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Deposition of the consultant, Dr. Sarah Gino

President. – Present here is Dr. Sarah Gino, who is being heard solely regarding the documents deposited with the office of the court. Dr. Gino has already provided her full personal details [è state generalizzata] and has confirmed the information already given.

Counsel Ghirga. – With a touch of emotion regarding the valuable work carried out during the hearings held earlier, the 41st hearing has finished which completes and the evidence hearings [istruttoria dibattimentale], therefore this would be... excepting and reserving that which will follow; given an extended, rather intense period elapsed, we will produce on a preliminary basis the documents in support of the oral testimony of Professor Torre as of July 6 which we were obliged to produce; there is already the CD with a scientific attachment about the laboratories or on the methodology plus supporting documentation for today's testimony... and a CD which both contains the documentary support for today and backup for the 6th [of July testimony]; there is already a duplicate so the Court will make use of it.

President. – Agreed.

Counsel Ghirga. – Actually, we can produce these because the 6th [of July testimony] is also on CD, we will produce a brief summary of today's [testimony]...

President. – After today's proceedings, all right.

Counsel Ghirga. – Yes.

President. – Dr. Gino has already provided her details. {63}

Counsel Ghirga. – With reference to Dr. Gino's testimony today, it covers the material... her commentary on the material produced on July 30, 2009 in accordance with an Order of the Court regarding the laboratory operations carried out by the Scientific Police of Rome on many and almost all the exhibits [findings, reperti] set out by the genetic consultancy already in the records signed by Dr. Stefanoni, [on] the oral testimony by Dr. Stefanoni, then her comment on the supporting documents of which she has knowledge and about which I would like to begin her [Dr. Gino's] presentation, reserving certain further questions until after the completion. Thank you, so you have consulted that…

Consultant. – And so, at the end of July the documents were handed over which contained status reports, the reports of quantification performed both with a Qubit fluorometer [Qbit in the transcript] and with a Real-Time PCR. I would start by analyzing that which follows from reading the Status reports in which we have information which indicates to us which personnel performed the analysis, the file number, the bio code number; which tells us that this file was shared with the ballistics and the latent fingerprints; which tells us the number of exhibits [findings or artifacts] analyzed was 229. However there exists in the first section [part] of these records... I think there is some information that is missing, or to put it better, information which is not easy to interpret and is indicated at the beginning of the [laboratory] operations. The starting date of the operations is stated as "start date: Nov. 12, 2007" but reading the records further, one notices that some samples were extracted before that date, Nov. 12, 2007, for example the first sample indicated as L1074701000 shows Nov. 5, 2007, as the extraction date. Then regarding another element that is not clear to me, I wasn't able to understand what the words

“committed to writing on Dec. 6, 2008” could be the end of the {64} transcription [writing down] of the whole but the way it is stated, one cannot know what it means. Further, there is a section with an index of exhibits [findings], a code is assigned to each finding, the number of traces which were drawn from that finding, and a description of the finding.

Now we move over to the list of traces: there is a code assigned to each trace, indicating what was the code of the sample when it was amplified, the type of the trace, a description of the sample. Then we move to the quantity of the extract which is always indicated as equal to 50 without a measurement unit however – but those in the profession know it so we can assume that this 50 indicates 50 microliters. There is also a section [fase] indicating the outcome of a diagnostic of the [sample's] nature, that is the outcome of that stage of laboratory investigation which tells me the provenance of the trace I have obtained, whether it is blood rather than saliva, rather than sperm. Once again, the outcome of the diagnostics of nature which, as we have said, tells us the type... the nature, the origin of the sample we are analyzing: for blood tests were performed, for example, such as tetramethylbenzidine or luminol; with regard to traces presumed to be of saliva, for example, whether amylase was run or not; for traces of semen, too, there is an indication [si valuta] if it was run ... what kind of diagnostics for provenance was carried out. Then we move to extraction, the extraction phase, and it is indicated – they are indicated: the date[s] of the first, second and third extractions for almost... for all the samples which are reported in the cards; we are talking about a single extraction so we have the date, the first date.

Then the quantification is shown, also three dates are expected, however we note that in these index cards [schede] the indication of the date is missing – missing is the indication of the date of quantification. [T]oday, at this moment, we can go back to when the quantification was carried out by analyzing {65} the reports that have been presented regarding both Real Time PCR and the Qubit fluorometer yet by reading the SAL cards, that does not show up; after which we pass to the amplification. As part of the information the dates of the first, second and third amplification should be included and the type of commercial kit used for the amplification of that trace. Both these pieces of information are missing from the SAL cards. As far as the kit is concerned, we can determine it by studying the technical report deposited by Dr. Stefanoni but for the date... as regards the date, there is an omission in the documents we have today, even after the requests which have been made: we have no indications of when the samples were amplified – and why is that very important? Because we do not know which samples, which traces were amplified together, we do not know if these traces were amplified repeatedly or there was only one amplification, and obviously this missing data is of certain importance because, for example, we have talked of problems of possible...

Judge. – Let's avoid comments which become rumors.

Consultant. – Of possible contamination among the samples, for without knowing the date of amplification we cannot know whether it could have occurred; also, regarding the amplification, everything related to the volume of the reagents, as well as to the amount of DNA for all samples under investigation, is missing.

