

WORK



► **BULL** Frog by Leonardo – the ceramic source of inspiration for the team's name.

► **PETER** Molyneux – Bullfrog's co-founder and programmer of Populous is soon to start work on what he reckons is going to be "the biggest thing ever". Just what this is he refuses to say.



► **LES** Edgar handles all of Bullfrog's administrative work, and also contributes ideas to the games – many of which are to be found in Populous.



► **GLENN** Corpes not only designed the graphics for both Fusion and Populous, he also contributed heavily to the game design and programmed the ST versions. What a guy...



► **WITH** programming and design work on Fusion and Populous under his belt, Kevin Donkin's currently putting Project F together with Shaun Cooper.



IN between subjecting himself to apoplectic seizure-inducing Thrash Metal music, Andy Jones is putting together the graphics for Project F.



► **DAVE** Hanlon – the professional musician who creates Bullfrog's distinctive sounds.



► **SHAUN** Cooper – from YTS scheme to Bullfrog game and graphic designer in less than a year.



IN PROGRESS

The team behind Populous, widely acclaimed as the best 16-bit game to date is understandably currently considered to be hot property. But it takes more than claims of "the best is yet to come" to impress an incredulous Gary Whitta.

Five years ago, Peter Molyneux worked as a Systems Analyst for a company producing accountancy software before his life was changed by a chance meeting with the man from next door. Molyneux and Les Edgar (for it was he) then decided to set up a business together producing professional (business) software for the Amiga: "Both Les and I are Taureans and so we decided to call ourselves Taurus Software," says Peter.

The company of two became a crowd of three with the addition of programmer Kevin Donkin and two years later the first product came off the line... a Database called **Acquisition**, which was followed by a Computer Aided Design package, **X-CAD**. However, all this serious stuff was beginning to prove a little tiresome for the trio, who decided to follow Commodore's lead and moved more towards the entertainment side of the industry.

As Peter puts it: "we were getting a bit bored of professional software. We all had Commodore 64s and were playing things like **Bounty Bob Strikes Back**, **Dropzone**, **MULE**, and **Paradroid** – is the best game of all time."

So the boys leaped into action and set up Bullfrog with the idea of creating leisure/entertainment software: "We took the name from a ceramic ornament we had around the office."

ENLIGHTENMENT

However, despite the team's enthusiasm for games, its first release was a drum machine/sequencer called **A-Drum**. It wasn't until late 1987 that Bullfrog approached Firebird with a proposition to convert **Enlightenment: Druid II** to the ST and Amiga.

"We know Andrew Bailey, the programmer of the original 8-bit versions," says Peter, "but we wanted to produce the game from scratch, and so we converted **Enlightenment** without using any of the original's source code – we just played the 64 version for reference."

Converting **Enlightenment** provided invaluable experience for Peter and Kevin in techniques such as sprite handling – which they had never tackled before. But the graphics presented an even greater problem. Bullfrog desperately needed an artist to carry out the work on **Enlightenment**, and their prayers were answered by the arrival of Glenn Corpes, an ex-operator of Cray supercomputers.

"Glenn came along wanting a programmer's job

when we desperately needed an artist," explains Molyneux. "I asked what he was interested in and he said 'drawing'. So I asked him to draw something for us – a brick and a tree I think it was – and he drew on computer this amazing brick and tree."

If anything, Glenn was more surprised by the quality of his doodling session than Peter was: "I used to doodle, and draw cartoons, but I had a very violent art teacher at school and so I stopped taking art when I was 13. I never had much experience with computer graphics either. I used to play around with art packages on my Amstrad 6128, and later **Neochrome** on my ST, but nothing serious." And so Glenn was recruited as chief graphics artist, and went on to produce all the sprites and backdrops for **Enlightenment**.

