HPH319

Ben Adam-Smith 00:00
This is House Planning Help episode 390. Hello, I'm Ben Adam-Smith, and this is the podcast for you if you're interested in self-build or retrofit. I'm exploring what houses we should be building in the 21st century and trying to break down the major roadblocks that may get in our way. Coming up in this session, I'm talking to Tom Woolley about his book: Natural Building Techniques. We'll dig into the materials, the qualities, getting healthy buildings, all of that in a moment.

Ben Adam-Smith 00:32
As I speak to you though, we're facing yet another heatwave. It would be interesting to rewind the podcast and to see how many times I've said that: "record breaking temperatures". And that's exactly where we're heading at the moment, they think they're going to break the existing record for the temperature here in England. To me, it's fairly obvious when my brother's got floods out in Australia, and we've got extreme heat here, it's another indication of climate change, and we need to prepare ourselves, make sure we do what we can. That's what this podcast is all about.

Ben Adam-Smith 01:03
But I thought because I'm facing the extreme heat, I would just give you a couple of tips for staying cool in your home. And this is really simple, but it's amazing sometimes how you see people not doing it, for example, walking down the streets, when it's really hot and seeing someone with a window open thinking, well isn't the rule number one to make sure that you open your windows, if it's cooler outside then in and the reverse as well. So if it's still really hot, I wonder perhaps people just feel so hot inside, they think if I open the window, it's going to be cooler, but not always. And then my second tip, useful tip, is to shade your windows and do it from the outside if you possibly can, it makes much more sense to do that. Because if you pull the curtains on the inside, okay, it helps a bit, but not half as much as shading your windows on the outside. And I think I'm going to look into retrofitting a few more shading options on my own house because I think it will just give me an extra flexibility. Take me down another couple of degrees. And then the third and final thing is to limit your activities inside the house. This isn't the day to be running on the spot inside or cooking your Sunday roast. Yes, it's salad for you, I'm afraid! But I do remember one year actually that we booked in some window maintenance, perhaps just not thinking there would be a heatwave. There we are at 35 degrees with all the windows wide open, thinking What am I doing? How have I got in this situation? And I'll tell you what, I'm gonna give you a bonus tip just for you, and that is to make sure you keep on drinking that water because our bodies are pretty good at keeping us cool. But you need to make sure the water is going in. There we go. Hopefully that's useful. If not pass it on someone else who doesn't know those tips.

Ben Adam-Smith 02:46
Let's get to our featured interview with Tom Woolley talking about natural materials and healthy buildings. He's also got a new book out called Natural Building Techniques - A Guide to Ecological Methods and Materials. As we get underway, I suggested to Tom that the idea of building with natural

materials or plant based materials, whatever you'd like to call it, is really appealing to lots of people. But why do a lot of people not follow through?

Tom Woolley 03:12
Well, for many years, people have been told that natural materials don't work, that they're not robust enough, that they're too expensive, that they're not certified, that there's all sorts of excuses. But in the last few years, those much more robust supply chains have come into place, lots more materials becoming available. Some of them are even cheaper, not all, so that the situation in terms of the market availability of natural materials for building has changed fairly radically in the last few years. And that's made things a lot easier, and encouraged people to try and use them.

Ben Adam-Smith 03:53
When we had you on before we were talking just about hempcrete. I'm sure it may pop up in the conversation today. But, I was wondering do the materials that we're going to be talking about share common traits?

Tom Woolley 04:08
The generic term that's usually used as bio-based materials. So, the idea is that we need to reduce the amount of energy that's spent on producing things like cement and concrete, mineral quarried materials and lots of plastic, chemical materials. All of these contribute significantly to global emissions. And so we need to reduce those.

Tom Woolley 04:35
The alternative general term seems to be becoming accepted as bio-based materials and certainly there are discussions going on at a European level on standards for bio-based materials. So bio-based materials can include timber, that's probably the one that gets the most attention, but it also includes things like straw, hemp, sheep's wool, and lots of other natural fibres, though they're less common in a way. And also there are natural materials which are perhaps not bio-based, but they're quite closely related like earth, and lime, and so on. They're very different from the conventional mineral, chemical based products, which are still largely what our buildings are built of.

Ben Adam-Smith 05:25
I heard you mentioned sheep's wool there. And I happened to be on a farm with my kids the other day, where they were talking about wool. And they said, the biggest problem is actually, that it almost cost them to get that into the supply chain. So invariably, they burn it or something ridiculous, because it doesn't even really burn, does it?

