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Higher Ed Now
STEM-ming the Criticism of the Liberal Arts

Christine: You're listening to Higher Ed Now, ACTA's podcast on issues in higher education. I'm your host, Christine Ravold. We have a special guest today joining the show from across the pond. Dr. Steven Cowley is an internationally acclaimed theoretical physicist and an authority on nuclear fusion. He has served as the head of the European Atomic Energy Community and the Chief Executive Officer of the United Kingdom Atomic Energy Authority. The Institute of Physics awarded him the Glazebrook Metal in 2012 and, in 2014, he was made a Fellow of the Royal Society and the Royal Academy of Engineering. Since 2011, he has been a member of the Prime Minister's Council of Science and Technology.
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I can hear some of our listeners thinking that this an unusual guest to have on ACTA's podcast and it's true. Most of our guests tend to be leaders in the humanities or in the world of education. But Dr. Cowley is both. He is also the President of Corpus Christi College, Oxford, which just celebrated its 500th anniversary and Dr. Cowley is the first scientist to ever hold the post. Dr. Cowley, welcome to Higher Ed Now.

Dr. Cowley: Thank you very much.

Christine: I supposed I will start with the ever-elusive idea of institutional mission. Corpus Christi was founded in 1517 by Bishop Richard Foxe to foster new humanist learning. Can you explain a little bit about that mission when the college was founded and also what that mission means now in 2017?

Dr. Cowley: Corpus was founded at a time of the beginning of great change in the United Kingdom because it was at the time, the beginning of the change, that led to the disillusion of the monasteries to Henry the 8th's (VIII) establishment of the Anglican Church. Foxe was both a man of the church and a politician. He had been the Lord Privy Seal to Henry the 7th (VII). And, as such, he had served the country and he wanted to train people that would be useful for what he called the

Commonwealth, the Commonwealth meaning the common wealth of all the people of the country. And he saw the growth of the Renaissance couched on the continent, so this was not really reflected in the United Kingdom at that time. He wanted to found a college that was picking up all the new learning that was happening on the continent. In a funny way, the new learning was old learning because one of the things they were doing, of course, was going back to the great classical scholars: the Greeks and the Romans and the original scholarship there. To Richard Foxe, this was the new learning.
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With it, they had a mathematician and an astronomer, so it was seen as a holistic college, not just teaching the Bible, how to be a priest, that kind of thing, but to actually teach people a broad range of learning that was then present. That must have been a very exciting thing to do, actually found a college.

Christine: How does that translate now in 2017, five hundred years after its founding?

Dr. Cowley: Well, in many ways, of course, that's sort of the mission of the modern…. What Americans call the liberal arts education is that broad-based education in the important things that we feel young people ought to know. Corpus is still a place, a fiercely intellectual place, a place where people take intellectual pursuit very, very seriously. It's wonderful to be the president of a college where you can actually go into dinner and the students are arguing about Greek Metre.

Christine: You are the first scientist in five hundred years to be the President of Corpus Christi. Why break with tradition after five-hundred years?

Dr. Cowley: Let's see if they like this one. Being a scientist, Corpus has always had strong science, certainly in the 20th Century. While it's a small college, and

there are thirty-seven colleges in Oxford and it's one of the smaller ones, it's one of the real original ones that had that idea that people should know something about science as well as know something ab out the Greek poets.

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Christine: I like that. As you're expressing the importance of science and the liberal arts, there is a great emphasis in America right now on prioritizing STEM education, science, technology, engineering and math. Some policy-makers have been gone on the record saying, "We don't need to be funding degrees in French History or Anthropology." "And it's a very utilitarian streak." Is that something also being experienced across the pond in the U.K.?