Then we turn to the stage of capillary electrophoresis, hence to the stage which is indicated here as a ran [sic – transcription error?] number [of] an instrument, then to the final stage where we obtain the raw data which is then analyzed with software and which gives us the genetic profile of the subject who left the biological trace also with regard to this type of investigation we do not have (inaudible) information relating {66} to the date and the tool that was used. [A]s far as the dates are concerned, we can retrieve them from the electropherograms which were deposited; therefore, of all this information I have highlighted as missing, the pieces which are truly missing and which, hence, do not allow us to

provide an assessment of these samples which were amplified together are [è] exactly the date of the amplification and the possibility that the amplification – the stage we call the apex of the laboratory investigation – might have been repeated. Why is it important to also know if it was repeated or not? It is important above all regarding these traces that we have always defined as low copy number [LCN further on], namely those traces which contain a tiny amount of DNA and for which – as we have already discussed previously and I would not return to the subject – it was necessary according to the guidelines that they should be... in short, the guidelines followed by the international community are not to re-amplify so we do not know if the genetic profile eventually obtained was a true profile or rather a profile borne out of what? Out of all those artifacts that can arise when one works in the presence of LCN DNA, therefore of DNA present in very low amounts, less than we said last time... I would say less than 100 picograms; I will note that even some articles, in fact, speak of low copy number under 200 picograms which is definitely more... a greater amount than the 100 picograms I have pointed out. These are the considerations I have to make regarding the SAL index cards, and finally to add to this, some exhibits are not... for some samples the SAL cards have not been found at least in the documents which we have at our disposal but this, I believe, was already said before me by Prof. Tagliabracci, for example exhibit 29 regarding the oral tampons from {67} Lumumba; better still, exhibit 58 – so this is the first point I have considered in the analysis of these documents.

Counsel Ghirga. – OK.

Consultant. – This is a summary of what I have said so far, therefore we have the lack of that information... [to] the lack of this information one should add however other omissions of some importance. We have said that for the extraction, reported were the date, the final volume, and also – in the technical report which was deposited – the method employed.

However it was often said in the recent hearings, as well as before the GUP, that there is a possibility some samples were concentrated; the SALs omit an indication of concentration for some samples [we have been told?], for example sample 36 B, the one drawn from the blade of the kitchen knife which concerns the Knox defense, for example; that the sample was concentrated both before the quantification and afterwards, during the quantification, – of that, there is not a trace in the SALs.

In addition, with regard to... in addition, note that the absence of the date of the amplification prevents us from understanding which samples went together; prevents us from excluding possible contamination; not stated in the report [reazione = misprint of relazione?] as we have said… are the numbers of cycles which were performed, thus if there were modifications to the protocol normally specified by the manufacturer or supplier of these amplification kits generally used in forensic genetic laboratories. The second point, the quantification: reports for two different types of quantification were deposited. First, the Qubit fluorometer manufactured by Invitrogen used with a commercial DNA quantity (inaudible) kit sensitivity 0.2-100 nanograms which is {68} manufactured by Invitrogen; that kit is highly selective for double-stranded DNA but is not specific for human DNA. It is able to quantify DNA with a double spiral, and as we said in a range between 0.2-100 nanograms, 0.2 nanograms corresponding to 200 picograms which, as we said, is the threshold to be able to consider the quantity of DNA present in this sample low copy number. The manufacturer however makes an effort to stress that these 0.2-200 nanograms correspond to an initial concentration of DNA in the sample equal to 10 picograms/microliter-100 nanograms/microliter. The second method used for quantification is Real Time PCR using as a commercial kit [inaudible] all produced by Play Bajo [?] System (or similar), which kit, unlike the previous one, which used with a fluorometer, is almost specific for the human – I say almost because it can produce false negatives, that is, they can give a major reaction with primates, therefore with monkeys, and its sensitivity is equal to 10 picograms per

microliter. What remarks can we make about the documentation provided? To begin with, in all these reports deposited and in the oral testimony in which Dr. Stefanoni was heard both before the GUP and before this Court it never emerged that a different method than Real Time PCR had been used for quantification; instead, analyzing the documents provided, one sees that on November 6, 16, 14 November some samples, among which the extractions A, B, and C from exhibit 36 – the knife which interests the Knox defense – were not... were not quantified, sorry, with the Qubit fluorometer and the results for the traces B and C, B being the trace which is said to have been present at the level of scratches on the blade of the knife, turned out to be "too low" – what does that mean? "Too low" is that we can find in the card which was presented, "too low" could mean, signifies according to common sense that that value was probably [forse] {69} too low relative to the threshold of the kit and also it could not be... one cannot tell whether it was DNA or not and more probably – seeing that, as we have said, the manufacturer states that the threshold of the kid is equal to... is less than 10 picograms per microliter – means that this trace could be the quantity of DNA present in that trace; could also be equal to zero; alternatively it could be... we could be in the absence of DNA, human and not, because we remember this kit does not detect only DNA but also detects the DNA of other animals. Those samples were nonetheless amplified, some even after concentration, and genetic profiles were obtained related to sample 36 B and another sample, which produced "too low" [and] instead ended up in amplification, is sample 33A and another, switchblade knife, which was seized in Sollecito's house. Now the question we are asking is whether the concentration of the DNA was below 10 picograms/microliter [so] we were surely in the presence of LCN DNA and still I repeat – without entering into the merits of the discussion which we had during the previous hearing -- [that] you may not have followed the guidelines for the result obtained to be considered scientifically valid, for we remember that the sample was amplified once and amplifications for verification purposes [di prova] were not performed, which nonetheless was provided for by the guidelines. Also [regarding] sample 36 B in general, from the documents we have at our disposal, those that were made available on July 30, we can note certain inconsistencies as to what was said before the GUP or otherwise in the technical report. [F]irst of all, before the GUP and, to be precise, on page 178 of the transcript one reads that the quantification for that exhibit 36 B was in the order of several hundred picograms. We have seen that in these documents placed at our disposal, there is, first of all, no {70} quantification performed with Identifiler, contrary to what was claimed, and that above all this sample gave a reading of "too low", therefore it is difficult to claim that there were several hundred picograms. In addition, the technical report deposited, on page 78, also [sempre] speaks of traces which were extracted from the knife, the knife of interes,t exhibit 36; the traces positive at quantification, traces A and B, were subjected to amplification and subsequent capillary electrophoresis and the traces negative at quantification, C, D, E, F, G, were analyzed after concentration by using [name transcribed as "peed buck"] or similar tools etc. etc. Hence two contradictions: first, the result obtained with the fluorometer for trace B and trace C are exactly the same, "too low", however trace B was shown as positive at quantification and trace C, negative. Second, we must point out that in her testimony before the GUP Dr. Stefanoni affirmed that trace B had been concentrated before extraction and subsequent to the quantification in which she obtained a final volume of the extract equal to 10 microliters, which was all used for the amplification; it does not show in the technical report, which actually says that only traces C, D, E, F, G were concentrated.