FUSION

With **Enlightenment** out of the way, the team started work on **Fusion**. "We wanted to produce a shoot 'em with a bit more to it – plus something to which we could apply what we learned from working on **Enlightenment**," Glenn explains. "We took inspiration from Paul Shirley's **Spindizzy**, which was my favourite game on the Amstrad. In **Spindizzy** you had to run over switches to change part of the level near you by opening a secret door or something, so you could get to a different place. I thought that was a brilliant idea, so we incorporated it in **Fusion**."

So work began in earnest on **Fusion**, with Glenn designing the graphics and Kevin writing the game code. Five months later an almost complete version was shown to Electronic Arts. "We chose to approach Electronic Arts because we saw that they weren't into conversions or licences," explains Peter. "With the exception of **Marble Madness**, all of Electronic Arts games are original concepts – and that's exactly the type of game that we want to produce."

REDEMPTION

By the time **Fusion** was finished, Glenn – who had designed and drawn all the graphics for the game – was itching to program. After all, it was the reason he approached Bullfrog in the first place.

"I brought my own ST into work and started playing around with an isometric routine called **Creation**," says Glenn. It was a simple but effective



BULLFROG

► PROJECT W. Like *Populous*, entire worlds are created by using one simple routine. However due to the flexibility of the vector graphics system developed by Glenn, a much larger range of landscape features can be incorporated, such as roads, waterfalls and villages.

idea allowing landscapes to be built and modified using an assortment of blocks. Glenn showed the routine to Peter who, realising the routine had enough potential to base some kind of game on, set up a replica of the system using Lego. "Lego was the only way we could try out the routine apart from on the computer screen – there's just no way you could make it work on paper," says Peter.

When *Creation* was mapped out on Lego, ideas for gameplay began to form. "We knew the game would revolve somehow around modifying the landscape – the initial idea we had was to survive against the elements," Peter reveals. "The way our first system worked was, as you put down land and modified the terrain, the water level would rise automatically, so after a while villages and people on lower levels would be flooded out."

That idea was dropped, however, as new and better ones were suggested, until eventually the idea was hit upon to use the landscape as a battle

ground for a war between two tribes, with the player changing the landscape to affect the course of the battle – and *Populous* was born. From that moment on, ideas began to surge forward – the first of which was to modify the routine to allow two-players to play head to head. "*Populous* was always a two-player game," says Kevin. "The player versus computer option wasn't added until much later."

It was at this point that 'Divine Intervention' gameplay elements began to evolve. "Knights were one of the first things we put in, and were included solely to finish the game. A game could get to the point where both players had massive populations, and there was just no way to win," explains Pete, "so you would create a Knight to go and massacre the other side and end the game at a stroke."

"We had so many ideas for things that you could do as a God that there was no way you could implement them all, so we just picked the best ones." Pete reveals. "One idea we had to discard

was disease. What happened was one player infected one of the other player's walkers with a plague, and that walker would then spread the plague among the rest of his population. But when we put it into practice we realised that the plague would then spread to your people too, and so have a detrimental effect."

PROJECT W

Populous is undoubtedly the game that really catapulted Bullfrog to fame – it's arguably earned more recognition for the team than *Xenon* did for the Bitmap Brothers or *Uridium* did for Andrew Braybrook. But how on Earth does Bullfrog intend to follow what is widely recognised as the most successful 16-bit game to date? The answer comes in the form of the two games that the team is currently working on – one of which was first

Project W's landscapes are calculated by the program rather than having to be stored in memory – a feature pioneered by Geoff Crammond in *The Sentinel*. This leaves a lot more memory and disk space to devote to game logic, allowing for more features and complexity of game design. One routine that's already working in what Bullfrog refers to as 'Ranking'. As opposed to *Populous*, where the people wandered about on their own, the inhabitants of Project W's world travel in groups – each of the six tribes has its own distinctive formation.



The flexibility of Project W's graphics system can only be truly appreciated by trying it out for yourself. Whereas in *Populous* your view of the game world is fixed, in Project W the player can rotate the landscape through 360 degrees, as well as zoom in and out – so you can go out far enough to see the entire world, or in close enough to see the leaves on the trees! It really does have to be seen to be believed.

