



NEW HARBIS

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ADVANCING BACKWARDS TO 1940

Let's advance backwards to approach where animators were during the 'Golden Age'. And then go forward from there – so we can do new things.

The thing you are going to build on must be basic.

Everyone wants to decorate their house with interesting pieces before putting in the corner-stones and supports. Everyone wants to jump ahead to the sophisticated bit – glossing over the dull, old support work.

But it's the thorough understanding of the basics that produces real sophistication.

As Art Babbitt said:

'The knowledge that went into making little drawings come to life is in the early Disneys. Nobody taught us how to articulate these fanciful characters. We had to discover the mechanics ourselves and pass them around amongst each other. There are many styles but the mechanics of the old Disney animation remain.'

They had it all worked out by 1940, around the time that *Pinocchio* was released.

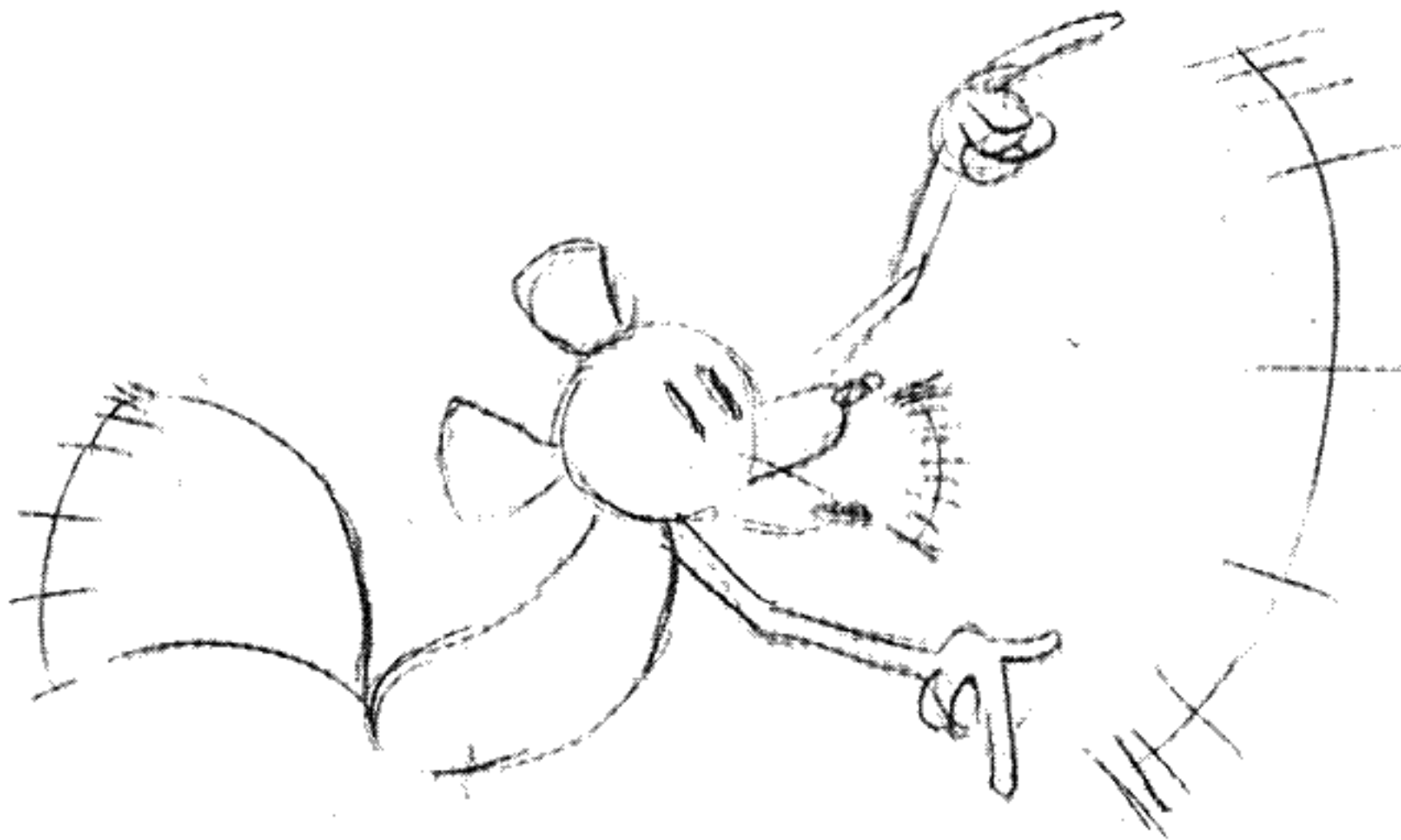
It was a wonderful system – precise and *simple*.

First we'll take it bit by bit – and then we'll put it all together.

HISTORY OF THE CHART and INBETWEEN

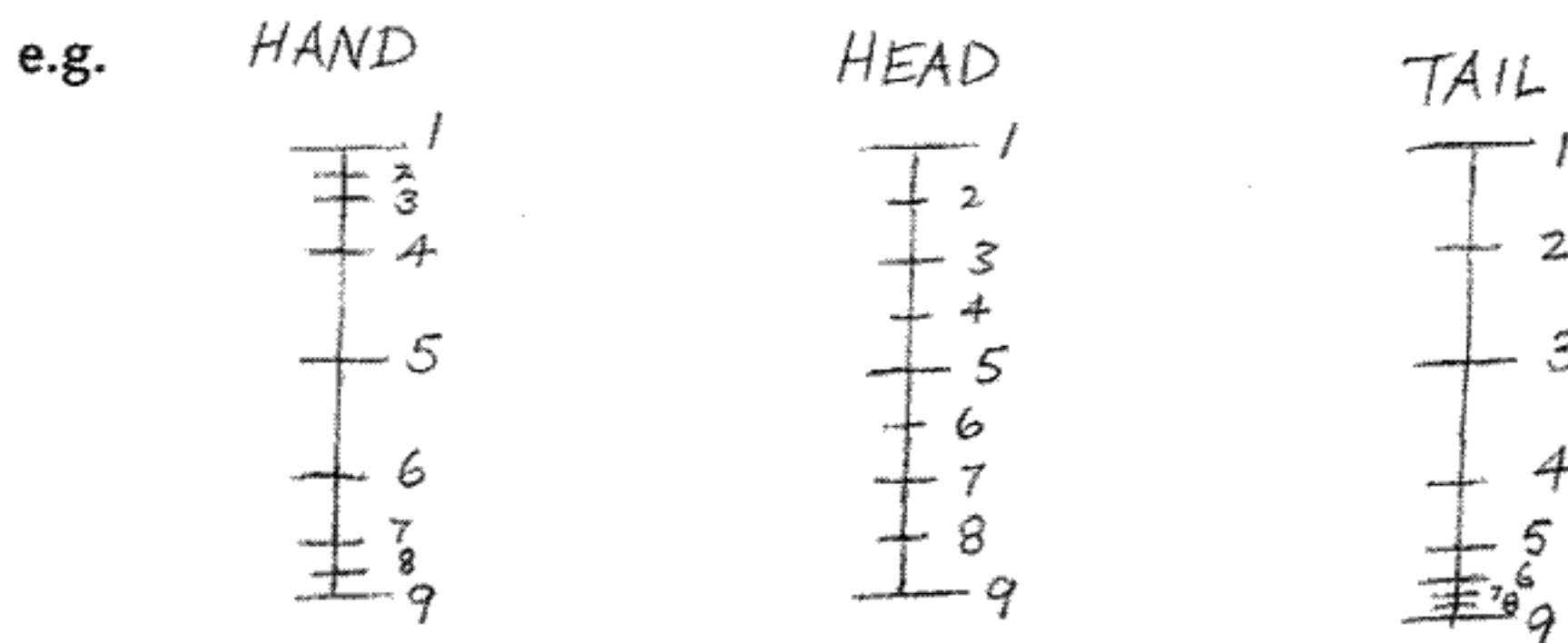
A very interesting thing happened when we worked with Grim Natwick. He was so old that each day he tended to snap back into a different professional period of his life: one day he would come in and do circular 'rubber hose' animation from the 1920s, then the next day he would be in a 1936 'Snow White' phase, making tons of smoothly moving drawings, the next day would be sharp, physical actions with plenty of static holds from his 1950 UPA 'Mr Magoo' period, then he'd be doing as few drawings as possible, as if he were animating a 1960s TV ad, and then the next day back into fulsome *Fantasia* mode.

One day I found him drawing in an old style – something like this:



He wasn't just showing the arc of the action – he was indicating all the different spacings on his drawing.

I suddenly realised that this was probably the origin of the charts that animators put on the edge of their drawings



I asked, 'Hey, Grim – did these charts just gradually move across the page away from the drawings?

A far-away look came into his eyes – '... Yes ...'

In the 1920s, animators did most of the work themselves. Dick Huemer was the top New York animator and was working for Max and Dave Fleischer on their *Mutt and Jeff* series. Dick told me they said to him, 'Your work is great, Dick, but we can't get enough of it.' So Dick said to them, 'Give me someone to put in the in-between drawings and I'll do two to three times as much work.' And that was the invention of the 'inbetweener'.

