 1961. Р. 96—99.

⁴ Idem. Некоторые вопросы устойчивости подписей во времени. *Вопросы криминалистики и судебной экспертизы* : мат-лы науч. конф. Душанбе, 1962. Р. 196—199.

 $^{^{5}}$ Idem. Устойчивость признаков подписей, выполненных лицами пожилого и старческого возраста в необычных условиях. Криминалистика u судебная экспертиза. 1984. Вып. 29. Р. 76—81.

⁶ Гриненко Л. Г., Абросимова В. Г. Методические принципы исследования подписей, выполненных с разрывом во времени. Актуальные вопросы судебной экспертизы и криминалистика на современном этапе судебно-правовой реформы : сб. науч.-практ. мат-лов (к 75-лет. основан. ХНИИСЭ). Харьков, 1998. Р. 54—55.

⁷ Абросимова В. Г. До питання про ідентифікацію виконавця підпису, виконаного з великим розривом у часі відносно часу виконання порівняльних зразків. *Криміналістика та судова експертиза*. 2000. № 49. Р. 65—69.

The immediate object is handwriting information of an identification nature contained in the above mentioned signatures.

Establishing stability of the signature signs depending on performing time is possible taking into account the formation stage of signature handwriting. Let us consider the characteristics of each stage.

Despite the same psychophysiological process of handwriting and signature formation, the signature stereotype is more mobile over time than handwriting stereotype. Factors that cause changes in signatures are the long process of formation of signature skills and the amount of practice of signing (i.e. how often a person has to sign).

While research on signatures that are at the formation stage, discrepancies established together with significant similarities can indicate further improvement of movements. This is most often expressed in changes: transcription, tempo, structure of movements, arrangement and coherence of written characters, as well as the type of connection, length and placement of movements while performing letters and their elements relative to the line, shape of movements in initial and final strokes letters. These discrepancies should be carefully analyzed by expert while comparative research. Then they are considered insignificant and explained by improvement of movements while forming signature.

In such cases, in the signatures executed later it was established similarities together with those that appeared form a new set of individual signs of signature of this person while subsequent performing period.

It should be noted while research on signatures formed (in case of availability of transcription discrepancies, some general and individual signs and lack of coincidences), forensic expert cannot reach a negative conclusion about identity. This is due to the fact that person whose signature samples are being studied by professional did not have a signature at performing time. As a result of further subscription practice, signature signs can change significantly. Therefore, in such cases, it is impossible to resolve the issue of executors of signatures being formed without sample signatures performed at the same time.

Middle aged people (30-60 years old) who have formed a signature handwriting do not experience significant changes in their signatures over time until they stop writing practice, due to retirement, for example.

Only if there are some insignificant discrepancies in formed signatures performed with a significant time gap, forensic expert explains this by circumstances known to him from the case file (for example, sharp increase or decrease in practice of signature performing).

If while research on analyzed signatures insignificant discrepancies are found, it indicates a certain improvement of movements, for example, insignificant discrepancy of transcription towards reduction of number of letterless signature elements, some general (coherence and arrangement) and separate signs (connection type) of movements while performing letters and

their elements, the location of the start end points or connection of movements relative to the string line).

It should be noted that people with extensive signature practice can have several signature variants: from full, so-called official, to abbreviated, typical for use in single-character documents of a significant number. In addition, during this period of life there is usually a change of surnames (for example, in persons who marry), that leads to a change in signature transcription.

These discrepancies can be considered typical signs due to further simplification of movements in the signature due to frequent performance and therefore insignificant. Coincidence of common features (size, slope), as well as stable, significant and rare, individual features form an individual set, characteristic signature of a particular person. They can be enough for a categorical positive conclusion about identity.

Research on signatures of elderly and old age people together with the established similarities reveal differences: signs of ataxia, decreased coordination of movements, low coherence of written signs and large arrangement, type of connection, tortuosity and angularity while performing rectilinear and arc elements of letters, form of movements in initial and final strokes that are available in the later execution of signatures. These signs indicate degradation of movements due to physiological changes in the body in old age and a decrease in writing practice including practice of signing. These discrepancies should be explained by circumstances of the case known to forensic expert and recognized as insignificant¹.

However, in the signatures of the elderly with a significant gap in time remain convergent transcription and such common features as the degree of elaboration, constructive simplicity of movement, size, inclination, as well as individual (shape when performing basic elements of letters, direction of movement, length and location movements while performing letters and elements relative to each other). If these coincidences are significant and their stability is established in the signatures of elderly, in their totality they individualize the signature of a certain person and are the basis for a positive conclusion about the identity.

In some cases, due to signature characteristics in different periods of its implementation (when these signs are denominated and in availability of samples belonging to different periods of human life), we can speak about the relative age of person while performing investigated signature.

