LEAD WITH WE
EPISODE 25: ANDRAS FORGACS

Andras Forgacs:

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Simon Mainwaring:

Welcome to Lead With We I'm, your host Simon Mainwaring, founder and CEO of We First. Lead With We is the podcast where top business leaders and founders reveal how they built their companies to be high-impact and high growth by putting We First. Lead With We is produced by Goal 17 Media, storytellers for the common good.

Simon Mainwaring:

Welcome to this week's episode of Lead With We, where I'm so excited to talk with Andras Forgacs. He's an entrepreneur, a venture investor, a Kauffman Fellow with the Center for Venture Education and today we're talking about two biotech companies he co-founded with his father, Organovo and Modern Meadow, which are transforming the way we make products across the board from medicine to footwear. The reason behind all of it is to bring about a more sustainable world. So Andras, welcome to Lead With We.

Andras Forgacs:

Simon, great to be speaking with you,

Simon Mainwaring:

Andras, you have this incredible background where you're steeped in business school at Wharton and Harvard, and then you went on to really become an entrepreneur and venture investor yourself. But then you started launching companies with your father after you'd worked in China in the early 2000s. Give us a little bit of background on the journey that led you to found these two companies.

Andras Forgacs:

Sure. I mean, I certainly have felt the pull to entrepreneurship very early on. It's not that I woke up one day years after business school and then just decided, let me start a crazy science-based company. I've had earlier experiences with that, thinking as far back as college even. I mean, in Harvard, I remember I was a student there studying social sciences and also pre-med, but at the same time, I also dosed very heavily on extracurriculars. One of the real formative experiences I had there was, I was a nerd among nerds and I got very involved in Model United Nations.

Andras Forgacs:

Model United Nations was this, for those of you who might not be familiar with it, is where university students pretend to be UN ambassadors to various committees of the UN and you

get together and you solve these global problems. You discuss these global problems, whether they're related to the environment or human rights or security council. I got involved in that and really I got more than involved in it. I became the secretary general of the World Model United Nations conference, and what I learned was that these big acts of idealism were actually entrepreneurial adventures, so organizing a conference is actually an entrepreneurial adventure.

Andras Forgacs:

Then when I graduated from college, I started with my career in finance. I joined what I thought was one of the most international organizations I could find, City Group. It had offices in a hundred different countries, the internet was taking off, dotcom was happening, and I got infected. I had the opportunity to be in this finance group at the start, basically, a dotcom initiative as the first employee. To be an entrepreneur within a larger company. And same thing in business school, I had the chance to run conferences and to be extracurricularly active. So by the time after business school, I started my first company, I'd really been starting clubs, and activities, and conferences, and initiatives within larger companies for awhile.

Simon Mainwaring:

That's really powerful context. I think we can all take those important dry runs even while we're in school and learn the skills that will mitigate risk later on. So entrepreneurship starts even before you go out and launch your first company, that's really powerful. How did you end up in China? It's a very different marketplace. It's hard to just step into and succeed. How did that come about?

Andras Forgacs:

That's a really good question. I first went to China in business school and then afterwards I started at [McKinsey 00:04:30] and when I left McKinsey, I co-founded Organovo. That was a biotech company that I co-founded with my father and a couple others, but it was still too small to have me join full time as an executive. It didn't need more overhead like me, what it needed was help in raising capital, capital formation. And so I stayed on the board and I joined a venture fund so I could learn the dark arts of capital formation, how to invest in innovation. I joined this really entrepreneurial venture fund based in New York, where my partner in that was the co-founder of Endeavor, a non-for-profit that promotes entrepreneurship around the world.

Andras Forgacs:

He had an incredible global network. He's very much a globalist, that was clearly something I was also very passionate about. What was very unusual about this setup was that we were a fairly small team, but investing not just in the United States, but all over the world. And we got active in investing in some entrepreneurial companies, some startup companies based in China, and those started to go very well.

Andras Forgacs:

The thing we realized is that it's hard to do venture capital by remote control. So for a while I was traveling there on a quarterly basis for board meetings and then I realized in 2010 and 2011, that really for me to best support the opportunities that we had there and for me to mind the store there a bit more closely, I really needed it to move there. It happened to be that my wife is also an architect and while that profession was slowing down in the United States at that time, there was incredible opportunities in that field, in China. We'd just got

married, she had graduated from MIT and graduate school. We felt that this was a bubble of time that we could really just go to China and have ourselves an adventure.

Simon Mainwaring:

Let me ask you about that because before we dig into Organovo, even though you're looking at China through the lens of venture capital, what did you take away from that, for those entrepreneurs here in the United States that always look to the Chinese market as a big marketplace opportunity or a supply chain opportunity, give us a few pointers as to what you took away from doing business there.

