United Nations

International Tribunal for the
Prosecution of Persons
Responsible for Serious Violations of
International Humanitarian Law
Committed in the Territory of the
Former Yugoslavia since 1991

Case No.: IT-03-67-T
Date: 12 January 2011
Original: English

Before:
Judge Jean-Claude Antonetti, Presiding
Judge Frederik Harhoff
Judge Flavia Lattanzi

Registrar:
John Hocking

Submission date:
12 January 2011

THE PROSECUTOR

v

VOJISLAV ŠEŠELJ

PUBLIC

REGISTRY SUBMISSION OF EXPERT REPORT
REGARDING THE MLADIĆ NOTEBOOKS

Counsel for the Prosecutor:
Mr Mathias Marcussen

The Accused:
Mr Vojislav Šešelj

IT-03-67-T 12 January 2011
1. Pursuant to Rule 33(B) of the Rules of Procedure and Evidence ("Rules") of the International Criminal International Tribunal for the Former Yugoslavia ("International Tribunal"), the Registrar respectfully submits the following.

2. Further to the Trial Chamber's "Decision on Prosecution's Motion for Admission of Evidence Relating to Mladić Notebooks with a Separate Opinion from Presiding Judge Antonetti Attached" of 22 October 2010 and the "Order Extending Time-Limit for Filing the Expert Report regarding the Mladić Notebooks by 60 days" of 12 November 2010, the Registrar assigned Dr. Dorišan Keržan as an independent handwriting expert in the case of Prosecutor v Vojislav Šešelj (IT-03-67-T).

3. The Registrar herewith respectfully files the handwriting analysis report of Dr. Keržan, together his curriculum vitae.

4. The Registrar remains at the Chamber's disposal should any further questions arise.

Dated this 12th day of January 2011
At The Hague,
The Netherlands.
Dorijan Keržan
Court Expert on Document and Handwriting Analysis

INTERNATIONAL TRIBUNAL FOR PROSECUTION OF PERSONS RESPONSIBLE FOR SERIOUS VIOLATIONS OF INTERNATIONAL HUMANITARIAN LAW COMMITED IN THE TERRITORY OF FORMER YUGOSLAVIA SINCE 1991

HÄNDRITING ANALYSIS REPORT – EXPERT OPINION

THE PROSECUTOR V. VOJISLAV ŠEŠELJ

CASE NO.: IT-03-67-T

November/December 2010, January 2011, Ljubljana

Dorijan Keržan, PhD. Court Expert on Document and Handwriting Analysis
I received Decision on prosecution's motion for admission of evidence relating to Mladić notebooks with a separate opinion from Presiding Judge Antonetti attached, submitted by Trial Chamber III from 22 October 2010.

In accordance with the Decision on prosecution's motion for admission of evidence relating to Mladić notebooks I have to:

1. read in the original version the extracts of the Mladić Notebooks whose admission is sought,

2. determine whether General Mladić is the author, by comparing them to other documents written by General Mladić in the same period, whose source and date are certain, known and reliable,

3. highlight any amendment, addition or deletion that might have occurred to the documents under examination,

4. if possible, to determine whether some of the entries were written at intervals over several years, by comparing them with other documents whose source and date are certain, written by General Mladić at different times starting with 1991, and

5. inform the Chamber of any other relevant information with regard to the documents under examination.

After discussion with the registry I have received three CD-s with the following, scanned images of the disputed/suspect documentation:
**DISPUTED MATERIAL**

Extract from the “Mladić notebooks” (disputed notes) on 12 November:

<table>
<thead>
<tr>
<th>Source</th>
<th>Notebook Extract Date</th>
<th>Extract pages ERN</th>
<th>BCS transcript ERN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>J000-3787-J000-3984</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>J000-2768-J000-3174</td>
<td></td>
<td></td>
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<td></td>
<td>J000-2768-J000-3174</td>
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<td>J000-2768-J000-3174</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>J000-3175-J000-3581</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Upon the aforementioned discussion it was established, that the original material (the original notebooks) are not to be sent out of The Hague and therefore the decision was made that the expert will be provided with scanned material to conduct the analysis which is to be checked using the originals at NFI the facility in Den Haag.

Dorijan Keržan, PhD, Court Expert on Document and Handwriting Analysis
<table>
<thead>
<tr>
<th>Source</th>
<th>Notebook</th>
<th>Extract Date</th>
<th>Extract pages ERN</th>
<th>BCS transcript ERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>J000-4408-J000-4735</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J000-1740-J000-2168</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>J000-4209-J000-4369</td>
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<td>J000-4209-J000-4369</td>
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<td>J000-4209-J000-4369</td>
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<td></td>
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<tr>
<td>J000-1313-J000-1515</td>
<td></td>
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</tr>
</tbody>
</table>

From this point forward when referring to the notes I will also use the numbering on the left side, namely note 1 will be Notebook 4, entry from 1 February 1992 etc.

When analysing the disputed material at the NFI in Den Haag I have found one discrepancy in the above material, namely under item 9, 10 and 11 those are not notebooks 14, 15 and 15 but all the entries are from the notebook 14. In my opinion this is only a typing mistake.

On November 30th I received the second CD contained high quality scanned images of the above described documents (600 dpi).
REFERENCE MATERIAL

The third CD contained images of reference handwriting, namely the images of letter with the evidence reference number 06793049 and 06793050. Included was the video footage (wmv format) with general Mladić, where the writing of a note is supposed to be done by General Ratko Mladić. Also pdf images of the handwriting produced from the video footage was on the CD. I received the CD on December 12th.

I have also received the scanned extracts from the notebook with evidence reference numbers 06490552, 06490553, 06490554 and 06490555. Those were sent to me on December 10th via e-mail.