Tom Woolley 05:46
It's a terrible waste. I mean, there's vast, vast amounts of wool going to waste. There's a factory that we work very closely with in Austria called Isolina, and they manufacture sheep wool insulation. They do it with a very economical process. It doesn't involve any glues or plastics, it's a very clever way of needle punching the fabric together so that it produces this wonderful sheep wool insulation, which is largely non-flammable and doesn't contain any nasty chemicals. They also have a way of treating it against moths or bugs that doesn't involve chemicals as well. So it's a pretty remarkable material. And they've

said to me that this process should be adopted all over Europe. I mean, it is, they're quite a small company in a little village. And it's been quite easy for them to set it up. But people are incredibly lazy, particularly in the UK, in Ireland, and they just can't be bothered doing anything about this, this fantastic resource.

Tom Woolley 06:51
The other thing is, there's an enormous amount of propaganda against sheep wool, which is a good example in a way, it's a case study of the kind of problems we have when we're trying to develop or promote bio-based materials. So for instance, there was a front page article on a daily newspaper a couple of years ago about moth infestation from sheep wool insulation. And by chance this story happened to be based on a house in Northern Ireland. So I was able to go and investigate it quite thoroughly and discovered the whole thing was a piece of fake news. In fact, the house had been largely insulated with recycled cellulose. And I'm frequently coming across this sort of fake propaganda against natural materials. And it's I don't know where it comes from. But it is very, very damaging, because these things, people read about it in the newspapers, and they pick up on it and they think, Oh, well, that's a big problem. And we've got sheep wool insulation in various buildings and touch wood, so far, we've not had any sign of any moth infestation, over 10/15 years of use of these materials.

Ben Adam-Smith 08:03
That's an example of where there are lots of sheep around, and wool is just a waste product in a way. How plentiful are these materials that we're going to be talking about? I'll just outline a couple of categories. I'm sure I'm going to miss stuff, but timber, lime and masonry, straw, hemp? Is it the case that they could just go on forever, because they're managed well? Or have we got to be more careful with some than others?

Tom Woolley 08:32
Yes, I think that's a very good point. Let's start with timber because timber is a big problem now. Because anyone who's building anything at the moment will know that the price of timber has gone up considerably. And there's enormous amount of wastage of timber, really. Timber is used in many situations, where it probably isn't needed to the extent that it is, but people just chuck it in as though it's a cheap material, which it no longer is.

Tom Woolley 09:00
Not only that, we have so little timber in the UK, even less in Ireland. Now then it is possible to get locally grown timber which can be used in buildings, but it's used very carelessly, I think, and that's a big problem. There's also a big development in recent years of using cross laminated or mass timber construction and that's using relatively low grade timber which is then glued together into big slabs. There's even a 12 storey hotel in Norway built out of these timber slabs but they've taken a big hit in the UK because there's been a lot of paranoia about new fire safety regulations and there's people take the view that timber's flammable so therefore we shouldn't use it in buildings and a lot of people have gone back to using concrete. I mean, these solid timber things aren't at all flammable really. It'd be very difficult to set fire to them. But there's so much prejudice and ignorance around this.

Tom Woolley 10:05
But we do have to be very responsible and careful about using timber. And one of the things that I've shown in my recent book is the use of roundwood pole timber. So there are some people, really great people, particularly a company based in Wales, that are building buildings with roundwood poles, which are just locally harvested timber from Wales. And they can make wonderful buildings with that. And that's a fantastic way of using timber more responsibly and economically. Not necessarily suitable for every kind of building, but it's a really great way to use wood, and it's coming from local forests that would probably have to be thinned anyway. So it's a great use of the resource.

Ben Adam-Smith 10:49
I remember watching David Attenborough's life story, I think it's A Life on this Planet. And one of the opening scenes is about mono culture, that this is the challenge that we have that we pretty much ditched wild and brought in harvests and things like this. So a lot of our forests are not the same as a natural forest. I know we've got to use some materials. But how can we be as responsible as we can? Or do we have to accept this is coming from somewhere that they have designed it, they've grown these trees, and they're harvesting?

Tom Woolley 11:26
Well, it's pretty depressing when you see countries like in South East Asia, where the forests have been cut down and replaced with palm oil plantations. And obviously, we need to be reversing that process. And we need to have people growing and replanting timber as much as possible. And for instance, hardwood was assumed to be not ethical, because it's coming from Africa or wherever. But there are actually well managed forests where local people need to generate an income from their sustainable management of their forests, and so you can buy hardwood timber from places like that.

Tom Woolley 12:02
But coming back to somewhere like the palm oil plantations, there's a huge amount of biomass waste from palm oil trees, for instance. And in fact, they can be made into bio-based composite products. Very little of that's been done. But you know, it's just amazing how much we waste of natural resources around the world, instead of looking for a way in which you can produce rugs and insulation material and so on from oil as well. And there's a company in Scotland recently starting to produce insulation based on sisal which is coming from Tanzania. So you know, there's a huge resource out there. We've barely scratched the surface of it.