Andras Forgacs:

I mean, China was just the wild East. It was an incredible entrepreneurial environment. Very talented entrepreneurs. The pace with which things move and the scale at which things can happen there is mesmerizing. At the same time, I learned that as a venture investor, I really liked working very closely with entrepreneurs. You might almost say I had entrepreneur envy. I wanted to really get involved and help our entrepreneurs, but I also learned that it's very difficult for someone like me to go to China and be entrepreneurial there. You really have to partner and be supportive of local entrepreneurs. There are some cases of foreigners being successful in China, but for the most part, it's a market where you actually really need to know how to operate and think locally.

Simon Mainwaring:

Let's draw a through line here because the journey each of us take so inform the way we bring purposeful business to life further down the track. So now Organovo, for those that don't know, is this incredibly exciting company that develops functional three-dimensional human tissue also known as 3D bioprinting technology. How did you end up focusing on that area and then how was the company launched?

Andras Forgacs:

Here's the through line. The through line is that I am my father's son, and I grew up in a family of scientists and doctors, and all throughout the dinner table and on long drives, I'd be talking with my father about science, and I almost became a scientist myself. And I've also always had a passion for international issues, of which by the way, sustainability and environment are some of the most pressing international issues and they have been for as long as I can remember. So that's a line. One, a passion for the sciences, two, a passion for international issues, including sustainability. At McKinsey, I was fortunate to be able to work in the New York office and to advise biotech and biopharma companies, and to also work in an area of innovation known as translational science.

Andras Forgacs:

How is it that academic innovation can make its way into industry, or can make its way from the laboratory bench to the patient bedside? Those were some of the projects I was involved in. At the same time, while I was working in McKinsey in 2005, 2006, 2007, my father was doing some of the most interesting scientific research of his career that was very translational in nature. He was a physicist who came to biology and started applying the principles of physics and biology to come up with a form of biofabrication that you mentioned, called bioprinting. It sounded like Star Trek to me and that's what got me started on having this dialogue with him that led to us starting a company focused on 3D bioprinting, Organovo.

Simon Mainwaring:

As I understand it, 3D bioprinting allows you to mimic key aspects of human biology and disease. How does that work? How do you create through 3D printing equivalent, the sophistication, the nuance of what is fundamentally biological? How does that work?

Andras Forgacs:

It's a great question. 3D bioprinting is a form of biofabrication. Biofabrication is the broader category of taking the building blocks of nature and creating new functional elements, macroscopic structures that have new functions and new properties. Bioprinting is a field that has really been emerging in the last couple of decades. And the form of bioprinting that Organovo pioneered was one where you would take cell aggregates and you would essentially deposit them in layers, almost like the embryonic precursor of a tissue or an organ. Then you would create an environment so that cells could essentially organize themselves, and then the right tissue can essentially mature over time and form.

Simon Mainwaring:

So you've got this really innovative and purposeful technology, how then do you take that to scale? How did you kind of educate customers as to what was possible and then drive the growth of the business?

Andras Forgacs:

In the case of Organovo, first of all, we have to find and assemble an amazing and a diverse founding team. There was my father and I, but we needed people who were, frankly, smarter than us and complementary to us to get the company even started. I remember that we found a number of people who had expertise that was complementary to ours, and then we had these Sunday night phone calls. And after many, many weeks of that, the founding team coalesced, and I remember one of our early brainstorms was, "Well, we've got this incredible technology. It's like a great hammer. Now let's find the right nail." And that was a challenge to find the right opportunity that would be the best deployment of this technology.

Andras Forgacs:

We landed on something that we were quite excited about, which is how about we create little human tissues and organs that allow pharmaceutical companies to test and develop new drugs? Like little livers, or kidneys, or skin tissues, so that instead of testing a new drug on just a loose Petri dish of cells that have no structural biology, we could actually see how molecules would behave in a real human tissue. And you could have a whole array of these tissues, and you could also induce some disease states, and it would become much more predictive of how a new drug might behave in real human biology. So that became the focus of the business early on, and the success of it being able to pursue that was really the credit of a great operating team.

Simon Mainwaring:

And that point is really well taken, as a founder, as an entrepreneur, part of the job, if not central to the job is assembling that right team and unlocking the full potential of that team. I find this so fascinating because then it evolved even further. You started to look towards consumer products and that led to the founding of Modern Meadow. How did that come about?