Apart from that I received the photocopy of the statement (Izjava) which was supposedly originally written by general Mladić. I received that via e-mail on December 13th.

At the Netherlands forensic institute I was given the originals (non-photocopies) of the disputed material to be examined.

As the reference material I was given the above mentioned documents in their original form except the statement (Izjava), of which only the photocopy is available.

BASIC PRINCIPLES OF HANDWRITING EXAMINATION²

- No two people write exactly alike.
- No one person writes exactly the same twice.
- The significance of any feature, as evidence of identity or non-identity, and the problem of comparison becomes one of considering its rarity, complexity, the


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relative speed and naturalness with which it is written, and its agreement or disagreement with comparable features.

- No one is able to imitate all of the features of another person's handwriting and simultaneously write at the same relative speed and skill as the writer that he/she is seeking to imitate.
- In those cases where the writer disguises their normal handwriting or imitates the handwriting of another person, it is not always possible to identify the author of the handwriting.

THE REMARKS ON THE EXAMINATION METHOD

The method for examining handwriting is based on the study of learned and individual handwriting features and comparing those of the questioned handwriting/signature against those of the reference sample.

Learned handwriting traits are those that the writer has acquired through learning. This refers to the way that children learn to write characters in school following the same consistent manner of writing and forming individual symbols.

Individual handwriting characteristics emerge as the writer, or rather his/her handwriting, gradually begins to deviate from the ideal learned way of writing to form his/her personal writing identity. In departing from the learned writing ideal, the writer forms his own personal handwriting strokes which can be used to identify him. These characteristics are divided into general and detailed traits. The general traits are normally easier to see, since they are associated with certain design characteristics, such as the type of writing, the manner in which the handwriting fits in space on the paper (width and shape of the margins, printing, the relative size of the writing, the slant/slope, style (angularity or roundness), legibility, fluency, proportions (relative size of letters or words, i.e. larger initial letter at the beginning of each or certain words), spacing between characters and/or words, alignment, line quality, baseline etc. The detailed traits, on the other hand, are hidden within the design of individual characters (design of the individual character – round, angular), individual character proportions (relative size of letter and their parts), individual character construction (number of the handwriting strokes, i.e. the movements that the hand makes when forming the written symbol, direction of the stroke, etc), connection of letters (whether they are /or not/ connected at the top, middle or bottom). Important features are the

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repetitive forms, which are repeated in different letters or parts of letters, and particularly the natural variation of the person’s handwriting – natural variation is the variability of constructing a graphem (letter or connected letters, sometimes part of letter) within the handwriting of one person. All these are effects of the movements of the hand, which are manifested in the shape and form of the characters, the pressure that was exerted on the surface with the writing implement, the slant at which the implement was used vis-à-vis the writing surface, etc. These are the cornerstone of the identification technique.

The first phase of analysis involves studying individual features of either disputed or reference handwriting. The quantity of the disputed and reference handwriting is assessed as well. That means that the possibility of the examination of it is assessed as well (whether disputed and reference handwriting has the characteristics that render the examination and comparison possible).

The examination of the disputed and the reference material is recorded – all of the features are either described or drawn. It is only after that is accomplished and all of the significant features are recognized in the disputed and reference samples, are those compared. This comparison initially focuses on identifying the differences between the disputed and reference sample, in accordance with the main doctrine of forensic handwriting analysis. If the differences are too substantial to be attributable to natural variability in handwriting or any other circumstances there may be, such as an attempt to disguise one’s own handwriting (falsifying handwriting), or severe mental pressure, i.e. stress, which can significantly distort the appearance of an individual’s handwriting, illness, or a significant time lapse between when the questioned and reference samples were produced, then the analysis concludes that the questioned and reference samples are not identical. Only if there are few or minor differences that can be attributable to a natural variance in handwriting is the focus of the analysis shifted to searching for identical features, in order to determine whether or not there is sufficient evidence that the questioned and reference material could have been written by the same person. I would like to caution here that the absence of differences itself does not mean that the samples are identical. This conclusion can only be arrived at based on the presence of identical individual features. The nature of handwriting is such that several different writers can use certain similar strokes, particularly with the letters of the simple design. Thus, it is rare when a writer can be identified based on a single act of writing. In cases where the handwriting is
found to contain the same level of identical and differentiating features (taking into account the aforementioned conditions under which handwriting can vary), it is impossible to prove whether the questioned and reference handwriting materials are identical or not. In analysing the handwriting, the natural variation is extremely important as the consistency or non-consistency of natural variation in disputed and reference handwriting is an important part of the process of assessing the similarities and dissimilarities between handwritings in comparison.

ANALYSIS RESULTS SCALE

♦ Findings strongly support the proposition that the disputed and reference handwriting was written by the same individual. The reference and disputed samples contain many important similarities (identical handwriting features). There are no significant differences between the two of them. There were also no special hindrances to analysis and comparison, resulting from such factors as simplistic composition of the writing, covert writing, photocopying, or any other form of copying etc. In my opinion, the disputed and reference handwriting were written by the same person.

♦ Findings support the proposition that the disputed and reference handwriting were written by the same individual. The disputed and reference samples display certain similarities (identical handwriting characteristics). There are no significant differences between them. The examination and comparison may have been limited or hindered by simplistic composition of the writing, covert writing, photocopying or any other form of copying and etc. In my opinion, the disputed and reference handwriting were probably written by the same person.

♦ Inconclusive. Similarities (identical handwriting features) and differences between the disputed and reference material occur with the same frequency, which makes it impossible to either confirm or disprove whether or not the questioned and reference handwriting can be assumed to have been written by the same person. Limitations to the examination and comparison can be the reason for inconclusiveness as well.