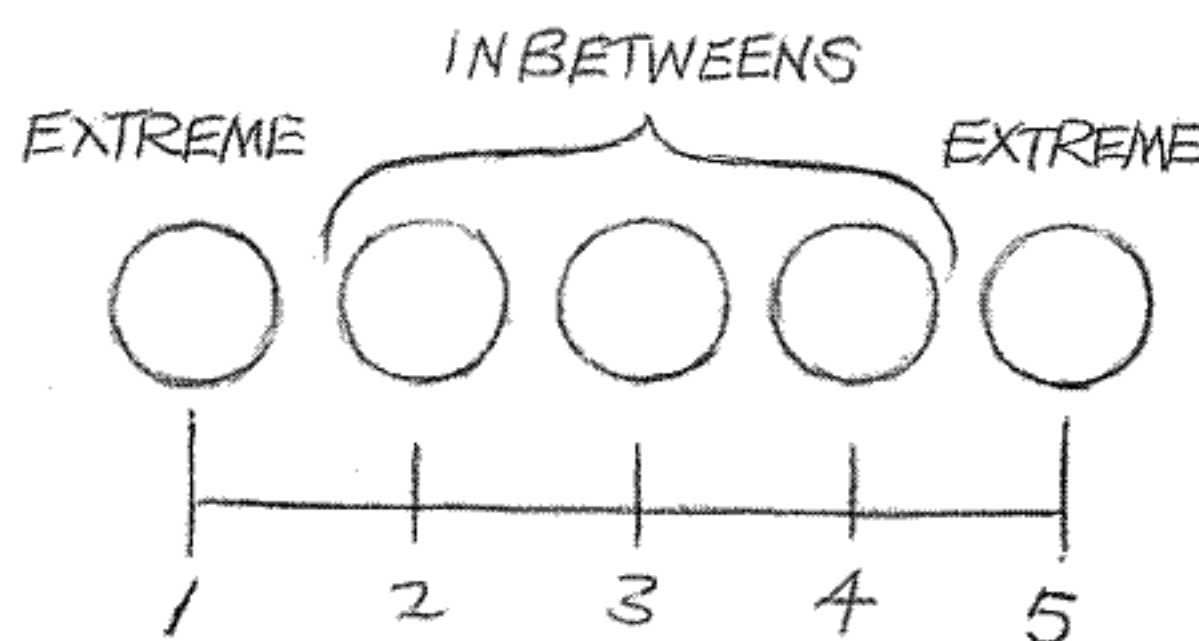
Dick later said in an interview that it had been the Fleischers' idea and that he just went along with it. But Dick actually told *me* that he had invented the inbetween and the inbetweener, the helper or assistant.

The main drawings or extreme positions came to be called *extremes* and the drawings in between the extremes were called the *inbetweens*.



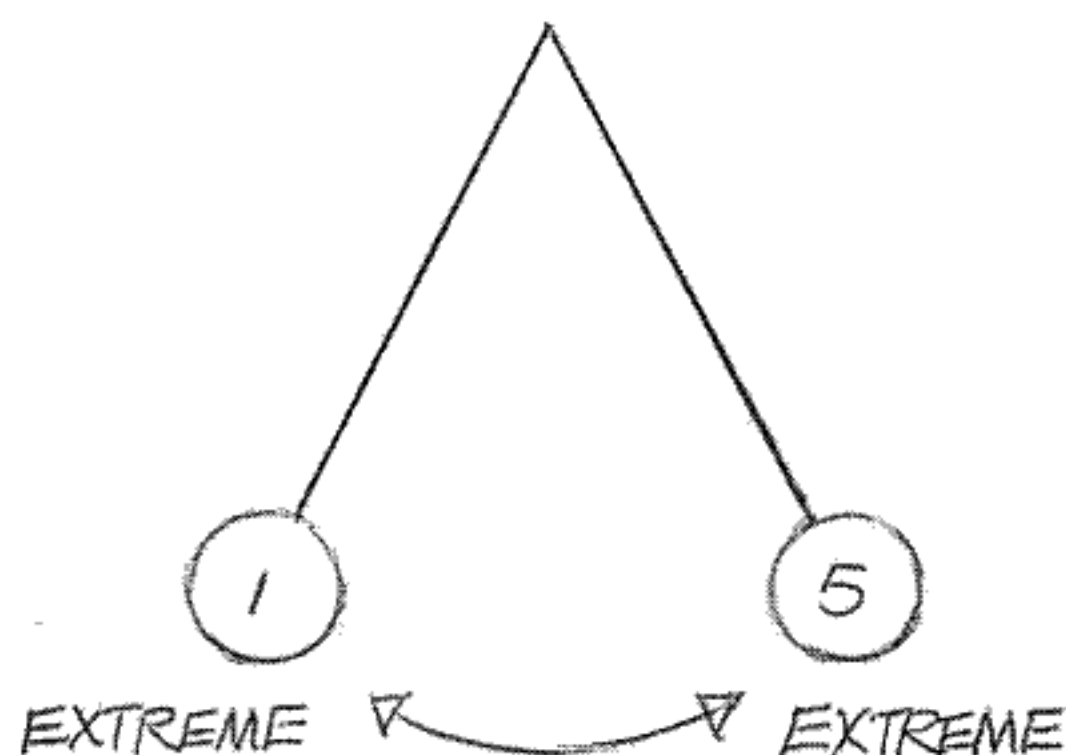
We'll put in three even inbetweens between the two extremes.

Number 3 is smack in the middle between 1 and 5. Then we put number 2 right in the middle between 1 and 3 – and number 4 in the middle between 3 and 5. We've got the inbetweens spaced evenly.

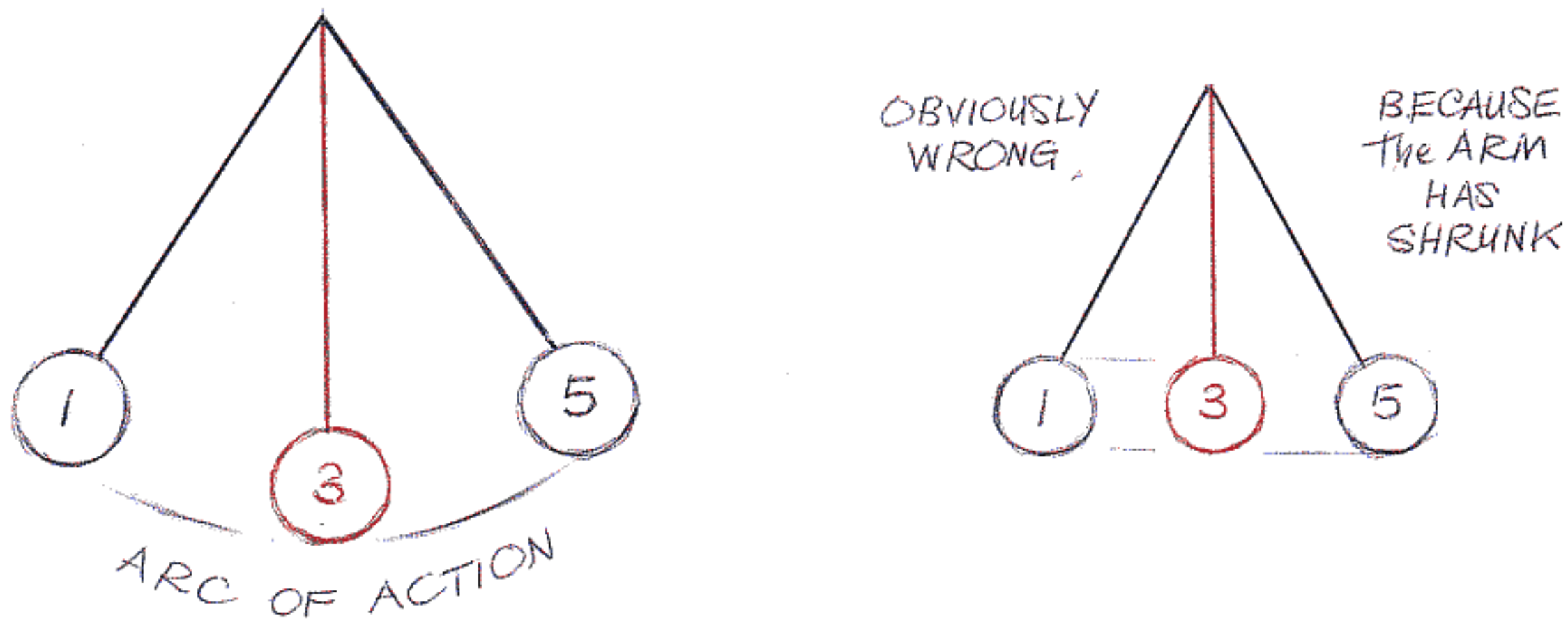


EXTREMES and BREAKDOWNS

Take the example of a swinging pendulum: The extremes are where there is a change in direction – the ends of the action where the direction changes.

