

Oral History: Edith Heard / 2018/2/13

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File: 2018_02_13_EdithHeard_levelled**Key:**

AFL = Anne-Flore Laloë, Interviewer

EH = Edith Heard, Participant

[??? at XX:XX] = inaudible word or section at this time

AFL: So we're here today, it's Tuesday the 13th of February 2018. We're at the Institut Curie in Paris, France and this interview is part of the Oral Histories programme of the EMBL Archive. My name is Anne-Flore Laloë and I'm the archivist the European Molecular Biology Laboratory. Now, please would you introduce yourself?

EH: My name is Edith Heard and I'm currently a head of department at the Curie Institute and professor at the College de France in Paris and from January 2019 I will become the Director General at EMBL.

AFL: Super. Now before we talk about your relationship with EMBL and your upcoming directorship, could you just give us a bit of a background: who you are, where you come from?

EH: [00:42] Okay, yes. So I was brought up in England, in London. I'm half-British, half Greek. But I was brought up in a sort of British scholarly environment and Greek familial environment. I went to a girls' school. I did science right up to the end and then I went to university in Cambridge, where I studied natural sciences, mainly thinking I was going to become a physicist – astronomy was my aim. And I'd never done any biology at that point and thanks to Natural Sciences Tripos I was able to discover biology for the first time in my first year at university. And that sort of won me over. Very quickly I was extremely lucky to have some very influential scientists teaching me: so people like Mike Ashburner, John Gurdon. And so I quickly switched and I graduated in genetics. And then, I wasn't sure whether I wanted to do a PhD or a Masters in biotech, but I decided to go for a PhD and I went to ICRF, Imperial Cancer Research Fund, now Cancer Research UK at Lincoln's Inn Field. And I did a PhD with Mike Fried, who's a big polyomavirus expert and worked on mechanisms of gene amplification for my PhD. It was quite painful, but I learned a lot and I

was convinced that a) I wanted to carry on in science and b) I wanted to understand how things work in normal cells as opposed to in cancer cells. So that's when I decided to do a postdoc on a developmental process of X-inactivation. So I went in as a geneticist doing molecular genetics and I joined Phil Avner's lab at the Pasteur Institute in Paris to do my postdoc and during that time I got a permanent position, a CNRS position in France. So... I almost went back to the UK, actually, at one point, but when I got this position I decided to stay on. And so my postdoc turned into a longer stretch of research which was actually very good because it was a period where I really set up some of the assays and set up the questions I wanted to answer, making all sorts of model systems, transgenic mice which in those days would take years. And so I became more and more interested in both the genetic control of X-chromosome inactivation, which was the process I decided to work on, and also into the epigenetics of it. And it was after nine years at the Pasteur that I decided to then move to Cold Spring Harbor for a year to become more expert in techniques such as single-cell techniques to look at gene expression, chromosome organisation and position, because I wanted to really follow the early steps of this process during development. So I went to David Spector's lab for a year and that's when I really got into the more cell biology side of things and chromatin, and that year was quite amazing actually. It really opened up my eyes. Not only in terms of the science that I did but also in the way that science can be done. And so then I came back to France and I set up my own lab as a junior group leader at the Curie Institute, in the department run by Geneviève Almouzni. My lab aimed to understand the epigenetic dynamics and chromosome dynamics and nuclear dynamics of X-inactivation in-vivo. And that what we did. So for several years I was a junior group leader in Geneviève's department and then when Daniel Louvard managed to set up the building that we're sitting in right now, which is the building for developmental biology, I was recruited as one of the group leaders to move here and I ended up becoming the head of the department, almost by default, but there you go. And so I've been here for now almost eight years, actually, more than eight years. Nine years and we've been continuing to work on X-inactivation. And I guess that's it. So yes, I've spent now more than half of my life in France. I moved here when I was just twenty-five, and yes, it's been great, but soon I'll be moving to Germany!

AFL: [05:25] Of course, yes. I just want to jump back quickly, actually, at your time in Cold Spring Harbor.

EH: Yes.

AFL: You said that's where you learned techniques.