Dorjan Keržan, PhD, Court Expert on Document and Handwriting Analysis
Findings support the proposition that the disputed and reference handwriting was not written by the same individual. The disputed and reference material contain some differences and very few similarities (identical handwriting features) can be found. There are no significant differences between the two samples. The examination and comparison may have been limited or hindered by simplistic composition of the writing, covert writing, photocopying or any other form of copying etc. In my opinion, the disputed and reference handwriting were probably not written by the same person.

Findings strongly support the proposition that the disputed and reference handwriting were not written by the same individual. Between the questioned and reference samples there are many major differences. There are no major similarities between them. There were also no special hindrances to analysis and comparison, which could result from simplistic composition of the writing, covert writing, photocopying or any other form of copying and etc. It is my opinion that the disputed and reference handwriting were not written by the same person.

EXAMINATION:

As to the several questions asked, I decided to work in the following way:

1. First the disputed notes were assessed and analysed. The comparison was performed between the notes as to establish the consistency of the handwriting of all of the notes and to establish whether the findings support the proposition that all of the disputed notes were written by the same individual or not. To do this the disputed notes were thoroughly read, assessed and examined.

2. While performing then first task I have also check whether there are any amendments, additions or deletions that might have occurred to the documents under examination.

3. The possibilities of the analysis of the timeline of the documents were assessed at the same time.

4. Last step was assessing and analysing the reference material and comparison of the reference material with the disputed material as to establish whether the

Dorijan Keržan, PhD, Court Expert on Document and Handwriting Analysis
findings support the proposition that the disputed notes and reference handwriting were written by the same individual or not.

First part of the examination and the analysis was done using high quality scanned images of the disputed handwriting. The disputed handwriting consists of 13 different entries in the notebooks allegedly written by the general Ratko Mladić. I received along the scans and high quality scans the transcriptions of the entries as well. One might note that there are some minor discrepancies between the scans and the transcriptions (omissions of letters and words, as for example in the transcription of J000-3029, where there are three words missing, probably because they are not really understandable, as they say “i kušlusirao je” /kušlušupao/ - the word is not known to me, possibly it comes from the word “kuš” (kuš), meaning “shut up”. It is of course possible I have misread the word. In the transcription of the J000-3045 the surname “Jonlić” is missing in line 13. Some other omissions are found elsewhere as well. The missing words and the discrepancies are shown below:

Second part of examination was conducted at the Netherlands forensic institute in Den Haag between December 20th and December 22nd, when I was provided with the original notebooks (original stands for non-photocopies or non-reproductions of any kind) and original available reference material (again, original stands for non-photocopies). While at the NFI I was able to assess and check my pre-assessment findings from the scanned documents and I have made the photographs of the disputed and reference material in ordinary and macro mode as to be able to present findings and to analyse certain features which are not possible to analyse on

Dorijan Keržan, PhD. Court Expert on Document and Handwriting Analysis
scanned material (namely the scanned images do not enable the depth of field which can be seen via magnifier or microscope and using macro photographs). Having analysed the disputed and reference material at the NFI in Den Haag and making photographs enabled me to continue the analysis also on the scanned images I have received previously and photographs I took at the NFI.

The originals were examined using Zeiss Sveni SV 11 microscope with up to 60-times of magnification and Regula 1010 handheld magnification device with internal light source (including ultraviolet light) and 10-times magnification. The photographs were taken with Nikon D80 camera with the Nikorr 18-200 zoom lens and Canon Powershot camera also mounted to the microscope.

All of the disputed entries are written in Cyrillic alphabet. Cyrillic alphabet used in Serbian language (azbuka) consists of 30 letters. For the purpose of this expert report I will focus mainly on the cursive written letters, as they represent the majority of the disputed text. The block capitals were examined as well, but mainly in the examination of the disputed entries and when comparing disputed entries between each other as to assess whether they are written with the same handwriting (as for the comparison of the disputed block capitals with the reference material I had only one word written in block capitals in the reference material). As to the cursive writing, certain letters in Cyrillic alphabet are of the same shape as in the Roman alphabet and they also stand for the same sign – examples are a, e, j, fairly similar to the Roman letter is also k (for the block capitals the letters that are written in alphabet and Serbian azbuka in the same way and represent the same signs are: A, E, J, K, M, O and T). Azbuka knows and uses certain letters which are by design the same as in the Roman writing, while they stand for the other signs: b stands for v (cursive and block capitals), g stands for d (only small cursive), u stands for i (cursive and block capitals), p stands for r (cursive and block capitals), c stands for s (cursive and block capitals) and x stands for h (cursive and block capitals). Azbuka knows as a certain peculiarity also three letters which stand for two signs, namely for Đž, Lj and Nj. It is important to be aware of those peculiar features in Cyrillic alphabet or azbuka to be able to assess them and particularly not to confuse them.
The analysis of the disputed and reference handwriting

The quantity of the disputed handwriting is very high – 169 pages which are more or less filled with the handwriting. Some of the notes are written in the notebooks with pre-printed lines (thus enabling the writer to follow the baseline) while others are written in the notebooks without pre-printed lines, hence the writer was forming his own baseline while writing.

The quantity of the reference handwriting is 6 pages of text. As there is a lot of the disputed handwriting the quantity of the reference material should be sufficient to perform the examination. All of the reference material is written without pre-printed lines. Two pages are from a letter, four pages from the notebook.

Overview of the general features of the disputed handwriting

The handwriting of the disputed notes is fluent, legibility is very good. The writer has an excellent writing skill and the control of the pen is excellent as well. Mistakes in writing are very rare. The slant of the handwriting is present, at the approximately 100 to 120 degrees. The baseline of the entries of the notebooks without pre-printed lines (notes from 1 to 7) have a tendency to fall, particularly the lower lines – it seems that the falling tendency is increasing through the page – the same tendency can be seen on the lower parts of the notes 9, 10 and 11 where the lines are not printed any more. On the notes 8, 12 and 13 this tendency is not clearly seen due to the pre-printed lines, although it can be observed with some words or sentences (in relation to the pre-printed lines).