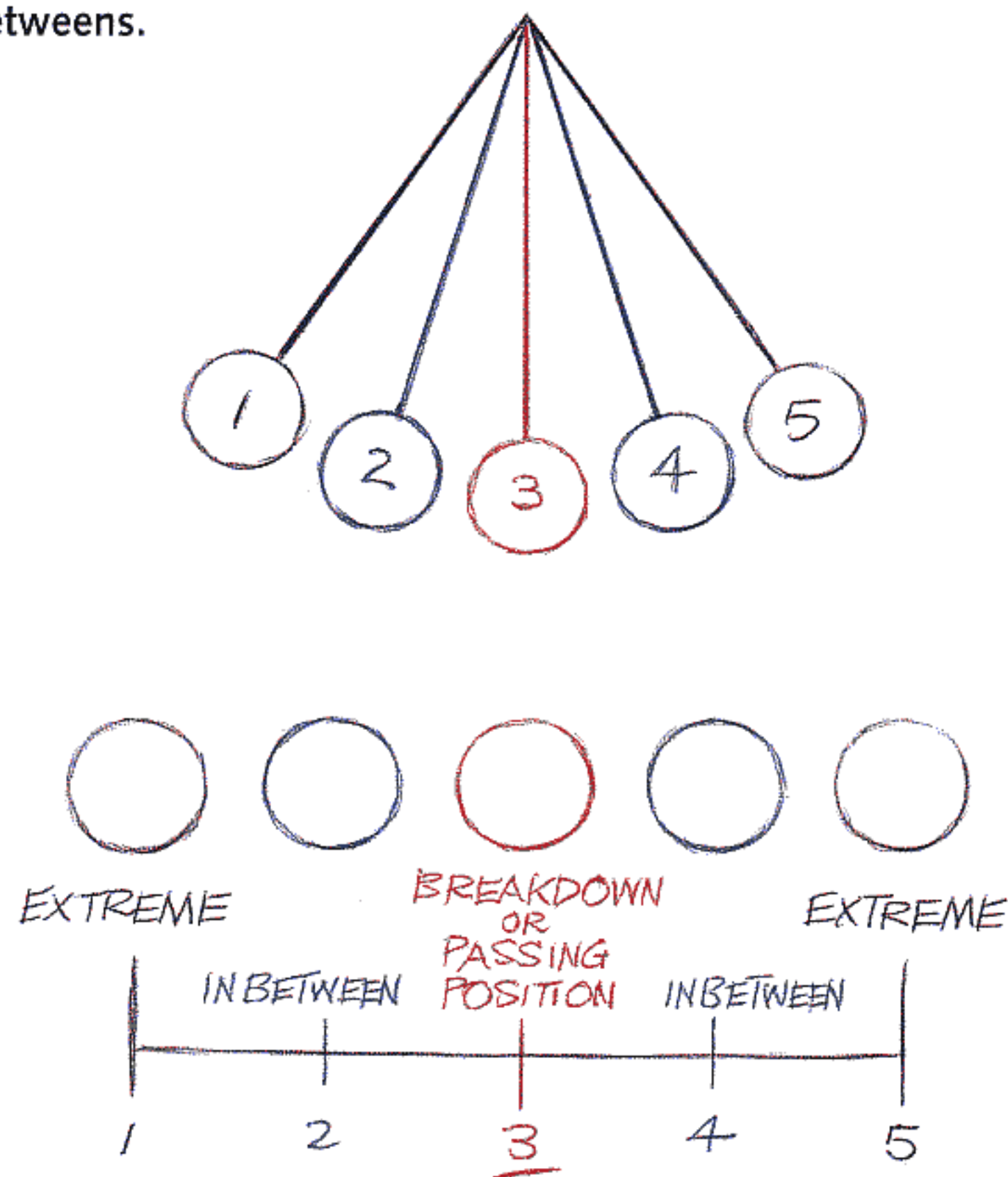


Because the pendulum's arm maintains its length as it swings, the middle position creates an arc in the action. We can see how important that middle position between the two extremes is going to be to us.



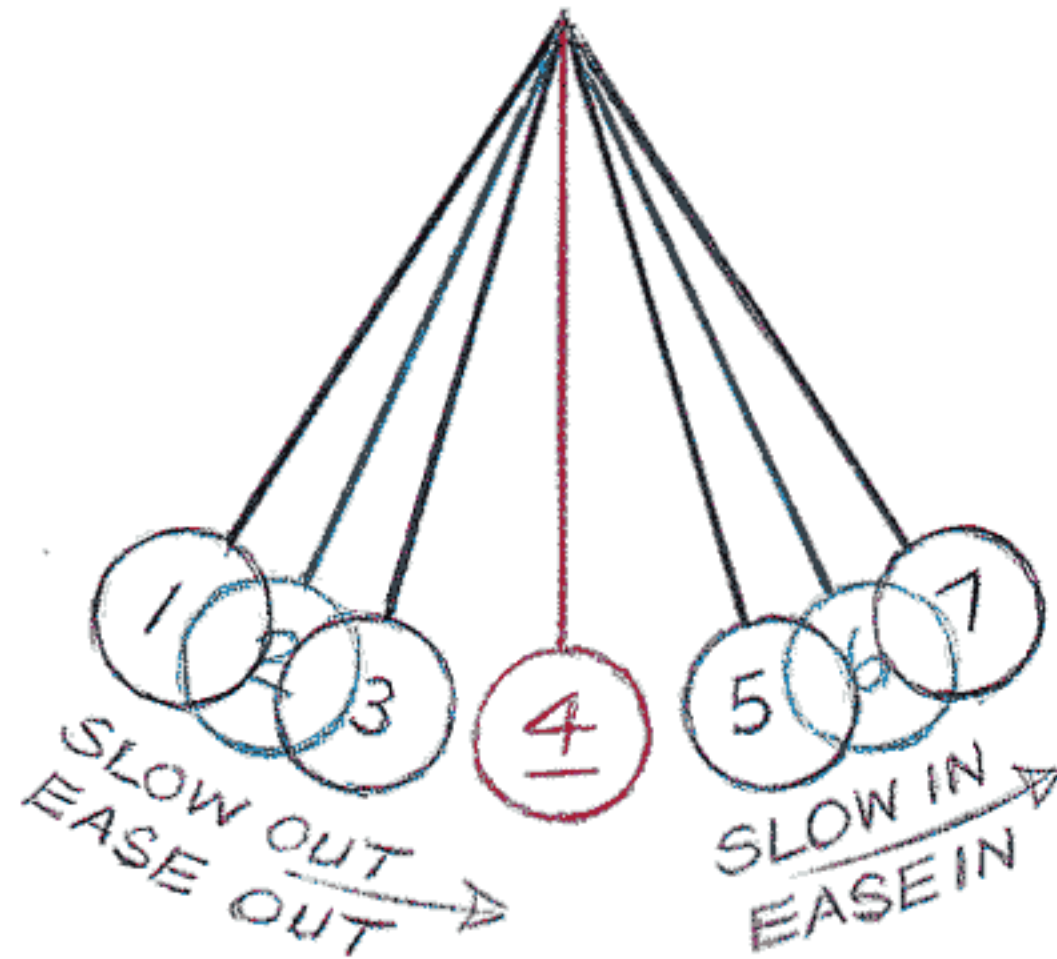
It's obvious how important this middle position is. In the 1930s they called this the 'break-down' drawing or 'passing position' between two extremes.

We'll add two inbetweens.



Some animators underline the breakdown or passing position because it's so important to the action. I have the habit of doing this because it's a position which is crucial to helping us invent. We're going to make tremendous use of this middle position later . . .

If we want to make our pendulum ease in and out of the extreme positions, we'll need a couple more inbetweens:

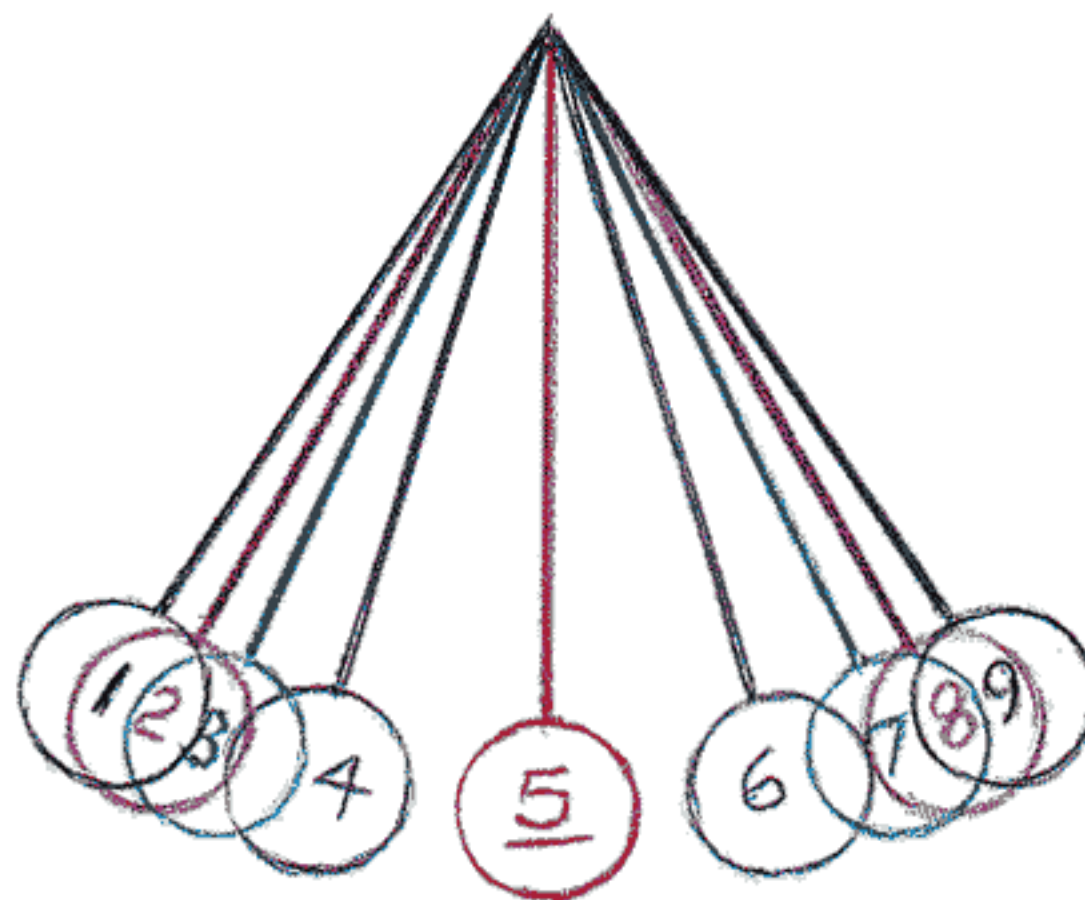


So our chart will look like this.



