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Lord Brian Flowers
Interviewed by Anne Buttimer

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Lord Brian Flowers

Lord Brian Hilton Flowers was born in 1924 in Blackburn, England. With BA and MA degrees from Cambridge and a Doctor of Science degree from the University of Birmingham he served as Professor of Physics at the University of Manchester (1958–72), returning there as University Chancellor (1994–2001). He also held the position of Rector at Imperial College in London (1973–85), and Vice-Chancellor at the University of London (1985–90). His scientific research has focused mainly on atomic energy and theoretical physics, and he has published on the properties of materials and on numerical methods. He has received many awards and honours, including knighthood (Sir) in 1969 and life peer-hood (Lord) in 1979. A founding member of the European Science Foundation (ESF), and its first President, from 1974 to 1980, he was thus also one of the founding members of the Academia Europaea (AE).

Anne Buttimer: Thank you so much for granting us this interview, Sir Brian. You were among the founding members of Academia Europaea and First President of the European Science Foundation, a body that was, in some

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ways, its parent. First I'd like to ask you a few questions about your life experience and career path, before entering into greater detail on the founding visions of Academia Europaea.

First, what was it like to grow up in the north of England in the late 1920s and early 1930s?

Brian Flowers: I didn't grow up in the north of England. I was born in Blackburn it is true, but left it at five weeks old. After Blackburn the family moved briefly to Rugby where my Mother's parents lived, and then to Chorley Wood near London where I attended primary school. Then when I was nearly eight years old we moved to Swansea in South Wales where I grew up. There I attended three secondary schools, thanks to the War. The first of them was near my home and I well remember the school buildings, which were of wood and glass, erected as temporary structures after the First World War. At the beginning of the Second World War, in 1939, it was decided that this was too hazardous a building for young boys in wartime so it was occupied instead by girls (for whom apparently it was not too hazardous!) and the boys moved to another school called Dynevor in the centre of town. This, after only one year, was destroyed in one of the first really bad bombing raids on the UK, and we ended up in Swansea Grammar School from where I went up to Cambridge in 1942. Incidentally, I was a very musical young man, playing the cello, and when Dynevor was destroyed all the sheet music of a cello concertina I had composed for the school orchestra also went up in flames.

AB: Interesting, mathematics and music have a lot in common. So you moved quite a lot as a boy. Incidentally what was your parents' profession?

BF: My father was a pastor.

AB: Did you find it difficult to change home places so often? Was it challenging to 'fit in' in each successive place?

BF: No, I didn't find it hard. My parents were very supportive and I settled quite quickly into each new situation. Besides, I liked school and was usually top of the class. Only once I had a rival for that position.

AB: You went to Swansea for a good number of years. What do you recall from those years at school? Were there particular teachers who inspired you, or certain subjects that attracted you?

BF: I had one great teacher in mathematics. He was a dedicated teacher and took a personal interest in his pupils. Many of us went on to degrees in

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physics and maths. Two others beside myself eventually became Fellows of the Royal Society.

AB: Do you remember his name?

BF: Foulkes, I think. He was not only a great teacher; in his spare time he used to calculate trajectories of anti-aircraft shells for the war effort, and I later found out that he had published a number of original papers in mathematical journals.

AB: Other memories of Swansea? What did you do during the Second World War?

BF: Wartime, yes. Swansea was badly battered. The local geography was important: while Swansea town itself is fairly flat, it is backed by hills and many houses were built on high ground. The Germans were extremely clever – they bombed these hills with incendiaries and lit up the whole of the lower town, which they proceeded to bomb with high explosives. There were many such air raids. I remember each time we heard the sirens we would expect that bombs were coming, so we climbed under the living-room table and waited until the danger had passed. After some months we got bored with that and just stayed in bed, trying to sleep through the whole ordeal.

AB: And were you involved at all in the war effort?

BF: I was a volunteer of the ARP (Air Raid Precautions*)*. We peddled our bikes around delivering messages of various kinds in pitch darkness. There might be no telephone or postal service, you know, after a bombing raid.

AB: Was this not hazardous?

