**#49S**
**Lila Recordings AM**
**Set 2: 10-11-06 to 12-11-06**
**Day 22**
**061111000**
**1 Hr 43 min**
Recording 49

Y: If you want to share or not?

B: Maybe I'll just show you the general equation, or at least one of them, regarding this integer mathematic.

Y: The which mathematic?

B: Integer mathematic. Which we, which we have…

Y: Ah, I'm very interested in that.

B: …which we have touched, so to say, yesterday (Yogeshwar acknowledges.) by splitting the number. So every number, actually, has a hidden period in it. For instance, in finding the factors of a number you split the number by the period of that number. But what is the… actually, the deeper line of thinking behind it? It could be expressed, at least one aspect of it, as follows. Here we have expression **[Recording time 1:12]**. I have alpha which is some whole number; then K, another – I mean integer. Then beta; then gamma of K which is another integer – they are all integers – multiplied by ten to the minus one plus beta. So, for instance in the example we have been presenting last time, yesterday, we had a sequence of numbers (Yogeshwar acknowledges.) which would have, for instance, 60,000 digits. And then when attempting to find whether 13, for instance, is factor of this number, we split it into portions of say of 6. (Yogeshwar acknowledges). So here in this equation, the generalization of this idea is given. So actually, this particular case which we have been presenting yesterday, it is just a special case of this general equation. For instance, if K is 13 as in our case, K is 13, plus gamma of K is 6 here. Or for the first step it is pentar of 13 of first degree is 4, actually. This is the result of a sequence of equations like this one, actually. The one presented last time, in order to be convincing I picked that example. But actually this is the whole mathematics behind it. For instance,…

Y: So it's 4.

B: Uh? It's 4, yes. Yes, it's 4. It is of the first degree; yes, great. And now**, [Recording time 3:18 – please check out flow of sentence on Recording]** whatever numbers we put here, whatever couplet…whatever pair of integers – for instance 16 or a number of 10,000 digits – 3…then to 10 to the minus one plus beta, which is the second number, gives us always whole numbers. What is this? This is actually cutting the number for which we are to find the factor; whether a certain number is integer times, contained, into the referent one. First we are cutting the number by once, by cutting one digit. For instance, if we have one six nine, instead of dividing…instead of…for instance…and we want to find whether 13 is factor of this number, instead of dividing the number beginning from the left to the right, we divide the number by four by treating it beginning from the end to the beginning. (Yogeshwar acknowledges.) because this number is somehow complimentary to 13 (Yogeshwar acknowledges.) in terms of factorization. So, this four actually is gamma of first degree of 13. Then, we could go on. We could proceed this line of thinking and then we could find gamma of second degree which is pentar. Because five is somehow, five is in the middle of a decade [**Recording time 5:29]** system of numbers. (Yogeshwar acknowledges.) And it is somehow like axis of symmetry. It is somehow… it was found to be very important in this theory.

Y: Is this true if it's only a number system that is of the base 10?

B: No, no, no. It is general.

Y: Independent of the base.

B: Independent of them, yes.

Y: OK.

B: Independent. It is the beauty of it. You could put it in number with bases three or four or whatever. And if you put it in digits, just in binary system, it has even more…you find even more insights. (Y: Hmm) And so the second step is to have equation like alpha K plus beta pentar of second degree of K. And then you cut the number by pieces of two; by segments with two digits. So you cut the number with segments of two digits and then you have another number which is known for 13 – I had two folders thick, maybe 200 pages written, when I was working with whoever has introduced this method. **[Recording time 6:58]** (Yogeshwar acknowledges.) And we had numbers and numbers and numbers and tables of these pentars of first degree, pentars of second degree, pentars of third degree. It is like cutting the number, then you cut by two digits. We have pieces of two, pieces of two, pieces of two (Yogeshwar acknowledges.) And then you still have remainder because you haven't found yet the hyperpentar. This is plus beta **[Recording time 7:28]**. This also produces whole numbers. This is actually a picture of how you operate…or how you exercise, actually, this procedure of cutting the number in segments of two, and so on. Then you have third degree pentar of 13 and so on and so and so on. Also you have a period – this number. It is all the same if I take, for instance, a segment of two digits or of four digits or of six digits or of eight digits, because it is the same thinking. The same pentar is operating. (Yogeshwar acknowledges.) It is like an instrument with which you cut the number beginning from the end towards the beginning. And you process the number. It is just like dividing but instead of the beginning you start from the end. (Yogeshwar acknowledges.) And finally, and finally you go to the pentar of degree four, pentar of degree five, pentar of degree six, and so on and so on. And then you reach the point when this beta becomes one. (Yogeshwar Hmm.) So this is… so then you don't cut the number by beta and you don't have any more reminders but you cut, you have a clean cut, so to say; a clear cut. You have just…you don't multiply anymore the number of digits contained in this segment by the operator – which was pentar of first degree of pentar of second degree (Yogeshwar acknowledges.) – but you just cut it because you have found the hyperpentar which is one. You always…you multiply the segment by one; which is the segment itself. So finally you reach the point which was presented on the yesterday's session. On the yesterday's session I presented a procedure in which we are operating with the hyperpentar. This means we have found, we have reached the point in this sequence of equations like this one, the point at which this beta becomes one. And so we have a clear cut of the number. So this is the hyperpentar or a very specific feature or property of the number regarding the factorization with this particular number. So for each number, for each and every number, this hyperpentar could be found which allows us to cut a large number with many digits – giant number with, for instance, thousands of digits – by summarizing. And this is a great gain in time. Instead of dividing you have summarizing (Yogeshwar acknowledges.) which is faster; which is many, many, many, many times faster and with spare precious time in computer. (Yogeshwar acknowledges.)

Y: And we're working in whole numbers.

B: And we're working, yes, entirely in whole numbers. So this is this theory **[Recording time 11:16]** which is very, very interesting. But I should have material to present it. It is very time consuming now to reinvent the whole (Yogeshwar acknowledges.) because it lasted for months. (Everyone laughs.) And the second point, I planned to…maybe to… at certain point to introduce fractal dimension. And maybe this is the point because also it will be useful for presentation of Darshana's charts based on Fibonacci. We might apply at least some of these notions about fractal dimension on Darshana's graphs of Fibonacci. So actually, at one point somehow, I believe since we have some, so to say, traces or some notions which lead us to the point when either fractal geometry should be somehow introduced or chaotic attractor. Although we are dealing, yes, with whole numbers and so on, but still since we are working with complex networks, since once we introduce time and space into the picture we come to the equations like the one presented with recursion – for instance, **[Recording time 13:04]**, M of $I^2$; and so on and so on; I factorial N to $I^2$ minus one; and E to the M over N – when we reach the point when we introduce **[Recording time 13:15**] recursion into the picture, then there are possibilities for doubling of the period or something like this. And whenever we have chaotic attractor, we have special means to find its dimension. For instance, by counting the points in an elementary unit of space time which is somehow introducing the parameter of density. But my idea was to present the dimension of fractal set. For instance, what is fractal? For instance, in fractals we have initiator and generator. Initiator is the basic picture and the generator is the one that generates new patterns which are fractal by nature, fractals meaning part. The basic idea of fractal geometry is to introduce geometry in which the dimension… it's not always…it could be fractal; it could be not an integer but fractal. For instance, it somehow answers the question why the spread out, why the pattern of the stars on sky is not – why not the whole sky is full of stars which are without distance between them?