What we're doing is easing in or easing out of the extreme positions. 'Slowing in' or 'slowing out' is the classical terminology for it, but I prefer today's computer animators' term of 'easing in' and 'easing out'.

To make the action even slower at the ends, let's add a couple more inbetweens.



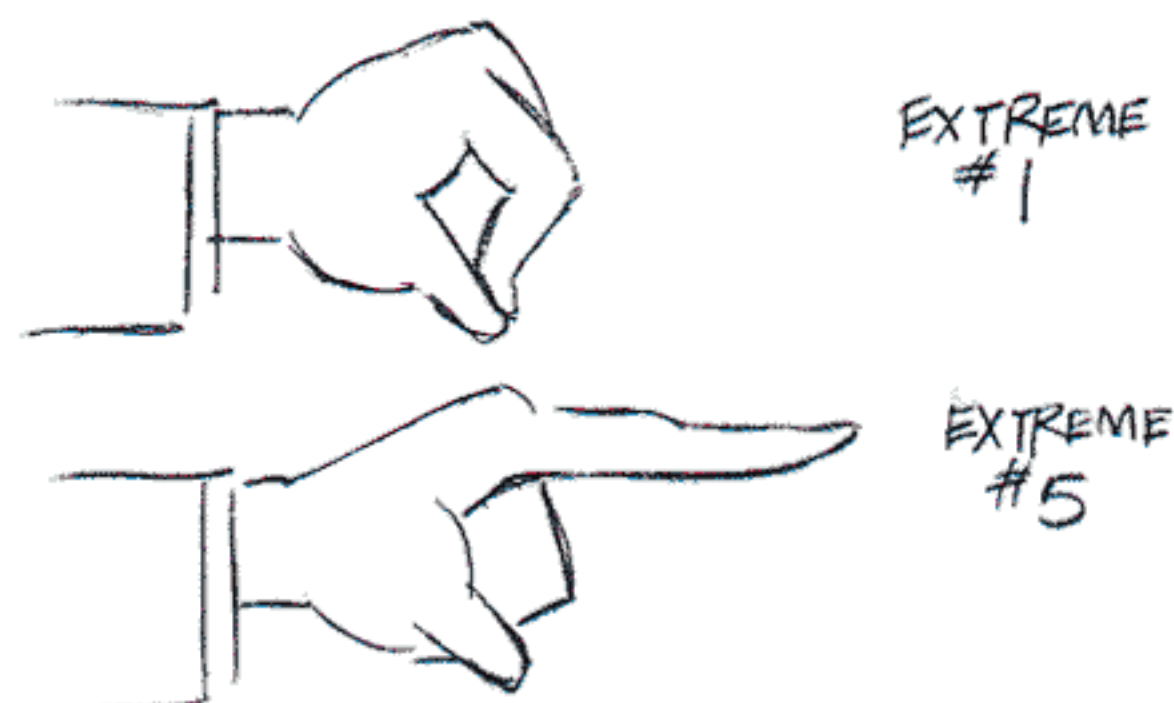
Now our chart will look like this.



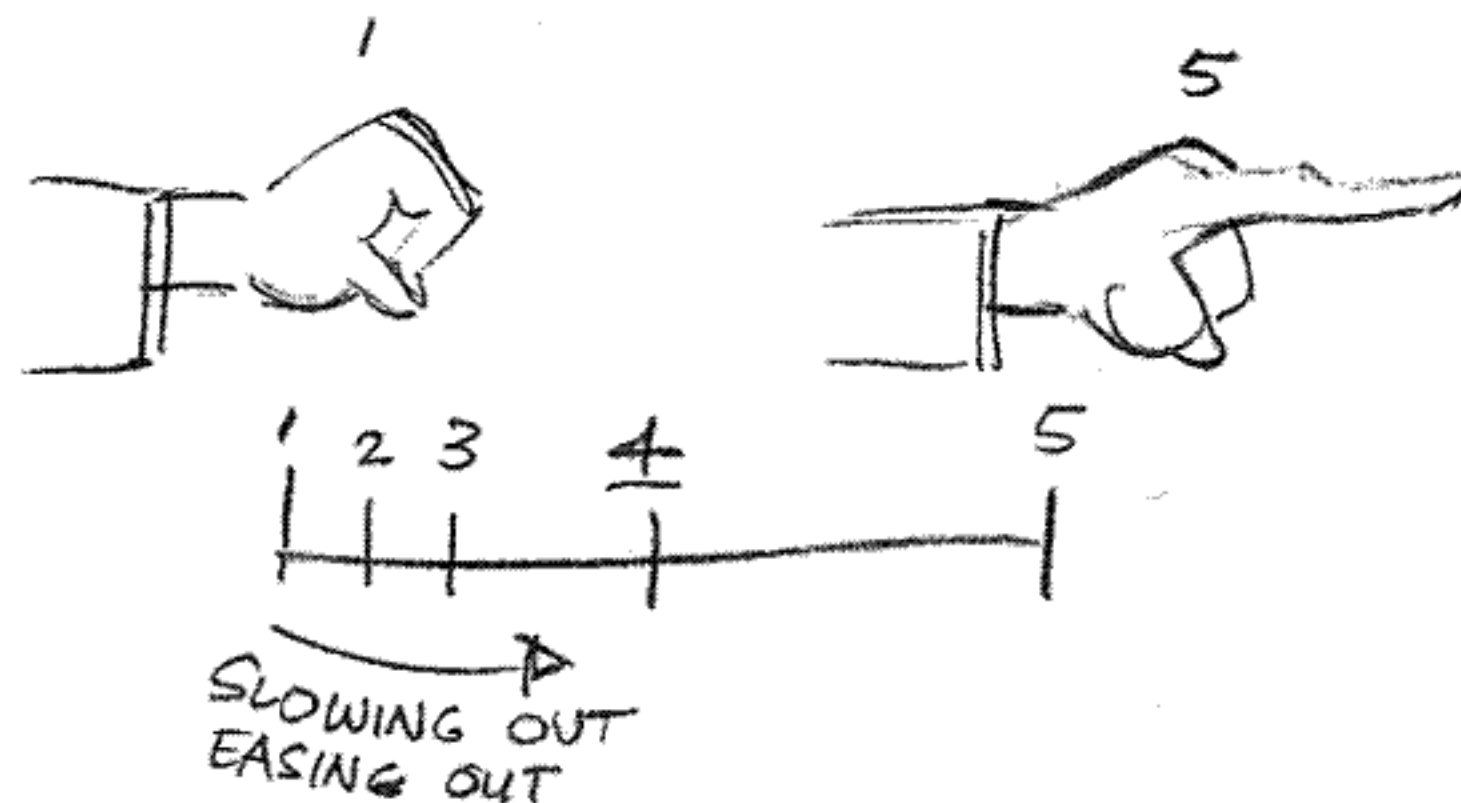
Ken Harris always called it 'cushioning' – which is a nice way to think of it.

Master animator Eric Larson – who became the instructor of the younger Disney animators – says that what animation has to have is a change of shape.