Andras Forgacs:

Remember Organovo was a company that was focused on a form of biofabrication called 3D bioprinting. I got really fascinated by this field of biofabrication broadly, and because we had

this experience of growing little human tissues and organs, we would also have these side conversations with others about, "Well, hey, if you can grow tissues, could you grow meat or skin? If you can grow skin models that cosmetics companies can use to test new cosmetics? Can you grow leather?" And those conversations were not core to Organovo and they weren't really resonant with us until I moved to China. Living in China for a year and a half, I just saw that it was an incredibly exciting time in 2010, 2011. The economy was booming, the consumer sector there was blooming, and there was just a lot of growth, but you could see that it was coming at the expense of the environment.

Andras Forgacs:

I was living in Shanghai with my wife, and it was a wonderful time, but we felt that there would be days when you just wouldn't see the sun. You could just smell the pollution in the air. And at one point in time, we felt like our hair was falling out, so I was really thinking about like, "Well, gosh, could there be a way to reconcile this incredible boom in consumption with having a better environment? And what is it that we know?" I felt like I had some insight on biofabrication and all of a sudden those conversations about could we make our everyday consumer products in a different way had meaning for me personally.

Andras Forgacs:

I was working as a venture investor. I was having a lot of fun working with other entrepreneurs. I was thinking to myself, "Well, gosh, I would like to shift into more of an entrepreneurial mode myself. What is it that I knew?" Well, I had co-founded this crazy biotech company that was 3D printing tissues. And what is the opportunity that I saw? Well, could we take biofabrication beyond medicine and could we apply it to some of our most cherished everyday objects, and benefit the environment? That's really where the provocation behind Modern Meadow came.

Simon Mainwaring:

Walk us through the next step, because you have this idea, you have a spark in your head like so many entrepreneurs do. What's the first action you take? You've got this technology, this innovation, and you think, "Wow, maybe we could make leather and replace the cost to animals around the planet," and so on. What did you do next to start to make it real?

Andras Forgacs:

The first action I took was having lots of conversations. I like to think out loud and to speak to people that I respect. And look, some of the conversations that prompted the idea behind Modern Meadow came in, they were inbound. Some brands were reaching out to me as a co-founder of Organovo and asking, "Hey, can you 3D print leather? And then we want to hear more about that." "Well, why is that interesting for you?" "Well, because we're a large footwear company, we buy millions of square meters of leather, and we have all these problems with it. Is there a better way to potentially do that?"

Andras Forgacs:

And by having more of those conversations, you eventually start to appreciate that maybe there could be a there, there. And then I would talk to friends. I would talk to people that were involved in the early days of Organovo. The very first step, I guess the early steps I took was you got to give the baby a name, so we came up with the name of Modern Meadow because it was really a new field.

Simon Mainwaring:

Literally.

Andras Forgacs:

Literally. We wanted to think about we're taking biofabrication in the new direction. It's a new field, and let's get a team together and apply for some grants, some small business innovation research grants.

Simon Mainwaring:

Locally here in the US or in China, or where?

Andras Forgacs:

In the US.

Simon Mainwaring:

In the US.

Andras Forgacs:

We did this in the early days of Organovo. We did this in the early days of Modern Meadow and what was great about the grant processes, and not that it's a lot of money involved in it, but it forces you to write down your ideas. You clarify what your technology is, what is the proposed research you want to do, why it could potentially become a business, what an impact could be?

Andras Forgacs:

And so one of the very first things we did with Modern Meadow is we applied for a grant with the US Department of Agriculture. And we applied for another grant then with the National Science Foundation. And we then applied for early seed funding to another organization called Breakout Labs. And basically all of these were just us putting our ideas together, getting some early financial support, getting some early funding. It was almost actually a year of that before we actually physically started the company in 2012.

Simon Mainwaring:

It's interesting, it's almost like you're manifesting it even before the company's launched itself. You create awareness and an appetite in the marketplace, you speak at conferences, you kind of sound out potential customers. And then you've almost got a marketplace opportunity of your own making, which I think is really a part of the entrepreneurial journey that people forget. It's not just capturing the opportunity after it's done, it's creating the opportunity in the first place-

Andras Forgacs:

And convincing yourself too. With each conversation, you're getting better at telling the story and you're telling the story to yourself, and you're telling the story to your friends to the point where either it sounds better over time, or it sounds worse over time and-

Simon Mainwaring:

You're desensitized to how crazy it sounds, right?

Andras Forgacs:

Exactly.

Simon Mainwaring:

You describe the vision for it as transforming the material world. What does that mean?

Andras Forgacs:

With Modern Meadow, we're very much focused on applying this biofabrication to developing materials and ingredients that can improve the health of the planet.