The layout of the pages is not really consistent, although the left margin is usually wider than the right. The spacing between words and lines is relatively constant. Style is very constant, headings in particular – they are very often underlined, sometimes with the double lines. Text is well organized with subheadings (which are sometimes ranked), which are usually numbered or marked with short lines or asterisks, sometimes small letters are used.

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2 Actual line of work was to analyse first the disputed and then the reference material and at the end comparing both. As to make the report clear the features found in disputed and reference handwriting are described together. As the consistency of the disputed handwriting itself is under examination, this analysis is presented at the appropriate moment.

3 Huber and Headrick are claiming that 1 to 2 pages are enough (Roy A Huber, A. M. Headrick: Handwriting Identification: Fact and Fundamentals, CRC Press, 1999), Kelly and Lindblom 4 to 5 (J. S. Kelly, B. S. Lindblom (ed.): Scientific Examination of Questioned Documents, CRC Press, 2006), while Hilton claims 5 to 6 pages (O. Hilton: Scientific Examination of Questioned Documents, CRC Press, 1992).
The beginning of each entry starts with the date, often the place and the heading (like meeting /SASTANAK/ or similar). The headings are always underlined either once (six times) or twice (seven times). Dates (or day and places as well) are often underlined, while the hour of the entry when it is present (seven times) is not underlined, but it has an interesting feature to have a short line at the end after the number for minutes (the same feature is later observed several times when subheadings are defined with numbers).  

When analysing the original notes, I did not notice any signs or traits of deletions or omissions of the text. There are some words crossed and new one written above or added between lines. The handwriting of those added words will be examined later and mentioned if there will be any difference in handwriting. It is impossible to determine the time when those words were written or added as there is no reliable methodology for that.

Following images are showing the baseline tendency and the slant of the handwriting. One can also see the left margin and get impression of the spacing. The organisation of the text and the style is clearly visible as well.

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4 Those features will be shown with the images in the part when detailed features will be discussed.

Dorijan Kerčaš, PhD, Court Expert on Document and Handwriting Analysis
The red lines are showing falling tendency of the baseline and the slant of the handwriting.

Dorijan Kerzan, PhD, Court Expert on Document and Handwriting Analysis
The red lines are showing falling tendency of the baseline and the slant of the handwriting. On the upper left image the falling baseline can be observed only partially while on the next page (3063) that can be seen far better. On the right bottom image the falling baseline can be observed only on the part which has no pre-printed line anymore.

Dorijan Kerčen, PhD, Court Expert on Document and Handwriting Analysis
The red lines are showing falling tendency of the baseline and the slant of the handwriting.

As to the notes, which are written in the notebooks with the pre-printed lines, one can observe the falling tendency as well, although it is limited to particular words – when the baseline of the handwriting touches the line, the falling tendency stops, as shown on the following images:

The red lines are showing falling tendency of the baseline and the slant of the handwriting.

Dorijan Kertan, Ph.D. Court Expert on Document and Handwriting Analysis
Overview of the general features of the reference handwriting

The reference handwriting is fluent, legibility is good. The writer has an excellent writing skill and the control of the pen. The slant of the handwriting is present, at the approximately 100 to 120 degrees. The baseline of the handwriting is horizontal, only some of the words are showing the falling tendency of the baseline. On four pages of the notebook the pre-printed dots are apparently serving as a baseline to the writer. The layout of the reference material is not really consistent, although the left margin is usually wider than the right. The spacing between words is relatively constant. The entry from the notebook starts with the date and the heading (SASTANAK). Following images are showing the baseline tendency and the slant of the handwriting. One can also see the left margin and get impression of the spacing. The organisation of the text and the style are visible.
Generally the reference handwriting is roundly designed with a lot of garland strokes (for example letters ʊ/ʊ, tʃ, ʌ/ʌ, z/ʌ, sometimes m/ʌ), particularly in the reference letter. Many letters have fairly big and often triangular loops. Connectedness is variable in the notebook, while it is fairly common in the letter.

The entries written in the notebooks with pre-printed lines can be examined in the view of the relation between the handwriting and the pre-printed lines. With the examination we are then trying to establish whether the handwriting is predominantly aligned with the pre-printed lines, whether they touch the lines downwards and/or upwards, what happens to the letter design elements which are structurally under or above normal letter height (for example loop in j or the upper part of b — both of the letters have those features in the Roman and Cyrillic handwriting).

The line density in the notebooks with pre-printed lines is relatively high (between line space is quite narrow), therefore the place for writing is limited. Despite that the predominant spacing of writing in all of the notes with the pre-printed lines is in the middle of the two lines, namely the bodies of the letters are predominantly above the
lower line and they are bellow the upper line, while the parts of the letters which are structurally above or under the body of the letter almost always cross underline or the upper line, and the same applies to capital letters as well.

I am showing that with the following images (not annotated as they are self-explanatory):

**ern 4564**

**ern 1007**

**ern 1980**

**ern 2080**

**ern 4293**

**ern 1433**

General individual features of the handwriting of all of the disputed notes are showing very strong similarities and similar tendencies and are therefore fairly strong indicator to confirm the proposition that they were all written by the same author, but the proposition should be confirmed also with the analysis of the detailed features.

**Overview of the detailed features of the disputed handwriting and the comparison of the disputed handwriting of the entries with each other**

First I assessed the block capitals in the disputed notes. Most of block capitals emerge at the beginning of the entries. Obviously not all of the letters are present, and some are only present once or twice. Therefore only some of those letters are suitable for the examination.

Letter C (S in Roman script) is the most common in the notebooks. It always starts with the initial stroke, which is almost always inside the loop of the letter (red arrows on the image). The ending is lighter than the rest of the letter.