Therefore my question in this: if trace B was not concentrated, why was not the amplification repeated? Further, the quantification of exhibit B, 36B, at this point is controversial because it is stated as positive in the report, negative as regards the outcome of the fluorometer, and also the method used in this quantification is not Real Time PCR but all three traces, A, B, and C were quantified using the fluorometer but the successive traces D, E, F, G, which were the traces extracted after December 17, if I am not mistaken, were actually quantified with {71} Real Time PCR and the result was given as equal

to zero as DNA quantification. This is as concerns the famous knife, which we have much discussed.

Counsel Del Grosso. – If you please, Doctor, if we can summarize some... briefly some aspects which have emerged from your report at this moment, I would like to know one thing: just now we have acquired the data on the quantity of the DNA found in the various traces which was later amplified and...

Consultant. – Exactly, only at this moment...

Counsel Del Grosso. – In the technical report, we did not have this data?

Consultant. – This data – we did not have it; we had at most a table telling us whether quantification was performed or no, however in this table, it is Real Time PCR that is always reported as the method and never the fluorometer.

Counsel Del Grosso. – Exactly, then before these documents were produced in July 2009 what was the information in our possession, of the Defense and of you consultants, related to exhibit 36 B?

Consultant. – That which is written in the technical report and also that which I have reported, that the trace gave a positive result at the quantification, traces A and B were then subjected to amplification, to capillary electrophoresis but the other traces C, D, E, F, G were negative, and also what Dr. Stefanoni told us at a hearing – in particular, I recall what she said before the GUP at this moment so I know exactly...

Counsel Del Grosso. – Let me look... I'm reading page 100... 178 of the oral testimony of Dr. Stefanoni October 4, 2008, before the judge of preliminary hearing, to the question, “But according to you, what was the quantity?” {72} “Yes, in the order of several hundred picograms” responded Dr. Stefanoni. Is that data, the order of several hundred picograms, compatible with the result which we have, “too low”, from the Qubit fluorometer?

Consultant. – No, it is not compatible.

Counsel Del Grosso. – Why do we remember what is the quantity...

Consultant. – It is not compatible because if had been truly several hundred picograms, the fluorometer would have seen that and there would have been a number, 0.1, 0.2, 0.4, however it was written “too low”.

Counsel Del Grosso. – Before these documents were produced in July 2009, we knew, as you have said, that this DNA was quantified with an apparatus called Real Time PCR.

Consultant. – Yes, exactly.

Counsel Del Grosso. – Now, however?

Consultant. – Now we know that the tool used was a different one because on these dates... let me look back at a slide so I don't say something wrong: November 6, 13, 14 – the samples which were extracted on those days were quantified with the Qubit fluorometer.

Counsel Del Grosso. – What is a different apparatus, if you can explain why and what respects?

Consultant. – It's different, properly speaking...

Counsel Del Grosso. – I'm asking you because...

Consultant. The method used is of a different type.

Counsel Del Grosso. – It is not specific for human DNA?

Consultant. – The kit which was used is not specific for human DNA, therefore some samples which may have tested positive but then did not produce genetic profiles – why? Because instead of DNA, it was DNA of some other animal and the principle upon which it is based is different... Real Time PCR is nothing else but an amplification which {73} is being performed, and it is more precise because it gives us additional indications that can help us to build our successive amplification, which is what should lead us to obtaining a genetic profile in such a way that it is done under the best conditions possible, in the sense that Real Time PCR, for example – call it pi-ci-ar if you wish – also gives us indications, for example, whether inhibitors are present or not, which is very important for the forensic geneticist but is impossible with a fluorometer.

Counsel Del Grosso. – Hence, according to you, we have discrepancies between what followed from the technical report and what was reported during the hearing before the GUP by Dr. Stefanoni and what emerges from the documents produced in July 2009?

Consultant. Yes, certainly we do and I have listed them before.

Counsel Del Grosso. Thank you.