Y: Without what?

B: Without distance between them. (Yogeshwar acknowledges.) We always have this distance…

Y: A complete white sky.

B: Yes. A complete light sky. Yes.

Y: Yes.

B: Why is it so? And the answer is that their density is somehow fractal. I'll come to that point. And so on. For instance, moving of a molecule in space. To make it simpler it could move by Brownian **[Recording time 15:54]** motion in a plane. It moves in a line which is typologically of dimension one. But still, after millions and millions and millions of years it almost – almost meaning nothing actually in eternity – it almost fills the whole plane. But the plane is of typological dimension two. So it is neither one or two. And most precisely the dimension of its notion is logarithm of three over logarithm of two. (Yogeshwar acknowledges.) This is it; yes. And I want to come to this point… how it is obtained. It is very beautiful. To finish my picture here – back to this one – how we actually introduced most simple presentation of a fractal, pattern of fractal. This is the generator, this is the initiator. So over the initiator, we perform the operation introduced by generator which is this pattern here. Then on the smaller scale, we introduce once again the same pattern. Then on an even smaller scale, which is logarithmic, we introduce the same pattern once again. This particular fractal is Koch snowflake (Yogeshwar acknowledges.) because it could go this way and this way and form a snowflake. But what is the feature, the underlying pattern? What is, so to say, the specific number of this pattern; its identity? It is obtained by fractal dimension. How it could be introduced? For instance, we have just one point. Now we are dealing with dimensionality – we are searching for dimension – so we introduce into picture dimensions. First we have point which has dimension one; the dimension of this point is one according to Euclid geometry – which is not sufficient to explain the nature. In order to somehow find the general number, to find the most emphasized feature of this (or simply its dimension) we cover it with one small square or a circle. And so the number of squares needed in order to cover this one and to somehow introduce it, somehow describe it, the dimension is one. Now second step is: we have a line which is typological dimension one, and now the number of tiny squares needed in order to cover this line and somehow to describe it or to discover this dimension its…the number is…if the length of this line is L and the number of small circuits or squares is N, the number of this is L over N; the number of this **(?) [Recording time 20:18]** is L (Yogeshwar acknowledges.) over…or better over epsilon; if we take this to be epsilon, the number is L over epsilon. If we have a surface which is of typological dimension two, the number of little tiny squares needed in order to cover the whole surface with the objective to find this dimension (the dimension of this set **[Recording time 21:13]**) is S over epsilon square; where this degree shows us, actually, the dimension. This is the dimension. And one more picture. If we have a three dimensional body, then we need tiny cubes in order to find its dimension, or its underlying most emphasized feature. (Yogeshwar acknowledges.) And the number of this is the volume of the whole body, three dimensional body. So the typology here is this of three Euclidian **[Recording time 22:04]** dimensions over epsilon on third degree. (Yogeshwar acknowledges.) And here is the dimension. And now, in general case we have logarithm of N is logarithm of V minus three (or D) – because in general case we have N is V or V prime **[Recording time 22:32]** over epsilon on D, degree D. (Yogeshwar acknowledges.) So this is the dimension D – which is our objective, to find the dimension for any set, logarithm of epsilon. If we assume that V is one, in general case, then logarithm of one is zero. **[Recording time 23:05]** So we have logarithm of N is minus logarithm of epsilon; or logarithm D minus V logarithm of epsilon; logarithm of N is minus V; logarithm of epsilon D is logarithm minus V logarithm of N over logarithm of epsilon; so D is logarithm of N over logarithm of one, over epsilon. And this is actually the formula for finding a dimension of a fractal set. (Yogeshwar acknowledges.) And we meet fractal sets in nature, everywhere; in the formation of stars; in the density of stars; in plants, and so on.

Y: Well, I think this is the third level mathematics in the Lila Paradigm (Biljana acknowledges.) where you have matrices that are the substates. And then those are related to each other; (Biljana acknowledges.) and you want to know what the dimension is. (Biljana acknowledges.) Then that would work.

B: Exactly; yes, I suppose you have seen fractals – at least Penrose, his…

Y: Oh, yes. I've seen his and…

B: But I could show it. I could show you, if you want, in my book in different dimensions.

Y: Yes.

B: This is the initiator, this is the generator. So this is the basic picture; these are the generated fractals. And the dimension, for instance, of Koch is this one. Why this one? Because we have here…we have obtained the dimension, dimension, dimension is logarithm of N where N is the number of squares or circles needed to cover the basic pattern. Here, the number of squares or circles is one, two, three, four. So N in Koch snowflake is four. So we have here, for dimension we have logarithm of four over logarithm of one over epsilon. And epsilon…epsilon is actually the diameter of this circle or square; which is all the same. (Yogeshwar acknowledges.) We're aiming toward the dimension. And the diameter is one third (1/3). If we – This is the figure. From here to here, we have one. So this is 1/3. **[Recording time 26:33]**

Y: Oh. That's where it comes from.

B: Yes. This is where it comes from.

Y: In the physics…

B: So this is one over 1/3 is three. We have logarithm of four over logarithm of three which is this one. So the dimension of a Koch fractal is not a whole number but it is fractal. It is a fragment. It is partial and it is logarithm of four over logarithm of three.

Y: In physics, you often get two, three and four (Biljana acknowledges.) and the ratio two thirds (2/3) (Biljana acknowledges.) or the ratio 1/3.

B: Ah, yes, like in these quarks and…

Y: In quarks and a lot of other places, also (Biljana acknowledges.) coming from a different approach altogether.

B: Yes. Yes. Here, for instance, "The…" this is Sierpinski triangle. This is the basic presentation of Sierpinski. Sierpinski, has lived by the end of the $19^{th}$ century. And even then he has come with this – not with a dimension in particular, but with these notions about fractal figures. And even like, place on moon is named after him. (Yogeshwar acknowledges.) Sierpinski – what is the name that we have? A big hole…

Darshana: Crater?

B: Crater. Yes. *Sierpinski Crater*. *Sierpinski Crater* is named after him; and he lived to be 98 years old, and so on. So, for instance, here we have the dimension is logarithm of three. Why three? Because the number of squares needed to cover the figure is three. So we have here logarithm of three; over logarithm of the inverse value of the diameter of this elementary square with which we are covering. And this is one half. Because if we draw a line here, if this is our one, referent length of one, then the diameter of the squares is this one which is one half. We have this and this and this. (Biljana is drawing.) All of these are of same length.

So if this is one, the diameter of the elementary…

Y: Is one half.

B: …circuit is one half.

Y: Yes. Be right back.