Letter A is written with two strokes, first being only single straight-lined stroke, while the second continues (sometimes with the eyelet) into the star-like construction of the letter with the connection of the second stroke with the horizontal bar traversing both almost vertical strokes and finishing with a relatively long line right of the letter body.

Dorijan Keržan, PhD, Court Expert on Document and Handwriting Analysis
(blue arrows on the image). The eyelet can be sometimes observed at the beginning of the horizontal stroke as well (green arrows on the image). At the top of the letter in some cases the crossing of the lines occurs (yellow arrows on the image).

Letter H (N in Roman script) is often constructed similarly as the A above, namely with the separated first vertical line and second line connected with the horizontal line with a triangular stroke. In some cases this triangular stroke is not entirely visible. Both of the vertical lines are oriented down (as with the A) and in one case even the connection between them (ern 1907) can be seen. The stroke from the second vertical line to the triangular shape can be done with the eyelet (ern 3914, 3044 and 2090 - green arrows). Triangular shapes are shown with light blue arrows on the image.

The Letter K is written in two forms, one being a derivation of the small cursive variant starting with the downward stroke and without pen lift the continuation into the loop follows; when loop almost forms the circle the stroke makes a line down at the approximately 45 degrees (ern 1985 and 1433 – not annotated). Second version consists of two strokes, first the downward stroke and the separately the right stroke, which begins with short initial stroke, from which the direction is changed to the left; when touching or crossing the downward stroke it turns right again (without pen lift), usually sharply, but sometimes round as well, into the final line. The initial stroke is shown with black arrows on the image.

The rest of the block capitals are not very individualized, although for example for E it is typical the horizontal lines often cross the vertical one and that with the P (R in Roman script) has a fairly small loop. Letter U (I in Roman script) has usually a short initial stroke, often retraced, and prolonged loop at the right side, while B (V in Roman script) has a tendency to connect with the following sign with the loop at the lower half, but those characteristics are not annotated on the image. Other letters are not present enough in the disputed material or have not significant features to be analysed.

Dorijan Keržan, PhD, Court Expert on Document and Handwriting Analysis
After the examination of the block capitals I examined in detail the numbers, but those are not very distinctive. No significant differences in number design were found when comparing different disputed entries. It is fairly interesting that two numbers are coming with two different designs, namely numbers 4 and 8. Number 4 can be constructed angularly with straight lines and with two strokes, while the other variant is characterised with round design and constructed with single stroke. Number 8 has also two designs, first being with one stroke starting left of the numbers center-line heading roundly down, forming a curve and then turning up, forming second curve, thus with the crossing the primary line forming a loop and ending at the beginning of the number. The second design consists of two loops. Designs of both of those numbers can be found on several entries. Number 8 is always present in one single entry with one design only, while for the 4 one can find both designs in the same entry and even on the same page (ern 1987). Number 2 has almost always the short initial stroke at the beginning and sometimes an eyelet at the bottom and the bottom line is curved in a convex form. Number 7 has a concave upper line. Number 5 is usually designed very narrow, zero begins and finishes on the left side of the loop. Number 9 as well can have two forms, which differ only at the end – the beginning is always with the loop which is without stop followed by the downward stroke, which ends straight or with short curve to the left.

The following image is showing numbers from the different entries. One can observe the above mentioned features and the general features of the date organization and the hour organization as mentioned in the general features section. The lines following the hour or following the number when it serves as a heading are marked with black arrows. The fours are shown with the red arrows; eights with blue arrows; twos with green arrows; and nines with yellow arrows. Other numbers were not shown with arrows, but can still be seen on the image.
Until this point the detailed individual features of the handwriting of all of the disputed entries from the 13 notebooks are showing very strong similarities and are therefore strong indicator to confirm the proposition that they were all written by the same author. To show that even better I was trying to find a word, that is present in most if not all of the entries to confirm the above proposition even further. The most common word found was the surname Karadić, which is shown on the images bellow.

Here it is possible to observe two variants of capital K (described above in the section on block capitals) with variations (annotated with black arrows, except on the ERN 2089, where by mistake the arrow is red – asterix is added when there is the variant of the letter shown), letter r (p in Cyrillic script) is also written in two variants (red arrows), one being completely opened at the top with sharp, arrow-like shape turned downwards, while the other is constructed with straight line and loop (annotated with asterix) on the right side (this is consistent with the range of variation of p /p/ in the disputed handwriting, which will be shown later). Interesting letter is č (h in Cyrillic script) which has the vertical part constructed with or without narrow loop (loop is usually present when the letter is connected with previous i (u in Cyrillic script), on the lower part the forward stroke is followed by the sharp downwards stroke which is usually connected to the upper horizontal line which finishes the letter. Also the letter č (h) is further described later.
The examination has this far shown high degree of consistency between the handwriting of the disputed entries from the notebooks and thus I can state an interim conclusion, that:

Findings strongly support the proposition that all of the disputed handwriting was written by the same individual. The disputed entries contain many important similarities (identical handwriting features). There are no significant differences between them. There were also no special hindrances to analysis and comparison, resulting from such factors as simplistic composition of the writing, covert writing, photocopying, or any other form of copying etc. In my opinion, all of the disputed handwriting was written by the same person.

This conclusion was later is confirmed with further examination bellow.

The examination of the originals in Den Haag showed as well, that no unusual amendments, additions or deletions were found in the disputed entries.

Analysis of the detailed features of the disputed and reference handwriting and the comparison of both

When analysing the handwriting it is very important to assess the range of variation in detailed handwriting features. The range of variation means the extent of variation in letter design found within the handwriting of a single person. Assessment of the range of variation is very important in further examination process, when comparison of disputed and reference material is being done – namely similar range of variation can be an important finding supporting proposition of the common authorship. Not all of the letters are equally interesting for the assessment of the range of variation since some are too simple in design, either objectively (letter o is usually just a simple loop) or can be executed in the simple manner by the writer.