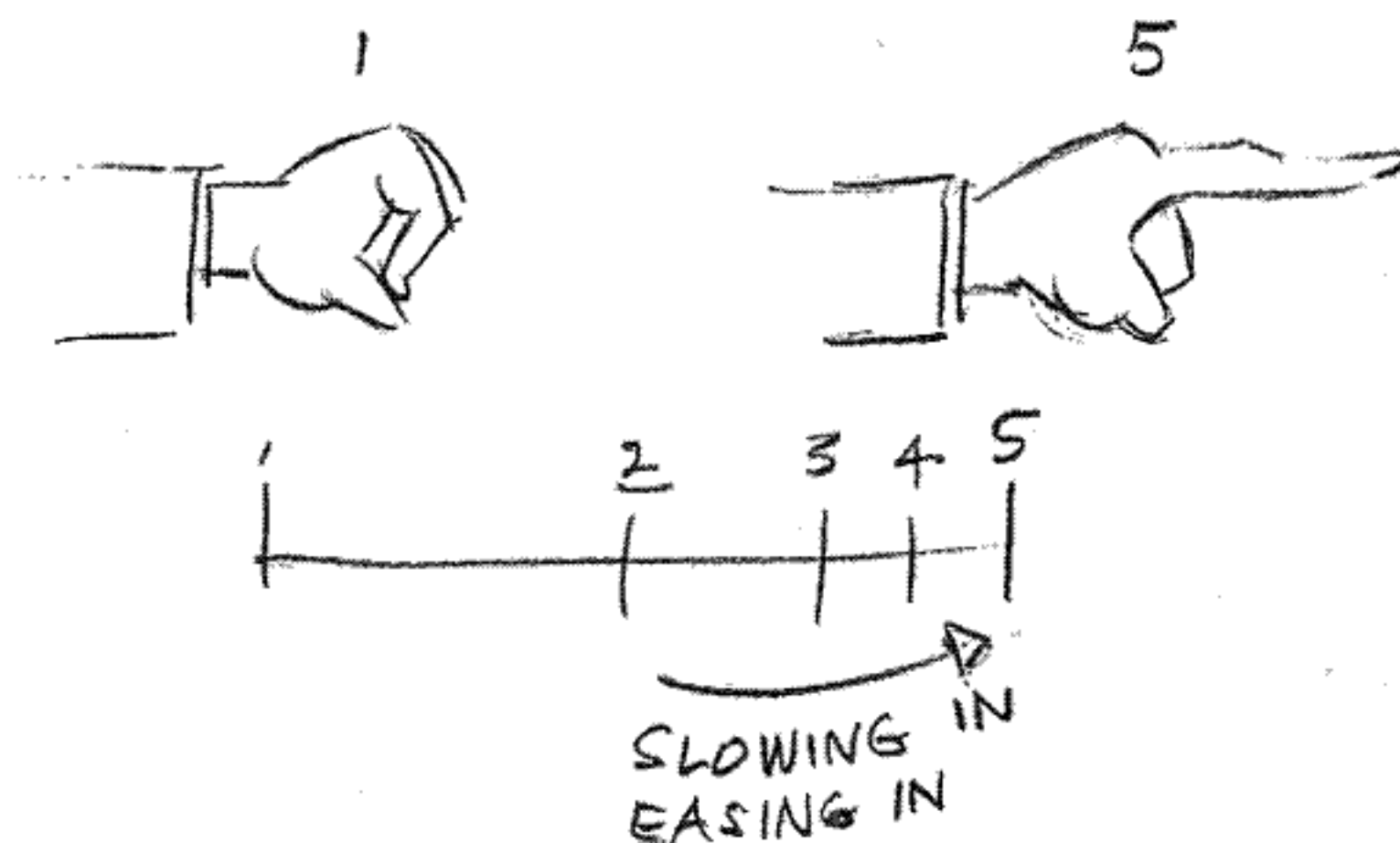
So, let's change from a closed hand to a pointing finger.



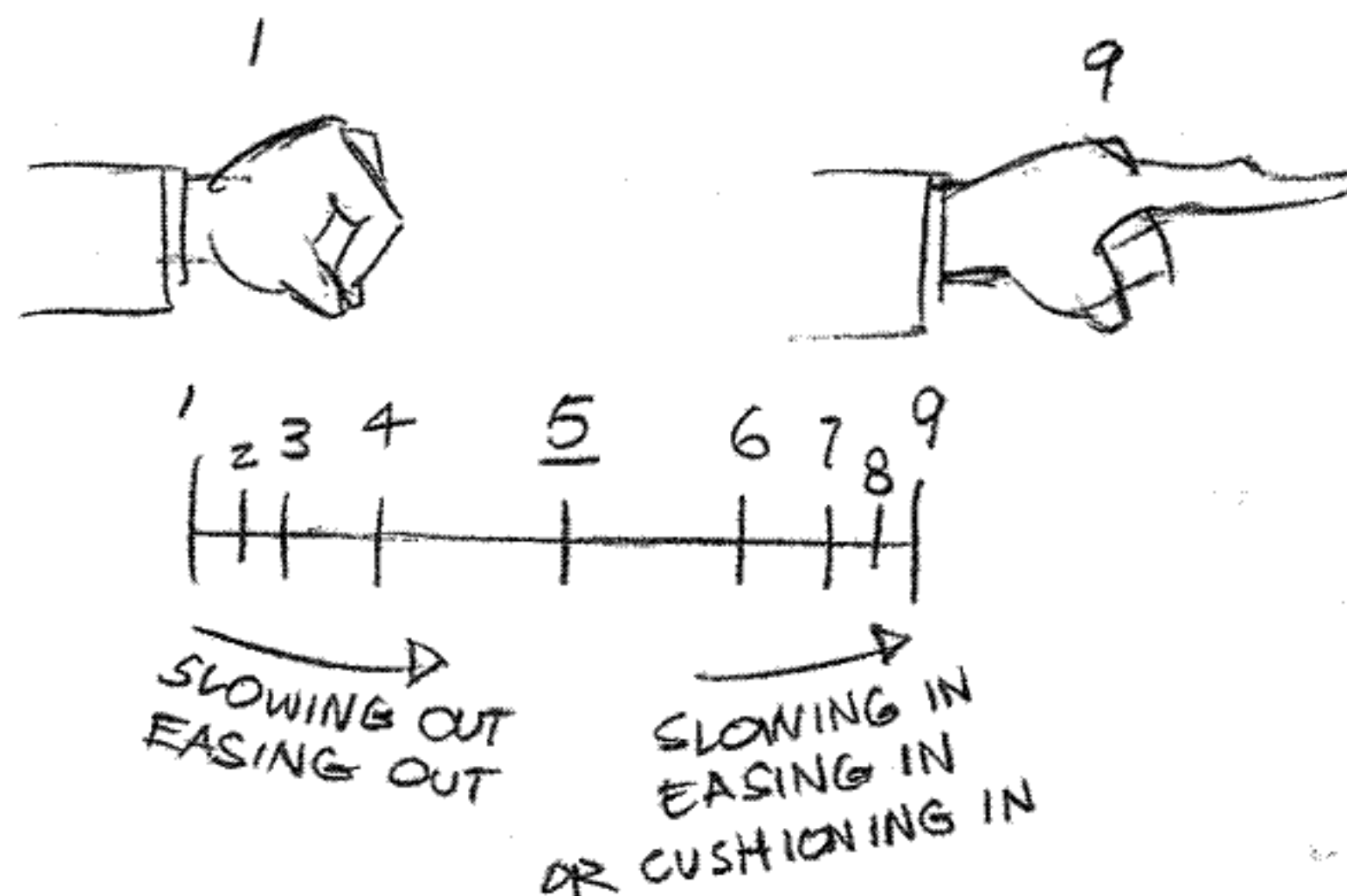
If we 'ease out' of number 1 in order to point – number 5 – the chart will be:



Alternatively, if we 'snap out' or 'speed out' of the closed hand and 'ease in' or 'cushion in' to the pointing finger the chart will be:



For a more relaxed, slower action we could add more inbetweens and ease out of the closed hand, and speed through the middle, and then ease in to the pointing finger.



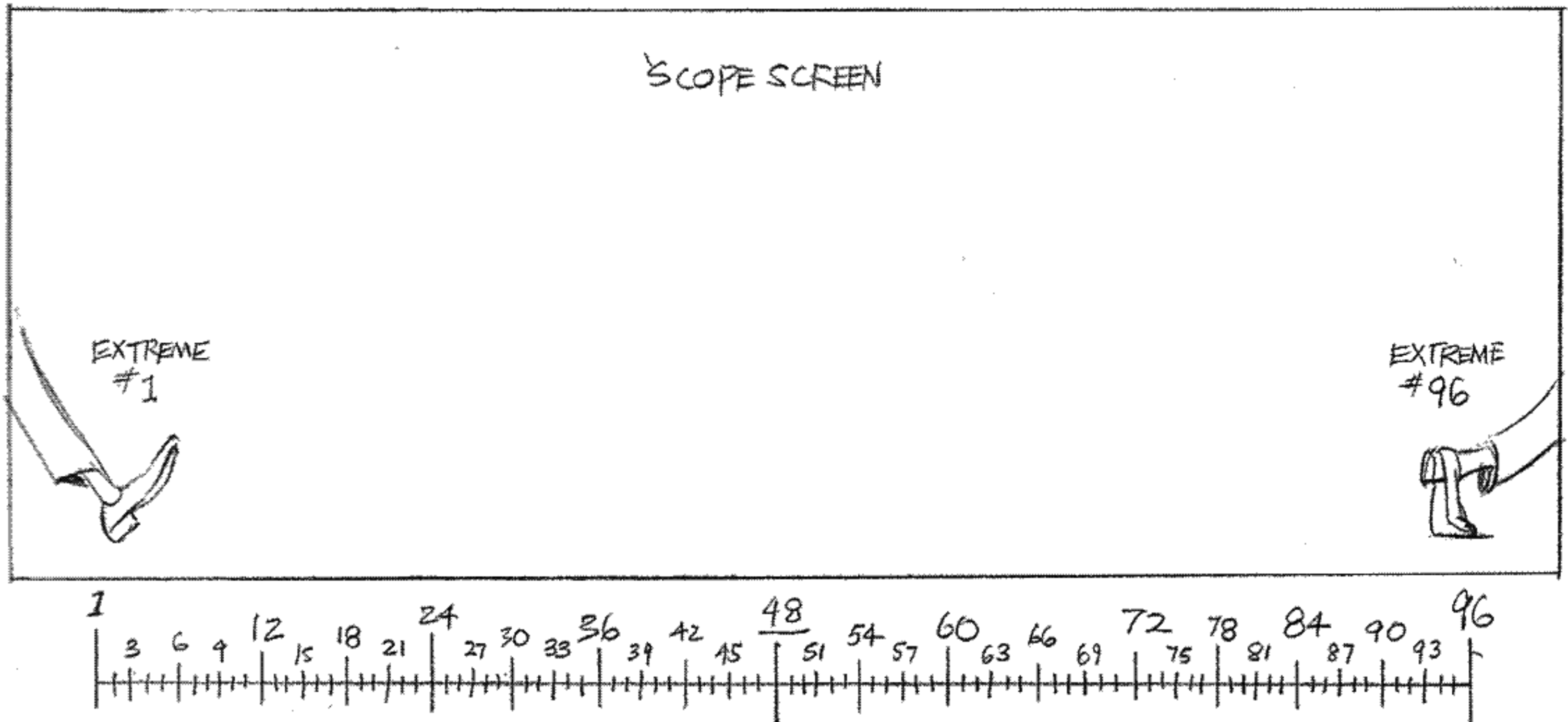
The animator can get away with just drawing the two extreme positions and making a chart for the assistant to put in all the inbetween positions.