Given the above, research on signatures performed with a significant gap in time is a rather complex procedure causing difficulties in assessing identified signs by handwriting expert . In addition, in some cases it is very difficult to trace stability of the performer signature handwriting over a long period of time.

¹ Чепульченко Т. А. Дифференциация возрастных изменений почерка (пожилой и старческий возраст, молодой и средний возраст) и подражания «старческому» почерку. Проблемы комплексного криминалистического исследования подписей: мат-лы Всесоюз. науч.-практ. семинара. Москва, 1986. Р. 68—73.

Within the framework of this research paper, the authors considered topical issues that are available in the modern forensic expert practice of handwriting research on signatures made with a significant gap in time.

Here are some examples of forensic handwriting analyses on such issues. For conducting a forensic handwriting reanalysis of a civil case, originals of investigated documents were received: a lifetime maintenance agreement for 2007 and a bank account opening agreement for 2004 ¹. Forensic expert who conducted the initial handwriting analysis came to the probable conclusion that M. had signed on his behalf in the 2007 lifetime maintenance agreement. Research incompleteness is due to the fact that the comparative material was provided in limited quantity and performed with a significant time gap ².

The issue of the signature executor identification on behalf of M. in submitted documents was raised for the decision of forensic handwriting reanalysis.

The signature under research on behalf of M. in lifetime maintenance agreement for 2007 had a full letter transcription: "M-e-p-κ-y-π-o-e". The signature was made by movements of a simple structure, a high elaboration degree at a quick pace. Letter size and acceleration are average, right slope, average connectivity. The study signature in the bank account opening agreement for 2004 had the following transcription and coherence: conditionally read the letter "H" + letterless strokes + flourish. This signature was performed through simple structure movements of a high degree of elaboration at a rapid pace (see Figs. 1-2).

И придав

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Fig. 1 Fig. 2 Fig. 1-2. Researched signatures on behalf of M.

Samples of M.'s signature and handwriting, performed while 1972-1974 in student notes, diaries and Military ID Card when he was 15-18 years old, were provided for reanalysis.

Signature samples of specified period were performed in full letter transcription, performing pace is closer to the average, coherence is almost solid, size of the letters is from medium to large.

The second part of the samples of M.'s signature was performed while 2016-2017, at the age of about 60, some of them were in applications of the pension case. The signatures were also characterized by a high degree of elaboration but were executed at a pace from fast to slow. In addition, in the signature handwriting there were violations of coordination of movements of the 1st group

¹ Архів ННЦ «ІСЕ ім. Засл. проф. М. С. Бокаріуса» (ХНДІСЕ) за 2019 р.

² Архів ННЦ «ІСЕ ім. Засл. проф. М. С. Бокаріуса» (ХНДІСЕ) за 2018 р.

(tortuosity and angularity while performing rectilinear and arc elements of letters, availability of initial and final reflex strokes), as well as violations of coordination of movements of the 2nd group. Line and unstable placement of movements vertically and horizontally while performing letters and their elements). There was an unstable size of letters: from lowercase to uppercase, slope varied from vertical to right. Coherence of movements was almost non-existent, acceleration and arrangement while performing the written signs increased.

M. performed a small number of samples at the age of 40—44 (while about 1994 to 2000). The signatures were made in formed written movements, at a fast pace, they had both a complete letter transcription and a simplified structure: "Mpk" + letterless strokes + flourish, "M" + letterless strokes + flourish (see Fig. 3—9).

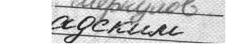


Fig.3. Sample signature of M. at the age of 17 years

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Fig. 4 Fig. 5 Fig. 4-5. Samples of M.'s signature at the age of 40-44

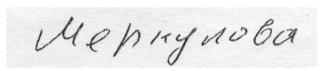


Fig. 6. Sample signature of M. at the age of 60 years

Through carefully comparing studied signatures with the existing groups of samples of M.'s signature, forensic experts established coincidence of the movement degree, some general and informative signs: the shape and direction of movements, connection, length and placement of movements vertically and horizontally, placement of start and end points, the type of connection while performing letters and their elements.

Given the above, forensic experts came to categorical conclusions as for performing studied signatures by M. himself.

Analysis of the identified discrepancies and their localization indicated they were characteristic of M.'s handwriting at different times of execution, as they appeared in signature handwriting formed while writing practice: transition to fast writing, change of transcription from full letter to simplified, as well as diagnostic signs that were found in samples of a later period.

Unfortunately, forensic experts are not always able to resolve the issue of identifying executors of signatures performed with a gap in time. An example is the report on impossibility of providing the conclusion of forensic handwriting analysis which solution was the issue of performing signature on behalf of $\mathbb C$. in the receipt for 2016, $\mathbb C$. himself or another person 1 .