B: OK.

B: (Speaks to Punita) This is interesting because here we have a three dimensional figure. (Punita acknowledges.) But when it is fragmented in this way and we obtain a fractal, the dimension becomes two.

Punita: The fractal dimension.

B: The fractal dimension (Punita acknowledges.) which typologically should be a plane; but it is a three dimension. It is three dimensional but its dimension is two. As if it is in plane (Punita and Darshana acknowledge.) which is very…which is great. Also this, you see? It also could be used here, Cantor's dust. If we have a sequence of figures like this one, finally we find out that if we summarize all the intervals **[Recording time 31:05]** which have been cut out of the figure, we obtain one as if we don't have any length at all. If out of the initial segment, we subtract or extract all the empty spaces, we obtain one minus one as if there was never anything in the first place.

Punita: It's a little bit **[Recording time 31:40]** in terms of Lila. (Everyone laughs.)

B: It could be found, a connection; for sure. We shall need to introduce fractal dimension at one point, maybe now. (Laughs) So the dimension of this figure which is three dimensional Sierpinski, although it is a three dimensional figure, it's two. Its dimension is two as if it is in plane. As if it is a plane figure (Yogeshwar acknowledges.) which is very paradoxical. We have different…this is Menger, Menger's body. The dimension is 2.7. **[Recording time 32:20]** And these are different Esher studies of patterns based on Sierpinski. Pictures like this have been done in Ravello Cathedral of the 18th century; which was designed by Nicola di Bartolomeo. In a church, some patterns like this one could be found.

Darshana: On the floor maybe.

B: Yes, maybe. And this one, this is *Cantor's Dust*. This is also a fractal set which has some very paradoxical feature. And it is as follows: We have here an initial segment. It is fragmented into thirds. So we always take out the middle part of the segment; the middle 1/3 of the segment. Then we have 2/3 left. Then we divide, in the same manner, the 2/3 into additional 2/3, and so on and so on. But when we find a sequence which is denoting the empty spaces – for instance, in the first step, for the first iteration, the empty space is 1/3. We write here 1/3. For the second iteration, which is this one, we have 1/9, now we have 1/9 of the whole picture; of the initial one. 1/9 plus 1/9, it is 2/9. Then here we have four empty spaces – one, two, three, four – and their length is three to the third degree because it is third of the third. So it is 4/27, and so on and so on. If we summarize them, we have 1/3 – out of the parenthesis – and then we have sum of…every next member is obtained by multiplying with 2/3. For instance, 1/3 multiplied by 2/3 is 2/9. 2/9 multiplied by 2/3 is 4/27. So the Q element, which is the ratio between them, is 2/3 on the square M where M goes from zero to infinite. And this, when we have sequence with infinite number of members we have 1/3 multiplied by 1/1 minus this Q element which is the ratio between them, one minus 2/3 which is once again 1/3, and this is one. So all of these breaks, what we are summarizing are the empty spaces. So all empty spaces summarized gives one. But one is our initial segment. So if – aha, yes, yes. Yes, this is why, yes, yes, I was inspired to introduce…

Darshana: Ah, if you take out your middle third here, you have one left. Maybe it's related.

B: Yes, somehow

Darshana: See this is like taking out this middle connection which leaves this. And yet it's one. And it doesn't matter how often you do it, it's always going to come out to be…

B: Maybe you could start with the bigger one and then extract instead of this.

Darshana: Extract; right. That would make a lot more sense.

B: Or even adding to this one.

Darshana: Yes. It's related.

B: But actually, yes. When I have seen your pictures, I remembered that I should introduce dimensionality and maybe try to find dimensionality somehow (Darshana acknowledges.) in those pictures.

Darshana: So maybe there's a relationship.

B: Or at least one projection (Darshana acknowledges.) of this line of thinking to do. So, if we subtract all the empty spaces, one minus one is zero as if we have nothing at all. (Laughs) It is one of the Cantor's paradoxes because in – when you have… because point is dimensionless, without dimension, and there are infinite number of points. And when you have zero multiplied by infinity, this is actually not determined; and you could obtain anything you want. (Yogeshwar acknowledges.) (Y&B laugh.) So he has many paradoxes like this one. Then in the afternoon we should do this, Darshana. (Darshana acknowledges.)

Y: OK. So you're developing a possible third level of mathematics that would be the third level to the Lila Paradigm.

B: Yes. And this is one line of thinking, to introduce this third level in matrices. (Yogeshwar acknowledges.) But another line is what we were discussing this morning because the subsumption of the substates also leads to at least Fibonacci.

Y: Yes, it did.

B: It also could be…a connection could be found here also to find the dimension or the overall state of consciousness. But it's very…it will somehow diminish the meaning of the state of consciousness. I mean, to put it into numbers. But maybe somehow it could be done in order to at least to express the complexity of the content of consciousness and how this pattern arises. For instance, the same as we have in our basic picture – we have nonphysical individuals and relations, and there is no relation without *relata.* It is the same as this on another level when we introduce consciousness because we combine, for instance, we combine direct knowledge with consciousness. (Yogeshwar acknowledges.) And these are our *relata*. And the state of likeness is state of consciousness. Once again we have relations and *relata*. And now this *relata*, in the first step we have one – for instance, now I am making it simple. – We have one direct knowledge, one for consciousness which is one, and one. But then they combine and we have one plus the *whole* number which is what, for instance, Darshana in another way was suggesting; one plus one which is one plus two which is three. And then in the second, then we combine the first and the second combination of direct knowledge and consciousness. I mean, they are always connected with the likeness which is a higher level of consciousness. And then we have plus three. And then in the next iteration in the consciousness of one individual, we have subsumption of all the previous ones which leads us to Fibonacci. We have one plus one. We have first, one. Then one plus one is two. Then one plus two is three. Then two plus three is five. And all these, somehow, are contributed into the overall state of consciousness which is likeness of all the previous ingredients. So the overall state of consciousness is subsumption of all the substates. (Darshana acknowledges.) And all the substates always include the previous ones. And the previous ones include the previous ones which is Fibonacci. Actually, maybe…

Darshana: No, that's…it could be more basic than the stuff I was doing because I called it *Knowledge and Consciousness*.

B: Yes, even though words are missing.

Darshana: But I was calling it *Consciousness* – I was calling a different thing consciousness. At that time we thought a different thing of consciousness. But I was still calling it knowledge plus consciousness. (Laughs) (Biljana acknowledges.) It was just a higher level thing. (Biljana acknowledges.) This is probably more basic. I'll have to think about it, but…

Y: I think it's on the right track.

Darshana: Yes, so do I. Interesting…

B: Because just the same we have here relation and *relata*; we have also here, relation and *relata*. Relation being the state of likeness and *relata* being the basic content which are (Darshana acknowledges.) knowledge and consciousness. And then all the substates of them are leading to Fibonacci because all of them are containing, are subsuming…

Darshana: Two things.

B: …All the previous ones.

Darshana: Right.