Ben Adam-Smith 12:43
Going back to timber for a moment, would you say that it is the self builders or the number one material that seems to tempt self builders?

Tom Woolley 12:54
Absolutely. I mean, if you want to build the healthy ecological building, and one that's going to tick the circular economy boxes, and can be recycled at a later time and is easy to change and adapt then you really can't beat timber frame.

Tom Woolley 13:10

I was very influenced by a wonderful architect called Walter Segal, back in the 70s when I was in London. And Walter Segal developed a fantastic system of timber frame construction. This is very, very economical, and yet very strong, and there are still people building Walter Segal frame houses. Not that many, but there are a few, it's a brilliant technique. So using timber for ecological construction sort of goes without saying, really, and we just have to make sure that we're using timber in a responsible way.

Ben Adam-Smith 13:45
Let's talk about some of those other sections of your book. So what about lime and masonry? What's an overview of this?

Tom Woolley 13:51
Yes, we are advocates of using lime instead of cement for instance. And it's still quite shocking that lots of important historic buildings are still being renovated with cement renders instead of using lime. Lime is a traditional material. Farmers would have had a lime kiln in the corner of almost every field in Ireland, sometimes it looks when you're traveling around. And they would have burnt the lime locally and used that for building and for lime washing and so on. It's a natural biocide so it's very, very good for healthy buildings, but it is still using energy to produce it and it's still slightly caustic substance. So for instance, we've been building hempcrete buildings for many years now using a lime binder which is usually specially formulated to work with. But I am now experimenting with alternative materials such as clay, a clay powder, which seems to work almost the same as lime. So if you were able to develop that and use it in an effective way, we would be saving a huge amount of embodied energy. But lime is still very important for the natural builder, and it provides a great alternative to using cement in so many different ways and buildings.

Ben Adam-Smith 15:18
And earth must, I suppose, be the oldest building material is it, or maybe stone as well?

Tom Woolley 15:25
Yeah, well, it depends where you are in the country. I mean, using stone is how many poor people built because it was just rubble stone that they got out the fields. It's still possible to use some stone in building because you can get hold of stone again, stone is often wasted. It horrifies me to see people are building just around the area where I live, and the first thing they do when they go on the site is bulldoze out absolutely everything into the ground. So there's lots of wonderful stone you could use in the building. And instead, it's just used to level the ground and goes underneath the building. It's a horrendous waste.

Tom Woolley 16:04
But I mean, there are lots of other ways that using stone. As for earth, if you're lucky, and you've got good subsoil, clay rich subsoil on your land, you can use that as a building material. Now, it can get a bit controversial here, because the people who absolutely love earth building techniques like cob and rammed earth will argue that you can build a building completely out of that material. Unfortunately, it's very difficult to achieve the kind of energy efficiency standards that we expect these days. But that's not to say that earth isn't still a very good material. It can also be a very health giving material in the building in that it is hygroscopic, and it contains certain sort of health giving properties, which are hard

to pin down. But people in earth buildings always speak highly of the quality of the environment in the buildings. So, I'm a great believer in hybrid construction these days. So you know, I would build a building with timber, hemp, sheep wool, earth and all sorts of other things depending on what's available and how they can be combined together.

Ben Adam-Smith 17:12
And straw buildings often have that nice feeling as well, that you were talking about with earth and cob and so forth.

Tom Woolley 17:19
Yeah, I mean, I'm not the biggest fan of straw.

Ben Adam-Smith 17:23
Oh, interesting.

Tom Woolley 17:24
Absolutely honest about that. Because I've seen so many straw bale disasters, particularly in Ireland. And there is a point of view that straw bale construction perhaps isn't particularly good, in very, very wet, damp climates. Now there are leading exponents of straw bale construction, who would absolutely be horrified with me for saying that, but I do think that...

Ben Adam-Smith 17:50
I don't remember reading this in your book!

Tom Woolley 17:52
No, because what I've done in the book is I found some brilliant examples of straw bale construction, particularly in England, where people have been very, very careful and done it really well. And particularly using straw bales as infill within timber frame, rather than using straw bale load bearing construction, which is how it was pioneered in America. And we often meet people who go, Oh straw bales are cheap, so it must be really cheap to build, and anybody can build with straw bale. And actually, it's quite a difficult technology to use, you really need to know what you're doing. And I always say, there are various people around the UK who run courses, training people how to do straw bale building. So I'm not saying you shouldn't use straw, but it's not quite as simple and straightforward as people think it is. So they can often make a mess of it if they don't know what they're doing.