For a comparative research, three samples of \mathcal{E} .'s signature were provided in applications for 2004 and 2006 on award of a disability pension and in the application for 2007 on the award/recalculation of a pension. In response to the experts' request for additional materials, the judge noted: "Due to \mathcal{E} .'s death in 2017, it is not possible to provide other signature samples".

The studied signature was made by movements of a simplified structure, it had a limited amount of graphic material: "E" + flourish. In addition, there were violations of movement coordination of the 1st group: blunt start of movement during the execution of the first element of the letter "E", small tortuosity and angularity, unmotivated stops of the typewriter.

Through comparing the studied signature with samples of \mathbb{C} .'s signature, coincidences of signature transcription, size, acceleration, inclination and individual features were established: structure of movements according to the degree of complexity while performing the "E" letter , direction of movements during execution and connection of its elements, placement vertical and horizontal movements. In addition, in the provided samples there were no coordination violations of movements and some discrepancies of separate signs were established.

Therefore, the provided comparative material, made much earlier than the studied signature could not be a basis for tracking changes in general and individual sings, in particular identifying nature and location of diagnostic sings that can appear over time in the signature $\mathfrak C$ ' handwriting, moreover, according to the case file, the document under research was drawn up shortly before $\mathfrak C$.' death who had numerous illnesses.

Based on generalization of forensic expert practice, it is determined that resolving forensic expert tasks traditionally divided into three stages of research: preparatory, analytical, synthesizing when research objects are signatures performed with a significant gap in time ².

¹ Архів ННЦ «ІСЕ ім. Засл. проф. М. С. Бокаріуса» (ХНДІСЕ) за 2019 р.

² Гриненко Л. Г., Суєтнова О. І. Щодо питання про дослідження підписів, виконаних з розривом у часі. Экспертное обеспечение правосудия на современном этапе судебно-правовой реформы : сб. науч.-практ. мат-лов (к 10-лет. основан. Крым. отделен. НИИСЭ им. Засл. проф. Н. С. Бокариуса). Симферополь. 2000. Р. 32—38.

Given research peculiarities of signatures performed with a significant gap in time, specifics and nature of objects, attention should be paid to the preparatory stage: preparation of materials for forensic handwriting analysis.

Firstly, if expert found significant discrepancies between general and individual signs in investigated signature and in the samples, it is necessary to apply for comparative material made as soon as possible before performing investigated signature. In case of dissatisfaction with the petition taking into account discrepancies observed in the investigated signature, it is very difficult and sometimes impossible to conduct an identification research and reach a categorical conclusion.

Sufficient comparative material is also required including samples of signature of the person being inspected performed at different times. This allows forensic expert to trace individuality of the signature over time at different stages of its formation. In addition, information about the intended signatory (year of birth, profession, large or small writing practice, health status, etc.) plays an important role.

If forensic expert finds significant discrepancies between sings in the samples and in investigated signature, then a categorical conclusion can often be reached only in tin case of availability of samples as close as possible to performing period of the signature being verified.

At the analytical research stage, general and individual features are thoroughly studied. The identified convergent signs are carefully analyzed, paying attention to identification significance and frequency of detection of each of them. At this stage, it is necessary to pay attention to signature practice of the person and nature of changes that could be due to the signature formation over time, given the age, profession, subscription practice, health status of probable signature executor. If discrepancies are identified, forensic expert should also carefully analyze them.

While research the most difficult is the *synthesizing stage*. Forensic expert should determine identification significance and materiality of identified signs, explain nature of their origin, evaluate them accordingly.

Conclusions. Thus, given the difficulties arising while research on signatures performed with a significant gap in time, the state of development of modern practical handwriting requires improvement of methodological approaches to this type of research (by updating them based on modern requirements), generalization of a significant volume as an experimental array and forensic expert practice.

Currently, forensic experts of NSC "Hon. Prof. M. S. Bokarius FSI" are performing R&D on the topic: *Improving research methods of signatures performed with a significant gap in time* which relevance is due to the need to improve forensic expert algorithm while handwriting research on signatures performed with a significant gap in time, as well as requirements of modern scientific standards.

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Актуальні питання почеркознавчих досліджень підписів, виконаних зі значним розривом у часі

На сучасному етапі об'єктами судово-почеркознавчої експертизи часто стають підписи, виконані зі значним розривом у часі. При цьому такими об'єктами є як підписи, виконані у різні проміжки часу, так і підписи, виконані відносно порівняльного матеріалу, із розривом у часі.