B: Because one and one at the first step. But then we have one... and those two also combine (Darshana acknowledges.) because this overall **[Recording time 43:06]** states of consciousness. Now it's like one ingredient to the knowledge.

Darshana: That's what I was doing. One gets mixed two; one gets mixed with two. (Biljana acknowledges.) And with all the previous ones, and that's – yes. (Biljana acknowledges.)

B: And there is always likeness between. There is always an underlying pattern of comparison of all the previously subsumed…

Darshana: Into A.

Y: Yes.

Darshana: Because A is the one.

B: Into the consciousness of the end **[Recording time 43:40]** because of the unitarity **[Recording time 43:42]** of A.

Darshana: Well, the likeness and unitarity are a little different according to how he *has* been saying it. But we'll talk about that.

B: We could have just… (Laughs)

Darshana: Whatever… **[Recording time 44:10]**

Y: OK. We'll work on it some more this afternoon. I'd like to share a couple of things I've found in my notes.

B: Yes.

Y: That's lambda, the Compton wavelength…

B: Yes.

Y: Lambda sub C for the electron. (Biljana acknowledges.) That's lambda sub C e – is equal to big N times K times the electric charge, the basic charge which is e to plus or minus, this. Now that opens up all of the electro-dynamics in physics. That tells you what's behind the Compton wavelength and what's behind the electric charge. And it's N and K. (Biljana acknowledges.) Now if you solve this equation for N, you take the Compton wavelength divided it by K and divide it by the electric charge and you get 3.180… (Dot dot dot) times ten to the twenty-third. You just solve the equation for N. This is K e plus or minus $10^{23}$ (drawing for long period). Give you another equation. The electric charge that is e plus or minus is equal to the Planck length, lp, divided by K, divided – well, it's K or the square root of the inverse of alpha; which is K. That's what K is.

B: Then here: lp over one over K. Ah hah, you have to minus one. OK. You have…

Y: to minus one.

B: to the minus one, yes.

Y: The inverse of alpha. OK. Now let's take a look at these in case you have anything obvious to say. Several possibilities that Punita has come up with and some that Darshana has come up with.

Punita: Yes. The first one is what I thought may had been presented; the first page, with no notation on Self in the upper right hand corner. That is what I thought… what I wrote down as the corrections that should be made on it. The one, Self with DB in the upper right hand corner is my view (Yogeshwar acknowledges.) of how it should be presented.

Darshana: The one with the star and the square?

Y: …the star…

Punita: Yes.

Darshana: OK.

Y: The overall state of consciousness of itself. So A's direct knowledge of itself compared with its consciousness of itself reduces to self enlightenment due to the unity of A.

Punita: It should say, 'reduces to'.

Y: It looks like A ●.

Punita: That's A period. (P&D laugh.). I predicted that. **[Recording time 50:00]**

Darshana: OK. Ah, I took the wrong one.

Punita: And I just 'upened' **[Recording time 50:06]** the call out to the comparison where it says, 'A's state of likeness.' At the end, I put a *colon* and that is 'A's consciousness of itself'.

Y: A's state of the likeness of each attribute in A's state of knowledge based on A with the corresponding ontological attribute of itself: (colon) A's consciousness of itself.

Y: I find no problem with that.

Punita: Then down below, 'A's direct knowledge of itself compared with its consciousness of itself reduces to self enlightenment'.

Y: Yes, that's pretty good.

Darshana: So he doesn't have knowledge anymore. He has an overall state of consciousness; but no knowledge is mixed in with it. It's just consciousness.

Y: It says, 'A's direct knowledge of itself'.

Darshana: Yes, but it says, 'A's state of consciousness of itself'.

Punita: Yes. Well, if you look at, 'I am a unitary existence *who* acts,' the who is due to the knowledge.

Darshana: Aha.

Punita: And it's a matter of how much to put in all at once to people.

Darshana: Yes. I just don't see how that's different from this. How *this* is different from *this*. That's the thing I have trouble with.

Punita: Well, it is a single state based on the state of knowledge and the state of likeness. It's the reduction of that, those two states.

Darshana: But *this* is that. Isn't it?

Punita: That is both of those states…

Darshana: Not reduced. It's both of them, but they're not reduced. (Punita acknowledges.) Well, how are they both then? Is it in another Individual's view point? Because if it's both for A, it seems like OK.

Y: Two different ways of looking at the same thing. (D&P acknowledge.)

Darshana: OK.

Y: OK, enough of *Self* for the moment. Let's look at *Matter*.

Punita: Now this is my misinterpretation of what Dar presented. Darshana presented the one with DAR in the upper right hand corner. And I made some mistakes on that and I apologize for that. I didn't understand what she had written down.

Darshana: Yes. Mainly, it's that this ought not be here; it ought to be down here because it's not separate from this in my interpretation.

Y: Yes. That's the way you do it. (Darshana acknowledges.)

Darshana: And, so that the overall consciousness is the dashed one, and A has in his overall state…not of consciousness, his overall state is a state of comparison of his knowledge and his consciousness.

Y: And it says, 'A's direct knowledge of B compared with its consciousness of a physical particle'.

Darshana: A is conscious…

Y: A is conscious of a physical particle and A knows that the particle is based on B.

Darshana: Or it could be that…

Y: And DB doesn't say that?

Punita: Well, DB is my presentation. Again, it's in the same structure…

Darshana: DB?

Punita: …as what was – the one that says DB in the upper right hand corner.

Darshana: Oh, yes. Right, got it.

Punita: And I'm trying to have a consistent presentation. (Darshana acknowledges.)

Y: A's direct knowledge of B compared with A's consciousness of a physical particle reduces to a single state of consciousness of a unitary existence that acts, that is based on B: (colon) a physical matter particle, proto fermion, due to the unity of A.

Darshana: So, he has two things and I have one. And that's the difference. I think that he's already in a state; but not of consciousness, an overall state of consciousness plus knowledge. And it doesn't reduce to a state of consciousness. So that's how I see it differently. But I could go his way if you decided…

Y: Is that two ways of saying the same thing or is it two different things?

Darshana: It's A in two different states here, the state of the comparison and the state of consciousness which results from the state of comparison. That's what the questions is; and I don't actually know the answer. I'm just basing it on what you've said. (Punita acknowledges.) I'm willing change it.

Punita: Why I think having the state of consciousness as a state of the individual is important is because that is the view point of a person in their normal state of consciousness. An individual is conscious of matter; that state. And we're…

Darshana: Well, how's that different from *that*? (Shuffles papers to different page)

Punita: Because they are not conscious of all those things.

Darshana: Well, he's conscious of matter.

Punita: There is no matter in there. There is…

Darshana: physical particle… Perhaps I'm looking at a different one.

Punita: In here there's…

Darshana: A's consciousness of a physical particle.

Punita: Where's the physical particle?

Darshana: Right here.

Punita: Where's it in the diagram?

Darshana: Right here.

Punita: No.

Darshana: Well, it's actually the whole thing, but…

Punita: But that has pieces to it.