Consultant. I would like to proceed to my observations at last: the traces we discussed last time, luminol-positive traces. What emerges from the documents disclosed in July 2009? These luminol-positive traces were named exhibits 176, 177, detected in Romanelli's room, traces 178, 179, 180 detected in Knox's room, and exhibits 181, 182, 183, and 184 found in the corridor outsidethe victim's room. These tracks, let’s recall, are those tracks that were brought into evidence by the spraying of luminol. Analyzing these SAL cards, we learn – in contrast to what the technical report of the Scientific Police represents, and to what has been claimed in the courtroom – that not only the luminol tests were performed but these traces were also subjected to a generic blood tests with {74} tetramethylbenzidine. Tetramethylbenzidine is the test we normally use in the lab to find out if a trace is possibly blood or not; it is a very sensitive method; I believe that Professor Tagliabracci during his last round of testimony stressed that repeatedly; however it is not specific because we have seen there exist false positives with this... with tetramethylbenzidine, so something that gives a positive result is not blood in reality. This data, however, is new; only now that we have the SAL cards do we know that a second test was performed; and what did that test produce? It produced negative results for the exhibits for which it was possible to obtain a genetic profile, that is 176, 177, 178, 179, 180, 183, while for exhibit 183, the other three exhibits... sorry, exhibits 181, 182 and 184 gave an “uninterpretable” result. At this point it seems to me justified to question whether these luminol-positive traces, which have been much discussed, can still be considered traces of a hematic nature; further, analyzing the quantification data we see that the quantity of DNA recovered from most of these traces should be compatible with LCN DNA, so with DNA present in low amounts; also in this case it is necessary to question whether the amplification was repeated or not to be able to consider the result obtained scientifically valid; these are

my remarks on the documents delivered to us.

Counsel Ghirga. – I...

President. – Please, counsel.

Counsel Ghirga. – Regarding tetramethylbenzidine, the chemical test for blood, on exhibit 176, as you said, negative; on exhibit 170, positive, relatively (inaudible) and 170 of the technical report already in the records from June 2008, you referred to these samples when you said... {75}

{75}
Consultant. – Yes.

Counsel Ghirga. – And this negative, how... where it says negative, what should we think, is it negative for blood?

Consultant. – When it is negative, because I am running a test on a substance which I assume is blood because of the luminescence, then it is obvious tha`t I am looking for presence of blood, if it comes back negative, this presence of blood cannot possibly be [non può assolutamenta essere] established.

Counsel Ghirga. – One cannot speak of it. I have asked you and I am asking you today at the public hearing: we spoke of quantity without bringing up [a parte riportare] certain proportions among microliters, nanograms and picograms which we already had (inaudible) last time but today you have made an assessment also [of] microliter/picogram, so if you could illustrate again for us, since I read in all the SALs that the quantity extracted is 50, 50, and I am repeating one question I have already asked you: according to this data, the quantity extracted is 50 and if you could suggest to us once again a proportion between microliters and nanograms...

Consultant. – As far as the 50 is concerned...

Counsel Ghirga. – In all the SALs, the amount extracted is written down as 50.

Consultant. – Exactly. So how...

Counsel Ghirga. – If you could explain this to us again.

Consultant. – I have already noted this obviously… The unit of measurement is not indicated but I assume for the operators who work in that sector it must have been equal to 50 microliters. What does it mean? It does not mean the amount of DNA present inside this trace but it is the amount... it is the volume in [with] which I have eluted [washed out] that which I have extracted, have extracted out of the trace, out of the substrate on which there was my DNA. To know what is the amount of DNA present in this volume of liquid – because, by the way, it's a liquid in [with] which we extract – we must perform a quantification, therefore this 50 absolutely should not deceive us: it is 50 microliters, it gives me {76} the volume... it's [the value] of the volume in [with] which I'm eluting the DNA.

Counsel Ghirga. – Can one say the DNA is a diluent [he probably meant to say "DNA is diluted"]? No.

Consultant. – The DNA is contained in the interior of this...

Counsel Ghirga. – Because it is a volume.

Consultant. – In the interior of this liquid; DNA can be equal to zero inside this liquid because there is no DNA in the trace, or it could be equal to 200 picograms, one nanogram, 10 nanograms – it depends. We only know the volume in [with] which the sampled material was extracted is 50 microliters, period – this does not give us any indication of the quantity of DNA present because the DNA might as well be equal to zero.

Counsel Ghirga. – The last question, President, related to exhibit 36, the knife, trace B. I have already asked you about animal species – could you explain again what it means, animal species?

Consultant – Animal species, I believe, is when... where there are tests specific for the human and which, therefore, can indicate that this trace is of human provenance... however when it is impossible, they say the trace derives from an animal but eventually tests should be run to ascertain which type of animal could have left the trace, such as cat, or dog, or...

Counsel Ghirga. – Thank you, because there is a cat, there is cat blood everywhere...

Counsel Del Grosso. – So, Dr. Gino, referring to what you have said, the luminol-positive traces – we have talked of the technical report – what information are we getting?

Consultant. – From the technical report, we only learn that these traces are those which at the site of the investigation had a positive result in what is called a generic diagnostic, that is positive in a generic test made by luminol. {77}

Counsel Del Grosso. – I recall there is a little square with the words: "generic diagnostic"; there is an X to say "positive according to the diagnostic."

Consultant. – There's a positive V but in the little square nearby it's written down; anyway, now I'm saying this in my own words, the concept is this: made in the course of the investigation with luminol – but we have seen for other traces, for example the trace where it said...

Counsel Del Grosso. – Closer to the microphone, please.

Consultant. – Where it said, I think it's 170, the square [il quadrati? either "i quadrati" or "il quadrato"]... it is written: "test made with generic diagnostic tetramethylbenzidine " and it's a positive result.