EH: Yes. I went there with a purpose which was to... I was trained as a geneticist and not terribly, I would say, not for long enough because, as I mentioned, I discovered biology quite late. And I always felt that, you know, I did a lot of molecular biology during my PhD, and I'd always felt that maybe I would like to get into the more three-dimensional side of biology or even four-dimensional side of biology. So I went to David Spector's lab to learn how to do fluorescence in-situ hybridization, immunofluorescence and also live imaging of chromosomal loci and RNAs. So I went there with that purpose but in fact I found myself in this amazing hotbed of science where, you know, you just have to walk to the bar and you bump into three or four superstars who just happen to be there, or who were working there, or who've come through to give a seminar. And that really was a turning point because it made me realize just how many opportunities there were to explore the subject that was close to my heart but with connections, with people, that, you know, had, I would say, the right technologies or the right know-how. So I collaborated with several people during my time there. And it also made me realize that, you know, as long as the right attitude is there, science just happens because scientists are curious, and usually quite intelligent, and things can move very fast as long as you have the right attitude. And of course funding.

AFL: Yes.

EH: [07:13] And that for me, in a way, my time at Cold Spring Harbor, I think, kind of primed me for EMBL. I mean, not that I was thinking at all about EMBL at that point at all, but just that way of doing science. Having people in a very intense scientific environment where there are different technologies and different topics that can meet and there's no fear, almost, of just saying, "Let's try it, let's try and crack the crystal structure of this." I mean, I didn't actually do that, but it was just amazing. And that was the time when antibodies that were very specific for chromatin marks had been developed and Dave Allis just happened to come through David Spector's lab to give a seminar. And he came with a few antibodies in his pocket, literally, and David Spector said, "Oh, yes, we'll just put them in the freezer, or whatever." And I said, "Well, can I try them?" And you know, that night, we went and had dinner with Dave Allis. I went back to the lab, I did the experiment, and the next morning I already knew that these were very, very important specific marks for the inactive X-chromosome. And so within 48 hours we already knew that we were on to something hot and because it was Cold Spring Harbor, things went very fast, and within a few months I already had, you know, some of the most important data that I generated in my career, just because I was in the right place, in the right time, with the right people around me, with the right attitude.

AFL: [08:38] That sounds really great, actually.

EH: Yes.

AFL: So you've mentioned EMBL now, and I think now it would be nice to [?]. What was your path to EMBL? When was the first time you heard about EMBL?

EH: Gosh, I can't remember, actually. The first time I heard about EMBL. I feel like I've always known it. It must have been when I was at Cambridge, in the Genetics Department. You know, there were a lot of EvoDevo people, Mike Akam and others, and so I kind of knew what was going on at EMBL: Nüsslein-Volhard, Eric Wieschaus. So, I'd heard about EMBL in that context very much. I'd also heard about the fact that there was EMBO, as well, and that was important too. So I kind of always knew about it, then I guess the first period where I was really sort of, you know, confronted with the EMBL model was when I moved to Curie, the Curie Institute, because Daniel Louvard was the director at that point. Now I knew Daniel Louvard from when he was at Pasteur: it turns out we were in the same building and he was on the floor below us or maybe two floors below us, so I knew him but I'd never really talked to him. You know, he'd just come back from EMBL, he'd set up his lab at the Pasteur and he was the star, so I kind of knew EMBL was good – it produced people like Daniel. But I had never really talked to Daniel. And then I heard about his project to set up this developmental biology building, which took over ten years to build. And so I actually, you know, plucked my courage up and went and saw Daniel and said, "You know, is there any chance that someone like me could apply there sometime in the future?" I was just a postdoc at the time and he said, "Yes, for sure, definitely, just get in touch." And so then it was actually that that made me apply to Curie when I wanted to set up my group after Cold Spring Harbor. But the building was nowhere near built. In fact, there was still another building here at the time. So then I thought, well, I'd really like to go to the Curie Institute. And I'd also come across Genevieve Almouzni who's a big epigenetics and chromatin expert. So, you know, that's how I came here. And then, as soon as I arrived at the Curie and got to know Daniel, he told us, and would at any opportunity tell us, in fact, there wasn't a single conversation I had with Daniel Louvard, I think, where he didn't mention EMBL: within two minutes, there would be an allusion to EMBL. And so the way he set up, not only the organisation of the way junior groups are hired here – the idea being they're hired for a 5-year period so that there's turnover – the idea that you set up facilities and platforms that everyone can share, people invest in big equipment that then is at everyone's disposal. So that it's a real community atmosphere with excellence, and scientific excellence always being the premium and not at any price. I mean extremely, I would say, rigorous evaluation of the people that we hire. And so it was in the air. I mean, for me, Curie was just, modelled, or at least the modern day Institut Curie, was modelled on Daniel Louvard's vision of what science should be about, which was EMBL. And so without even knowing, I actually picked