GRAPHICS

Like the company's games, all of Bullfrog's graphics are very much a team effort. Although they're produced by only three people – Glenn Corpes, Andy Jones and Shaun Cooper, everybody contributes. Peter Molyneux can't draw for toffee, but that doesn't stop him giving artists Glenn, Andy and Shaun ideas to put into practice.

Bullfrog is particularly proud of the way in which graphics and game design are interdependent elements in all its games, rather than the graphics being just a fancy frill. As Glenn puts it: In '*Populous*', the graphics' geometric shape defined a hell of a lot about the way in which the game worked. It's really helpful to be involved with both the graphics and the programming." Programmer and artist Shaun Cooper agrees: "Something I've noticed lately during the development of **Project F**, is that if Andy (Jones) comes up with an idea for a certain graphic or type of graphic, the whole game begins to revolve around those new graphics. **Project F**'s gameplay has gone through a lot of changes due to the inclusion of new graphical ideas."

It's partly Glenn's recent move out of graphics and into programming and design that has led to much of the recent graphics work falling to Bullfrog's other resident artist, Andy Jones. Andy joined Taurus on a YTS scheme to test products such as *Acquisition*, and went on to convert *Fusion*'s graphics to the ST, before designing many of the sprites for *Populous*.

Since Andy learned much of what he knows from Glenn, both artist's techniques are very similar – they never sketch their graphics on paper first, preferring to go straight to computer with their ideas. "The reason for this," Andy explains, "is because what you sketch out on paper and what you eventually draw on computer will often look completely different."

The use of colour also plays a big part in the overall effect of Bullfrog's graphics. "Colour is very important. The original Amiga version of *Fusion* runs in Halfbright mode, with 64 colours on screen at a time, which enabled me to produce proper shadows, and that contributed greatly to the overall effect."

Glenn, Andy and Shaun design their graphics on *Deluxe Paint II* and *III*, and to a lesser extent, Rainbird's *Advanced OCP Studio* on the ST. The latter package includes a map editor which proved invaluable for Glenn when he was designing the levels for *Fusion*.

According to the trio's experience, graphics can be a very hit-and-miss business. Says Glenn: "You can never tell how long a certain graphic is going to take. For example, my original graphics for the *Populous* landscapes that you see in the finished game were only a couple of days work, whereas the people – like the Walkers and Knights – took a couple of weeks on their own."

mentioned in Issue Seven – but the names have now been changed to protect the innocent.

"We first got the idea for **Project W** at around the time that *Populous* was completed," Glenn explains. "It was inspired by *Populous*, but it's altogether a different game." Like *Populous*, the idea for **Project W** was hit upon accidentally by Glenn: "I just want to have a go at vector graphics. I'd seen other vector-based games, and thought that it looked incredibly difficult, so I wanted to see how long it would take to put something like that together – and then see how fast it would run."

With the mention of the term vector graphics, you'd be forgiven for thinking that Bullfrog was developing a simulation of some kind – but instead the vector routine that **Project W** employs is used to generate landscapes, in a similar way to David Braben's *Zarch* and *Virus*. "Like *Populous*, we want to base **Project W** on a world, because we think that that idea is far more exploitable from another angle," explains Peter, who is co-programming the game with Glenn. "At the moment it looks a little similar to *Populous*, but is in fact very different. The only similarity between the two games is that you're looking down on a landscape."

While **Project W**'s graphics are already looking polished, the game design has yet to be finalised. It's known that the game will allow up to six people to play head to head (either via serial or modem link), with each player in command of a tribe of people, but that's about it – or at least that's all that Peter and Glenn are willing to reveal at the moment.

Project W's revolutionary landscaping system has already attracted attention from outside the software industry – so much so that it's shortly to be seen on a TV special about worlds inside computers. "The BBC is doing an episode of *The Late Show* called *Virtual Worlds*, about the conceptual idea of holding a virtual world inside a computer," Peter explains. "They contacted Electronic Arts and were shown *Populous* to demonstrate the idea of a virtual world. They were very impressed by what they saw, and when I told them about **Project W**, and that we were taking the idea of virtual worlds even further than with *Populous* they asked us to show it to them."