Darshana: It’s comparing this to this. (Punita acknowledges.) So it’s really this, but it’s really the whole thing.

Punita: Yes, I know. See that’s it. It’s really this, but it’s really the whole thing. That’s the problem--that it’s in a state…

Darshana: Well, he’s comparing the likeness of this to this.

Punita: I understand.

Darshana: Right.

Punita: I’m just saying, that’s not a single state.

Darshana: Right. But is he in two states? He’s in this state and he’s in this state? And he’s in this state? So three states here: consciousness, consciousness and knowledge, and then there’s this third state here?

Punita: This state, the normal state of consciousness, effectively wipes this one out. You can, as we’re doing right now, put your attention on this subtle state. (Darshana acknowledges.) But in every day consciousness, the person reading this is…that is all wiped out by their consciousness of the physical.

Darshana: Hmm. OK. I get what you’re saying. So you don’t really need this one at all except to show that these are combined to make this.

Punita: And what we’re trying to communicate is how the consciousness of matter (sound of Punita banging something physical) (Darshana acknowledges.) comes about.

Darshana: So his overall state is consciousness of matter. It doesn’t actually have knowledge in it except as a previous condition.

Punita: He is in *this* state and he is in *this* state of…and he’s in this state. There’s many states that he is in and they subsume to a single…

Darshana: A state of consciousness.

Punita: ...state of consciousness. And that’s…

Darshana: So his knowledge actually becomes consciousness.

Punita: It affects it. That’s why this is a particle based on B. That’s why I put the ‘as a particle’ number first …

Darshana: Uh huh.

Punita: Based on B, **[Recording time 57:55]** based on B. So it reads, visually, like that.

B: Ah, yes.

Punita: And whether**..,[Recording time 58:00]** from the matter…

Darshana: So if his overall state is a state of consciousness…

Punita: That's the other…

Darshana: …where's the knowledge at? If this is his overall state, (Punita acknowledges.) where's the knowledge? It's like, where's the meat?

Punita: But the person looking at this…

Darshana: This is the knowledge?

B: No, it is included. I projected.

Darshana: It's included in the consciousness. The knowledge is included in consciousness.

Punita: The fact that it is based on B, that it is that particle, is the impact of that knowledge on the state of consciousness.

Darshana: So his overall state really is more than just his state of consciousness because he has this knowledge which is impacting the state of consciousness. (Biljana acknowledges.) So this really isn't his overall state; it's his overall conscious state. But his overall state would also include the knowledge.

Punita: But the knowledge manifests in the overall state as that particular particle, mainly the one based on B, rather than *a* particle.

Darshana: What…my problem is, I have knowledge in addition to my consciousness.

Punita: But what we're describing here is the everyday person who's reading this is in a state of knowledge.

Darshana: So this is only the everyday person. This doesn't apply to people who have had an enlightenment experience, for example.

Punita: I think your everyday state wipes…you may know this, but in your everyday state…

Darshana: Yes. You know it. You're talking about your everyday conscious state.

Punita: That's exactly what we're…

Darshana: But it's accompanied by knowledge. So your overall state is not this. This is just your conscious state. Enough.

Y: Yes, I think…

Darshana: We've both made our point and we just didn't…

Y: And I listened carefully to both of you.

Darshana: OK.

Y: Biljana…

B: Hmm

Y: You have anything to say about it?

B: Shall I decide between them? (Laughter)

Darshana: Yes, why don't you? (Laughter) Your opinion is valuable (Laughs) because I really don't know which is right. I'm basing one on several different things.

Y: I'm just studying to see what the problems are.

Punita: I don't see it as a right or wrong. It's a matter of what we're trying to communicate to whom.

Darshana: Well, one's right and one's wrong because they're quite different. (Laughs)

Y: OK.

B: It could be subsumed. (B & D laugh.)

Y: OK.

Darshana: What's your opinion?

B: I should go once again through the both of them. Here I don't see where the sentence ends, so to say. A's direct knowledge of B compared with its consciousness of a physical particle…

Darshana: That's not a sentence.

B: But this is the sentence: A is conscious of a physical particle and A knows that the particle is based on B. This is end of this, and… **[Recording time 61:14]**

Darshana: …particle – just go in here.

B: Aha, additional explanation: A is conscious of a physical particle and A knows that the particle is based on B.

Darshana: Yes. I changed that last night because I didn't have this. And I'm not sure which one is right, or best, in this case, to A actually speaking. And he says, "The physical particle I am conscious of is based on B's attributes of existence, unity and ability to act."

So, I'm conscious of this particle and I know that this is based on these three qualities. And that's my overall state because I'm both in a state of knowledge and I have this state of consciousness. Now, I'm just basing this on what Yogeshwar has said which may have changed, and also on my limited experience of consciousness *plus* knowledge that I consider to be my overall state. But, I'm not a hundred percent on that. I just want it to be addressed. And then if it can be dealt with and eliminated and clarified then that's fine.

B: So this far, those two diagrams are the same. (Darshana acknowledges.) A's consciousness of a physical particle; A's state of the likeness of… **[Recording time 62:48]** A's state of knowledge based on B…

Darshana: This needs to be changed. So this – that would not be in here, in mine. If it were how I meant it. I haven't finished it.

Y: It would be over here.

Darshana: It would be over here.

B: So, actually, Don has like another perception added to the…

Darshana: Kind of into A's…

B: Into A's…

Punita: Because it's a state of A. It's not a state outside of A. (Biljana acknowledges.)

Darshana: Yes, but I consider *this* to be that state; that knowledge plus consciousness. And…

Y: Well, that's a matter of presentation. It seems to me that conceptually the difference between them is: here we have reduction and here we have comparison.

Darshana: Hmm. Hmm.

Punita: Well, there's comparison in mine also.

Y: Yes.

Darshana: Comparison and reduction, both.

Y: Yes.

Darshana: First comparison, then so to speak…

Y: So I can see that this, the additional factor, is do we want to include it at this point or not? And I think that's simply a compositional question about thinking of the reader. And, as you were saying, (Punita acknowledges.) that it's a matter of presentation of when you want to say that; the reduction statement.

Darshana: So are there two different states that A is in; the state of comparison of his knowledge and consciousness, and the reduced state of that comparison? Is that the case? I have a genuine question.

Y: I think it's a very nice point of…

Darshana: Logic?

Y: To be discriminated.

Darshana: OK. **[Recording time 64:52]** (Laughs)

Y: And I think the answer probably lies in two other words.

Darshana: And maybe in a middle concept because usually when two people are really sure (Punita acknowledges.) of something, each of them from there own experience, it's actually the same thing, but thought of in a different way hopefully. (P & B acknowledge.) Although, it's a pretty basic experience. (Laughs)

Punita: Yes. I presented this to Sati yesterday and she got it immediately. And also, this in words to Namrata the other day when we were walking and she just lit up.

Darshana: I did it to her in words and she did not get it.

Punita: Well… (Biljana laughs.) Yes. So there's my words about my concepts.