Dr. Cowley: There's certainly those forces trying to say that if government is going to get involved in funding universities, then it should have this very utilitarian approach. I think what's actually just false about that is that the only utility is in studying the STEM. Frankly, I think the challenges that are coming out for us are social and political and that involves the humanities and the social sciences. Machines are going to do much more for us in the future. We're going to have machines to do our basic law. We're going to have machines to drive our cars. We're going to have machines that are going to check our account balances and do things in amazing ways. Those machines need only a limited number of people to service the machines, but we have to think how we're going to run our society when many of the jobs that we currently have are no longer there.

Christine: So do you think the STEM fields are going to be more easily replaced in the future as well?

Dr. Cowley: Absolutely. We already have computer programs that write computer programs. So how many programmers are we going to actually need in

the future? But we are going to have to have people who figure out how you run a society when machines do most of the jobs that we currently have. And part of running a society is making sure that people are enjoying themselves, that are fulfilled, are having some spiritual life or – you know – all these aspects that I think in a way, if you go back to the founding of our college – Richard Foxe's generation would think about more than we would because they were close to the realities of life and death, etc. And they saw spiritual dimensions and they saw the humanistic values very strongly, I think. So I'm not a big believer in the idea that everybody should get a STEM education. I think that that actually would prepare us for the future very badly.

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Christine: I think that's right. Leaning a little bit more on your sciences background, can you think of instances in which the liberal arts have informed impressive and very important progressions in the science that wouldn't have been possible if it was studied in a vacuum?

Dr. Cowley: Yes. I think if you look back over the history of the really great breakthroughs, the moments that Einstein describes of trying to think what it would be like to travel on a light beam, they're not moments in which somebody was thinking, "How do I do this sum? How do I do that integral?" All this mechanical stuff that we learn in our STEM subjects. They were moments of inspiration and those inspirations were as much part of their emotional and their creative life that had nothing to do with—they were about imagination. And therefore, they cross the boundaries of anything that you could describe as a subject. They're just thinking.

Christine: We often refer to Steve Jobs, who obviously in addition to having great technological breakthroughs, made himself very wealthy, which we admire, as a result of education. But he always refers to a course he took at Reed

College in calligraphy as informing the design of a lot of his products that most people find really indispensable now. If you use a utilitarian understanding of education and education funding, we wouldn't have those products today at a public school at all.

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Dr. Cowley: That's actually a terrific example of exactly why the future, with all its technology, is going to be so dependent on people who think imaginatively because the only way we want this technology is if it enhances our lives. We don't even know how it's going to enhance our lives. Actually, some people like driving their cars. Right? So are driverless cars a good thing? Maybe they are but maybe in some ways they're not. How we organize our lives in the future will be different, and it's not about learning to do sums.

Christine: I can imagine, because I listened to your TED talk on fusion, that your world is much more expansive when you think about it in terms of theoretical physics, that the universe and the scale of human importance seems rather small when put to consideration of the universe. Yet you seem to have a very good grasp of putting those things into perspective and why those things are important anyway.

Dr. Cowley: I spend a little bit of my intellectual time thinking about astrophysics as well as about fusion, and part of that is just the sheer scale of the universe and us as being such little dots inside it. It's easy to sound gushy on this subject, but it's difficult to actually comprehend. The more you know about it, the more real it is. And when it's real, it's awe inspiring: the universe. I'm not sure that I'll live long enough but sometime, probably in the next century, I think we will find some form of life, probably a very primitive life—not aliens—on another planet somewhere.

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Christine: A string of amino acid and some proteins.

Dr. Cowley: Something like that. Exactly. It's almost certainly not going to be complex life like us but we will detect the signatures of some primitive form of life somewhere else. Then think about the psychology of realizing we're not alone. Once we see it somewhere, we can be pretty sure it's all over the place. Discoveries like that just expand everything in a marvelous way. You might then start, instead of looking at Sci-Fi movies as good entertainment in which starts get blown up and things like that, you actually start thinking in terms of, "Okay, if there's life in other places, what would you like to ask them? What would you like to know? How did it evolve there?" Obviously, if it's primitive life, you will learn only a little bit from it, but you might learn something about the way life started here on earth. I'm not a religious person at all. I don't not believe in God and I don't believe in God.