Generally the disputed handwriting is roundly designed with a lot of garland strokes (for example letters ţ/ţ, t/t, i/i, ţ/ţ, sometimes m/m), many letters have fairly big and often triangular loops. Connectedness is variable. Sometimes the block capital is used in cursive writing.

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5David Ellen: The Scientific Examination of Documents, Ellis Horwood Ltd, 1989

Dorijan Kerzan, PhD, Court Expert on Document and Handwriting Analysis
The reference handwriting is showing very similar roundness in design with garland strokes with the same letters as in the disputed handwriting big and triangular loops are common in reference handwriting as well.

The disputed and reference handwriting both show strong lines, the under the baseline features are fairly deep (as shown below) and are constructed like a loop which can be either oval or triangular, or just as a straight line. The third variant of under the baseline feature is arrow shaped downward strokes (only .Euler or  in printed version in Cyrillic script; and  in Cyrillic script). The handwriting is clearly rounded and not angular, with a lot of garland features, which are with some letter a rule, while with some more variation is present. It is interesting that cursive letters ě /\, t /τ/ and  /\ are constructed in the same manner and differ only in diacritical signs. Letters i /i/ and m /m/ are also shaped in garlands (m predominantly). Diacritical signs are written with connecting stroke, which is often only indicated. Letters are very often connected at the top with the convex line. Connectedness of words is variable (even the same word has not letters always connected in the same way) and many letters are often not connected in cursive writing. Following image is showing connectedness of words (chosen randomly – red arrows) and the shape of some of the letters (not annotated):
Variability of the connectedness is shown with the following image — red arrows are indicating the interrupted line between same letters, while the black arrows are indicating differences in connectedness between two entries of the same word:

From J000-3032

Dorjan Keržan, PhD, Court Expert on Document and Handwriting Analysis
Analysis of the letter construction and shape

I will begin the analysis of the individual letters with the letter д (п or Α in printed version in Cyrillic script). The letter is characterised by short initial stroke (blue arrows), which is followed by the curved lined to the left and then downwards where most often the loop (red arrows) is formed — the loop can be round or, more commonly triangular. Often there is a trait of the ink deposit on the left side of the loop (the same is with all the under the baseline loops, irrelevant of the letter — the ink deposit is the characteristics of the loop). The other variant of the letter does not have the loop on the lower half, while it has an opened arrow shaped down and connected up stroke. When connected to the previous letter there can be an inside of the loop retracing stroke (blue arrow with the asterix).

When analysing range of variation of the reference material I have found similar features and I have marked them with the same arrow colours.
Next letter to analyse is ҫ (ҫ in Cyrillic script). It has basically two designs: the first (black arrows) is angular (like in block capitals) starting with a stroke downwards (sometimes preceded by a short initial stroke) which turns sharply and sometimes connectedly straight up to reach the beginning of the second vertical line which is oriented downwards; this one is then triangular (blue arrows) connected to the horizontal stroke, which is very long and finishes well beyond the letters body (yellow arrows). Second design is rounded (red arrows), with similar starting stroke, but it then with a concave curve turns upwards, followed by retracing stroke, which finishes in an eyelet (green arrows) that turns left and connects with the final horizontal stroke, which is long as well (yellow arrows). Rarely the mix of the above designs can be observed (not marked). Also the eyelets can be seen on the upper part of the line as well (green arrows).

The features found in the reference handwriting correspond to the ones described above.
Very interesting and important peculiarity of the disputed (and reference) handwriting is found in letter e (same in both scripts) and s (c in Cyrillic script). As seen on the image below, both letters can be very similarly designed. Both are curved with inside short stroke or even eyelet. Above the images the actual letter combination is written to show that. Eyelets are marked with red arrows, short inside strokes with green arrows. Then very similar features can be observed in the reference handwriting.

Disputed

Reference
Next letter to be analysed was r (p in Cyrillic script). Letter r is executed in two different designs, one being completely opened at the top with sharp, arrow like shape turned downwards (green arrows), similar as with the letter d (g), while the other is constructed with straight line and loop on the right side (this variant can be made with the loop or loop-like stroke that continues forming relatively big inside eyelet — red arrows). Image on the right is showing both variants written together — sometimes they are even used in the same word. See also comment of the surname Karadić for that letter.

The very similar features can be observed in the reference handwriting.
Next interesting letter is ć (ћ in Cyrillic script) which has been described above. I am presenting here some of the uses in other words than Karadžić in disputed handwriting – the sharp downwards stroke and connection with the upper horizontal line are marked with red arrows in both disputed and reference material. When connected with the following letter the connection with the upper horizontal line is missing while it is still long and forward oriented (green lines). Again the features found in disputed and reference material are very similar.
Letter I (ин in Cyrillic script) comes in two shapes, first being made of two strokes, upwards stroke on the left and downward stroke on the right — the strokes can be separated at the top or touched (red arrows); second design is made with narrow garland stroke (green arrows). Again the round garland tendency of handwriting, although narrow in this particular case, can be observed in second variant of then letter.

The features found in the reference handwriting correspond to the ones described above.
Letter м (м in Cyrillic script) comes in two shapes as well, first being made of two strokes, upwards stroke on the left and separately (red arrows) downward stroke with the garland move (green arrows) upwards and the retracing move downwards (possible eyelet) on the right (red arrows); second design is pure garland (green arrows) made with initial eyelet on the left portion (blue arrows) – eyelet can occur on the right side as well. The м (м) is also showing the round, garland design of the handwriting, even more clearly then the preceding letter l (л).

The features of the letter м of the reference handwriting are consistent with the features of the same letter of the disputed handwriting.