Darshana: Yes, your words are…that communicate to people, but are they *right*? Because if they're *wrong,* it's going to be misleading them. (Laughs)

Punita: No, I totally agree that it has to be…

Darshana: It's got to be right. And that if it's right and it communicates, this is ideal.

Punita: No, I totally agree with you on that. If there's any error in relation to the truth of the matter, that it's useless.

Darshana: Even if it communicates.

Punita: I don't…if it communicates, it is wrong.

Darshana: Exactly. So we've got to make sure that it…

Punita: But there is going to be some error. Any time we move to words (Darshana acknowledges.) from the truth…

Darshana: But we don't want a big error.

Punita: Yes, we add something or take away. And it's a matter of how we decide and that's…

Darshana: Totally agree.

Punita: So I'm saying, there's not a right…

Darshana: But you can make errors; one can.

Punita: There's some **[Recording time 66:34]** error in it.

Darshana: One can make *big* errors.

Punita: Oh, yes. That we're trying to avoid.

Y: OK. I want to put that aside now. I just want to go over a point **(?) [Recording time 67:02]** a circuit. That if we take this as a sequence of time for… with respect to this individual here and we say, "Well, he's in present time here. But here's one point in the past, one point in his past again, further back, and further back." Or if we take the whole thing as, taking the arrows as being all in present time. These are the – if you take them singularly, with a *past*, you get waves. (Biljana acknowledges.) And if you take them as all in present time, you get discrete or photons; you get photons instead of a wave length. And it's a matter of what you take as your referent. (Biljana acknowledges.) And that is what complimentarity is about. (Biljana acknowledges.) Now I have not, in any of the papers I've read to you or anything I've shown you, has that been stated explicitly. I just have hinted at it by saying that complimentarity is dealt with. But I didn't go into which one does what or what – in Feynman's electrodynamics what he does is he has *this* arrow sweeping around (Biljana acknowledges.) like this. And this is the referent Individual. That's Feynman. (Punita acknowledges.) He has a mind of his own. (Laughter)

Punita: So to speak. (Laughs)

Y: Brilliant man. And he's taking them one at a time, so to speak. And that gets you the wave **[Recording time 69:56]** as he goes through…and the wavelength is here. And this is one lp and one tp. And that equals the speed of light. (Biljana acknowledges.)

Punita: Is that in time achievable; once around?

Y: The amount of time that you get, there is one Planck time. (Punita acknowledges.) And the amount of space that you get…because of, if you recall, because of the bifurcations. (Punita acknowledges.) But by taking this approach that he took, you get the wave amplitude varies. **[Recording time 70:56]** (Punita acknowledges.) And then all he did then was just square the amplitude. (Biljana acknowledges.) Amplitude is really probability; as Max Born pointed out. But if you take the approach of a crossover arrow who is in present time, that makes all this be as if it were one time. They're all in present time. And you take that as your referent. Then you get all the Planck lengths; and they're all totaled up. And that's all in a package as a photon. (Biljana acknowledges.) Now…

B: Here is Individual; we have bifurcation. Here a fork structure and this is space. (Yogeshwar acknowledges.) There's all of this and space, space, space, space.

Y: Right. Now, I've never written that up. But in order to connect it to electrodynamics, this is necessary. Now we're going on to another thing. If you have this substate, you have one effect. But if you take it like this, you have a different substate. That is, it's not in circuit.

B: Aha, yes.

Y: That substate. This one is in the circuit. (Biljana acknowledges.) Or you can go like this.

That's a substate. (Biljana acknowledges.) Now to get the electric charge for an electron, you have to take this blue one (Biljana acknowledges.) and get the probability for that and compare it to the one for a single. And that makes this into an electron. And that's a positron. It's the ratio of the two. But this is three; this is F3 and this is F2. And that ratio gives the magnitude of the electric charge on the electron.

B: Why F2?

Y: Why what?

B: Why F2? This is F3; OK. This is F3 because we have three. But when to compare with one, why do you say F2?

Y: Well, the probability…

B: Because the rest…

Y: The probability of this occurring, this substate occurring, is F2.

Darshana: Is it because you have an arrow in the circuit, or not?

Y: Well, no, we have to do this. So she was right. I left that out. And you were right, Darshana. That said, there's one in the circuit. So this is F2 and this one is F3.

B: Aha. But this F3 is taken from the circuit; is not in the circuit.

Y: That's right. This one is removed; and it just includes this one, this arrow here, from A. So that's F2.

Biljana: The second one. And the first is three from…taken off the circuit.

Y: Taken off the circuit.

B: They are taken off the circuit because in Baker's paper he has said three.

Y: This one…this one that includes the circuit.

B: Yes. The second one includes the circuit. Yes, yes. And this is the connection between…

Y: Produces quarks. And this is the electric charge of a third and a third and a third of this one. These are all down quarks. And this is 2/3 plus. **[Recording time 77:28]** These are minus. So you see that the same Individuals appear as up quarks or down quarks or electrons or positrons depending upon which combination of which substates are with which substates. We've just been doing that to get time and space and that sort of thing, of which of these substates, which states are being united with which ones. And all of them occur. Every possible combination occurs. And out of that you get, out of $10^{23}$ we get about $10^{96}$ particles; out of $10^{23}$ Individuals. Because if…we have every combination and that would be expressed by powers of 10 and powers of N and N factorial, it's just a matter of combinatorics and all the details on that need to be worked out. But they haven't been worked out. It's just the basic idea that I have that this leads to the combinations necessary to describe all the atomic particles and predict other ones because to get an electron we have to combine *this* state **[Recording time 79:34]** with the blue state with *this* state and the whole circuit.

B: Three of them. So it has a special meaning that these three are taken out of the circuit…

Y: Yes.

B: Rather than to be viewed as a fork structure, they are not viewed as a fork structure of three, but as three separate.

Y: That's right. That gives you three dimensionality. (Biljana acknowledges.) And you can't get any smaller than that. You get smaller than that, less than three dimensions, then we go into the two dimensional realm and then you get quark because you get… There's another combination here. And that's this one.

B: Uh huh, uh huh. Yes, the same, but two dimensional.

Y: And this one.

Darshana: Hmm

Y: And this one. (Biljana acknowledges.) And each one of these produces a different quark.

Darshana: Quark!

Y: And the arrows that are involved in those are the gluons. And as far as I can tell, it all works out. But I don't know enough about the details of chromodynamics which is the color theory of Murray Gell-Mann. (Biljana acknowledges.) I don't know enough about it to prove it all by mathematics. But that's something to be checked out. So you can see how complicated it gets very easily; and we've only begun. (Biljana acknowledges.) We have a circuit of all n Individuals, little n, and all K. All their arrows are going across. This will just be… (All laugh.)

Punita: Black.

Y: Black, solid. (Laughter)

Darshana: Yes, I tried drawing a few of those papers. Aah! All numbers! **[Recording time 82:06]**.

Y: You're defeated…

Darshana: Well, matrix theory. Maybe with matrices, it wouldn't be that way.