up all the EMBL, sort of, ways of doing things, and the way we run this department, for example, the way indeed we deal with junior group leaders arriving, the mentoring, the way young people can just get into science even if they're just a master's student. So I realized that there was this sort of atmosphere that was EMBL-like only when I started, actually quite late on, to be asked to come and visit EMBL for unit reviews, for example – so I've been on two or three of the Unit reviews – and then I just suddenly thought, "Wow, this feels like home! This is how we function too!" And of course it took me a few seconds to realize, yes, of course, this is Daniel Louvard's moulding of the... And so I think that EMBL really influenced the way modern biology is done in France because not only was the Curie Institute somehow influenced by Daniel and that, but then also, when he came back to France, he also decided to set up these junior group leader positions, the ATIP-Avenir, with exactly that idea in mind: that there has to be mobility and they have to stay for five years and we give them funds for them to do great science and then don't bug them. And so that was actually what I got, I got one of those grants as well, when I came back to France. So EMBL has sort of permeated my career, actually, all the way through, and in particular since I've been at the Curie Institute, which is since 2001. Yes.

AFL: [13:30] So your first, as a background, as an EMBL flavour... So you mentioned a few unit reviews: was that the first time you travelled to Heidelberg?

EH: No, no, of course I didn't. Ever since I was, even as a postdoc, I think I came to meetings, EMBO meetings and EMBL meetings. No no no. And I'd organised even a meeting a few years ago with Janet Rossant and Ruth Lehmann. And I'm often, I was often there. I was, yes. But, nevertheless, I'd never really seen the inside of the labs. I'd collaborated with people who worked at EMBL but I had never myself gone there, into a lab and talked to people. And I think that's what the unit review kind of reveals to you. I mean you see just how people are doing their science and how they interact and you get to talk to the postdocs and the students and that really give me a flavour of, you know, this sort of buzz that is great when science is really happening and I thought, "Gosh, yes, that feels like the way it feels at home!" And so that was really, I think, what primed me. And so when the offer to join EMBL as the DG came, I mean, I have to admit, I had – because I was going to step down as head of my department anyway, I knew that and I wanted to step down in 2019. So people knew this and I had been contacted by several places to find out whether I wanted to be their director or to run for director. And I'd said no to everything just because I was actually looking forward to not being the director of my department anymore and to doing more science with my lab and everything. And so when the offer came for EMBL and to be the DG, I have to admit, I was surprised at myself that I not only considered it but I actually then said yes. Because – and actually a lot of people around me were surprised –

because I had been saying, "I'm so looking forward to stepping down from being director!" But you know, EMBL is different. It's unique. And I don't think I would have said yes to anything else. Just because of this EMBL spirit and what it represents scientifically. And, well, yes, I mean, I guess we might come back to this, but for me, especially these days where science is not, it's supported well, but basic research and the sort of curiosity-driven research is less easy, somehow to defend these days, it seems than it used to be, which I find extraordinary because there are so many exciting discoveries being made in biology. But so it was an opportunity to think, well, maybe I could make a difference with the directorship of EMBL because that's the whole mission of EMBL, to really stimulate, exciting, cutting-edge research, produce technologies, train people to do it that way. So, how could I say no?

AFL: [16:30] So, how does one become Director General of EMBL?

EH: That's a really good question and I ask myself that every day. We'll see. I'm not quite sure how. What do you mean? What is the process of selection? I don't know how confidential it is, actually. All I can say, really, I was just contacted out of the blue, told that I was on a shortlist, evaluated by some committee who decided that I was – my name had been put forward – and decided that I seemed to have all the right credentials and I was told I should just turn up for the interview if I agreed to go forward. Turn up for an interview. Yes. And so it quite intimidating because it was an interview with some, you know, very prestigious people – and I didn't know that they were going to be there. And so it was quite an adventure and, there was no support in terms of PowerPoint or anything. I really just had to use my brain and my voice. And it was actually very pleasant because it was a real dialogue with the committee. But then of course, me being me, I came out thinking, "Well that was completely not what I expected and not at all probably what they expected. So I didn't imagine that it was actually successful, even though I had a good feeling when I discussed with them. I thought I'm sure that's not what they wanted. And actually it seems it was. So that's how one becomes selected for DG. How then one becomes DG, is another matter. And that's where I'm still wondering what one should do to prepare oneself. Luckily, it was done sufficiently in advance that it means I've been able to have a dialogue, not only with Iain Mattaj who's been extremely supportive and helpful in preparing me, but also with everyone else. So I'm sort of touching base with not just with the scientists and the unit heads, but also the heads of the various other actions that EMBL is important for. So I'm starting to prepare myself, but I don't actually know whether it the right way or not. And everyone says to be, "Don't worry, it'll just happen when you arrive." So we'll see. But what is wonderful is that EMBL is so well organized I feel that it won't be too difficult for me to figure out how it's organized, and then I can do the more fun side which is to explore what

opportunities there are to evolve certain things, to just learn about the science, to think about new approaches, new technologies that might be interesting to elaborate on, and getting people to, everyone to work together, which I mean, it's already happening, and I think, I hope that with my arrival as someone from the outside it means that maybe, on the one hand it's an opportunity for people to come up with some new ideas but also maybe an opportunity for me to create a bit of disorder because I don't know how it all runs, yet or perfectly. So sometimes out of chaos, some good things come. So I'm hoping to bring in a little bit of chaos, not too much.