Tom Woolley 18:43
But no, I found some wonderful examples of straw bale buildings, recent ones in the UK. There is a wonderful database of straw bale buildings around Europe now, which has recently been published. And there are literally thousands in many other European countries and only a handful in the UK. So it's not really taken off as a technology here. You have to be a real enthusiast for it I think to go for straw bale.

Ben Adam-Smith 19:10

Well, it's one that has always tempted me and I hope I get that chance to work with it. But I'm now intrigued by how can it go wrong? You know, what are the warning signs? Is there anything you can tell me? Or do you think it really is just down to that climate that you've got to be building this in the right place?

Tom Woolley 19:26
First of all, you do need to have some training on another project where you really get to understand what's involved. And there are different ways of building with straw bale. So where either you have a roof is resting on the walls and then you have to allow for the fact that bales are going to move. The bales themselves need to be extremely well rendered and plastered in order to make them safe from fire. And basically I suppose because we fell in love with hempcrete construction, which is just so much easier than straw bale construction is difficult. But on the other hand, I mean, we built the first straw bale building here in Northern Ireland, our local school, that has ever got planning permission and building regs approval in the UK. And it was all done by the teachers and the children in the school and everyone had wonderful fun. So it's not like it's I think it's not a good thing to do. I'm just warning people that they need to make sure they get it right.

Ben Adam-Smith 20:24
We've talked about hempcrete before, and there's a podcast to refer back to, but is this what you would pick if you were doing something naturally, or how do you choose the right material for the right project?

Tom Woolley 20:38
Yeah, I mean, if somebody comes to me and says, I really want to build the most energy efficient, healthy house that I could possibly do, and I want it to be affordable and simple, then really hempcrete is the answer. I mean, it's, you would normally build a timber frame structure, which could be done with posts and beam or even with roundwood construction, or with ordinary stick frame construction, but then all the walls are then made of hempcrete. And the hempcrete would normally be about 300/350mm thick. It can be placed into the building in so many different ways, which is one of the exciting possibilities that's available now. And it will give you fantastic thermal performance. But it also creates a very healthy environment, because hempcrete is the most hygroscopic material we know. In other words, it's able to manage moisture in the building. And you shouldn't get any buildup of damp or mould in the building because it will retain relative humidity at 50%.

Tom Woolley 21:44
So we've actually had a study done over the past year by University of Ulster on one of our hempcrete buildings. And that shows very clearly that despite the temperature and the humidity going up and down all over the place throughout the year, the relative humidity in the hempcrete building stays exactly the same, at around about 2%, throughout the whole year. Even with people coming and going and doing activities in the house and having showers it still stays the same, and so it's a remarkable material.

Tom Woolley 22:15
And actually just a funny little story in relation to this, we have a conservatory on our main house, which we sort of abandon in the winter, because it's too cold, it's not heated. And it was starting to have quite bad condensation this year, and the water was running down the windows. And then we thought we're

being a bit stupid here because we've actually got test blocks of hempcrete sitting around all over the place, so we'll put some in the conservatory. And within 24 hours, the condensation had vanished completely. It's the most remarkable material for creating a good indoor air quality. And we know that the thermal performance is very good. And we can probably tweak it even more if we wanted to, if somebody wanted to be really, really super insulated. Those things can be done.

Tom Woolley 23:03
But also now it's available in different forms. So you can get lime and hemp delivered to site, you can mix it in a mixer and you can cast it in shuttering, which we call hand casting. If you're lucky, you can get an expert sprayer to come along with the spraying machine and they will spray it all into the building for you. There are also a range of hempcrete blocks that can be used. Blocks are not as good as hand casting, but they're still quite useful for certain circumstances. And I just went to see a hempcrete house the other day in Maesteg in South Wales, which has been built by a wonderful new company called Wellspring Homes. And they've built this house as a trial basically. They wanted to see if they could build a house out of hempcrete, which they've done. The house has now been sold. And it's got a mortgage from Nationwide Building Society without them batting an eyelid. They didn't even question there was anything funny about it. So they've now got planning permission to build another eight houses near Swansea. And they're going to try and make those houses as efficient and affordable as possible, because they've learned a lot of lessons from doing this initial house. And there are companies like that springing up all over the UK now. So it's starting to creep into mainstream construction. At least, that's what we hope.

Ben Adam-Smith 24:26
It's interesting you mentioned that financial aspect: insurance and so forth. Because I do feel I hear this a few times, that again, people like the idea of it, but when it comes down to actually committing or whether it's the insurance, I don't know what it is perhaps people around them saying, Oh, you don't want to do it that way. They don't do it. So do you have any advice for someone that's in that position, and possibly, or quite easily could be swayed towards natural materials?