Dorjan Kërzan, PhD, Court Expert on Document and Handwriting Analysis
Letter т (τ in Cyrillic script) is written with variations and sometimes reductions. It is garlandly shaped with concave lower lines (green arrows) and tendency to have loops in vertical strokes (sometimes instead of loop we can see retracing – red arrows). The connecting stroke with the upper diacritic horizontal line is always present (blue arrows) but the ending part including that connecting stroke can be reduced as shown on the right side with the black arrow. The long horizontal stroke at the ending is evident as well (not marked).

Those features are found in both disputed and reference handwriting.

Letters and features shown above are displaying fairly wide range of variation, which as has been shown is consistent in disputed and reference handwriting. Letters which will follow have lesser range of variation in disputed and reference handwriting, but are nevertheless interesting and important from the handwriting examination point of view.
Letter p (н in Cyrillic script) comes in two variations, first being opened at the top and having an eyelet at the bottom right corner (red arrows), there is often a tendency to connect with the following letter (green arrows) and if the letter is not connected to the previous letter it begins with sharp downward stroke. One slight difference can be observed when comparing disputed and reference p, namely on the reference material there is never a sharp turn to the final horizontal stroke, which can be found in the disputed notes – yellow stroked arrows on the image. Rest of the features in disputed and reference handwriting are consistent.
Next letter is ς (ς in Cyrillic script), which is similar in shape to letter τ (τ). It is garlandly shaped with concave lower lines and tendency to have loops in vertical strokes (green arrows). The lower vertical starts from the right with very short initial stroke (not always though) and is marked with red arrows. The disputed and reference handwriting are showing very high degree of consistency.

Letter c (ϲ in Cyrillic script) is constructed with the garland stroke (green arrows) and very big and wide loop (with ink deposits on the left side – not annotated) under the baseline (red arrows) in both, disputed and reference material:
Letter k (κ in Cyrillic script) is not very distinguished but it is certainly constructed in the same way in disputed and reference material:

**DISPUTED**  
[Images of handwritten k's with arrows pointing to similarities]  
**REFERENCE**

Letter u (υ in Cyrillic script) has two variations, with big loop under the baseline (red arrows) or just the straight line instead of the loop (green arrows). The stroke at the top is garland (blue arrows). The features are consistent between disputed and reference handwriting.

**DISPUTED**  
[Images of handwritten u's with arrows pointing to similarities]  
**REFERENCE**
Letter ž (ж in Cyrillic script) is garlandly designed with possible eyelets. It is fairly similar in construction to ő (ő cursive) without underline and t (т cursive) without line at the top. Yet again there is consistency of the letter design in disputed and reference handwriting.

Letter b (б in Cyrillic script) is narrowly constructed with oval loop at the lower half (red arrows) and short ending stroke (green arrows) in both disputed and reference handwriting.
The v (с in Cyrillic script) is narrow as well with two oval loops in both disputed and reference handwriting.

Letter h (х in Cyrillic script) is fairly simple in design but the left side connection stroke is showing fast and fluent writing habit (not annotated). The connecting stroke is sometimes missing as well. Both variations are found in disputed and reference handwriting.

Dorijan Keržan, PhD, Court Expert on Document and Handwriting Analysis
Last feature I would like to show is long diacritical sign on the i, very similar to the one on t (τ) or p (p). with indication to the connecting stroke (red arrows) and again ink deposit on the right side of the bottom loop (green arrows). The features are consistent on both disputed and reference material.

The analysis of the disputed and reference handwriting, features and traits of both showed many similar tendencies. The differences that are not the consequence of the natural variation of the handwriting were not found. Furthermore, the natural variation of disputed and reference handwriting are consistent. Other letters as well are displaying similar consistency between the disputed and reference handwriting. The quantity of the similarities and similar features and traits is very high, no real differences were found. Hence the findings and conclusions are as follows.

CONCLUSIONS:

The examination and the cross comparison of the disputed notes showed that:

Findings strongly support the proposition that all of the disputed handwriting was written by the same individual. The disputed entries contain many important similarities (identical handwriting features). There are no significant differences between them. There were also no special hindrances to analysis and comparison, resulting from such factors as simplistic composition of the writing, covert writing, photocopying, or any other form of copying etc. In my opinion, all of the disputed handwriting was written by the same person.
No amendments, additions or deletions of any significance were found in the disputed notes.

The examination of the reference and disputed handwritings showed that features and traits found in the disputed handwriting are consistent with the features and traits of the reference handwriting. The examination and comparison of the reference and disputed handwriting thus gave the following result:

The reference and disputed samples contain many important similarities; there are no significant differences between the two of them. There were also no special hindrances to analysis and comparison. Conclusions strongly support the proposition that the disputed and reference handwriting were written by the same individual. In my opinion, the disputed and reference handwriting were written by the same person.

Timeline of the entries was impossible to determine, because the handwriting in adulthood rarely changes without illness or heavy injury.