Counsel Del Grosso. – However, by checking the SALs, that is only by checking these documents we have found out that a specific test for blood was administered.

Consultant. That's a test which also...

Counsel Del Grosso. – This is the test whose name I cannot master...

Consultant. – Testing with tetramethylbenzidine, it's a test like luminol – also presumptive because he does not tell us whether that is really blood. A positive result tells me it could be blood, it could be blood of a dog, a horse and a human. To find out if this is truly blood, which contains hemoglobin, it is possible to run a test, e. g. with immunochromatography to learn if that is human hemoglobin, or other

types of analysis instead which can indicate to me the presence of hemoglobin but do not tell me whose blood it is, therefore this test tells me that blood could be present.

Counsel Del Grosso. – But the result was negative?

Counsultant. – But the result was negative.

Counsel Del Grosso. – Thank you.

President. – There are no further questions, for the counter-examination only on the last aspect obviously because it was been {78} exhausted...

Prosecutor Comodi. – Yes, yes, I'll be very brief in fact.

President. – Please, Prosecutor.

Prosecutor Comodi. – Regarding the last argument, to your knowledge... the assessment of whether it is blood or other material which reacts to that test with TMB was negative; but to your knowledge, was Amanda's DNA found on the traces we are talking about?

Consultant. – Hold on a second so I can go to my slides because from memory, I can say things that are incorrect. Now, I have found for example exhibit [finding] 178, telling us from this material Knox's DNA was extracted; the same for 179, 180.

Prosecutor Comodi. – Here, perhaps without being able to affirm with certainty that these traces are human blood or other material, can we exclude, in any case, that these come from an animal since this is human DNA?

Consultant. Well, let us go over this again: human DNA, which could emerge not from blood but also, as I said last time, could emerge from...

Prosecutor Comodi. – From biological material.

Consultant. – From saliva, from exfoliated cells.

Prosecutor Comodi. – That for sure.

Consultant. – Yes, exactly.

Prosecutor Comodi. – Certainly, but I must say there is data... on the other hand, there is negative data from that...

Consultant. – From tetrabenzidine, from TMB.

Prosecutor Comodi. – Yes, from that test it was not possible, therefore, to establish what it was – which material, in sum, was analyzed, correct?

Consultant. – Yes.

Prosecutor Comodi. – At least it was not established {79} that it was blood, but I can say it was confirmed that Knox's DNA was found?
Consultant. – True, Knox's genetic profile was found.

Prosecutor Comodi. – Okay, and still on the subject of this TMB, from this test in percentage terms according to your experience, this test done on traces revealed by luminol – are there more of the cases in which the test is negative, this type of... negative with TMB, or more of the cases which result in a positive?

Consultant. – I would say it's 50% because sometimes luminol gives positive traces that can in reality turn out negative with TMB and sometimes... I would say 50% and 50%; impossible to say yes or no one way or the other.

President. – Excuse me, but TMB – can you explain to us?

Consultant. – It is tetramethylbenzidine, TMB, this is an acronym that is used...

Prosecutor Comodi. – In essence, it is a reaction, and what is that reaction?

Consultant. – Yes, yes, it is a c[o]lorimetric reaction which occurs in the presence of tetramethylbenzidine. There was a time they used benzidine; later they saw it was carcinogenic and it was better to remove it from use, so it [TMB] is being used... but it is exactly the same principle if you're familiar with the "stick" we use to check, say, for the presence of blood in urine – it works exactly in the same way – we have a c[o]lorimetric reaction.

Prosecutor Comodi. – Good, another question, but perhaps you have already answered it implicitly because turning to the SALs... well, besides [a parte] your first... your first questions... date of transcript...

Consultant. – OK, that is the first slide which I showed on this subject {80} here.

Prosecutor Comodi. – Date of transcript June 12, 2008.

Consultant. – Yes.

Prosecutor Comodi. – Do you know what is the date of the report by Stefanoni deposited...

Consultant. – If you ask me, it's got to be 12... I believe yes... on this related point, it was in fact... I remembered [ho messo] what it means because it was my... I did not realize, but it's OK.

Prosecutor Comodi. – And do you know if... when it was that the list [iscrizione] of suspects was communicated to the Scientific Police?

Consultant. – No, I do not know that; at this point I imagine it was December 11, 2007, am I deducing correctly?

Prosecutor Comodi. – Because there is a different dating depending on whether the proceeding was still against unknown persons and they made the extractions against unknowns and so...

Consultant. – I only pointed out that I could not resolve this discrepancy between the two dates, now I have an answer, which is fine.

Prosecutor Comodi. – At the beginning of the operations, then in the proceedings it became against known persons.

Consultant. – Against known persons, OK.

Prosecutor Comodi. – The fact that... I mean, as regards the dates in general, the date – that some dates are missing...

Consultant. – So for example here...

Prosecutor Comodi. – Concerning...

Consultent. – It refers to that, to the amplification....

Prosecutor Comodi. – OK, OK, suppose anyway that it was exactly its importance if I am told that certain operations were not properly performed after the first, but anyway, suppose it was exactly its importance for the purposes of {81} the final result – the fact that some date is missing from the SALs, what does it mean?

Consultant. – But I...

Prosecutor Comodi. – That is, for the purpose of the final result from a technical-scientific point of view because the formal, administrative, legal, organizational, so to say bureaucratic, etc., I should say that is beyond your specific competence.