AFL: [19:56] Just to get you started, then.

EH: Yes.

AFL: So, do you already have a few ideas of where you'd like EMBL to go over the next decade or so? Or?

EH: I do, actually. When I was interviewed... It's quite interesting because I do these lectures at the Collège de France every year and every year I have to lecture on a different topic so it gets me out of my comfort zone – which is painful at the time but actually really useful when it comes to thinking about what the big questions might be on each of the topics that I look at or work on. And so I guess because of that, I'm sort of thinking about the impact, well, the possibility that we now have to study in incredible detail the molecules involved in biology, and to bridge that to the cell and the organism. And that's clearly something that's already happening at EMBL in a very sort of profound way and, you know, just the fact that there are technologies, cryo-EM, all of the bioinformatics, and the fact that, you know, there are incredible imaging approaches that were developed at EMBL and that are used at present. So I was thinking, thanks to my studies, as I said, for my lectures, that one should really start to think at the more global level, at population level, because that's how organisms evolve, and to understand why certain, for example gene regulation networks, are the way they are, it's actually important to put them not only in the context of the organism that they're in but the organism in the context of the ecosystem its in but also in the context of its particular population dynamics. And here I'm not just talking about animals: I could be talking about bacteria in a gut or plants in their particular different climatic situations. So I was thinking that one of the things that one could work towards – and it's already happening at some levels at EMBL – it to try and exploit the incredible richness in Europe of biologists working on various organisms and systems, from the gut microbiome to, you know, the marine biologists in Europe, especially in northern Europe for example, and to try and see whether we can come up with projects that would allow us to explore how ecosystems work together and what the impact is, for example, of the

environment and, you know, climate change. I mean, I was always, “Climate change, of course we have to deal with it, but it’s a little bit too much of a buzzword.” But actually when you start to talk to the scientists who, for example, are in the field or when you start to think about what’s going on in our oceans and seas and when you realize that now we can actually go in and sample these things. For example, I was very inspired by Tara Oceans – which was an EMBL project – and the fact that now we really have the possibility of going in, looking at life *in situ*. And asking questions about, you know, “Well, what happens then if the environment changes in this way or that way, whether naturally, throughout a year or throughout a decade, or generations, depending on the organism we’re talking about, or in terms of climate change as well. And so because I’m surrounded by biologists of all sorts, people working on *Drosophila*, people working on fungi, people working on plants, I realize that actually EMBL is unique in being able to explore everything if people want or just a few things if they want. So what I’m hoping is in the first couple of years, I’m just going to continue on the project that’s already there – I mean that’s the whole point – the indicative scheme is there, the digital biology programme, which I think is incredibly good basis for then the next step in a few years time, where maybe we could imagine setting something up that goes beyond the organism to the population. And as I said, the population can mean different things in different contexts. And what that means is really integrating different datasets and trying to make sense of them, so obviously computational biology will become even more important, but also being able to get the highest quality datasets, whether it’s at the cell biology level, at the molecular level, when it comes to protein structure, when it comes to the way that an embryo can develop in different contexts, being able to image that and then extract the information cell by cell. And I think all of these things are happening actually already. And what I’d like to do is maybe is to take them that one step beyond and say, “Okay, now that we know how these things sort of work, can we actually start to ask questions like: well, what happens then if you put a population of fruit flies in a stressful environment? Can we actually look at the changes and quantitate them properly. And that’s the key: being able to quantitate and being able to assay properly. And I think we’re finally getting there in biology. The physicists and the chemists have been there for a while, but finally in biology we can actually do that. And because the essence of biology is time, looking over time of an organism, time of, generational time, so exploring how organisms behave in different contexts in, both in the natural environment, but also in a controlled way. And so that means maybe setting up virtual labs where different entities come together within EMBL to attack specific projects. So I could easily imagine, you know, I’m taking Tara as an example just because it actually happened, but maybe doing another Tara-type project, whether in the sea or on land, actually, and just saying, “Well, can we