I was spoilt by being taught by marvellous, hardworking, top Hollywood animators and I had a few shocks when I worked with some of the lesser mortals.

Here's how a Hollywood hack animator might duck the work:

A character enters screen left . . .

and goes out screen right.



To walk across the screen it's going to take 4 seconds – 96 frames. So the animator does drawing number 1 and drawing number 96 and gives this chart to the assistant and goes off to play tennis. He wanders back in next day and blames the assistant for the terrible result.

This may seem far-fetched, but it does happen.

Moving on – we know the extremes and the breakdowns are crucial to the result, but the inbetweens are also very important.

The genie in the computer creates perfect inbetweens, but for 'drawing' people – getting good inbetweens can be a real problem.

Grim Natwick constantly intoned, 'Bad inbetweens will kill the finest animation.'

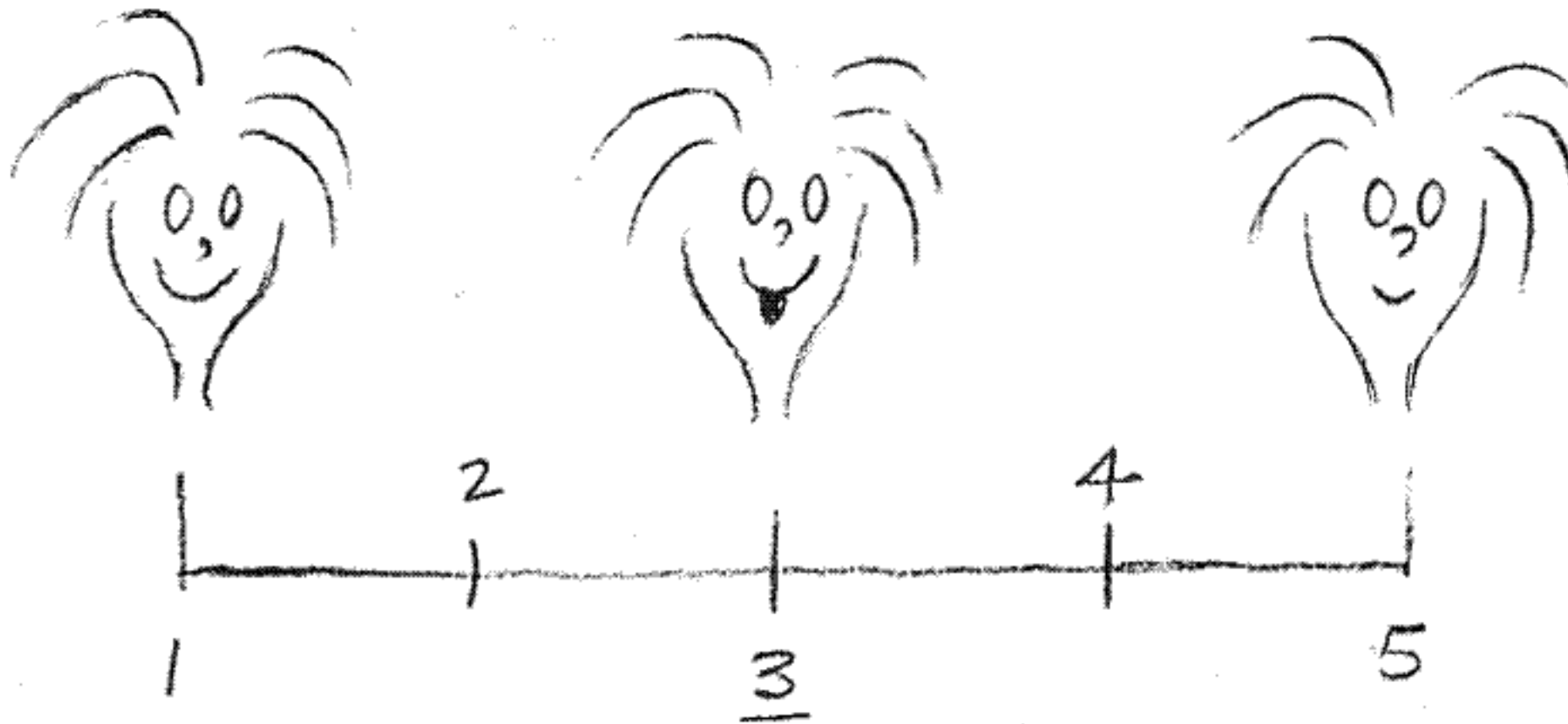
In 1934, when the novice Milt Kahl – having just started work at Disney – first met the great Bill Tytla, he told Tytla that he was working in the inbetweening department. Tytla barked, 'Oh yeah? And how many scenes have you screwed up lately?'

Like most people starting out, I did all my own inbetweens. Then I got my first 'official' job animating for UPA in London. They gave me an inexperienced assistant who drew well, but this is what happened:

We had a simple character of the period, a little girl called Aurora who was advertising Kia Ora orange drink. 'Where's the Kia Ora, Aurora?'

She looked like this.

I drew drawings 1 and 3 and 5, my assistant put in inbetweens 2 and 4.



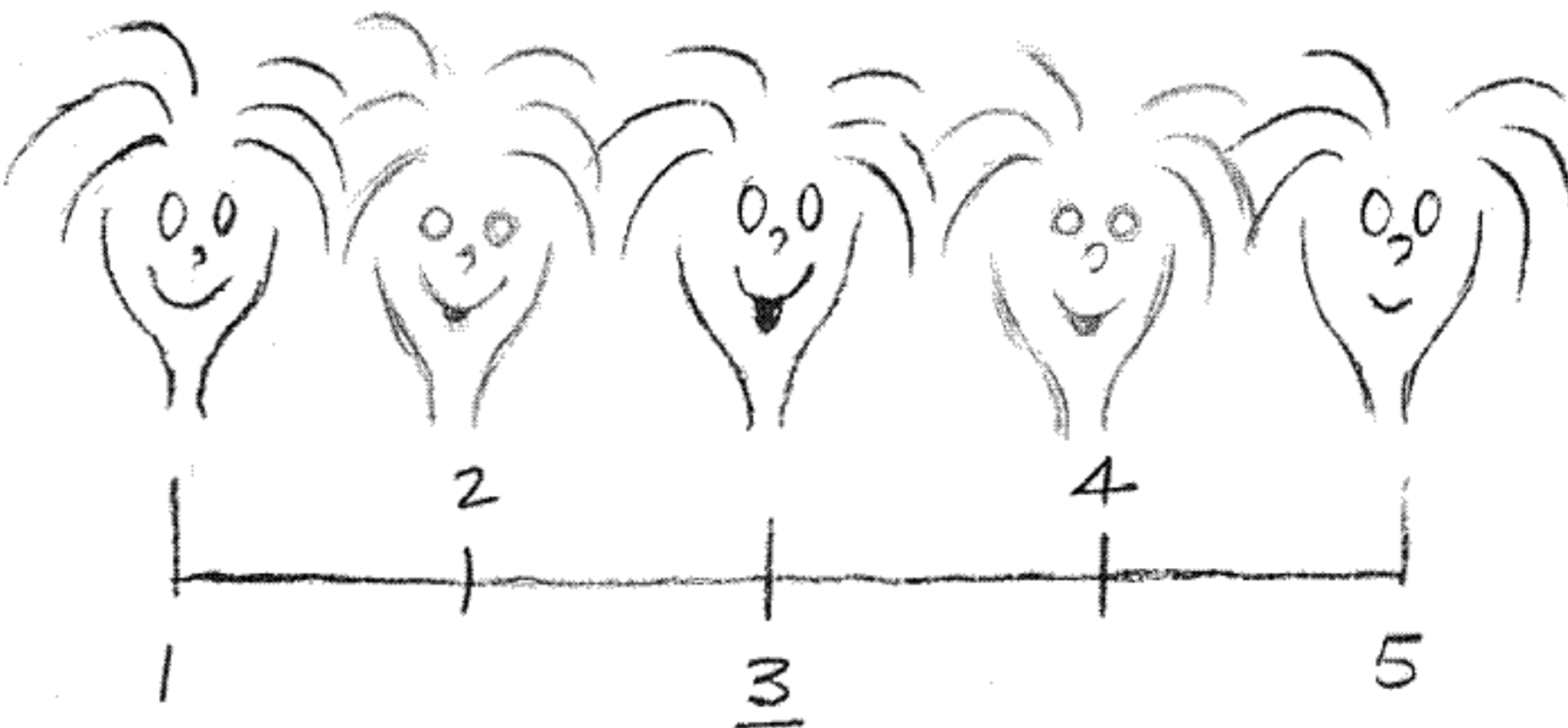
He had ambitions as a designer and he didn't like egg-shaped eyes like this:



He liked circular eyes like *this*:



So the inbetweens all went in like this:



The result on the screen, of course, is this:

Wobble, wobble, wobble.