Christine: Would you classify yourself as an agnostic?

Dr. Cowley: Sort of. Yes. But I think those are very interesting questions. I've never really been a scientist who thinks that science and religion are different, are exclusive: that they divide. I've always thought that when you talk about evolution, you should talk about creation. And the reason you should, I don't believe in your standard creation kind of thing……

Christine: Not Geneses I.

Dr. Cowley: No. Not at all. I absolutely think Darwin was probably right. But Darwin was wrestling with this issue. "Does the fossil record give us any sign that the biblical truths is truth?" And it doesn't, actually, give us very much a sign of that – at least I think so. But it's still a question you should be asking and maybe

we haven't answered it completely yet and we should challenge those. And those are the kind of questions—they're not science questions and they're not humanities questions. They're just great questions.

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Christine: Well, I love that because your world kind of expands and contracts and once you've come to a great big breakthrough, it really does bring you right back to "What is the well examined life and the life worth living?", which I, as an English major in college, always think the life worth living is definitely found in a library somewhere. On a more administrative note, I don't understand perfectly well how governance works at Corpus Christi or at Oxford but, in America—it's in the word—we trust trustees to manage the financial and legal sides of colleges and we do, at ACTA, believe that they have a unique position in a university to make decisions that affect quality, access, costs in higher education. A recent survey found that board members do believe in the value of the liberal arts, yet nine in ten are concerned that the liberal arts are not well understood as an educational concept. Why do you think that is so difficult for people to understand, or why it's so difficult to communicate?

Dr. Cowley: I think in my lifetime we've gone through various challenges and that's partly because…. Something like liberal arts. There's a tendency to define it, for instance, in terms of a set of things you ought to know. "Here's the box and, if you're well educated, inside that box are all the things you need to know," which is a very simple concept and probably entirely wrong, but it's the way I think people have grappled with this. Teaching well, in the liberal arts sense—in the Oxford sense, which is not quite the same as the American liberal arts sense because we tend to divide along subject categories much more….

Christine: "We" Oxford? Or "we"…..

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Dr. Cowley: "We" Oxford. But in both Oxford and in your classic American liberal arts education, the key think, at least for me and I think for many educators, is that it's about learning to think. It's learning to think in a broad range of contexts, so it's not learning to think exactly along the lines of the way we teach, say, in physics or the way we teach, say, in classics, but it's along a broad range of things. But it's about learning to think. It's not about a set of things that you need to know. And if you see it that way, it's kind of a difficult concept because you can't grab it in the same way you could in saying…..

Christine: …"here's the list."

Dr. Cowley: …"here's the great books curriculum." Right? I mean I sure like great books and there are great books. There's no question about it. But if you just define the curriculum in terms of a set of great books, I think you miss the point.

Christine: I think there's actually a lot of overlap. I've the privilege on this show to speak to people that say that, "The purpose is to learn how to think," and the getting there is a very ephemeral place to go. But everyone values that as an end goal and we see that with employers and we see that with high-minded education for education's sake sort of people as well. Another question about the differences between the U.K. and the U.S., and I should let listeners know that President Cowley's also attended Princeton University and has taught both there and at UCLA, so you have some familiarity with both systems. We seem to, in America, be having a crisis of confidence in higher education that some people have said is cultural and some of it's financial because it's sometime prohibitively expensive. Do you experience that at all in England, in the U.K.?

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Dr. Cowley: I think we do. I think the number of people going into the humanities and into the traditional humanities is shrinking. I'm concerned about that because I'm not sure what people think went wrong with that education. I think we educated extremely well in the latter part of the 20th century, both in the United States and in Britain. One of the interesting things is to look at the world rankings of universities and realize that, fundamentally, it's Britain and the United States for the first twenty-five places. That is because I think our education system works very well at the college level—the college and the graduate school level. I think both countries have been challenged at the school level. Exactly how we educate in school has been a difficult thing and perhaps it's that transition between school and university that has been increasingly difficult to manage.