"I think what impressed them," says Kevin, "was that they had been told that to run something like *Populous* or **Project W** where you have real-world aspects you needed a 20Mb mainframe or a multi-million pound Cray – and then we came along and did it on a half-megabyte home computer."

During the five minute interview with Bullfrog – which eventually ran to one and a half hours – Auntie Beeb filmed a short clip of **Project W** in action, so if you're interested, tune in in September when the programme goes on air – it could be your only chance to see it before the game is released next February!

PROJECT F

Project W looks like being Bullfrog's most ambitious project to date, but **Project F**, also currently under development, is a completely different kettle of fish. It's being put together by Kevin, along with Shaun Cooper, who joined Bullfrog as part of a YTS scheme last August, was taught to program by Peter in a few months and went on to design many of the graphics for *Populous* (the volcanic level was entirely his creation).

Project F is a return to the *Fusion*-style action

genre, and like Bullfrog's last arcade effort, there are plenty of puzzle elements built in too... "Project F is meant to be much more immediately playable than anything we've done before," claims Peter.

Project F's gameplay is based entirely around the concept of water – the scenario traps you in an eight-way scrolling maze-like world that is slowly but surely being flooded. Your job is to collect the objects and complete the tasks that allow you to escape, and then get out before you drown – and of course there's an assortment of aliens out to stop you. "We're quite proud of the water aspect," says Peter. "It's something that we don't think has ever been done before."

As testimony to Bullfrog's attention to detail and realism in its games, everything in **Project F** behaves as it would do in real life – especially the water, as Kevin is quick to point out: "The water actually rises properly. It's not just a case of it coming up line by line – it overflows realistically, like from the lip of a glass."

With **Projects W** and **F**, Bullfrog looks set to prove that it's no two-game wonder – but this is only the start of the story. Work is soon to begin on **Populous II**, which Bullfrog is confident will be a significant improvement over the original. "It's not going to be just **Populous** with a two stuck on the end," promises Peter. "We won't be using any of the routines from the original. Obviously we can't change the original concept too much, but we will be approaching the new game from a completely different angle with a totally different graphics engine."

PROJECT X

And then there's a project which Bullfrog refuses to discuss beyond name – the working title is Project X, and all Peter, who has produced the original specification for the game, will say is: "Believe me – I can't say anything about it, but **Project X** is going to be... frighteningly good."

At the moment **Project X** is coming together on paper, and programming work should begin within the next couple of months. But don't expect anything for some time – **Project X** isn't due to be completed until the Summer of 1991!

GAME DESIGN

There's a whole world of difference between the styles of gameplay found in **Fusion** and **Populous**, and the diversity between **Projects W** and **F** promises to be even greater. It seems that Bullfrog doesn't want to produce any one kind of game, but does the team have a criteria for the type of product it produces? "We always look for originality and playability in our games," Peter reveals. "Lasting appeal is also an important factor. I personally believe in the 'pound-an-hour' theory. That is, if you spend £25 on a game, you're entitled to get 25 hours of solid enjoyment out of it. In short, we want to write the sort of game that we want to play."

"Although all our games are original, we don't want them all to be strategy-type affairs like **Populous** – we're aiming to produce a variety. That's why we're doing **Project F**, which is more in the classic arcade mould."

"By originality, we don't necessarily mean a revolutionary new games concept – you can take a tried and tested style of game and approach it from a new angle. That's why I liked **Kick Off** and thought that was original."