Установити стійкість ознак підпису залежно від часу виконання можна, зважаючи на ознаки, характерні для стадій формування підписного почерку. Оскільки факторами що викликають зміни в підписах, є тривалий процес формування підписної навички й обсяг практики виконання підпису (тобто як часто особі доводиться розписуватися).

Під час дослідження підписів, що перебувають на стадії формування, розбіжності, установлені разом із суттєвими збіжними ознаками, можуть свідчити про подальше вдосконалення рухів. В осіб середнього та зрілого віку (30—60 років), які мають сформований підписний почерк, суттєвих змін у підписі з часом не настає, доки вони не припиняють займатися письмовою практикою, наприклад, у зв'язку з виходом на пенсію. Під час досліджень підписів осіб похилого та старечого віку разом зі встановленими збіжними ознаками виявляються розбіжні: ознаки атаксії, зниження координації рухів, низька зв'язність письмових знаків і велика розстановка, вид з'єднання, звивистість і кутастість під час виконання прямолінійних і дугових елементів літер, форма рухів у початкових і заключних штрихах, наявних у пізніших за часом виконання підписах. Ці ознаки свідчать про деградацію рухів унаслідок фізіологічних змін організму в старості й зменшення письмової практики, зокрема практики виконання підпису.

З огляду на викладене, дослідження підписів, виконаних зі значним розривом у часі,— це доволі складний процес, що нерідко спричиняє труднощі в оцінюванні експертом-почеркознавцем виявлених ознак. У межах цієї наукової роботи автори розглянули актуальні питання, наявні в сучасній експертній практиці почеркознавчого дослідження підписів, виконаних зі значним розривом у часі.

Стан розвитку сучасного практичного почеркознавства потребує вдосконалення методичних підходів до такого виду досліджень. Станом на сьогодні експерти проводять науково-дослідну роботу за темою «Удосконалення методики дослідження підписів, виконаних зі значним розривом у часі», актуальність якої зумовлена необхідністю вдосконалити алгоритм дій судового експерта під час проведення почеркознавчого дослідження підписів, виконаних зі значним розривом у часі, а також вимогами сучасних наукових стандартів.

Ключові слова: ідентифікаційні почеркові ознаки; підпис; стійкість підпису; стадії формування підписного почерку; почеркознавче дослідження підписів, виконаних зі значним розривом у часі.

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Актуальные вопросы почерковедческих исследований подписей, выполненных со значительным разрывом во времени

На современном этапе объектами судебно-почерковедческой экспертизы часто становятся подписи, выполненные со значительным разрывом во времени. При этом такими объектами являются как подписи в исследуемых документах, выполненные в разные промежутки времени, так и исследуемые подписи, выполненные по отношению к сравнительному материалу с разрывом во времени.

Установление устойчивости признаков подписи в зависимости от времени выполнения возможно с учётом признаков, характерных для стадий формирования подписного почерка. Поскольку факторами, вызывающими изменения в подписях, является длительный процесс формирования подписного навыка и объём практики выполнения подписи (то есть как часто лицу приходится расписываться). Во время исследования подписей, находящихся на стадии формирования, различающиеся признаки, установленные вместе с существенными совпадающими признаками, могут свидетельствовать о дальнейшем совершенствовании движений. У лии среднего и зрелого возраста (30-60 лет), имеющих сформированный подписной почерк, существенных изменений со временем не наступает, пока они не перестают заниматься письменной практикой. Во время исследований подписей лиц пожилого и старческого возраста вместе с установленными совпадающими признаками появляются различающиеся: признаки атаксии, снижение координации движений, низкая связность письменных знаков и др. Эти признаки свидетельствуют о деградации движений вследствие физиологических изменений организма в старости и уменьшения письменной практики, в том числе практики выполнения подписи.

Учитывая изложенное, исследования подписей, выполненных со значительным разрывом во времени,— довольно сложный процесс, который нередко вызывает трудности при оценивании экспертом выявленных признаков. В рамках данной научной работы авторы акцентировали внимание на некоторых актуальных вопросах, существующих в современной экспертной практике почерковедческого исследования подписей, выполненных со значительным разрывом во времени.

Состояние развития современного практического почерковедения свидетельствует о необходимости совершенствования методических подходов к такому виду исследований. В настоящее время эксперты проводят научно-исследовательскую работу по теме «Усовершенствование методики исследования подписей, выполненных со значительным разрывом во

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времени», актуальность которой обусловлена необходимостью усовершенствования алгоритма действий судебного эксперта при проведении почерковедческого исследования подписей, выполненных со значительным разрывом во времени, а также требованиями современных научных стандартов.

Ключевые слова: идентификационные почерковые признаки; подпись; стойкость подписи; стадии формирования подписного почерка; почерковедческое исследование подписей, выполненных со значительным разрывом во времени.

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