Consultant. – Of course. Let's say that the importance of the lack of the dates as regards the quantification and capillary electrophoresis, I have clarified that [myself], only in the sense they are missing here but we find them elsewhere, so these are indications which we have and which are useful in the study of the documents, the study of the investigations performed; but what is actually missing, nowhere to be found in all the documents have received, is the date of the amplifications. I'll use the example of the laboratory where I work, for example we, too, are supposed to create a card in the records where we put down, however, the exact date when amplification is done because that way we can see which samples, perhaps from different cases, are amplified together to properly run this control against possible contamination that exists inside the laboratory. So to me, as a consultant to a party, to know or not to know whether, on what day, ten samples which contained the victim's DNA, and that sample 36 B, were amplified – you understand that may interest me, because I see that, as we have said of the quantification, exhibit 36 B gave "too low". [T]herefore [there is] an indication of this uncertainty over the quantity of DNA, which could be equal to zero; you know I get suspicious that there was contamination in the successive amplification operations but I cannot verify that until I know which samples were {82} amplified together.

Prosecutor Comodi. – OK, so these dates in essence would be of use to you not to assess the goodness of the investigation but to check for the possibility of contamination.

Consultant. – [That's] one, and two is to check whether indeed none of the samples submitted was amplified, for instance, two or three times because a reaction of amplification can occur but, from

personal experience, it can go wrong because at a moment when you are distracted, you forget to add something, or it goes wrong because you have miscalculated, and it's true that you have quantified but the quantity of the DNA is not satisfactory and so you decide to amplify again to obtain, obviously, an even better result than you can obtain; it's obvious that... knowing if a trace was amplified several times gives me additional information, particularly about those traces that, as we said, were equal to... that contained an amount of DNA below 200 picograms, which, as we said last time, is the boundary to consider a trace LCN and so knowing whether it was performed... I am not only talking about trace 36 B but in general, of all these traces which resulted in less than 200 picograms at quantification, for which of them amplification was repeated or not...

Prosecutor Comodi. – In the files that you could examine after their deposition at the end of July, is there a list of quantifications?

Consultant. – There is a list of...

Prosecutor Comodi. – Of samples quantified?

Consultant. – Yes, a list of samples quantified, in fact as regards quantification, I know exactly when they were quantified. {83}

Consultant. – Yes.

Prosecutor Comodi. – For each sample.

Consultant. – Yes, exactly.

Prosecutor Comodi. – Indeed?

Consultant. – Yes.

Prosecutor Comodi. – That is what you cannot detect?

Consultant. – I cannot detect that and I cannot even detect the date when the amplification was performed because the amplification which I have in mind is the amplification with the commercial kit Identifiler, which is different from the amplification done with Real Time, there are two completely different things.

Prosecutor Comodi. – And if done on the day of quantification (overlapping voices)?

Consultant. – But that is not indicated anywhere.

Prosecutor Comodi. – No, I'm saying what does it matter at the level of the final result if it is done the same day as the quantification or on a later day?

Consultant. – No [i.e., it matters], because I'm interested in knowing which samples – perhaps I have assembled samples in that amplification which derive from a different quantification and if I know when the sample was amplified I know exactly what the samples are... what type of DNA these samples contain; I know if from amplification 1 Meredith's profile came up or instead from sample 2 Raffaele Sollecito's profile emerged or Amanda Knox's.

Counsel Del Grosso. – President, I would like to intervene to say that if by means of the question to the consultant for the party one wishes to obtain the data which was not provided by Dr. Stefanoni, this does not seem the correct procedure, we do not have the data of amplification, she should have reported in {85} the course of her examination that the dates of amplification were those of quantification, it seems to me that...

President. – Agreed, but the Prosecutor is asking questions, please.

Counsel Del Grosso. – We are making hypotheses as to which...

President. – Yes, but the consultant can answer perhaps...

Prosecutor Comodi. – It has been said [in a hearing]...

Counsel Del Grosso. – How is the consultant [supposed] to know whether the dates of amplification and quantification are the same, excuse me.

President. – Agreed, true, however...

Prosecutor Comodi. – If it were so important, one should be able to ask...

President. – Let us respond...

Prosecutor Comodi. – In the two days of hearings.

President. – Excuse me, but the consultant will answer questions if she can.

Prosecutor Comodi. – Obviously, it was not so important.

President. – Please.

Prosecutor Comodi. – You know the reason for that... if there is a reason, let's say a technico-scientific preference or if there is an obligatory selection of the fluorometer for any samples?

Consultant. – No, it is not possible to tell why it was used only on certain dates, the only supposition I can make is that perhaps the Real Time [device] was busy... that is, I do not know that; these are suppositions I can make, I don't...

Counsel Del Grosso. – Objection, President.

Prosecutor Comodi. – Yes, the fact that...

Consultant. – Or perhaps it was broken, I don't know...

Prosecutor Comodi. – And the fact that {86} the fluorometer is used... does it mean the use of the fluorometer affects the final analysis?

Consultant. It's not... I cannot say at this moment that it affected the final analysis in general, but I can

say that up to July 30 we believed that the only tool used was the Real Time PCR so it is not clear which method was used because one does not know how the two traces, B and C, which gave a "too low" reading with the fluorimeter, are stated in the report, one as positive and the other as negative upon quantification, even though the result was exactly the same, perhaps... I do not know [how] from trace B a genetic profile was obtained but from trace C no genetic profile was obtained.

Prosecutor Comodi. In fact... I mean that you also gave a further response, however as regards...