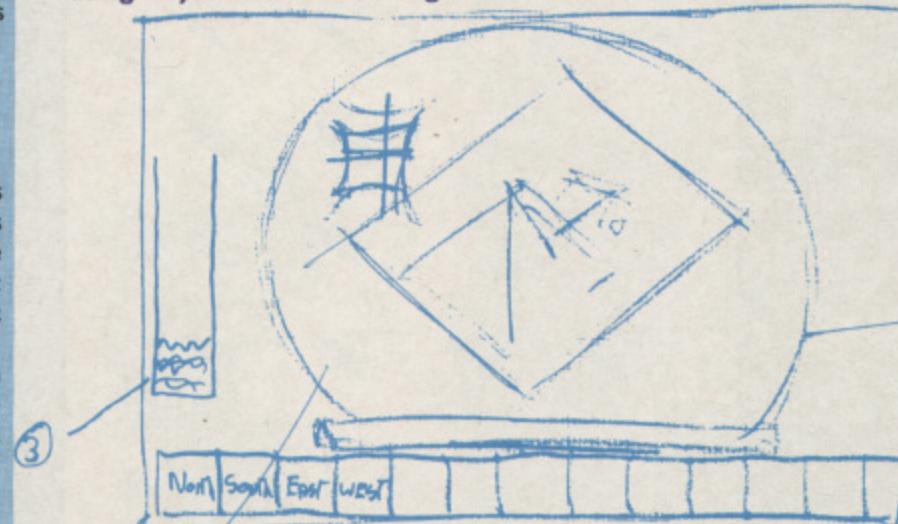
"We believe that games should be a team effort. That's why every Friday afternoon we stop work and have a meeting. We just sit down and share ideas – either an idea for a new game or ideas to improve ones currently under development."

It's Bullfrog's belief that even sound should play a part in the design of a game. "Sound should be an interactive element in the same way as our graphics are. We're trying to emphasise that in **Project F**. Instead of just gurgling effects in the background, we're going to use sound to warn you of danger, so the sound of water becomes fiercer as you approach it, or as the screen fills with it."

"We don't want to be known as the Vector Graphics King, or the Arcade King, or the RPG King – we'd like to think that we can turn our hand to any kind of original game. We believe that our strength is our creativity. Even if we were to do a coin-op conversion, we'd approach it as we would an original game."