actually exploit very defined places and times, particular organisms, and try to see whether out of that information we can actually extract useful data that will show us why, you know, certain fungi, or certain plants, or animals, actually react more or less appropriately in terms of nutrition, in terms of climate, in terms of... So that's kind of where I hoping that we'll get to. Now, how far we'll get, I don't know. But I just feel that we need to go beyond the organism and the cell and hopefully we can get there. So it means thinking about population genetics, which maybe has, there's a little bit of that, but I think we could explore it more, and the power now of genomics which is becoming cheap and easy, I think you could really, really go quite far. And that's the power of Europe. There's a lot of different niches of expertise and I think one of the roles that EMBL can have is to really help to harness those, that richness and put people together to work.

AFL: [27:31] Well, actually that's one of the original core missions.

EH: Exactly.

AFL: Federate these activities. That sounds really really exciting actually...

EH: I hope so!

AFL: ...as a way forward.

EH: And also because, I mean, you know, I'm not trying to push one particular question or organism. I think, you know, I want, the first thing I'll do is probably in the first couple of years, is have a sort of series of brainstormings where we bring in some of the top scientists from EMBL and from other parts of the world as well to just try and discuss and come to a conclusion about what the best questions that can be attacked are. And then that can be our basis. So, we'll see. As I haven't started yet, it's easy to fantasize.

AFL: Which is probably the best place to be to fanaticize. One of the things that, of course, is quite special about EMBL is the fact that we are on six sites now...

EH: Exactly.

AFL: ...and how these six sites complement each other.

EH: Each other, yes. That's actually one of the things I find most exciting is that you have six sites who complement each other both in terms of their science and technology but also in terms of their geographical location, and so I find it wonderful to think that indeed in this day and age where it's so easy to travel and to connect by internet that we could have these these kinds of virtual labs I was talking about, we could actually go beyond where each of these sites is – and that's already happening thanks to programmes like the EIPOD programme, you know, shared postdocs between two different labs, ideally on two different

sites. And so that's incredibly enriching. And I think it's already working and I think one of my ambitions is to make it work even more, to try and bridge between the six sites as much as we possibly can, and make sure that – although obviously Heidelberg is the, sort of, central base – nevertheless that the other sites should be, I would say in almost osmosis with each other and with Heidelberg. So I really intend to make the most of that. Now, I don't know whether I'll do this, and as no-one's probably going to be listed to this until a long time after I'm dead, one of the things I was thinking would be that I could actually spend, at the beginning of my mandate, spend a period at each one of the six sites – or the other five sites – so several weeks perhaps to really sort of become part of it and see the way they function and try to get a better feeling for their talent and the opportunities at each of the sites, which means that then, afterwards it will be easier for me perhaps to make the most of everyone and to make the connections as easy as possible. So that's my intention, to maybe spend a good chunk of time at each of the sites early on. We'll see.

AFL: I find that each time I go to one of the sites I come back and think, "Oh, that one's definitely my favourite!"

AH: I know, exactly, me too! I've been now to almost all of them. I haven't yet been to Barcelona and Hamburg, but I've been to the others and each time I'm totally stunned. Firstly. There are two things: one is each of them, as you said, has its uniqueness and its charm and its power, but at the same time it's EMBL and it's this wonderful feeling that you still have the same basic feeling that the way things are organised, the way you do your research, the kind of getting things done efficiently, getting things done efficiently, quickly and in a completely open way, but on the other hand, each of them as you said, has their specificities and different scales. You know, you go to Monterotondo, it's quite, it's only a few people, a few labs, but very very very tightly knit. You go to the EBI, it's six hundred people and at the same time they're also very tightly knit but in their own way! So it's actually, yes, I find that wonderful.

AFL: Yes. I know I sometimes describe the sites as trying to describe a smell: you know exactly what it's like when you smell it, but it's really hard to describe, to define.

EH: Yes, to describe.

AFL: And it is a great part of the EMBL....

EH: [31:50] That's right, and I think that's really precious and I realize that it's easily maintained because people who have been to EMBL appreciate it. So when you talk to people who have been to EMBL, the alumni, it's amazing the enthusiasm that, as soon as you say

EMBL, their eyes light up! That's quite unique, I think, I don't know many places that do that to scientists.

AFL: That's really great. Do you see more sites in EMBL's future?