Christine: A lot of the time we hear that American colleges say they have a difficult time because they have students that have been passed on by the K-12 system. That there's only so much they can do when their students haven't been adequately prepared for college level work.

Dr. Cowley: One of the challenges, probably the biggest challenge we have at Oxford, is that most of our students come from the higher socioeconomic parts of British society. The difficulty is, of course, that they have gone to schools that prepared them better for Oxford, and we try on our entrants to counteract that. It's really a form of positive discrimination based on socioeconomic background. We look to try and make it easier for people who've had less good schooling to get into Oxford because we believe that they will, having got to Oxford, benefit from the system and pull themselves up. You can only go so far with that because if you really aren't well prepared and you're stuck in at the deep end in a really challenging university course….

Christine: …then you've been set up to fail.

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Dr. Cowley: Yes. So it's a very difficult question. Both sides of the political spectrum in Britain, Oxford is being challenged to do more to try and.create places for people from underprivileged backgrounds. We do do some and it's just not clear what works. I think American universities have been challenged in this space too.

Christine: I think that's correct and it does bring in questions of academic rigor and great inflation and how do we remediate students who aren't quite yet ready but deserve the chance to do that. And the whole time, it's all very expensive. I know that in the U.K., university used to be free… until 1998?

Dr. Cowley: Yes.

Christine: It changed after that to a capped, sort of, tuition system that was recently increased. What was the lobby for that because, in American right now, there's a strong push for free college.

Dr. Cowley: And there's a lobby in Britain for free college again because we're finding that the government then provided a system of loans and, what's really happened, is – I don't think too many students were frightened off going to university, but they graduated from university with horrendous debt because they borrowed lots of money. That puts them in a very difficult position about what they might do with their lives and the kind of careers that they might do. And that's worrying because you don't want to suck all of your talented people into the high paying, sort of, career structures of maybe finance law, etc., because that will produce a society that is highly unbalanced. But if all students come out with huge amounts of debt and they have to take one of these high paying jobs, that's going to slue our society in ways that are not good.

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Christine: This is true and I think this is something we mentioned in a previous podcast: why it's so important for colleges to keep costs manageable if we're expecting students to finance their education through debt. Do you experience employers being dissatisfied with the level of college graduates in the U.K., or employers usually quite happy?

Dr. Cowley: I think all employers would like us to train their employees, which is not what we're there to do.

Christine: No. It's not job education or career training.

Dr. Cowley: So if you put a bunch of employers in the room and say, "What do you want us to do?", they'll tell us, "We want you to replace the training program that we have to pay for." They won't put it like that, but that's what they mean, and we should resist that completely because it's not what we're doing and it's actually not what they need from us. In fact, what they need from us is to give people the kind of broad-based background that, when they come into that training program, they do it well. But when they meet things later on in their career that had nothing to do with the training program, they have a basis on which to evaluate, to move forward – a more generalistic basis.

Christine: Getting in to that, again, adaptability in learning how to think, part of that is embodied in a canon or the training for that comes from the canon, which has been somewhat resisted in the United States as being delegated to dead white males or that it's antiquated and patriarchal and is no longer valuable to an enlightened society. What would you say to those sorts of critics?

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Dr. Cowley: I think that's mixing two things, usually, when those criticism appear. The idea that there are great ideas out there that you should learn about because you're unlikely to discover them for yourself. I mean, I never in a million years, could have done the things that Einstein did and I studied very, very carefully his thoughts and they are beautiful. They are lovely and I could never have had them myself. I encourage anybody to go and study it and see that point. There's that side of it, and we really should encourage people to understand that when you go to university, don't just study anything. There are some ideas that you really ought to know about and they're very important. And, in a sense, if that's what you mean by "canon," I'm absolutely on that. The canon isn't necessarily well represented—I think it isn't well represented—by this, sort of, hundred-year-old canon that we tended to impose maybe a hundred years ago, which was largely of dead white males. I mean, there's an awful lot of the most interesting ideas have come from completely other civilizations. They've come from other parts of our society. They've come from other ways that people have thought about things that weren't simply in the canon that we would have pulled out in Oxford a hundred years ago. So there's confusion of the idea that there are special ideas that people should study and the idea that those ideas were somehow always associated with western civilization. I think the point is there are special ideas but a lot of them have nothing to do with western civilization.