Dorijan Keržan, Ph. D.
HANDWRITING EXPERT

Dorijan Keržan, PhD, Court Expert on Document and Handwriting Analysis
Annex I
<table>
<thead>
<tr>
<th>Dates</th>
<th>Occupation or position held</th>
<th>Main activities and responsibilities</th>
<th>Name and address of employer</th>
<th>Type of business or sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2010</td>
<td>Assistant director of the National Forensic Laboratory</td>
<td>Strategic planning and coordination of the NFL tasks, international relations of the NFL, investigation and research of handwriting etc.</td>
<td>Ministry of the Interior of the Republic of Slovenia, Štefanova 2, 1501 Ljubljana, Slovenia</td>
<td>Public Administration</td>
</tr>
<tr>
<td>August 1997 – June 2010</td>
<td>Head of Document, Handwriting and Currency Division of the NFL (under different names)</td>
<td>Strategic planning and coordination of the division, developing new research and investigation methods, training of the police and other staff on the different levels, investigation and research of handwriting etc.</td>
<td>Ministry of the Interior of the Republic of Slovenia, Štefanova 2, 1501 Ljubljana, Slovenia</td>
<td>Public Administration</td>
</tr>
<tr>
<td></td>
<td>PhD, Faculty of Arts, University of Ljubljana, Slovenia</td>
<td>Social science, focus on scientific ethics, bioethics and public perception of science</td>
<td></td>
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<tr>
<td></td>
<td>Faculty of Arts, University of Ljubljana, Slovenia</td>
<td>Masters degree, Faculty of Arts, University of Ljubljana, Slovenia</td>
<td>Social science, focus on interpretation of texts with historical and archeological value</td>
<td></td>
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<tr>
<td></td>
<td>Professor of Slovenian language and literature, professor of philosophy, Bachelors degree</td>
<td></td>
<td>Faculty of Arts, University of Ljubljana, Slovenia</td>
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<td></td>
<td>Applying philosophical analysis on historically relevant texts, ethics</td>
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<td></td>
<td>Faculty of Arts, University of Ljubljana, Slovenia</td>
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<tr>
<th>Mother tongue(s)</th>
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<tr>
<td>Slovenian</td>
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<tr>
<td>Understanding</td>
<td>Speaking</td>
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<td>B1</td>
<td>B2</td>
</tr>
</tbody>
</table>

(*) Common European Framework of Reference for Languages

Technical skills and competences
- Basic technical skills.

Computer skills and competences
- Computer literate (Microsoft WORD, Microsoft EXCEL, MS PowerPoint, Lotus Notes, Adobe Photoshop ...), Internet-based applications and internet research, document management systems.

Artistic skills and competences
- Literature

Other skills and competences
- Language skills, training skills and experience, lecturing skills and experience, presentation skills

Driving licence
- Categories: B, G, H

Additional information
- Publications (strictly forensic):
  - Dorijan Karžan: Zloraba fotokopirnih strojev (Misuse of photocopying machines), Revija za kriminalistiko in kriminologijo 45 (2), 1994, str. 150-155;

Papers presented at the conferences:
- Dorijan Karžan: Minimalna zahteva za usposobljenost izvedencev za prinoske rokopisov, (Minimum standards of knowledge for the handwriting experts), Dnevni varstvoslova, Bled 2002
- Nataša Žener, Dorijan Karžan: Preiskovanje ponarejenih evrov v skladu z evropsko zakonodajo, (Investigation of counterfeit Euros according to the EU legislation) Slovenski dnevni varstvoslova, Bled 2005
- Alojz Rozman, Dorijan Karžan: Tiskarna ponaredkov – študij primera, (Illegal printshop – case study), Slovenski dnevni varstvoslova, Bled 2007
- Alojz Rozman, Dorijan Karžan, Nataša Žener: Prepoznavanje evra – anketa, (How to examine Euro – survey), Slovenski dnevni varstvoslova, Bled 2008
- Uršula Rožanska, Dorijan Karžan: Računalniška obdelava podpisa, (Falsification of the signature using computer), Slovenski dnevni varstvoslova, Ljubljana 2009
- Dorijan Karžan: Handwriting and motor neuron disease : a case study, ENFHEX Conference, Handwriting evidence and crime, Cracow 2009
- Dorijan Karžan: Bioetika in forenzični postopki, (Bioethics and Forensic Procedures), # simpozij Bioetika, Ljubljana 2010

Other
- Forensic court expert appointed by the Ministry of Justice of Republic of Slovenia since 2000
- Member of EASA (European Association of Social Anthropologists).

Other publications (on ethics, history, social anthropology ...)

For more information on Europea go to http://europass.cedefop.europa.eu

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• Dorijan Kerzan: Ideološke predstave o družini, v Časopis za kritiko znanosti, letnik 24, 179/1996, str. 133 - 148
• Dorijan Kerzan: Gelinerjev sprehom med vedami, sprememba beseda k Ernest Gellner: Antropologija in politika, Revolucije v Svetem gaju, Studia Humanitatis 1999, str. 275-294
• Dorijan Kerzan: Kinship and Family in Public Debate on Assisted Conception v MESS, FF, Ljubljana, Vol.5: 211-228
• Dorijan Kerzan: Med "emskim" in "etskim" ali identiteta antropologa v Anthropos 2005 1/4, str. 255-275
• Dorijan Kerzan: Razveze poroke in družine, v Prave poroke?, Ljubljana, Krista 2006, str. 61-74
• Dorijan Kerzan: Sloščenje novih oblik sorodstva Novo mesto, Goga 2006 (znanstvena monografija, 271 strani)
• Dorijan Kerzan: Naravna starševstva, v Socialno delo 48 (2009) 1-3, str. 131-140
• Dorijan Kerzan: Sage in socialna teorija: Gisli Pálsson (ed.): From Sagas to Society; Comparative Approaches to Early Iceland v Časopis za kritiko znanosti, letnik 24, 178/1996, str. 281 - 284
• Dorijan Kerzan: Kirsten Hæstrup (ed.): Other Histories v Časopis za kritiko znanosti, letnik 22, 175/1995, str. 299 - 300
• Dorijan Kerzan: Janet Carstan, Stephen Hugh-Jones (ed.): About the house: Lévi-Strauss and beyond v Časopis za kritiko znanosti, letnik 24, 178/1996, str. 269 - 300
• Dorijan Kerzan: Pokrajinske islamske antropologije: Gisli Pálsson, E. Paul Durrenberger: Images of Contemporary Iceland; Everyday Lives and Global Contexts v Časopis za kritiko znanosti, letnik 25, 182, str. 277-279