Consultant. Yes, but the quantification... excuse me, but the quantification gives me exactly the same value so I cannot justify a positive trace at quantification because I obtained a genetic profile later, and a negative trace at quantification because I did not obtain any genetic profile later, therefore either it is an error in recording [the result: un errore nel senso che mentre scrivevo]... but still the fact is that there are two differences so it is important to me if that trace is negative or positive because if it is negative at quantification, it indicates that perhaps this phenomenon of contamination of which we have always spoken cannot be excluded in the amplification phase.

Prosecutor Comodi. – But in the course of a preliminary hearing earlier and in the course of a debate hearing later, Dr. Stefanoni explained, described the amount examined from that notorious trace B? {87}

Consultant. – She spoke of several hundred picograms but "too low" does not correspond to several hundred picograms.

Prosecutor Comodi. – Referring to what?

Consultant. – To trace B, because we are always interested in trace B, because what concerns trace A, which gave a profile, did not interest us.

Prosecutor Comodi. – But referring... the minimum which you have said is how much?

Consultant. – The final concentration of the sample is equal to 10 picograms/microliter.

Prosecutor Comodi. – Picograms.

Consultant. – Uhm, uhm.

Prosecutor Comodi. – Let us reread well page 78, which has not been read completely.

Consultant. – Page one hundred... page 78?

Prosecutor Comodi. – 178 of...

President. – Before the GUP?

Prosecutor Comodi. – Yes.

President. – Please.

Prosecutor Comodi. – You recall what is the quantity of DNA... more or less from the middle of page

178, "the total amount which I had at the end because obviously depending both on the number of cycles for which I have the threshold of the signal [minimum signal] and then on the result expressed as concentration in nanograms/microliter" "if I can express it in nanograms/microliter" and the question, response: "in nanograms/microliter it was very low, it was something like..." and the judge interrupted because it was heard directly by the GUP, "OK, if there is no precise record, that is, if you have to make a guess" the answer: "I do no recall the total amount" "but according to you, the order is several nanograms or {88} almost in the picogram?" the answer: "yes, it was in the order of several hundred picograms, yes, the total amount" – what does it mean? That is to say, on the total amount something different from the indication you gave earlier of the minimum amount...

Consultant. – But first of all, out of the Qubit that quantity does not emerge, absolutely, and it was not done with Real Time, which is why this several hundred picograms would have been an error, a view, an imprecise recollection, but the fact is, it was said, "several hundred picograms", so if I could build on...

Prosecutor Comodi. – (Overlapping voices).

Consultant. – If I could build – until that moment... until the 30th – only on that indication, it is obvious that all the things were done upon that indication, after which I find out "too low", this "too low" does not correspond to several hundred picograms.

Counsel Ghirga. – But she has already responded.

Prosecutor Comodi. – How?

Counsel Ghirga. – Already responded (out of reach of the microphone).

President. – It has been confirmed, all right then.

Counsel Ghirga. – (Out of reach of the microphone).

President. – Are there other questions by the prosecutor?

Prosecutor Comodi. – Thus, are you aware that the Doctor stated before the GUP, because this is the audience to which several references have been made, that she had performed PCR with 28 cycles?

Consultant. – Yes, she said that she had performed PCR with 28 cycles.

Prosecutor Comodi. – Do you remember that?

Consultant. – Yes, because in fact she was asked why, if dealing with LCN, she did not amplify with a greater number of cycles than is normally suggested in the guidelines.

Prosecutor Comodi. – OK, from me, {89} no more questions.

President. – The Civil Parties, if there are questions, there are no...

Counsel Maresca. – No questions, President.

President. – There are no questions, there are no further questions, to complete the examination, will you please, Counsel.

Counsel Del Grosso. Yes, Dr. Gino, to conclude, is "too low" a negative quantification by the machine?

Consultant. – Well, "too low" does not mean...

Counsel Del Grosso. – Too low. [As translated into Italian.]

Consultant. – Too low.

Counsel Del Grosso. – Does that mean that the machine cannot read it?

Consultant. – It could be that the machine is unable to read and so it could be equal to zero.

Counsel Del Grosso. – Still a negative quantification?

Consultant. – It is a negative quantification because the machine cannot read, therefore it cannot say zero; it is a concentration that gives me negativity.

Counsel Del Grosso. – Since Dr. Stefanoni, in the course of the investigation, in the course of the hearing of 23 May 2009 tells us that she does not disclose, in her technical report, the data related to the quantification but tells us later that when the quantification is reported as positive, as is the case with track 36 B, it is useful for amplification – so when quantification is positive, it is useful for amplification; so I read the words of Dr. Stefanoni: when quantification is negative, it is not useful for amplification?

Consultant. – It's not, exactly.

Counsel Del Grosso. – Page 138, hearing March 23, 2009. Referring to the luminol traces, I'd like to seek clarification. You were able to ascertain from the documents produced that one is dealing in this case with LCN?

Consultant. – Yes, as I have mentioned before, it follows from the quantification {90} that the quantity of DNA present in this trace, if I may consult the documents...

President. – If they are at your disposal, it is authorized.

Consultant. – I'm going to do it... I'm going to give an actual example, that is we won't be talking in the abstract but, for example, of sample 176... the quantity of DNA is 0.04, we are talking of nanograms/microliter so it is means 40 picograms/microliter so we are well below the minimum threshold of which we have previously spoken, so some of these findings [exhibits], I would say practically all of them with the exception perhaps of 180, can be considered LCN.

Counsel Del Grosso. – Oh, and...