Tom Woolley 24:57
If you want to build a house where you can get a mortgage and insurance without any problem or query, but it's quite likely to burn to the ground in a few years time, then you can use conventional construction with flammable insulation materials, which probably have very bad fire stopping and everything's wrapped in plastic and you'll have serious problems with overheating. There's a whole catalogue of things that are wrong with how conventional buildings are built. But you have no problem getting a mortgage or insurance for that. But you go along to the company and say, We're building this really wacky eco house with hemp and goodness knows what else, then surprise surprise, you maybe have a problem.

Tom Woolley 25:39
We just don't do that. We go along to the insurers or the mortgage people and we say, There you go, there's the house, look at it. And they go, That looks fine to us. And so they don't have a problem. It's only if you wind them up.

Tom Woolley 25:53
I mean, I've come across people recently wanting to build a straw bale house and they go bounding into the planning office and they go in to see the building regs people and say, Oh, we're going to build this really great eco house. And surprise surprise, they get problems and resistance. So you just have to be tactical and not make a big song and dance about it, and then there won't be a problem.

Tom Woolley 26:14
And of course, the fire risk if you build a hempcrete house is absolutely zero because there was a house in Devon, which I've illustrated in my book, where there was a very serious fire. The house was built out of hempcrete, but there was a fire in a faulty freezer in a lean-to. They had six fire engines there, and I've got pictures of the flames coming out of the building. But there was no damage to the hempcrete at all. And the engineer's report, he was the insurance assessor, makes quite remarkable readings as he says he'd never seen anything like it before going into a building, which had just a serious fire like that, and realising there was absolutely no damage to any of the hempcrete.

Tom Woolley 26:55
We know that these buildings are safe, so therefore there shouldn't be a problem. But you do run into it from time to time. And we've done a project in Scotland recently where the local head of building control said he wasn't going to allow a hempcrete house over his dead body. So we pointed out that there were already 12 hempcrete houses in Scotland with building warrants, but that didn't shift him. But we then got what was called LABSS certification for hempcrete, which proved to be not a problem at all. Because we were dealing with a different official and a different council authority who was responsible for this. And he said no problem, we were able to go ahead and build the house. But you do sometimes run into that kind of objection, which is often based on prejudice and silliness rather than any sensible thing.

Tom Woolley 27:44
But we constantly have to be on the alert. The regulations are changing at the moment, the thermal performance regulations are changing, the fire safety regulations are changing. And there is this sort of inbuilt assumption that bio-based eco materials aren't as good or aren't as safe or whatever. That's something that we have to watch out for. But an interesting thing I discovered the other day was that mainstream plastic foam insulation companies and other synthetic insulation companies have been told that they have to revise their thermal performance claims. The thermal performance that they're claiming is much worse than they currently claim. And that's one of the benefits of the Grenfell inquiry because Grenfell has exposed the way in which these companies lie and cheat and fake the results for all these tests. And they've been caught out now. And so the official bodies that certify these things have now said, right, you're gonna have to come in, get into line. And that means that they can no longer claim that these products are as super insulating and as wonderful as they'd been claiming the last few years. And that means that something like hempcrete for instance, then can be shown to be as good as these materials. And not only that, it's also cheaper now than it was because the cost of oil-based petrochemical materials has shot up, whereas the bio-based materials have stayed much the same.

Ben Adam-Smith 29:15

Yeah, hemp and particularly characteristics like that sound incredible. Where does it come from the source of the hemp? Is it's something that can be grown locally?

Tom Woolley 29:26
There are two main processing factories currently in Yorkshire and they get farmers to grow hemp for them under license. One of the companies has got 50,000 acres of hemp being grown this year. I was talking to somebody yesterday who said he plans to set up a new hemp processing plant in England and they were talking about growing 60,000 acres of hemp but not this year, next year. There's other companies coming into the market now, because of this sudden recognition about the need for what's called carbon offsetting, or carbon farming, people have suddenly realised there's a lot of money to be made from producing bio-based materials and being able to sell the carbon offsets to companies that aren't being as environmentally friendly. So there's a lot of people jumping on the bandwagon, and then that could be a bit of a danger, I think, because in a sense, we want responsible people, environmentalists running this industry, not people who are just coming in it to make lots of money.

Tom Woolley 30:33
But at the moment, there isn't a problem getting hemp for building. And because hemp is a useful crop for farmers to grow between cereal crops, and it is a food crop itself, it means that they can clean up the ground with hemp one year and then plant wheat or barley the following year. And so it's part of a rotational system. There's plenty of space to grow an awful lot more hemp if we need it. And there's a huge surplus of hemp in Europe, mainland Europe as well. So people have been bringing in hemp from France and Lithuania and other places.