Christine: That's a really important point. There are a lot of ideas that aren't, strictly speaking, just in the western canon. But we do think that they're a good place to start, especially in American, in the United States, because so much of our own history is shaped through the history of western ideas. But that's a really important distinction and a good one to point out. One idea that I might give full credit to western civilization, however, is the idea of free expression and free speech. In my humble opinion, and it could be biased, the United States has probably the best written protections of free speech of any other country in the

world. We talk about it so much because it links to academic freedom, which is so crucially important in order to get any scholarly work done or to do any real learning or create dialogue. It seems to be under threat in America. We see a lot of—sort of—liberal reactions to controversial ideas or ideas that we think enlightened people don't need to hold on to anymore. Do you experience that at Oxford? How do you protect academic freedom without a law codified the way we have it here?

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Dr. Cowley: We have laws codifying free speech and a lot of countries do. What worries me, looking at particularly the campus aspect of this, although we can see it in the general political dialogue both here and in the U.K., is that disagreeing is not viewed on – as much fun as I think it is. I think it's fun to disagree. I think it's fun to hash out ideas. I think it's fun particularly when people actually are not just making it up for the sake of a law school class or whatever, but because they actually really think this. Right? Then we can really get to the bottom of it. I think we're disagreeing increasingly with anger and with irritableness, partly because people aren't confident enough in the power of discussion, argument, reduction – all the things that you can go right back to the Greeks and talk about. "This is what we should be doing," and anybody who says, "Don't bring that argument to me. I need my safe space. I need my *whatever*," what worries me about that is just this idea that we're missing out on the process by which we can all change our minds. I think if you've never changed your mind, then you probably haven't had enough arguments.

Christine: I think we can all agree on that. Before I let you go, there's one other question, which is having experienced both the United States and the United Kingdom's education systems, what do you think each does best and what things could they learn from each other?

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Dr. Cowley: I'm probably a bit biased here on this. I went to school in Cambridge. My father was a professor at Cambridge.

Christine: Which college?

Dr. Cowley: Trinity College. So I grew up in the system. Then I went to Oxford as an undergraduate and then I went to Princeton for a Ph.D. and they were all incredibly exciting. I've often thought it was the perfect way to do it was to do an undergraduate in Britain and a Ph.D. in the States. Princeton was thrilling at that time in physics. There were so many great people, great ideas. My co-students, who I've stayed in touch with in all these years, were highly competitive, highly motivated. It was one of the most exciting times of my life. I think the intensity at which the great American graduate schools train their Ph.D. students is unbelievable and it's the reason why – well, I think there are two reasons. One is the intensity and the other which is the openness of, again, scientific and intellectual debate—more widely than just my experience in graduate schools in the states. If you go to quite a few countries around the world to a seminar in a university, somebody will give a talk and nobody will say anything during the talk. And then at the end of the talk, the senior professor in the audience will ask the first, second, maybe the third question and then the next one down will ask some questions, and it will almost never come to the graduate students who probably have the best questions because they're sharp. They're on the top of their game. In Princeton at that time, and in all American universities that I've experienced, the enthusiasm in which we encourage young people to think for themselves is just fantastic. I'd do it all over again.

Christine: Dr. Cowley, thank you so much for your insights and for making the trip all the way over here to talk about higher education. We certainly enjoyed having you.

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Dr. Cowley: Thank you very much, Christine.

Christine: If you have questions or comments about this podcast, please send them to info@goacta.org. For more information about the liberal arts and its role in American higher education, please visit www.goacta.org. Until next time, I'm Christine Ravold and this is Higher Ed Now.

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