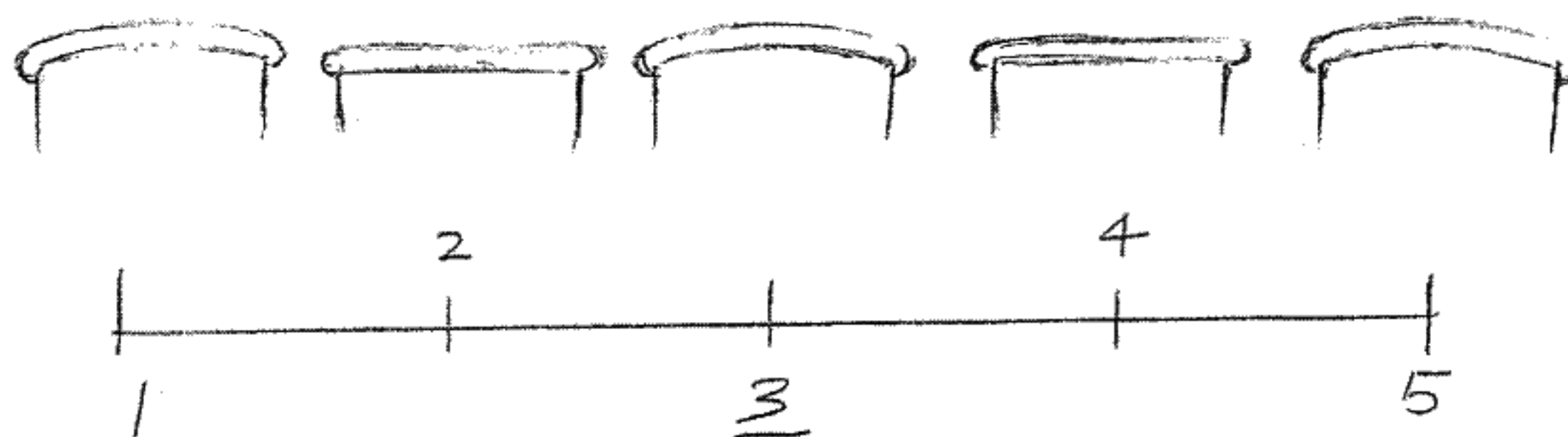


As is common in production when racing to meet the deadline, we end up hiring anybody off the street who can hold a pencil. And this is what happens:

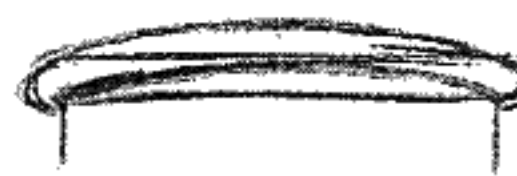
Say a live actor is holding an animated coffee cup –



The inbetweener from the streets doesn't understand simple perspective – so the curved top of the cup gets put in *straight* on the inbetweens.



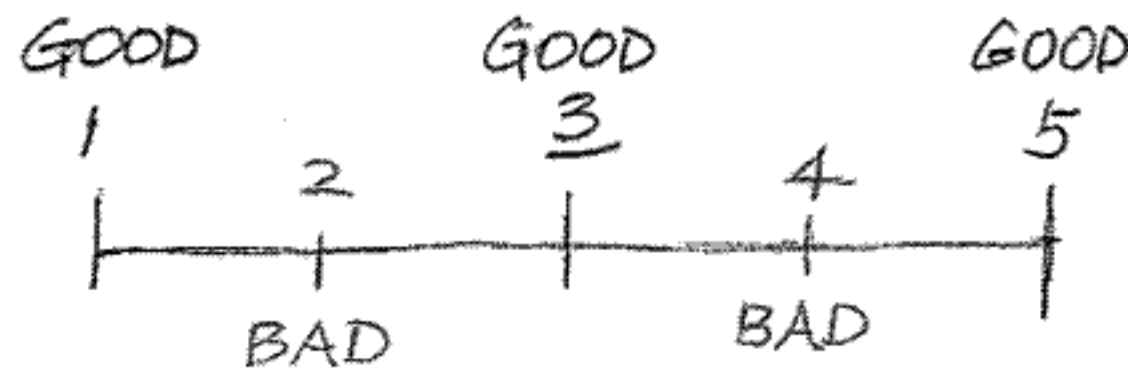
Result: 'Frying tonight.' Wobble, wobble, wobble.



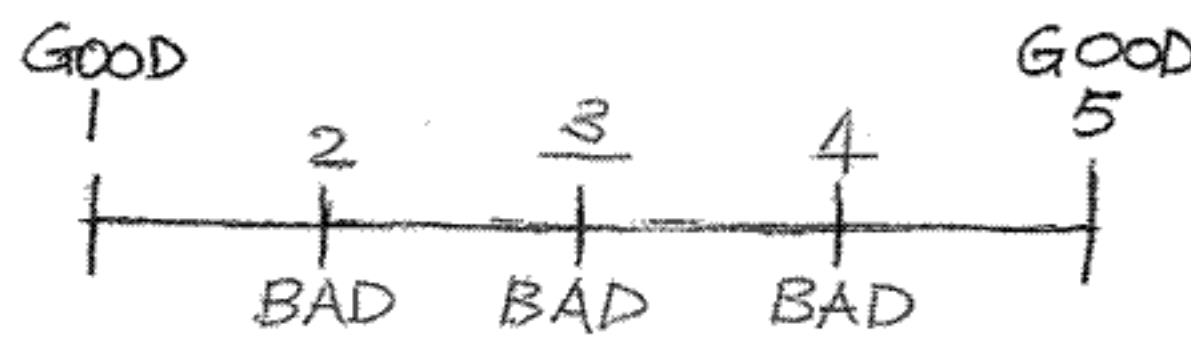
And if it's this wobbly with a simple thing, just imagine what it's going to be like when we are dealing with complex drawings. All the shapes will be doing St Vitus's dance. So the assistants' or inbetweener's job is really *volume control*.

A lot of assistants worry about the quality of their line – matching the animator's line quality. I always say never mind the line quality – just get the volumes right. Keeping the shapes and volumes consistent = volume control! When the thing is coloured in, it's the shapes that we see – it's the shapes that dominate.

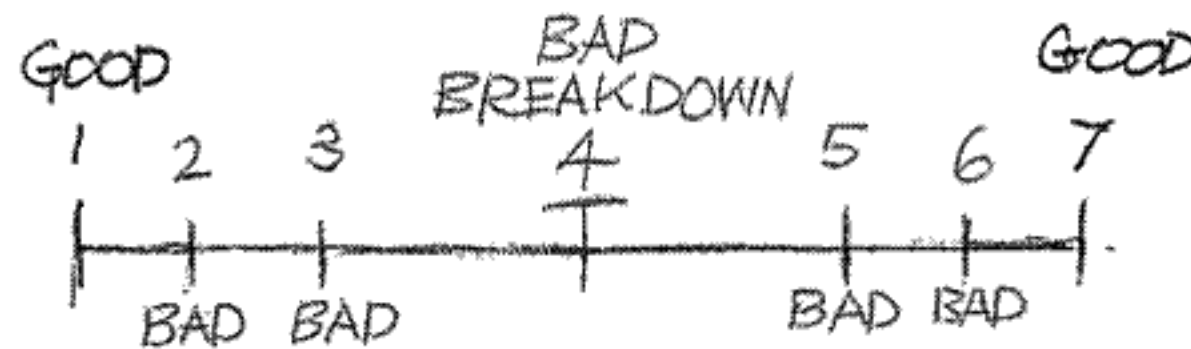
Whenever we were under the gun and short of skilled helpers, we found if we outnumbered the dodgy inbetweens by three good drawings to two bad ones – we just scraped through with an acceptable result.