BF: Oh yes, extremely so. But one felt obliged to help in any way possible.

AB: Then you went to college in Cambridge?

BF: Yes, in 1942. I had wanted originally to do mathematics, but because it was wartime physics was regarded as more useful. I therefore spent two years (1942–44) reading physics and was awarded an 'unclassified' BA degree (because I had not done the prescribed three years). This was the case with most graduates in those years of war.

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AB: What was the atmosphere like at Cambridge during those years? It was quite a lively milieu during the 1930s, I understand.

BF: It was wartime. There was blackout, there was rationing of food, clothes and many other things. Students and professors tried to get on with their work as normally as possible, but social activities were heavily reduced, and many staff members were involved in the war, in the forces or otherwise. I did some mathematics as well as physics, and continued my music by playing in the Cambridge University orchestra.

AB: And then?

BF: In 1944 I was sent to Canada to join the atomic energy project there. I found this fascinating, not only scientifically, but also practically. It was intended to win the war. The project was to make a bomb. And it was successful.

AB: How do you feel about that now?

BF: We had to. It was the only way to win that war. Sad about the deaths in Japan. But without that bomb there would be have been hundreds of thousands more deaths.

In 1946 I returned to England and joined the Atomic Energy Research Establishment (AERE) at Harwell instead of returning to Cambridge as I had originally intended. This was an extremely exciting experience: working with experts in a wide range of fields – physicists, engineers, economists, lawyers, even politicians.

AB: An early experience of interdisciplinarity?

BF: Yes. Then in 1950–52 I went to Birmingham for postgraduate study for which I was awarded a DSc (not PhD). Rather than continuing within a university career, however, I returned to Harwell and soon became Head of the Theoretical Physics Division of AERE at the tender age of 28.

AB: This was your first experience of an administrative post: did you enjoy being in charge?

BF: Well, I had to work my way gradually into the role, learning through experience: how to make decisions, sometimes in situations where opinions were varied and sometimes contentious. Some of my staff members were considerably older and more experienced than me, which

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was difficult for one or two of them. Harwell had a wonderful range of special fields, many very bright people, and interaction among them was lively and fruitful.

AB: In 1958 then you became a Professor of Physics at the University of Manchester. Tell me about Manchester at the time. That city had also been heavily bombed, but I suppose by the late 1950s reconstruction was close to completion?

BF: There wasn't much bomb damage left – a little here and there – no that wasn't the problem. The problem was air pollution. Occasionally in the 1950s, in the right season, you could walk into a lamp post in full daylight because it was so dark. It was quite appalling really. On one occasion I had to walk home – a distance of only a few miles – because all transport had ceased. I couldn't see where the pavement ended and the road began. I had to crawl along, feeling with my feet, and eventually got home. But it took a long time. That only happened once or twice. But there was always a lot of smog. They talk about fog in San Francisco but those who haven't been to Manchester don't know what a real smog is. It's all changed now. Manchester is a booming, busy, happy city with clear air and full of students – many more than in my day.

AB: How were the students? Did you have doctoral students who graduated in physics and went on to assume careers in physics at other universities?

BF: Oh yes. But to complete the Manchester story, long after I had left, and had indeed retired, I came back as Chancellor, an honorific position in England, where you wear magnificent robes, give degrees, shake hands and smile, and chair one or two committees. I did this for seven years (1994–2001) with great pleasure. It rounded off my career.

AB: That must have been gratifying for you. Looking at your CV, it seems that in the years up to the 1970s, much of your activity was focused on science. In addition to your university-based work, you became a Fellow of the Royal Society in 1961, and you chaired the Science Research Council in London during the late 1960s. From the early 1970s, however, your attention seemed to gravitate toward administrative tasks and institutional leadership. Is this a fair perception?

BF: Yes; quite frankly, I think there comes a time in the career of most scientists when he perhaps loses his creative edge and should graciously bow out, leaving space for younger scholars. This is how I felt, at any rate.

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I did not deliberately choose these administrative tasks – I was invited to undertake them – but yes, this was mainly during the 1970s and 1980s.

AB: You were apparently quite effective in these administrative roles. What were the secrets of success?