EH: Not in the immediate future. I have to admit, I think that given the economic situation in the world, and Europe, I think one has to be realistic. And I'm actually more for consolidating what we have. And when I talk about, you know, new projects, I'm actually thinking about using the existing sites and maybe some of the partner countries and the other member states, to set up projects where, you know, there's a deep involvement but without necessarily building a new building or... But we'll see. I mean, who knows how things turn out. If there's a fantastic project proposition and opportunity, I'm not saying that I would say no, absolutely not. It's just seems that given the current situation, it seems, you know, more reasonable to say we want to consolidate what we have and make the most of all that talent to go forward, which I think shouldn't be too difficult.

AFL: And then take the idea of virtual sites?

EH: Exactly! And you know, maybe a boat, or a truck! Ha, we could have an EMBL lorry!

AFL: That would be pretty fun! That would be pretty fun! So, looking at EMBL as a whole again: we've spoken about the science, you've touched on the training aspect of it, you've touched on the services, but you're also going to be taking the helm of quite a chunky administrative structure.

EH: Yes, well, I have to admit I'm not a born administrator, – that's for sure. But I also get the feeling that that's also why they hired me. I think what was expected from me, from what I understood, talking to the people, the Council, EMBL Council, was they want someone with a vision of what EMBL should be about in the future and that makes the most of what is there. And, administratively speaking, EMBL is pretty well run. So I've already met some of the people in charge and I'm very impressed because they are very good at what they do. And what I'm hoping to do it learn a lot from them and work with them to make their lives as easy as possible and the only thing that I require from the administration for such a, you know, huge entity is that their mission should be to make science, technology, training as easy as possible. I think that's what happens and that's what EMBL is about and again that's what Daniel Louvard set up at the Curie Institute. And I can really see the difference compared to other institutes in France where the administrative staff and the administrative structure are there to help science happen and so I'm going to be extremely vigilant that that is the way things happen at EMBL, but I have no worries about that. But, you know, I do sometimes wake up in the middle of the night and think I am not trained to deal with, you

know, administrative details and stuff so maybe I should go on some course and learn all about it to but then I talk to a few of the people, friends of mine at the Curie and elsewhere and they say, "Don't worry, we'll help you." So I've already been offered some free coaching and, you know, as I've said I've already met some of the people at EMBL who are in charge and it's actually a real pleasure to exchange with them. So yes, today, I'm not too worried, but I do go through moments when I'm thinking, "How am I going to handle that?" The other aspect, of course, is the more political aspect, which, you know, EMBL is about its member states. And that was, you know, one of the reasons I accepted the job was also because it is about Europe and the member states, so I feel quite strongly that one of my jobs, my first jobs will be to convince the member states that EMBL is the best thing that they have when it comes to science and biology in particular but science in general. So that's what I would like to do, is to, you know, also make sure that all of the member states realize just how important EMBL is for their future, that science is not just about dreams, it really is about producing the future advances that will make our lives better places, and not just in terms of our health, but also socially better places, you know, understanding how things work and making sure that people care about that, training them in the right way. So that's going to be one of my personal missions, is to really make sure that I can manage to do that. Again, just like with the administration, I don't know if I'm born to be a politician or to deal with politicians – probably not, but I feel that when you care enough about something usually you can manage to convince people. And again, I'll see how it goes, but so far, the contacts I've had very informally with some of the people in charge in different member states has been very good. But that's something that I'm aware of. It's a big part of the job, it's not just about sitting in Heidelberg running some of the science. It really is about getting out there and making sure Europe is on board. So, yes.

AFL: But, I mean. You're only going to be the fifth EMBL DG and there hasn't really been a pattern for that.

EH: No. I think not. I realize that indeed they've all been rather different. So, yes, it'll be another different type. I mean, first of all, I think the fact that I'm coming in from the outside, even though I know how EMBL functions, I really am coming in from the outside, and yet I've had an established career for many years. I think probably it means that I will actually bring in some new ways of thinking and doing things. There is an element of me that wants to... You know, we talked about that when I was at Cold Spring. What I really appreciated when I was at Cold Spring Harbor is that you could just turn up, any time of the day or night and chat with people. And it wasn't just the scientists in the lab, there were, you know, the people who were involved in books, writing books, publishing, they were the editors of the journals that they have, there was the person who runs the courses, Dave Stewart, who I