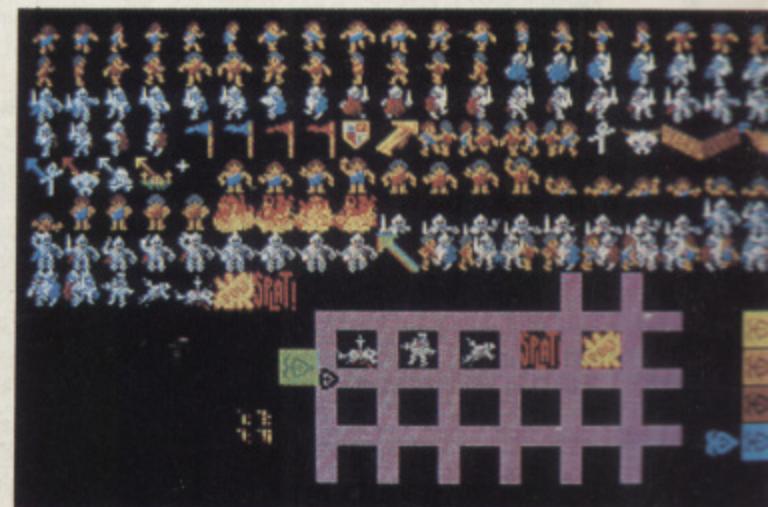


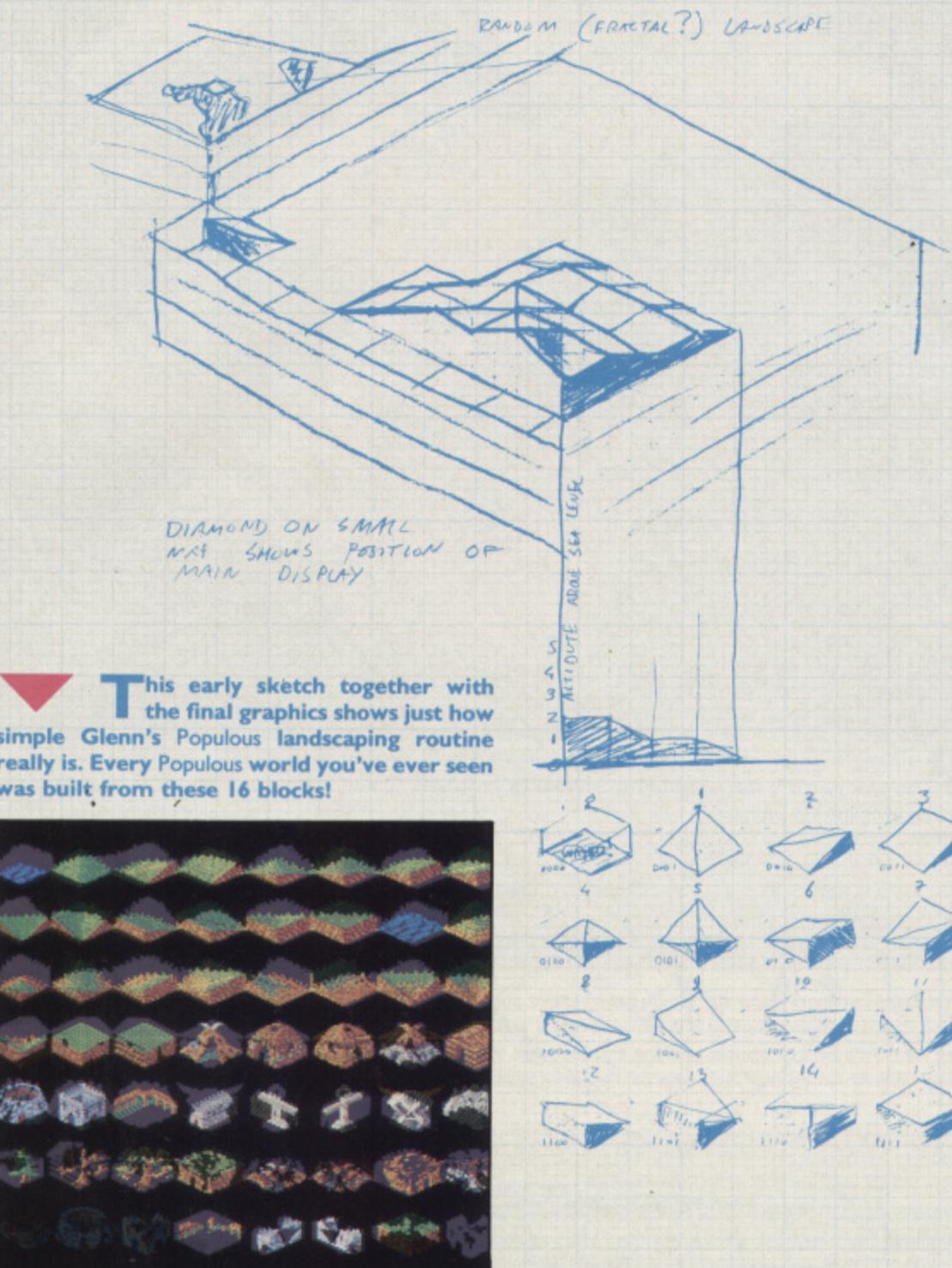
Bullfrog's Lego model of Populous still stands in the company's office as a memorial to the game's development. Incidentally, plans are afoot for a board-game version using a system similar to Lego...



A very early sketch of Populous shows one of the ideas for presentation that never made it – placing the world inside a crystal ball.

Populous' 'stickmen' sprites took the most time to develop than any other graphic elements. This sprite screen, used in the game's development, shows all the animation frames used to depict, walking, combat, drowning – and even a few ideas, like the 'POW' and 'SPLAT' icons that never made it into the finished game.





This early sketch together with the final graphics shows just how simple Glenn's Populous landscaping routine really is. Every Populous world you've ever seen was built from these 16 blocks!