Simon Mainwaring:

It's so interesting to me that you are so inspired to solve for climate challenges and to protect the planet, which is not only for your own future, but all of our futures. And then you look to nature itself, through the spectrum of bio-inspired, all the way through to biofabrication, to actually solve for that.

Andras Forgacs:

I would say Simon, that we were fairly consistent in the why of what we wanted to do, but we were finding our way on the how. So as I mentioned, we wanted to take this field of biofabrication and aim it at creating new materials that could move us away from traditional leather that comes from animals, because of the environmental footprint that that has, greenhouse gas emissions. And also move us away from petrochemical derived synthetics because of the tremendous environmental footprint that has, and greenhouse gas emissions.

Andras Forgacs:

But the exact technology that would solve for that, we have to find our way. And honestly, what we started with eight years ago is not what we practice today. Because eight years ago, we were literally growing skin cells from animals to create little skin analogs and tanning it, and being very literal about trying to create a form of leather that doesn't come from a dead animal, was coming from the cells of an animal. But that wouldn't scale. That's not a technology that would actually work for the consumer because nowhere in the world at the time could you grow metric tons of skin cells. It would be prohibitively expensive, so we had to constantly evolve our capabilities and our toolkit to be consistent with the why that we're solving for, but fairly agnostic about the exact how.

Simon Mainwaring:

There's such a powerful lesson in that, because your why timeless while your how, how you express it, can actually evolve until you land on that ideal solution, as you say. And so, sometimes there's always a business case, Andras, where people are like, "Well, tell me, what's the business case for identifying what your why is, the purpose of your business?" In these terms, it's everything. It is your business. It's the driver of your business. It's the innovation unlock. It's the solution in the wings that you're searching for that can then give you an opportunity in terms of the bottom line.

Andras Forgacs:

That's exactly right, Simon, because what is the why? The why is a problem that's so compelling that it draws you to it, but it also attracts your early support, your advisors, your early investors, your talent. It's that flame for all of us moths to gather around.

Simon Mainwaring:

This really interesting journey that has connected very disparate dots and come to life in terms of what you're doing at Modern Meadow. What form is it taking now? Because you've pushed the technology to the point where you've got social proof of it, but then do you work with an auto company? Do you go out to footwear and apparel companies? How do you take it to market?

Andras Forgacs:

It's always tricky, because we've got this long lead time, deep science innovation that we're working on. And so we were already dialoguing with brands even before we started the company. I found it always very, very productive to speak with brands to learn what they want out of this kind of innovation. And it's been a learning journey, very much for us. The challenge however, is that if you engage too early with a brand and get them involved in product development or application development before the fundamental technology is ready, you're basically tripping over your skis. It's taken us a number of years to be able to solve for all of the parameters that we've had to solve for. To come up with a material that is first and foremost desirable, because if it's not desirable for the consumer, if it doesn't look good, feel good and perform, then the consumer's not going to care.

Simon Mainwaring:

Right, it's product efficacy for [crosstalk 00:22:58].

Andras Forgacs:

Product efficacy [crosstalk 00:22:59] cannot compromise the efficacy of the product. The second thing you need to solve for is accessibility. You need to develop technologies that can scale, ideally that don't require new factories to be built because that takes time. And technologies that can scale and become cost-effective because if you have a brilliant solution that the consumer loves, but it costs 10 times as much, the consumer's probably not going to pay for it.

Andras Forgacs:

Then finally, sustainability. So those three legs of the stool we need to get right, but it's really, really difficult to develop new to the world materials that solve for all of those things. And we finally got it right. We're scaling it, we're manufacturing our technologies on commercial lines, and we're engaging brands now on product development and application development in a way where we're able to send them materials that they can work with that they recognize and allow us to make products like that.

Simon Mainwaring:

I mean, it's becoming very real and Andras just held up a shoe there that is made out of the products that they've been developing. What you said is so important so let's talk about how this becomes tangible in the marketplace. You've got this material you call Zoa and as I understand, it's bio-fabricated leather that's made from lab grown collagen, but what does that look like? Is it a sneaker? I know that the first t-shirt you made was displayed in MoMA.

Andras Forgacs:

Zoa is our brand for the whole world of bio-fabricated materials. Our bio alloy technology is the first family of materials that we're developing under this Zoa brand name. What we mean by bio alloys is it's a combination of proteins with bio-based polymers, with biopolymers. And the combination of these ingredients is, it's an ally. It's a miscible blend of these ingredients where it behaves as something completely different than it's underlying ingredients. That's

our first technology and as you've mentioned, one of the proteins that we went really, really deep on is collagen.