got to know really well, and so that's for me what EMBL is also about, being able to kind of connect all the different facets of science, not just the scientists, in the a single entity – and entity, I mean the whole of EMBL, not just, you know, Heidelberg or the other sites – and so I feel that, that's, I really want to somehow make sure that that happens. I think it's happening already, but as I have haven't been in EMBL, really. But I care a lot about making sure that people connect with each other and care about each other and the entity they work for. And so I'm not quite sure how I'm going to do that – if it already exists, then fantastic, I'll just stimulate it even more – and if there are some aspects I feel don't exist, I'm going to find ways of making sure that that happens. And so... Yes, I'm one of these people who, I mean, I have ideas, but I'm actually happy to change them if they're not good ideas, and I'm also happy to take on ideas. So I'm hoping to use some of those really excellent brains that I'm going to be surrounded by, at EMBL, and the alumni, to help, you know, find new ways of making sure everyone connects. Because, you know, you've been to these institutes where you realize that it's when people just, they want to be in the lab, or they want to be in their office and in that environment, that things really happen and that the magic kind of happens. And for me, that's why EMBL is such a special place and that's what I really want to nurture. Because in other places in the world I think it's been lost. I've been, you know, to several institutes where I think that the science is fantastic, but you sort of think, you know, where's, lets kind of really get things going by sort of connecting with each other at every level. But is could be also that that's the way we're evolving, because you know, there's so little time, everything has become so much more frenetic. So should there be ways that we preserve that time for connecting better? Again, that's food for thought. We'll see. Hopefully, I'll indeed get some, several colleagues on board once I'm there and we'll find out whether indeed there are ways that we can nurture that right spirit that is so important for productivity in science and for imagination and creativity.

AFL: [41:02] The scientific spark.

EH: Yes, which is, but like I said it's not just about the scientists. That spark that makes people want do, want to work in a scientific environment where we can really discover new stuff and we can do that actually just by talking to each other as well.

AFL: Yes, that's true... The... EMBL has quite an active communications team, and that's developing with time and space. What, how would you like EMBL to be known more by the general public?

EH: Yes. I'm, I feel quite strongly about this, actually. We're in an age where communication means so much, and I think, you know, when EMBL was set up, we were still using fax machines, if they even existed, actually, but just about. And so now, you know, tweets,

Facebook, the whole process of life just seems to be so much about communication. So I think it's really important and I think EMBL is definitely moving in the right direction by taking this on. It has to be the right kind of communication and I think there are very few places that actually yet do that. I mean, I realise that. The UK are pretty good at this for example. For example the Wellcome Trust. They are very good at making sure they have the right messages immediately, so for the better or for the worse. You know, when there's some kind of, I don't know, medical scandal or whatever, they know exactly what to say, and when there's something new and exciting, they are out there with the journalists immediately, even before the journalists. So I think that's what we should aim for, but has to, it's a lot of work, and people have to be doing it the right way and have the right information. So it means that everyone has to be on board: so it's not just about the people working for communications, it means that everyone has to realize that communication is actually one of our endeavours. We have to get that right. And so what I would like is that when people switch their radio on, on Sunday morning or whatever, and they're listening to, you know, a programme with scientists, non-scientists and basically if someone says, "Well, did you hear about the latest discovery where people have been able to show that – I don't know, I'm just making this up, but you know – the way a butterfly's patterns on wings forms is actually through this couple of genes and actually you know, you look at the males and the females and they're totally different! Well, now we know how it works! Or that Tara went and found some new organisms that no one had ever imagined!" So right now, we do hear that, but often people are more interested in, for example, "Oh, Musk sent off his rocket into the sky, and, wow, we were listening to David Bowie playing and it might reach Mars!" Which is wonderful, but people dream about space and astronomy – I did, actually, when I was young too, I still do, I'm still fascinated by all that – but I want people to be as interested in biology as they are in the other sciences and I want people to realize that there's so much there being discovered and so much more to learn that everyone wants to hear about this and has an opportunity to, and that we don't just hear about biology when it's because some, I don't know, drug company has issued something that has, you know, drugs with side-effects that weren't expected. And at the moment I feel that biology often boils down to human health. Much less often now do we hear about the exciting new breakthrough. I mean, when you look at the people who won the Nobel Prize. They were not trying to cure any diseases, they were just trying to work out, they were discovering things and trying to work out how things work. And I feel that we have to get biology back out on that level of wow-factor the way that CERN still makes people "Wow!" and I think that's what EMBL can do. And I think Europe is in a very good place because of EMBL and so yes, the communications are very important when it comes to that and I think that's – we

have an obligation as scientists to make sure that the right messages get out and in the right way. And that is about communication. And most scientists would admit that they haven't been trained to communicate. They've been trained to do science, to be rigorous, to have ideas, to test them. But to actually stand out there and to tell, you know, Joe Bloggs about why what they are doing is actually exciting is not easy and I've discovered that because of my lectures at the Collège de France. They are general public and you have to make sure that you get the message across simply, truthfully and yet in an exciting fashion and it's not an obvious task and that's why we need the communications people to help up with that.