Consultant. – However as for this matter, we do not know if the guidelines were followed, if they were reamplified, if it was verified that the same type of profile turned up more than once.

Counsel Del Grosso. – Excuse me if this question is irrelevant, between a datum, a quantity below 10 picograms and a quantity of several hundred picograms, for you geneticists dealing with such quantities every day, is there a difference that you can determine to be material, low, we may fail to understand it in quantitative terms perhaps but below 10 picograms, what can an amount be equal to?

Consultant. – It's a minuscule amount, it's an amount that we should anyway always bear in mind that even if I amplify – because I've decided that I'm going to take everything I have and amplify everything I have even if it's below the amount normally used – [and] it's an amount that gives rise to a genetic profile, I must always put this question to myself, whether this genetic profile was not generated from something else, so it is not derived from a contamination [event]; there's a difference between talking of hundreds and of a few tens of {91} picograms just as there's a difference between talking of one nanogram and 100 picograms: one nanogram is a good amount of DNA that lets me work in full confidence; 100 picograms, 200 picograms, below 200 picograms, as I was made to point at the last hearing [by] the consultant of the prosecutor, but I would say that below 100 picograms one should take care, that is I must pose the question, if I get a result, how to interpret it.

Counsel Del Grosso. – These guidelines which have been cited several times in these evidence hearings, which prescribe these precautions, a double amplification and whatever we have referred to, serve and are necessary to avoid and stem the risk of contamination which is...

Consultant. – Yes, certainly, because...

Counsel Del Grosso. – Tell us why?

Consultant. – It's that... naturally, all that can help us because obviously repeating genetic profiles, rerunning amplifications, thus obtaining genetic profiles from the same extract of DNA, we can consider only those alleles, i.e. peaks, good and valid which repeat themselves every time we run an amplification. In contrast, we must consider the peaks which do not repeat themselves to be spurious, and the spurious peaks can derive from stutter[s], as has been surely said, from the stutters, thus this erroneous amplification of the allele, or rather, of other DNA which travels around – it is said that DNA flies, DNA flies not [because] it has wings but in the sense that all of us shed DNA and it's true that when... in a laboratory where they amplify hundreds upon hundreds of samples every year some trace of amplified DNA can be present in the tools, can be present on the pipette I use, can be present in the hood under which I prepare my reactions; this is a reality that must be taken into consideration: one cannot eliminate that {92} contamination; one cannot say: "My laboratory is the best of all because we have never had contamination" – that is simply not true [as] cases of contamination exist; it is necessary to take this into account, above all these instances of contamination that happen when one works in extreme conditions, that is with a few...

Counsel Del Grosso. – But with these infinitesimal amounts, is the risk of contamination greater?

Consultant. – It's not that the risk of contamination should be greater; it is more likely [lit. easier] that I should find the contamination, hence the risk of contamination is the same.

Counsel Del Grosso. – Certainly, but is it more...

Consultant. – When from the sample... however it is easier to find that out because we may have zero DNA of my extract with a tiny amount of that contaminant, it is obvious that I should know that, while I have, instead, a great amount of DNA of my extract and that tiny amount of the contaminant, it's an

overwhelming amount of DNA and of the extract and therefore I am ignorant of that contamination.

Counsel Del Grosso. – You have already said this but I would like that this be confirmed, the other traces that gave "too low" with the Qubit fluorimeter test, except two, it seems to me, read: "no data available of genetic profiles?"

Consultant. – Exactly, the only two which gave a genetic profile were traces 36 B and 33 A if I am not mistaken, anyway a trace related to exhibit 33.

Counsel Del Grosso. – Regarding trace 177, one of the luminol-positive ones that we said was LCN, is there a way to retrieve other genetic profiles in addition to those already found?

Consultant. – Yes, I stressed that at the last hearing, I brought forward... exhibit 177 as an example, where I pointed out that in addition to the profiles... that is, other that the peaks related to the victim and those attributed to {93} Amanda Knox there were other peaks which were not taken into consideration although some were higher than 50 RFU, which we have always talked about.

Counsel Del Grosso. – The last question then, which is a clarification for me, when you spoke of the concentration referred to by Dr. Stefanoni of trace 36, if you could explain that... you have identified a certain inconsistency between...

Consultant. – As regards that trace 36 B, let me say this track seems unfortunate because there is a whole series of inconsistencies. First of all, it has been stated that it was quantified with Real Time but in reality it was quantified with Qubit; the result was put down as "too low" but was stated as positive in the report; whereas trace C, which resulted in "too low", also with Qubit, was indicated as negative. Regarding trace 36, during a preliminary hearing it was stated that there was a trace that was concentrated before quantification and after the quantification. Of all this, there is not a trace in the technical report, because in the report... nor in the SALs because the technical report says that traces C, D, E, F and G were concentrated however trace 36 B is indicated in the report as... as equal to trace A, positive at quantification. That is an inconsistency regarding these documents.

Counsel Del Grosso. – Now as regards only the luminol traces, I wanted [to ask] if you remember, whether during the oral testimony before the GUP by Dr. Stefanoni – page 58 and further – she spoke of only having run a generic test on these traces, the luminol positive [test], but not of having performed other tests, which emerged today...

Consultant. – Yes, in fact it emerged that the tetramethylbenzidine test was negative for most {94} of the traces and was non-interpretable for two.

Counsel Del Grosso. – Thank you, no more questions.

President. – Good, as there are no more question, Dr. Gino is dismissed, the report shall be obtained together with the other documents produced by the defense of Amanda Knox.