BF: I worked my way gradually into these positions. And I learned how to make decisions. I have always found decision-making rather easy. The solution is either obvious, or finely balanced in which case it doesn't matter. However, I always consulted widely, before making my decision.

AB: Some of these administrative positions were primarily academic or at least research-oriented, such as the departmental headship in Manchester and chairmanship of SRC; others were primarily issue-oriented, societally-relevant questions of technology and environment. Did you find both of these equally interesting, both equally challenging in terms of inter-disciplinarity? Why, for example, were you appointed to the SRC?

BF: Well, I'd been serving on SRC committees for some years from Manchester, and I more or less slithered into it gradually and I turned out to be fairly effective at it.

AB: Was this a good occasion to meet people from other disciplines?

BF: Well yes and no, really. I was on the Nuclear Physics Committee to begin with, then I got on the Physics Committee, which was a broader thing, and then I was involved in the Science Board (as it was called) which got me involved with others, including engineers. I mean, already in Manchester I had a great deal to do with chemists and engineers in an academic sort of way, planning courses that involved two or more subjects – that sort of thing. So it was really in Manchester that I started to become multidisciplinary in my interests, although remaining a physicist in my personal work and attitudes.

AB: This question of interdisciplinarity lies at the heart of my basic questions about your later work…

BF: At Harwell, too. That was an applied job, involving people who were building reactors and that sort of thing, and I was doing calculations for them, so you involve yourself in their disciplines. At Harwell I was involved with physics and mathematics, with engineering, with metallurgy, and – because of the radiation hazards, with biologists and medics. But I would call it multidisciplinary, not interdisciplinary.

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AB: So from early on, even during your 'science' period, you were involved in multidisciplinary interactions.

BF: Yes, early on, from an educational point of view that was the great thing about the nuclear power question. And that's why I stayed at Harwell rather than going back to Cambridge because I was already in a much wider world that that which Cambridge would have provided.

AB: And this was the time in your life at which you were perhaps most creative also?

BF: That was the formative period. Yes, I was at my most creative in the 1950s and early 1960s, but it also formed me into the sort of person I became.

AB: While continuing your scientific trajectory, however, you also became involved in societally-relevant questions such as energy, environment and technology. I wondered if your experience of pollution in Manchester afforded some motivation for this turn?

BF: It certainly had a psychological effect. But again, I was invited to do it, to become Chairman of the Royal Commission on Environmental Pollution (1973–76). That came out of the blue. What active interest I had shown on environmental matters before that – I'm not sure that I had shown any really – but I was regarded as the sort of bloke who was a good chairman and could do things like that. So I was asked to do it and then I became deeply involved in it, in air pollution especially and in the environmental consequences of nuclear power.

AB: And that happened right before your first major sortie into Europe-wide scientific collaboration within the European Science Foundation. Could you tell a little about how this came about?

BF: It all arose from the fact that we had joined Europe and the research councils (or whatever they were called in the different countries) were getting together on a bi-lateral basis. So we in the SRC would have to do with the CNRS in Paris and the DFG in Germany and so on. And some of us began to feel that all this was a bit silly. After all, we were now in Europe and we shouldn't be operating on bi-lateral bases but should be operating on a multi-lateral basis. I mean especially when you have bi-lateral arrangements for the same thing between three or four countries, all done bi-laterally, it's just absurd. So the idea gradually grew 'wouldn't it make more sense to discuss these things jointly and come to a

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joint decision – for those of us who want to at any rate – and go on from there?' That was the founding idea, the only founding idea in fact, for the ESF.

AB: Was the idea one of standardizing procedures and policies, or was it one of collaboration on specific issues?

BF: Not really. It was an idea for us to work together. No question of centralizing diktats.

AB: You chose Strasbourg rather than Brussels. This seems significant.