Andras Forgacs:

The way our journey went there is, look, leather is essentially collagen. Collagen is the most abundant protein in your body. It's the main protein in your skin. It happens to be the main biological building block of leather, so we went really deep on collagen and we figured out a way to produce collagen that doesn't come from animals. We brew it in yeast. Then we also looked a bit more broadly and asked ourselves what other proteins that we could derive from plants, let's say? So today we have the ability to derive proteins from fermentation or proteins from farming, from agriculture. And our first-generation of Zoa bio alloys are actually going to be plant derived.

Simon Mainwaring:

I mean that blows my mind. You're going to have plant based bio alloys, and you can control the properties of them. And there's absolutely no limit to the application of what you can do. I mean, how is it showing up in the marketplace right now? Is it in cars and leather seats or is it in shoes or how's it being used?

Andras Forgacs:

Yeah, so we're at a pretty exciting moment. After years of development, we're about to enter the market so we're pretty excited. A little scared, because we've been researching this and developing this technology for quite some time.

Simon Mainwaring:

I think entrepreneurship is just controlled fear. That's what I've discovered anyway so that's appropriate, yes.

Andras Forgacs:

Yeah and that's exactly right. But we're really proud of this platform of materials we've created, these Zoa bio alloys that are high-performing, beautiful, scalable, sustainable. That allow us to create materials that are 90% fewer greenhouse gas emissions than traditional leather, 30% to 50% fewer greenhouse gas emissions than synthetic leather. And allow us to just move away, to begin the journey of moving away from animal product and virgin petrochemical product.

Simon Mainwaring:

How do you expand this? How are you going to go to scale?

Andras Forgacs:

We ourselves don't operate the commercial factories. We've been really fortunate to be able to work with best in class textile manufacturers who have the equipment, who have the decades of expertise on how to design and produce, performing materials, high-performing aesthetic materials. We've developed a technology that can leverage that equipment, but through an entirely new process, a radically new process. So we have to work with them to transfer our technology, to teach them a very new process, but really it's a partnership.

Andras Forgacs:

We partner with some of the most iconic, innovative brands in the product categories that we want to go into. So footwear is one of the ones that we're really focused on because footwear is just such a large product category. It's half the market for traditional leather and synthetic leather, so we're going market by market. Footwear, furniture, accessories, apparel, automotive, but each of those applications requires different kinds of materials that perform differently so we're going market by market.

Simon Mainwaring:

What I love about the journey you've shared is that you had this disparate experiences when you were younger, that then manifest themselves through the lens of the medical field with Organovo, your initial company you founded with your father. Then that technology was transposed across to consumer products and now you're rolling it out across industry vertical, over vertical, over vertical, and doing that at scale through partnerships. There's no way you could've known that in the beginning, right? Did you have any idea of this in the beginning?

Andras Forgacs:

No, you can only dream. And as an entrepreneur, you can only dream about the journey ahead, but I'll tell you, if you knew everything that was involved in the journey ahead and how difficult it would be and how long it would take, most entrepreneurs will be psyched out of the journey. So I think a little bit, or maybe a lot of naiveté is actually important for entrepreneurship because you know what? When I started the company in 2012, did I think that it would take eight years before we would actually show up on some of our first products in the market? No, I thought it would be less than that. I thought it would be a fraction of that.

Andras Forgacs:

But then in retrospect, any new to the world material takes more than a decade to develop. I mean, the 20th century was one of a revolution in polymers. Those polymers were developed over a decade and a half or two decades by major companies like DuPont and Dow. So we're a little startup company and we're actually proud of the fact that before the decade is out, our innovations are going to hit the market.

Simon Mainwaring:

I really want to thank you, Andras, for sharing the journey that you and your father have led and for the insights into the companies that you've started, that have the potential to have really meaningful impact at scale. So thank you for sharing that with us and we wish you success in the future.

Andras Forgacs:

Thank you Simon. I really appreciate it. And I have to say, look, this journey started with a few people, but the credit really goes to the amazing team that we have. The sign of great entrepreneurship is that you're always able to attract more and more talented people to the enterprise over time.

Simon Mainwaring:

Very well said. Thank you Andras, and thank you for the leadership in the innovation space. It really does show that purpose is an innovation driver that can really impact our future.

Andras Forgacs:

Fantastic. Great speaking with you, Simon.

Simon Mainwaring:

Thanks for joining us on this week's episode of Lead With We, where I spoke with Andras Forgacs, who's the co-founder and CEO of the very exciting startup, Modern Meadow. Who shared with us how purpose can drive innovation that leverages nature to actually solve for the climate crisis, and how that innovation can evolve over time to unlock enormous marketplace opportunities.

Simon Mainwaring:

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