Tom Woolley 31:12
The other big development is the development of fibres. So when you grow the hemp crop, you have to strip the fiber off. The fibre is extremely valuable, and that can be used in a variety of hemp fibre insulation products or composites. Interiors of BMW cars are made out of hemp fibre composites now. Airbus are using, experimenting, with hemp fibre composite to replace plastic in aeroplanes because it's not flammable. And so there's all sorts of things developing all over the place. And there was a meeting recently in Belfast, which I wasn't able to get to, where a whole lot of plastic composites people suddenly have woken up to the potential of bio-based materials. So they had a big conference to see how they could get in on it. Because they've realised that that's the way things are gonna go in the future.

Ben Adam-Smith 32:09
Yeah, really interesting, and I could dig further into this but I've got few more things that I want to ask you relating to the book. So one is, is this an update or additional to Natural Building, one of your books from before? It's obviously very similar title: Natural Building Techniques?

Tom Woolley 32:29
Yeah, well, I tried to follow a similar format to the previous book, which was quite successful, because I think people don't want to read the whole thing. They think I want to build a straw bale building, so they'll dive into that. It's very much an introductory book, it gives people an overview. So for instance, you know, what I've said in the straw bale chapter is if you want to go into this in much more detail,

there's a fantastic new book published by permanent publications, permaculture people, and that's the one to go to if you want a lot more detailed information.

Tom Woolley 33:02
But I've added in a few things, so that there's a chapter about renovation and retrofit, which is quite an important one. I've also been able to include a great deal more information about suppliers, and sources of materials and different kinds of natural, manufactured products that are available. We certainly went around when I did the previous book. So it's following similar pattern to the previous one but it is a lot more up to date, obviously. And it's looking at recent projects, and giving people a lot more information about the sorts of options available.

Tom Woolley 33:40
I also discuss quite a lot of the problems and issues, some of which we've just been talking about, you know, how you should go about doing projects, and what are the sorts of obstacles you're likely to run into, and so on.

Tom Woolley 33:53
We live in very interesting times, because I'm still really trying to get this message across about the importance of natural materials, even to people in green movements. And they're still effectively promoting the use of petrochemical insulation materials. And that's quite a problem, because they don't really understand insulation and other building materials. So one of the ideas of this book is, hopefully they will read it and realise that it's no good just saying, Let's insulate all the buildings in Britain. But there are groups saying exactly that at the moment. You've got to say what kind of insulation? How are you going to do it? Is it going to be done properly? It's no good just saying, Let's insulate it. There must be lots of white van men out there just happy to come and stick any sort of plastic rubbish into buildings. That is not good enough. We have to get people to use the right materials and the right techniques that aren't going to damage the planet and aren't going to damage people's health.

Ben Adam-Smith 34:57
You mentioned cost, on and off through this conversation. But again, people want to make the right decisions. But it comes back to cost. And the example that's coming to mind is an eco-architect friend of mine who wanted timber windows, but she just couldn't afford them. And basically, after months of thinking about it had to go for uPVC and almost cried over having to make that decision, because it was about four times cheaper.

Tom Woolley 35:28
Funnily enough, I had exactly the same conversation with somebody recently about that, and they ended up using PVC because it was so cheap. I mean, one of the the issues here is an indictment of the construction materials industry and the joinery industry in the UK, is that we rely entirely on importing timber windows, or high performance timber windows from the Baltic. And some of the organisations, I don't particularly want to name names, that have been promoting low energy building have tended to do that. Instead of setting about 20/30 years as they could have done, and setting up a proper joinery workshop make high quality windows in the UK, they've chosen just to import them from the Baltic instead. And that's pushed up the prices more and more and more.

Tom Woolley 36:21
The trouble is that uPVC windows are just one of the most horrific things you can put into a building in terms of the damage that the production of PVC has done to the planet, the fact that they were shown to be an accelerant in the fire in the Grenfell inquiry. But they don't last that long, they tend to start to fail after 5/10 years, and you have lots of problems with them. They're not particularly efficient. So they end up sticking horrible toxic foam around them to get them to be airtight. I mean, there's 101 reasons why not to use them. And it is a massive problem, because cost is a key thing. And if we're talking about a lot of low cost renovation work, people simply can't afford these very, very expensive timber windows.

Tom Woolley 37:09
But I read some interesting study recently that says that it's not worth spending the extra money on triple glazed windows for instances. Studies have been done to show that it hardly makes any significant improvement. So really good quality timber, double glazed windows, which are a lot cheaper are okay. But no, I understand that problem. The only thing would be if somebody's really got a low budget, then there are absolutely masses of waste PVC windows out there which get ripped out and thrown away. And I just wonder whether they couldn't be repaired and used. Even if you assume you're going to have to take them out again in another five years.