BF: We chose Strasbourg. And the reason was this. When we were discussing the question of how this should be led we decided on choosing a President, a Secretary-General, and a place. The possible candidates (there were very few of us, perhaps 10 in all) were either me as President with Friedrich Schneider of the Max Planck Foundation as Secretary-General, or Heinz Meier-Leibniz, a German, as President with an Englishman, Henry Walker, Secretary of SRC, as Secretary-General. There was no French candidate at the time – they were all busy about other things. So then it was clear that it was going to be led by an Englishman and a German, so the place had to be France. But no, not Paris please. We were leading this ourselves, the research councils, not the French Government, and also not Brussels.

AB: Could you tell me who the 'we' were, these 10 or so who were involved in these early decisions?

BF: I cannot remember them all by name. But they were leaders of the research councils who were talking together in those days.

AB: Were all nine countries involved?

BF: This had nothing to do with Brussels! It involved the research councils: the British, French, German, Dutch, Belgian, Danish, Swiss, Swedish, Austrian – just from memory. It was decided that I should be President, so that was that. Of course, we had to invent the machinery. We had a Council that consisted of some of the heads of the various research councils.

AB: Can you remember whose voices were the most compelling in that early group? Apart from the council representatives that constituted your original ESF Council, who were the most important early 'movers' in the direction of interdisciplinary and international collaboration?

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BF: Me, Hubert Curien of France, other Frenchmen, van Lieshout from Holland, Peter Fricker (Switzerland), your friend Torsten Hägerstrand (Sweden) and some others.

AB: But the main ESF idea was to promote collaboration among institutions whereas the original idea of Academia Europaea was to focus on individuals.

BF: That's right. Now we come to Academia Europaea. Well, it was a very English idea. And I mean English, not British. We were faced with a situation where the institutions were getting together via the ESF and, of course, later on there came other organisations with which the Research Councils became affiliated…

AB: What do you mean by saying that the AE was an English idea?

BF: I say that because in England the society that contains individuals is the Royal Society. Individual scientists, if they are considered good enough, become fellows of the Royal Society. They are chosen according to their individual merit, not according to what organisation they belong to. This is where the individuals determine what happens. And it is a body that has become as powerful as the research councils. It plays a distinctive role in that, whereas the research councils are talking more and more about projects, the Royal Society is talking more and more about individuals. So it is the Royal Society that started the scheme of selecting Research Fellows to relieve individuals of their academic or other time-consuming administrative duties and allow them to concentrate on their research. Of course, they were often involved in projects of one sort or another, so there was always a connection with what the research councils were doing, you cannot avoid that.

AB: Individuals would need grant money to pursue their own research, no?

BF: Yes, I mean one mustn't say that individuals are one thing and organisations are another with nothing to do with one another. That's nonsense. But the emphasis of The Royal Society is on individuals and the emphasis of research councils is on projects. So this, as I say, is a very English idea because even though there are academies of science in other countries…

AB: The role of Academician used to be quite strong in China and Soviet countries…

BF: That's a different thing. It's an official position – or it used to be – it is changed now. So there was really no academic body comparable with the

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Royal Society elsewhere in Europe. There were such bodies, Academies of Science, but they were much less influential than the Royal Society was in England.

AB: You mean less influential within their respective countries?

BF: Yes. That's right. Germany, for instance, did not have one science body; it has a number of science societies scattered over the country. Most of these societies were formed on a provincial basis. Of course there is the French Academy, but that is a very elitist body, which consists of very few people. It is a very different sort of body from the Royal Society. So, with this sort of background, I and others – Arnold Burgen became leader of the band as it turned out – started saying: well now, we've got the institutions together, it's time we got the individuals together. It's time to get something like a Royal Society of Europe. Again, it had nothing whatsoever to do with the European Community or with Brussels. If there was a potential political partner it was more likely to be the Council of Europe – unofficially, of course. Now some people objected to this. Quite a lot of French people objected, the French tradition being quite different as far as the individual is concerned. The individual in France is not the same as the individual in England.

AB: Could you elaborate a little on that assertion?

BF: The French concept of the state is that the state will provide. It's a very socialist concept. And even though France may not be socialist from time to time, this concept of the state being responsible… it's a 'top-down' society, whereas England is a 'bottom-up' society really. We keep on fighting the fact that people tell us what we've got to do. That's not our idea of how things should be.