AFL: [45:59] Can we see, do you see a mandatory communication training for scientific staff at EMBL in the near future?

EH: Actually, that's a point, and maybe that would be a good idea! I don't even know whether there's even an option to do that. But it's true – I realize that, I mean, because I work on epigenetics, it's one of these hype topics that people love to talk about and there's a lot of fantasy put into what it means. And it took me a few years to work out, when people would ask me, journalist, or just someone, you know from the public, "Oh, well, what do you think about the way the environment influences this?" And I would immediately say, "Well, what's that got to do with epigenetics?" And then I realized that they'd just go off disgruntled and then I thought, "Well no, I shouldn't do it that way, I shouldn't do it the scientist way and say, you know, why are you asking me a question that has nothing to do with what I think is my topic?" So you know, to learn to engage with someone who doesn't know about you and to do it in a way that allows them either to reformulate their question, or you actually manage to answer part of it and to make it sound like you've actually got a dialogue with them, and actually have a dialogue, I think that's not obvious and it does require training. I ended up never being trained, so probably I could do it better than I do but I do realize that it requires a few realizations. You know, when I was interviewed on the radio, I was told after the event that, you know, it's the complete opposite to the way that you normally write a paper for example. Usually as a scientist you want to give some background, you introduce, then you talk about your strategy, why you did something, and then you talk about the results and then you discuss them. That's the way scientists function. The way journalists function is: they want the hot stuff immediately. They want your hot conclusion before you've even begun to tell them about why or how you did it. And so it's actually a whole order of presenting or, and thinking that is different and it does take, I think, some training. Some people do it much more naturally than others.

AFL: [47:59] But certainly one important aspect of, again, the training core mission of EMBL.

EH: Absolutely.

AFL: We're going to start wrapping up in a second. But I just want to, is there something that you just want to record for the archive: a story, a hope, a dream, something...

EH: [48:20] I really hope that maybe by the end of my mandate – who knows how long or short it will be – but, that, that there will be visibility of excellent science and basic research in the world that will be EMBL. That basically EMBL will be at the top of everyone's agenda. I don't care – I mean obviously I should care about, you know [?] or Shanghai, what do they call them? the classifications of institutes where. I never even bother to read about that. But I would love it if indeed people talk about EMBL as the place where, you know, major science and major discoveries have been made. It is already, but I think we can do even more given the talent that there is in Europe. And so I really want, you know, science to be, I would say, Number 1 on the agenda of people in Europe and it should be through EMBL. I'm not sure that that's a terribly good answer, but again, just like you were saying it's difficult to put into words somehow what you feel about EMBL, but I think EMBL is such a unique opportunity in the world to do collegial science. There's no other place or entity like it. And so I don't think it's fragile right now, but because the world is changing very fast, the political situation in Europe is quite volatile, and economic situation in the world, and so I would like to be remembered as the DG who not only preserved EMBL but actually made it, you know, I would say, a selling point for Europe to say, "Look, we have EMBL and we have managed to do great science and to prepare the generation of new scientists for the future, despite all the other stuff that's going on in the world." So, you know. Who knows? We'll see.

AFL: I think it would be fair to say that you're very excited about taking up post in January.

EH: [50:38] I am, I am. I'm daunted. I'm also quite daunted. But the excitement always, you know, is the major, I would say, factor. But it's true that when I go to one of the sites, it takes me a few minutes to think, "I'm here and I know why I'm doing it." It's when I come back home to Paris, to my lab and I'm thinking, "Goodness, what on Earth came into me and why am I doing this?" And I mean, I'm sure people will listen to this in the future and think, "How could she express doubts?" But, you know, I think it's good to express one's doubts and fears, and to me it's really important because it means that then people know that there are, that I will need help and support and I hope that that's what EMBL will find is a good thing about me being DG, is that I come in with a very open mind and not that many à priori, which means that together, we can make it better. And that's always the feeling I get. When I get to each of the sites, it's just this kind of welcoming, not just in terms of the scientist I am but just personally. People are just very open and welcoming. And I hope that

that means the excitement will be there the whole way through, even when I end up becoming feral, as Iain puts, when I'm totally overwhelmed with everything and all the different aspects of the role as DG, even then I hope that there will be enjoyment through the interactions with people, through the, you know, missions that I have to fulfil, each one of them, I find interesting and exciting from the outside. And well see.

AFL: That sounds really great, thank you very much, Edith.

EH: Well, thank you.

AFL: Edith for welcoming me into your Institute Curie office.

EH: Well thank you for coming, it's my pleasure.