Tom Woolley 37:47
But the cost as a whole of building is just expensive anyway. But then I built a cabin, trying to use as many recycled and scrap materials as I could get hold off. But despite that, I was horrified how much money I had to spend just getting a few sheets of plywood or some roofing material. I mean, it's really appalling. So that's why you have to find ways of using your lower cost materials that are locally sourced. That's the way we have to be moving.

Ben Adam-Smith 38:21
In your book, it's lovely to see a number of places that I've actually visited, including some passive houses. But I definitely get the feeling that you're still, well actually you write a section about why you don't like Passivhaus. But coming back to things like plastic that we've just been talking about, I don't like plastic, but I have some airtightness products within my building, trying to absolutely minimise those. But the investment of a small amount of these products, that hopefully one day will be made of natural materials, vastly accelerates the performance compared to the alternative. So, over to you, what's your take?

Tom Woolley 39:04
There are certain things that I can't see how we can make them out of anything else other than plastic. So I mean, I think it's quite unreasonable, unless you're gonna live in a cave and in the mountains that you can say, right, you should never use plastic at all. And I think using it in a very limited and responsible way, isn't something that people should be condemned for. What I think is bad is when it's used extensively when it shouldn't be, and it doesn't need to be. So for instance, wrapping buildings in plastic membranes is just something that we don't need to do. We can build airtight buildings with

hempcrete that are fully breathable, and aren't wrapped in plastic. That's one of the main things that we have to stop doing.

Tom Woolley 39:50
Because there was a report published by Greenpeace about the amount of plastic that people throw away in their house, but they never focus on the fact that 50% of the plastic waste that's going into the oceans is actually from the construction industry. So the more we can reduce the amount of plastic materials, but I also think that it's completely unacceptable to argue, as the Passivhaus and other people do, that we have to use these plastic, synthetic oil based materials, because that's going to save the planet by reducing energy. Because first of all, these materials don't work very well, you have to seal everybody up in these toxic flammable boxes of materials, and it just isn't acceptable. I think, you know, untold damage has been done by people in organisations like Passivhaus by promoting these materials. And not only that, slagging off natural materials behind the scenes and telling people you couldn't possibly build an energy efficient house with hempcrete because it's no good. That's got to stop. And I'm delighted to see there is a little bit of a shift now. We're starting to get people who are extreme energy efficiency fanatics, starting to say, well, maybe we could be using natural materials instead. So that's very encouraging, I think.

Ben Adam-Smith 41:08
But I'm getting the feeling that a lot of the groups out there are almost converging, and I'm not going to defend Passivhaus that is built of ICF and SIPs and has loads of unnecessary plastic. But, you know, this may just be a point we're gonna have to disagree on, but if you're building natural materials, Passivhaus, and also, keeping a sensible form, you know, the form of the building on its own, has such a major difference on how much energy you're using. It's all these these sorts of things. And I know, again, mechanical ventilation, you prefer trickle vents, and so forth. But you know, that's just drafts at the end of the day, there's no control there.

Tom Woolley 41:51
No, no it's not because we don't mean, because we've built hempcrete houses that we've been able to monitor, and we only were using trickle vents and a tiny amount of humidistat extra ventilation in the wet room. We know that that works and it isn't drafty. There is no problem with drafts. But I think it's also it's about using, I agree with you about using sensible design approaches. I think that's very, very critical.

Tom Woolley 42:12
But I've got recently involved with something called Active House, which I think has a much more holistic and sensible approach to these issues, particularly about design and configuration of buildings, and use of daylight and passive solar and so on. And Active House was set up in Germany very early days in opposition to Passivhaus. And you won't find many people doing Passivhaus in Germany. They're much greater support for Active House. And Active House has spread all over the world, and is very strong and very big. They just had a huge conference in Rotterdam. And for some strange reason Active House hadn't really impacted in the UK. But recently, we've set up the Active House Alliance, it's properly established as a company now, you'll start to see people offering Active House certification in the future if people want that sort of thing. Personally, I'm not bothered about certification, but that's

something some people want. So look out for Active House, because I think that's a very interesting development. It does provide an alternative to the Passivhaus fanaticism.

Ben Adam-Smith 43:37
Now, you mentioned monitoring a little while ago, and this is something that I think is so important. So having got this opportunity to go through the book again, and look at all the materials, have you noticed any improvements in how they're used or any useful information that is coming forward, having come a couple of decades forwards?