AB: Well, French people do not hesitate at protesting against unpopular decisions! But perhaps during the Mitterand years there may have been a stronger socialist ethos. Curien formed part of Mitterand's entourage from time to time but he always maintained a completely objective perspective on science.

BF: Curien was not politically committed. He regarded it as his duty, as indeed I did, to serve the government in power.

AB: Apart from just meeting for discussion or debate, were there any specific themes proposed for exploration or research collaboration by these individual members?

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BF: The idea in Academia Europaea was *not* collaboration. The idea was to meet and discuss, have conferences and study groups – well, to that extent, I suppose, one was collaborating.

AB: But were there subject areas – topics or themes – for these study groups to explore as bases for dialogue and mutual understanding, or…

BF: Well, this all gradually emerged. It didn't all happen straight off. We started out with the main preoccupation of electing people to it, finding out who should be elected. And no, we were not going to be told by academies or national research councils who to elect. We were going to elect our own crew. In England we elected one or two people were not even members of the Royal Society (they became fellows later) and similarly elsewhere.

AB: But how did you get the names of these initial members? I've heard that you had around 100 Foundation members. Is this so?

BF: We started off with about 10 people who became the 'Acting Council' (I think that was what it was called), with Arnold Burgen as President, and we elected the first 100. That was quite a difficult task. It wasn't so much a question of who is the most eligible – because that would have been very controversial – but rather who would be likely to be enthusiastic about the whole concept and understand it. I must say, I cannot remember the details of how we chose the 100. But in 1988 we held the foundation meeting in Cambridge. I cannot remember what we talked about. We probably talked about what it was we ought to be talking about.

AB: But you laid down a set of aims and objectives, no? Some draft statutes?

BF: Yes, and we got some idea about structure; for example, the idea of subject area sections.

AB: That must have been a challenge: how were these defined and chosen?

BF: It wasn't so bad, largely because those of us who were forming the Academy decided that there should be no distinction made between the sciences and the humanities – unlike the Royal Society. Everybody was to be involved. So the number of committees we had to start with was small – six, I think, and if that's all you have, the subject areas will be very broad. So that would certainly have been discussed at the Foundation Meeting. And I suppose we talked about further members. Eventually we got going with a fairly complicated election system for new members. It was a system that

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resembled the Royal Society system to start off with, but it gradually developed its own style and shape. It owes nothing to the Royal Society now – as an institution, I mean – but it did to start with.

AB: In terms of the initial 100, was there an effort to extend the range of membership to other parts of Europe – East and South – beyond those few countries whose research councils had been part of the initial discussions? I mean, it seems to me that the initial 10 were exclusively from Western Europe…

BF: Yes, exclusively so. Those of us who had already been involved with the ESF knew that it was not possible to define things as narrowly as that. Our first problem there – if I remember rightly – was about Israel. I had the unfortunate job of having to go to Israel and say: 'Look, we will willingly invite a suitable Israeli scientist on to any of our study groups or subject committees, but Israel is not going to be a member of the ESF. This is a European body. You may consider yourselves as European, but we don't.'

AB: Another of those decisions you had to take…

BF: That was a job I had to do. A difficult job to take on board in a lecture entitled the Einstein Lecture, which had just been invented (I was the first Einstein Lecturer). My lecture consisted of telling them about the ESF, what it was and what it hoped to do and also to tell them that in no way were they going to be members of it. But it did mean that we started to invite a few – two or three – Israeli scientists on to some of our various activities. And in exactly the same way we invited a few Russians.

AB: Very good.

BF: I cannot remember if there was a time interval or not. We didn't invite the Russians because we had invited Israelis – of that I'm quite clear – but anyway we started involving both Russia and Israel on to committees. That incidentally shows how impossible it is to separate entirely the activities of the ESF and the AE. Individuals were involved in both.

AB: Was there any tension that arose between the ESF and the AE as the AE began to grow? Would there have been competition for funds or concern about overlap of agenda?

BF: There were many who believed that it was not necessary to have an AE. There were several Englishmen who were quite sceptical about the idea. Do you know Peter Swinnerton-Dyer?

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AB: No, sorry.