28

SOUNDS DIVINE

All of the sound heard in Bullfrog's games is created by 22 year-old Dave Hanlon. Dave has been playing musical instruments since the age of seven, specialising in the keyboard and guitar, and used to work producing demo tapes for up-and-coming musicians. He was introduced to computer music by Andrew Bailey, the original programmer of **Enlightenment**. "I'm a great fan of Rob Hubbard's C64 stuff – in a way that's what inspired me in the first place," he admits.

Dave uses a complex (and expensive) set-up, comprising a Yamaha SH101, a Roland synth and an Amiga 2000 to create his distinctive sounds – all of which are sampled. "I'm not particularly good at programming synths, so I just take my sounds from the real world."

In Dave's experience, it's sometimes the most unlikely sounds that make the best samples. **Populous'** atmospheric wailing and chanting, for example, came from one of Dave's old Yello CDs! "I prefer to sample from a Compact Disc rather than an album," he confesses. "Samplers are very receptive, and can pick up the hiss that a record produces. CDs are much clearer."

Perhaps the weirdest sound Dave has ever sampled was for the swamp in **Populous**. "I dropped a wet sponge into the bath and played the result back at half speed. Perfect!"

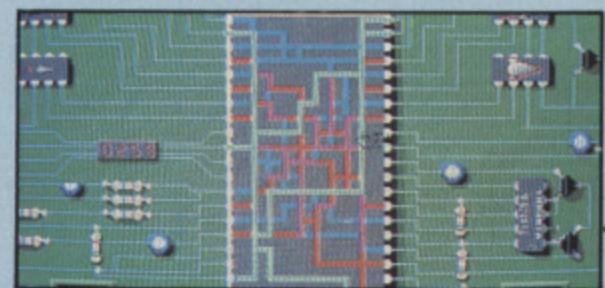
Since Dave isn't able to regularly visit Bullfrog's offices, he often has to rely on a 'brief': "Peter (Molyneux) gives me a few adjectives to describe the mood of the game and I create the sounds around that. For example, with **Project F**, I'm told that the game is based around water, so I've got to get plenty of 'watery splushy' effects – but I've got specific orders not to sample the toilet flushing!"

For the moment, Dave's efforts will be concentrated on the music and effects for **Projects W** and **F**, but what does he have planned for the future? "I'd really like to get my own studio – one of professional quality where I could work. It's only a dream at the moment, but one that I plan to realise."

THE GAMES THAT NEVER HAPPENED... BUT MIGHT

We subject all of our games to one simple acid test," explains Peter Molyneux. "When a game reaches a certain stage, we all play it – and if we don't enjoy it, we don't continue to develop it. The theory is if we don't like it, how can we expect anyone else to?" It's this policy that has led to many of Bullfrog's games grinding to a halt in mid-development. The games haven't been dropped as such – they've been put on Bullfrog's proverbial shelf, and may still be tweaked, finished and released – either as separate games or bundled on a compilation.

One of the most promising of all Bullfrog's 'shelved' ideas is **Ember**, based around the classic Light-Cycles sequence from Tron. The player pilots a tiny speeder craft around a faulty microprocessor chip, trying to repair it by reconnecting its broken elements. The player is up against both a strict time limit and a rival speeder craft which destroys your handiwork.



Colony is an arcade adventure cum puzzle game set on a crippled colony starship, with the player set the task of repairing the ship's cryogenic suspension system, in order to save the passengers and crew before the thaw out – and die out. The game allows the player to drop video cameras around the ship so you can keep tabs on things while you're not there – the camera's transmissions are shown on multiple displays at the top of the screen.



Hell – based on Atari's **Joust**, one of Bullfrog's favourite golden oldies, this is a multi-directionally scrolling shoot 'em up set in the underworld, with the player up against a bevy of suitably hell-like enemies. A novel feature allows the player to change the craft he pilots at special 'garages' positioned around the maze, each with its own strengths and weaknesses. The visuals may look dodgy, but these are just 'scratch' graphics thrown in to allow the game to be tested.