Y: Well…

B: The dimensionality is still a problem. **[Recording time 82:21]**. (Everybody laughs.)

Y: It would be from here across the whole solar system. (Laughing)

Darshana: Yes.. But you can put it in the computer. (Laughs)

Punita: Big computer, God's computer.

Y: Now, I have a question of you. (Biljana acknowledges.) In the early universe, this part, we're putting in arrows. (Biljana acknowledges.) And after a while, we get this (Biljana acknowledges.) or we get this. (Biljana acknowledges.) Now, I'm going to add more arrows. I'm going to add F2 arrows. And is it that I would expect *this* to happen, or would I expect *this* to happen? In other words, (Biljana acknowledges.) F2 telling us when this occurs, but what about this? Because if that were to occur, we would get this one and this one. (Biljana acknowledges.) So we get more. So is the probability affected?

B: It is. This is why at one point, you have avalanche in terms of circuits, but also in terms of arrows.

Y: So it does affect the probability that the more arrows are in (Biljana acknowledges.) the graph, the more likely we're liable to get one like this.

B: To join together two existing.

Y: And then – so we can't calculate…

B: It is, yes…

Y: But if by saying F2 more…

B: Yes, it is very linear. But it is something to deal with. Otherwise, it will be too complex. Yes, it is linear. We have…for instance, this is why I stress this question, whether these three, in the description of electron, are taken out or are in the circuit. Because, for instance, I have looking at Baker's paper when he is finding N.

Y: Y 2.

B: Yes, I'll try to do it for 2 but I shall…see the picture.

Y: All right.

B: But my point was, here he's observing the circuit with N – even though 2N, but for now let us say it is N. (Yogeshwar acknowledges.) Working with **? [Recording time 85:19]**. And then he has here a portion for which he observes one bit of time. And he supposes here F of I; for I is 3. He is…and now still he's observing this as a circle and somehow circling around the circle. He doesn't say here, 'first crossover in a circuit' which this is. He doesn't say first crossover, but he's looking at structures of three. So, is this for reason or is this just to make things easier somehow to approximate? You know, this is why I ask the question whether this comparison is between the three arrows taken out of the circuit, on one hand, and on the other hand, we have a structure of four…**[Recording time 86:22]** a fork of two. For individual A of the circuit we have one crossover and the circuit is the first crossover. In his article, in Baker's article, we have a separate chapter and separate expected number for first crossover, which appears later; then structure of three separate from circuit. (Y & P acknowledge.) It is one thing to have a fork structure into a circuit and another thing to have just three.

(Yogeshwar acknowledges.) And he's taking just three of them. So I was wondering whether it was really for a purpose or it was just to alleviate somehow, to make it easier.

Y: I don't know.

B: And also another point made by him in his handwriting. By the end of the paper he writes, "There are no loners." When you have one circuit of…you know how …there is no probability, or there is probability but very, very, very small. Once you have everyone in the circuit – not everyone but almost everyone, so to say – and to have a loner, (Punita acknowledges.) the probability for this to happen is very, very, very, very, very small; much smaller than not to have loners at all.

Y: I remember when he came up with that. Yes.

B: He has written in his handwriting, there was written just shortly, "There are no loners."

Y: Yes.

B: At one point, "There are no loners." which is really so. Somehow I have this in picture when I asked you about Satan which was funny question. But I don't think, of course, Satan is a person or somehow. But as a matter of principle, this situation when we have a total loner (Yogeshwar acknowledges.) which is perceived in your knowing, is much less probable than to have just zeros in the matrix; just zeros now and then, you know. When viewing the picture in terms of matrices, we have, for instance, once we come to a point when we have many, many, many arrows – this state of affair (shows picture)…a situation like this one which is for instance…and we have ones, ones, ones, ones. (Yogeshwar acknowledges.) All the rest is ones. (Yogeshwar acknowledges.) So this is actually your illustration of God **[Recording time 89:18]** which is very beautiful. I like it very much. And Satan, and we have one Individual isolated. But in terms of matrices if you look at this, this picture is very ordered one. It has *implicate order,* to use David Bohm's – not implicit, implicate. It is a difference. Implicit is something which is hidden (knocks on something hard) **[Recording time 89:50]**. But implicate, implicates something. It is also hidden but it has a very hidden meaning into it. Implicate…

Darshana: Implies.

B: Implies. Yes, implicate and implicit is not the same. And so this is, implicates order. Just one individual excluded in terms of probability is much smaller probability. It is such tiny. It's much smaller than to have – in terms of matrices because it is easier to see – than to have ones, ones, ones, ones, ones, zero here; ones, ones, ones, ones, ones. (Yogeshwar acknowledges.) Ones, ones, ones, ones, ones, one other zero here; ones, ones, ones, ones, ones. And then ones, ones, ones (Yogeshwar acknowledges.) ones, and somewhere we have zero. This is of greater probability. And in terms of relations and *relata* it means we have universe in which almost everyone is connected to anyone else; we have arrows, arrows, arrows, arrows, arrows (Yogeshwar acknowledges.) and just one Individual. It is in a state of no knowledge of another, but in a state of knowledge of any other. And then another Individual which is in state of no knowledge of another one – this is A, this is B, this is C, this is D – but in a state of direct knowledge of any other one. So this picture, when we have just one state of knowledge missing or one Individual in state of no knowledge of another but in state of knowledge of others, and we have several of them – which is few zeros thrown…

hidden into a matrix of ones. (Yogeshwar acknowledges.) This is much more probable than this one which implicates order.

Y: Yes. I can see that.

B: So this was my question when I mixed.

Y: But what I am saying, what I was saying, is that if there's someone that is not connected *to.* (Biljana acknowledges.) Never mind about whether he's connected to them. It's whether…if no one…if someone is left out, (Biljana acknowledges.) then all the rest of them are…

B: Ignoring **[Recording time 92:26]** him, so to speak.

Y: They withdraw from him. (Biljana acknowledges.) Then that situation means that the whole universe or all of us are in a satanic state.

B: Yes, yes. Exactly. It is great. Yes.

Y: OK.

B: So yes, the picture is more complex. But you should deal somehow. And the fact is that by introducing his reasoning, Baker, for instance, finds out the quantum's **[Recording time 93:06]** length correctly. No…he uses the quantum's length and finds the N which I want to do the opposite. I want to try the opposite. And I was thinking of this several days, how to do it. He has this picture. He has F of I here. And he says, "In one bit of time…" because this is **? [Recording time 93:40]** somehow 2N, while we have X circling over the bigger circuit, the larger circuit, this is the same as we have X plus one circling over the smaller circuit which is 2N minus F of I. And later on he takes for F of I, 3rd square of 6N squared factorial which means that he's taking assembles of three arrows (Yogeshwar acknowledges.) *outside* the circle. So this is an approximation. And now…this is one equation of one unknown. And he finds the X, for instance. Maybe I'll see the right number in his paper. Anyway, he finds X which is, for instance, N minus F of I over N, or something like this. And then once he has this he **(?) [Recording time 94:54]** X in this equation and then we have just N. Then he introduces also lambda into picture which is lambda multiplied by frequency. The wavelength multiplied by frequency is speed of light. (Yogeshwar acknowledges.) And the frequency here is the frequency of these bits introduced into this picture which is one over the time length of the bit which is expressed now in terms of N. (Yogeshwar acknowledges.) And so he finds N. (Yogeshwar acknowledges.) And now, this is for – so to say – for this first boson for X boson because we have first crossover. And now if we introduce W boson which is the second crossover, then I was thinking how to apply his method but to do the other way around in order to check whether this thinking is…

Y: So we start with N.