BF: He's an aristocrat, a baronet, he's a very powerful Cambridge mathematician and got involved in the sorts of things I did. I mean he became involved in the University Grants Commission, a government body that dished out grants to universities and he issued a report on how we should be more centralised. He was a centraliser. That's what I'm trying to say. He saw no point whatever for a body of individuals. Now he certainly believes that the Academia is totally unnecessary. I don't know how many others there were in England that were thinking like that. But that was not the main English reaction. After all the AE was fashioned after the English model. Incidentally, Peter Swinnerton-Dyer was a great supporter of Brussels. Where were we?

AB: Tensions between the ESF and the AE?

BF: Well, there was that sort of tension. There was no tension between our various activities: never a question 'should the Academy or should the ESF launch some activity or other?' Each body behaved quite independently in that respect. So I would say there were no tensions in that respect. The tensions arose among universities and among individuals who didn't see the point. In fact, there were some individuals who didn't see the point of the ESF either, or for that matter of the European Union.

AB: Now I gather that in the early years of the AE, there was quite a good deal of overlap of membership with the ESF. As the years went on, there was less common membership. What difference has this made for both organisations?

BF: Quite a few of those who were involved in the running of ESF – by no means all – were amongst the early members of the AE. Yes. That was natural enough. We knew each other's work and that sort of thing. Now, of course, things have changed. At the moment there are about 2000 members of the AE. But I must remind you that there are no individual members of the ESF: the members are the research councils.

AB: Now I have a more general question for you. The AE seeks to simultaneously promote international and interdisciplinary collaboration (not sure 'collaboration' is the correct word) but the aim is to proceed with conferences and study groups that aim to transcend divisions between science and humanities, between 'pure' and 'applied' scholarly work, between Academy and society. Is this an impossible dream?

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BF: What do you mean?

AB: Well, promoting international scholarly exchange may be more easily accomplished within a particular field. I mean there are scientific languages that enable scholars to transcend the barriers of different vernacular languages; also in the hard sciences, there are sources of funding. Interdisciplinary collaboration, on the other hand, may be more effectively reached if there is a shared sense of a problem to be solved, some societally-relevant issues that need to be approached from several different angles. To achieve both simultaneously is surely a lofty goal, but is it achievable?

BF: How do you think the Nuclear Power people – to go back to my old hobby horse – can go across the world together and talk to one another? They are multidisciplinary and they are international.

AB: In a way that illustrates my second point: the sense of a shared sense of challenge with a societally-relevant question is perhaps the most effect way to achieve multidisciplinarity. Now I look around at my younger colleagues and all the pressures that surround them at mid-career, with tenure and promotion highly contingent upon progress within their own fields. Are they not more likely to spend whatever time may be available for them beyond their everyday duties in the scientific organisations that are specific to their respective fields?

BF: I don't agree. I've spent more time with people who are not in my discipline than I have with those people who are. I don't agree with you about that. I think you are approaching it from a very academic point of view. I think you can be both internationally-minded and multi-subject minded at the same time.

AB: Well, many of us aspire to this. I wasn't defending the current academic situation, simply reflecting on the everyday realities I observe around me. And my question is whether the AE could provide the kind of leadership, motivation and inspiration for individuals at all stages of their careers, or is it a body just for those – like you and me – who have retired from the fray?

BF: Let me put it this way. It is natural, in England for example, for people from various universities to collaborate. They might meet at a conference and decide to work together. It is just as natural for people from different countries to collaborate for the same reason. The internationalism is in that sense. It's not a sense of organising the nations or anything. It's a question of individuals finding interests in common and building on them. And the

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AE, as well as European research councils, are capable of providing different ways for dealing with that sort of problem.

AB: How well do you think the AE has succeeded in fulfilling its initial vision?

BF: Well, that I find great difficulty to answer because, apart from the first few years, I've had nothing to do with the AE. I'm still a member, Emeritus Member now that I'm so old. But I haven't been to a conference for many years.

AB: Is that because you're retired, or just tired?

BF: I'm tired. I'm not allowed to travel a lot. I've had two strokes. And I take it easy. I worked hard, paid or not, until I was 75.