Tom Woolley 43:59
Yeah, I mean, there is still a problem that we don't have enough data, and that's a battle that I'm engaged in at various different levels. So UK government organisations, like Innovate UK have been very happy to throw lots of money at petrochemical techie solutions to things, but they're not being very supportive of natural and bio-based approaches. That again might start to change a wee bit. I've managed to get some of the people in that field to at least listen to me now. It's taken 25 years to get them to do that of course, but you know, I think things are shifting slightly.

Tom Woolley 44:03
And there's some very good centres being set up. University of Suffolk, for instance, I'm hoping to go to in the autumn to see work that they're doing testing buildings, and we do need more of that data. So the data we've recently got on relative humidity in our hempcrete house is really important. We had a meeting in Cardiff the other day with Cardiff University about doing testing of the hempcrete houses that are being built in South Wales, so hopefully we're going to get more of that information, so that people can really learn about how well these materials work. We know that they work, but it's no good having the anecdotal information that we know that they work really well, and even better than synthetic materials. We need to have the hard facts, we need to have the data. And we also need to have more standards.

Tom Woolley 45:29
So I've also been going around to Europe, slowly but surely talking to people in different countries about getting bio-based standards for building. I do work for an organisation in Brussels called ECOS. They're interested in this Nature Plus, in Germany, it's been around for a long time, but they're starting to expand some of the things they're doing.

Tom Woolley 45:52
One of the big threats that we see is that some of the big nasties, as I would call them, the big commercial companies in the construction industry, have started to see that there's a threat from natural and bio-based materials, and they are making some moves, which might not necessarily be the right thing to do. So we've got to get on top of our game and promote standards and data and technical information. It's absolutely critical.

Ben Adam-Smith 46:23
And is there a final thought that you'd like to close with?

Tom Woolley 46:27
Yeah, well, the thing we haven't perhaps talked about, which we probably could spend another hour on is about indoor air quality. That to me is one of my main preoccupations at the moment. I was very lucky to go to a conference organised by the British Society of Ecological Medicine. There are a lot of doctors who are now recognising environmental causes of health problems, and that's another massive breakthrough. And we're rapidly going to be facing an epidemic of mould growth in buildings, particularly with heating and electricity costs going up, people can't heat the houses. Even houses that have been renovated and retrofitted, are full of black mould. And we've got masses of evidence of this. And this isn't just a UK problem. I mean, we've got some wonderful connections with people in Finland. The Scandinavians have very big problems with mould and health problems, which they've researched much more extensively than we have.

Tom Woolley 47:25
So there's beginnings of a lot of very important work going on about indoor air quality, and particularly about the dangers to health of emissions from plastic and synthetic materials like VOCs, and formaldehyde, and PFA, PCBs, and all sorts of other things, which are in buildings and are causing more and more problems for people. So, natural materials are the solution to get out of this problem, but we've got a big area of work to do there, and that's going to be one of my main areas of work over the next few years.

Ben Adam-Smith 48:03
Tom, thank you very much.

Tom Woolley 48:05
Thank you. Thanks, Ben.

Ben Adam-Smith 48:08
Head online to take a look at the show notes for this session: houseplanninghelp.com/ 319. You can review all the key points once again, we always give you that summary. And what did you make of it then? Different viewpoints, anything impacted you? If you'd like to make a comment or ask a question, do that within the show notes on social media. We've got the links for you. And of course, links to Tom and where you can find his book: houseplanninghelp.com/319.

Ben Adam-Smith 48:40
Let's finish up on a Hub update. This is the membership community that I run alongside House Planning Help. Takes the learning further, gives you the opportunity to get under the hood of some real projects. We've been filming in Oxford for around about a year on a retrofit project. So there's another chapter of the Kinver story to look at. That's new in The Hub. And this one, lots of interesting things going on. It's the heating strategy that's the focus of this episode. They're not using a hot water cylinder in this scenario, it's a sun amp heat battery. And all that's explained why. I think one of the reasons was the space requirements. Gordon Bunker from Western Renewables, we have a chat with him. They're using an air to water heat pump, again he'll go into all the details of why that has been chosen for this project. And controversially, there is an element of cooling on this particular project as part of the strategy. So find out what that's all about in The Hub.

Ben Adam-Smith 49:38
We've also got your courses trying to lay out a path for you. Beat that path down! Private members-only forum so you can chat with like-minded people. If you fancy a chat with me, I put aside an hour each week to field any questions that you might have. If you want to pick my brain that's during office hour. We've got live training, where we bring on guest experts to get their insights. All of that in The Hub. If you want to find out more head to houseplanninghelp.com/join.

Ben Adam-Smith 50:06
That's it for today, thank you for listening. The House Planning Help podcast is produced by Regen Media: Content that matters.