B: We start with N and find lambda and check if lambda is at least approximate to lambda of W boson. And to do this we have now three circles. And we could imagine this in three dimensional. This is over sphere, actually. And even…my problem was, if it is on a sphere and I have two crossovers, and for the first crossover I take approximation of F of I and for the second approximation I take the approximation of F of I – although actually it is the first crossover and the second crossover, they are the same and I could not get the third equation. And I need three equations of three variables. And it was my problem. But then I thought that since we are dealing with approximations I could think like this: I have here first crossover which is F of I. And then for the second crossover – although it is the same actually; but if it is the same I don't have another equation for the second to take like fork of one arrow more. If for these three, for this first crossover; you know, the first crossover, if I consider the whole circuit as one arrow and I have then crossover here, I have actually a fork of two. So he's right in a sense because I have an individual here in the circuit. I have one arrow, one arrow and it forks into two. And I have a bifurcation of two, (Yogeshwar acknowledges.) these structures here which is the first crossover. The first crossover is the same as if I have a fork of two because for this individual I go this way, this pathway, and then I have bifurcation in two (Yogeshwar acknowledges.) which creates one dimensional space. So… which is correct; the first crossover is one dimensional space. But this structure is the same as this structure of three. And this structure of three is F of 3; if it is so.

Punita: I don't agree.

B: I do not either…

Punita: OK. Fine.

B: But I am trying to explain his reasoning.

Y: She's thinking out loud.

Punita: OK. Yes. All right.

B: Yes. I don't agree. And even he himself does not agree because he…in his article he has separate chapter for F of three **[Recording time 99:12]** and separate chapter for first crossovers. (Punita acknowledges). So he's aware of it but it's too complex to do it other way and so he does approximation. And there is a justification for his (Punita acknowledges)… because you know there's another thinking here. To, for instance, to join together the circuit with the fork structure. This also creates a crossover. For instance, I have the first circuit which appears for 7 or 8 – the expected number is 7 or 8 arrows. But until this happens, I have many, many small fork structures. (Punita acknowledges). And then, all of a sudden it is just the same as you, Yogeshwar, are implying, I have one additional arrow which will join together this one little fork with a circuit. And this is a crossover.

Y: It is?

B: Not always, and for this I have made another presentation which I have shown to you. There is another presentation…

Y: It might be a crossover.

B: If you remember – actually, in order to have crossover we need arrows in both directions. I'll make now a distraction. For instance the smallest circuit is one of three. This is the smallest circuit possible, of three arrows. And then, to this one…and I have, for instance, another smallest circuit; I have two small circuits. And now an origination takes place for the one Individual from the first circuit. Now, taking into account that they, so to say, share common knowledge, (Yogeshwar acknowledges.) and now all these Individuals in this smaller circuit – for instance, this is G1, this is G2 – all the Individuals in this smaller circuit, all at once originate themselves. This is why we introduce now the mathematics now of arrangements, mathematics of whole circuits, (Yogeshwar acknowledges.) of whole arrangements. And this is a flavor **[Recording time 101:50**] of it. So this is the second degree (Yogeshwar acknowledges.) of our calculus. On this second degree, this whole assemble of Individuals originates itself. The whole universe originates itself into a state of knowledge of the other universe. But not the other way around. So in order to really have a crossover – and I presented it with matrices also, and I could do it again – so in order to really have now a merging of two circles into one large circuit, we need this also. (Punita acknowledges.) Because in this direction from G1 to G2, we have state of direct knowledge. So the universe of G1 is in state of direct knowledge of the universe of G2. But the universe of G2 is in state of no knowledge of the universe of G1. So this operation is asymmetrical.

Y: Yes.

B: And it should be stated in our new mathematic. (Yogeshwar acknowledges). Because our new mathematic on second level **[Recording time 103]** as elements have a whole baby universe. (Yogeshwar acknowledges). So this is taken into account.

Punita: I just want to point out it is not sufficient that you just have symmetry because if you had an arrow from here to there, you still would not have a crossover. You would have this universe in the knowledge of this one, this universe in the knowledge of this one. (Biljana acknowledges.) But you still wouldn't have a crossover; whereas, in this one you do. (Biljana acknowledges.) So I'm just saying that just the symmetry is not sufficient.

B: The symmetry in sense of diagraphs, of directed graphs, (Punita acknowledges.) not the symmetry in sense of undirected graphs. So the symmetry in sense G1 is in state of direct knowledge of G2 (Punita acknowledges.) when G1 is a whole universe and G2 is in a state of knowledge of G1. This is the symmetry. This is symmetry. (Punita acknowledges.) So this is in this direction and the other one is in the other direction.

Punita: Yes, but that isn't sufficient to get a crossover. If this arrow were up here, this red arrow were from this to A, you would still have this condition; but you would not have a crossover.

B: Now I have this situation. I have a crossover but in a smaller circuit.

Punita: Yes, but you have a crossover…

B: I have crossover in this circuit.

Punita: Yes, but if the red arrow was here, – OK – If this red arrow was here, you would still have these conditions, but no crossover.

B: If I have this one, then I have also G1 in state of knowledge of this, of this, of this.

Punita: Uh huh. And you have G2 in a state of knowledge of all this. But there's still no crossover.

Y: The question is whether *this* is a circuit, whether you go this way and then right back.

B: I have a smaller circuit here. This one. A smaller…

Y: Yes. That's if this arrow is there. But he's suggesting we move this arrow here.

B: No, if…

Y: And then…

B: Ah. Ah. Ah. If we have…

Punita: See, we still have the symmetry (Biljana acknowledges.) between the two universes; but we do not have… That isn't sufficient to have a crossover.

B: Ah, yes. Additional is needed.

Punita: Yes. I just wanted to point that out. That, that's not a sufficient. It's a necessary condition but not a sufficient one.

B: Yes, because it is not enough that they share a common knowledge. It is not enough. The underlying reasoning in a sense of pathways should be preserved, should be kept.

Y: For symmetry.

B: For symmetry.

Y: It depends on how you define symmetry. But according to the mathematics, you're right. (Punita acknowledges.) OK. Out of time.

B: Ah hah. So we finish.

Y: Time flies fast when you're having fun.

B: Yes. (Laughter) Maybe I'll do this. (Yogeshwar acknowledges.) Proceed in this way with all these approximations and here, for F here.