AB: That was quite a commitment, quite a life's work and it is good to see you looking so well.

BF: At age 75 I was told that I should do nothing except sit on my bum for 3 months. At the end of 3 months I decided I rather liked this life of sloth. And I've lived a life of sloth ever since. Are we through now?

AB: Unless there is something more you would like to add?

BF: Well, apart from a personal remark that I try to follow what is happening in physics occasionally via graduate student textbooks. I try to study it for the good of my soul and to satisfy my curiosity. The other remark is that I do not know which way the ESF is going to go. I rather fear for it because I think the influence of Brussels has greatly increased since its foundation. And, of course, more countries are involved as well. So if you say that Europe is a Europe of 27+ countries, organised from Brussels, and that is the concept you have of Europe, then it is probably better that Brussels organises something. But I would hope that they might – they haven't shown signs of this yet – but I rather hope that they might take the ESF and 'Brusselise' it to some extent – but keep the essential idea of the ESF going, rather than set up an entirely new institution. Of course they have set up a European Research Council, yes, and that body is liable to do many of the things that the ESF should otherwise be doing. So present indications are the opposite of what I would like. That's why I say 'I don't know what will happen to the Academy either'.

AB: Given its chosen location in Strasbourg, did the ESF seek any connections with the European Parliament?

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BF: Oh yes, there were great efforts made. Once a year we tried to hold meetings with members of the European Parliament. We couldn't get them interested. Parliament members are only interested in the next 6 weeks or so, unless there is money in it for them. I don't mean money in their pockets but things they'd like to achieve. It's very difficult to get parliamentary interest. If somebody in England wishes to further a pet project and thinks it would be a good idea to get political support and holds a meeting in Parliament he is likely to be very disappointed with the number of people who turn up – two or three or something.

AB: Very disappointing. Perhaps it may be the same everywhere: politicians are interested in what is currently salient in their houses and assemblies. It is difficult to rally support for long-term concerns such as those of the AE. I'm not sure it is different in universities and research schools. One of the reasons I asked you about your own career experiences is that there was so much that went on during the 20th century that shaped our current academic institutions, yet young researchers are quite unaware of these things.

BF: I didn't tell you that I became a politician at one time?

AB: You were appointed to the House of Lords and the Select Committee on Science and Technology…

BF: No, not that. A body of people broke away from the Labour Party to found what was called the Social Democratic Party (SDP). Shirley Williams was one of the four MPs (they were called the 'gang of four'), with David Owen as leader of the band. Shirley asked me to join and I said no. I was an Independent Peer, sitting on the cross benches, independent of all parties. And then two days later I rang her up and said 'I've been looking at my face in the mirror and I can't stand the sight of it: do you mind if I change my mind and join?' She said 'No, you're welcome'. So I did. I was the first peer to announce that he had joined the SDP. And I made a personal statement very briefly, and changed where I sat.

AB: Was this a compromise that you had made?

BF: A suitable compromise, half-way between everything. And then others came along, of course. And eventually I became a front-bench spokesman on the sorts of issues I'd been concerned about – education, science, energy, environment – I was quite busy being a front bench spokesman, commenting on government policy and stuff like that. And that lasted

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about two years until David Owen resigned. Then the whole thing fell apart. So, with a feeling of great relief I went back to the cross benches where I've remained ever since.

AB: You must have had incredible stamina to handle all of these various roles, nationally and internationally for so long.

BF: At the height of my activities I was Rector of Imperial College, President of the Institute of Physics, President of the ESF, Chairman of the Royal Commission on Environmental Pollution, and Vice-President of the Association of Commonwealth Universities (which didn't involve a lot of work). But I was leading four or five institutions simultaneously and all of this may have contributed to my heart attack in 1985.

AB: Even if the load involved in each of these may not have been heavy, the fact that all of them were simultaneously on your shoulders, knocking on your door for attention, as it were, must have been a potentially enormous burden. But you continued to write. Tell me about your *Properties of Matter* (1970).

BF: That book is of considerable personal interest to me – apart from the fact that I wrote it. When I was in Manchester it became very clear to me that the whole syllabus of undergraduate education in physics there at the time was hopelessly out of date and had to be revised. That, incidentally, was where I met serious opposition in my efforts but I was quite sure I was right and I did it. So we set up a little committee to re-vamp the syllabus and I was asked whether I would give a course on the properties of matter as an introduction to physics. I had everything in it: material science, fracture mechanics, etc, all at undergraduate level. I gave that course for three years. That was one of the rules we made, that nobody should give the same course more than three years running.

AB: You wanted lecturers to constantly refresh the content of their courses?

BF: At the time there were two members of staff who had given the same courses for 15 years without changing anything. So we made this 3-year rule so after three years I gave my course to my colleague Eric Mendoza (whose name is listed as co-author of the book). He then gave the course for three years before going as professor to Bangor in Wales where he continued to give this course to his students there. Similarly, someone who had been a lecturer in Manchester and taken the course out of interest took a job in Liverpool and asked if he could give the course there. So it

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gradually spread and the pressure to produce a book became overwhelming. By this time I was far too busy to write a book of all things. So Eric Mendoza offered to write it from my lecture notes. I had very extensive lecture notes. I'm not very good at speaking off the cuff in front of a whole bunch of people in a lecture theatre, so I write everything out in full, more or less in the way I'd wish to give it. I don't just read it, of course. So the first draft of a book was already there and I said to Eric: 'Would you like to polish this up and produce it jointly as a book?' He agreed and we eventually published in 1970. That's the history of that book. And it's still used today.

AB: Amazing: 39 years ago. But I think that perhaps it was because the material had gone through all those rehearsals for students, it contained carefully and selectively screened material and therefore came across very lucidly for students. And the other book, *Introduction to Numerical Methods* (1995)?

BF: That's an entirely different story. That was one I wrote entirely myself. It's all explained in the Preface in fact. While I was deeply engaged in university administration and had to chair an endless series of boring meetings I took to writing out little bits of computer programmes while I was conducting the meeting. People were wondering what I was doing, thinking perhaps that I was taking careful notes of every word they said, but I was working on a computer programme.

AB: Mischievous you!

BF: Eventually I began to realise that I had quite a collection of these things and I wondered if I could systematise it somehow, what I should do. So first of all, I searched around and discovered that I had a niche because I was doing this in a language where there was no existing book. I was doing the numerical analysis using the particular language C++. So I thought that maybe I should try my hand at writing a book on numerical analysis. That was my first entry into the computer world.

AB: It was a fast-moving world at the time.

BF: Yes it was. Anyway, I worked on it for a few years when I retired in 1990, devoting myself full time to it, with the permission of my wife. It was difficult for her. She had waited all those years for my retirement and here I was with my head buried in a book. Well, I produced it and it went to a second edition and it is still selling.

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AB: Throughout your career there has been evidence of your commitment to science and also your commitment to the applications of science in the service of society.

BF: I got this all from Harwell.

AB: You insist on the distinction between British and English. Could you explain?

BF: You only say you are British if you're Scottish or Welsh. Some say they are British as well. We all carry British passports. If you ask me what my nationality was I would say 'English'. If you ask me what my citizenship is I'd be bloody-minded and say 'London'.

AB: What about the UK?

BF: Well, my Email involves UK. I know. It's a question of administrative scope. The UK is essentially a political thing, nothing to do with motivations.

AB: When I reflect on your story, I can discern your parents' influence – the idea of being of service to society. Equally important was the whole experience of moving from place to place, getting in touch with many different people and settings at a young age. The wartime effort, even going through danger as a voluntary messenger boy followed by the intellectual and aesthetic challenges of Cambridge. Most of all, the Harwell experience emerges as the most influential in forging your ambitious visions for the ESF and the AE as powerful for promoting both international and interdisciplinary collaboration Europe-wide. During your career journey, you have contributed so much to the worlds of scientific administration, to the applications of science for the resolution of issues confronting society and environment. Most of all you have acknowledged the integrity of all branches of scholarship in the sciences and humanities and provided the ground for their encounter and further growth. We all owe you an immense debt of gratitude.

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