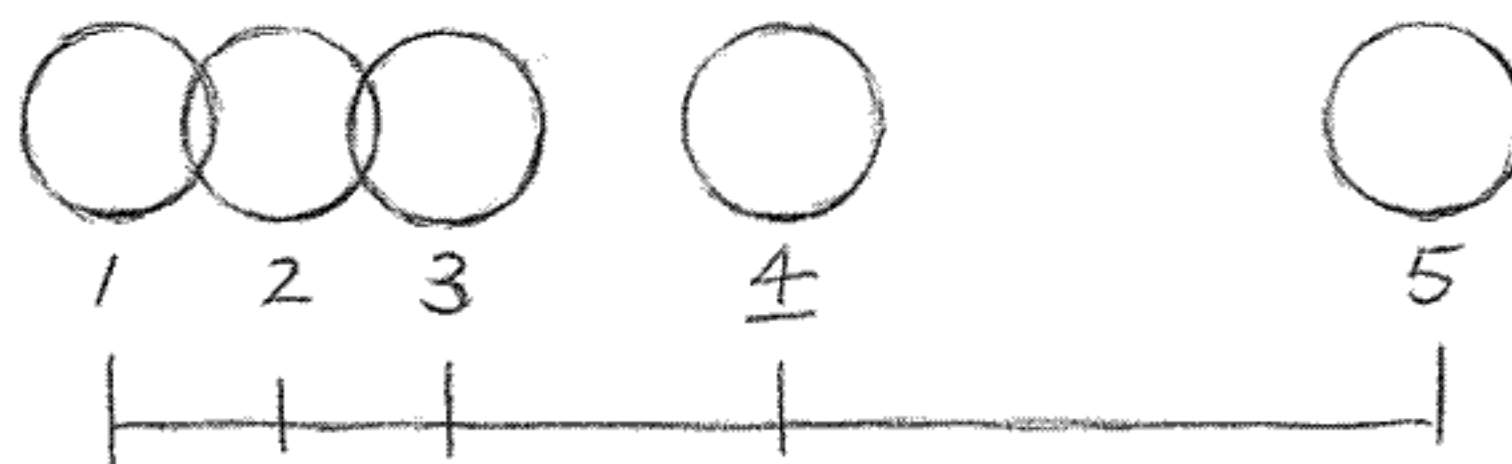
When we only had two good ones with three bad ones in between them – the bad ones outnumbered the good ones and the result was lousy.



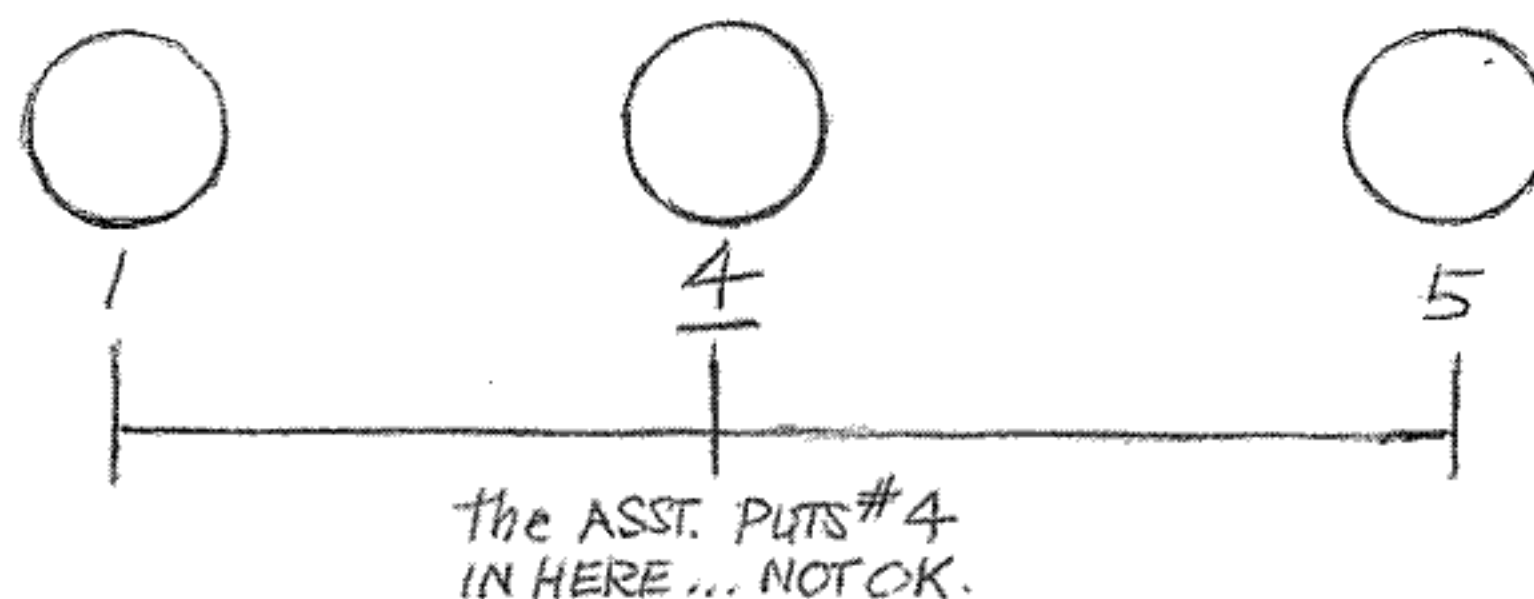
If the breakdown or passing position is wrong, all the inbetweens will be wrong too.

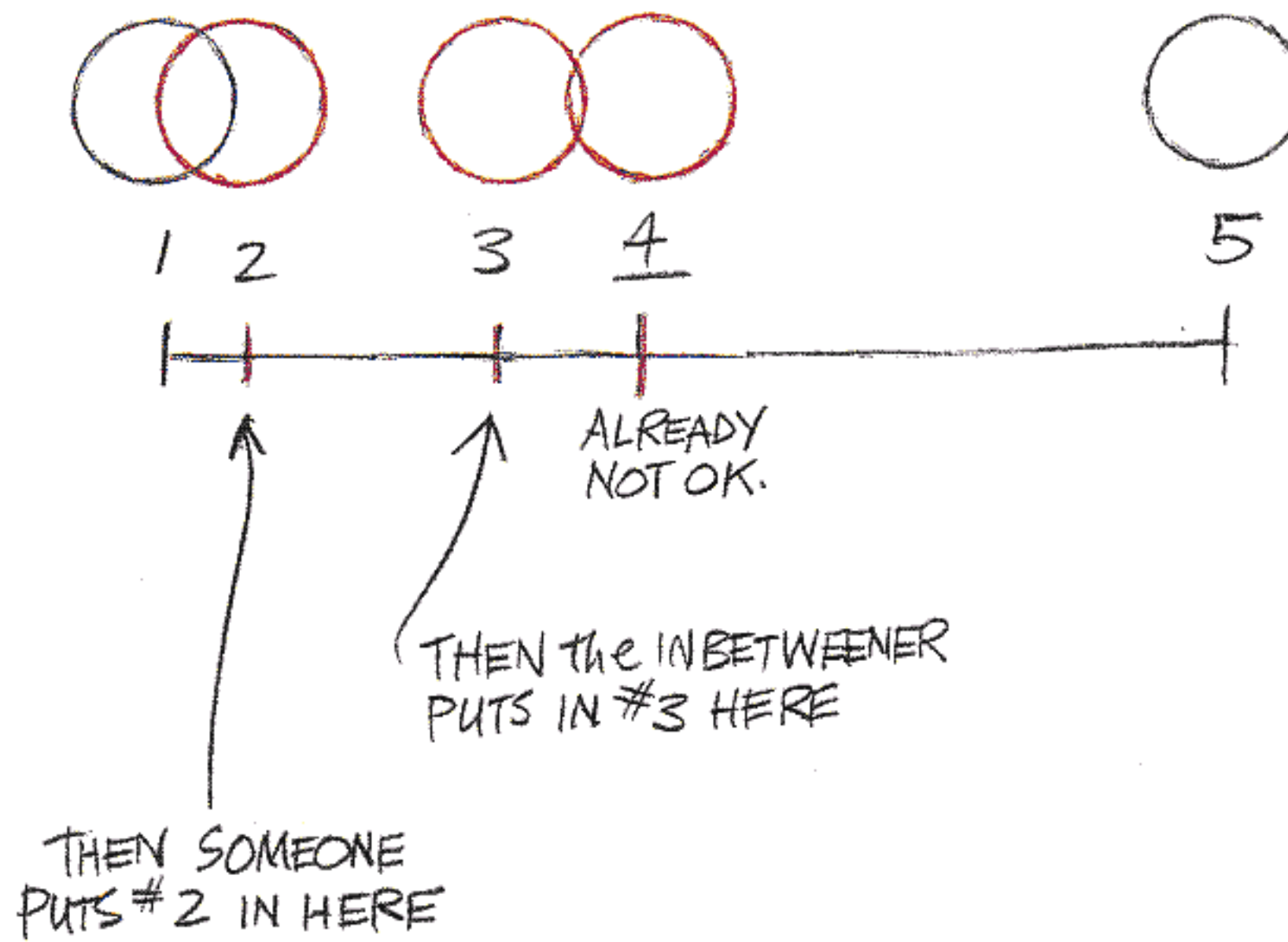


When we're not accurate, here's what happens: The animator supplies a chart and wants equal inbetweens. This is putting them in the right place.



But let's say the assistant puts the breakdown or passing position slightly in the wrong place –





So: Number 4 is wrong.
 3 compounds it.
 2 compounds it more.

And instead of ending up with fluid actions like this –

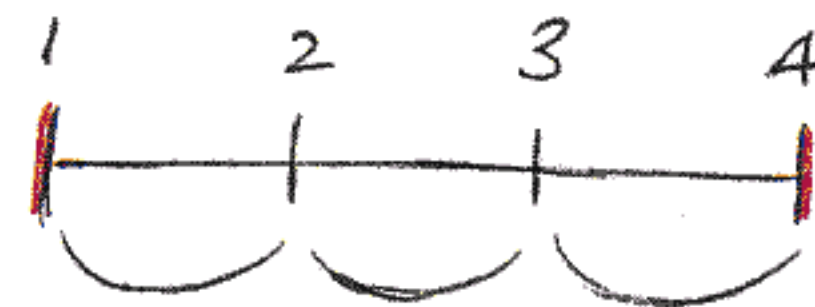


– we'll get this all-over-the-place kind of thing.

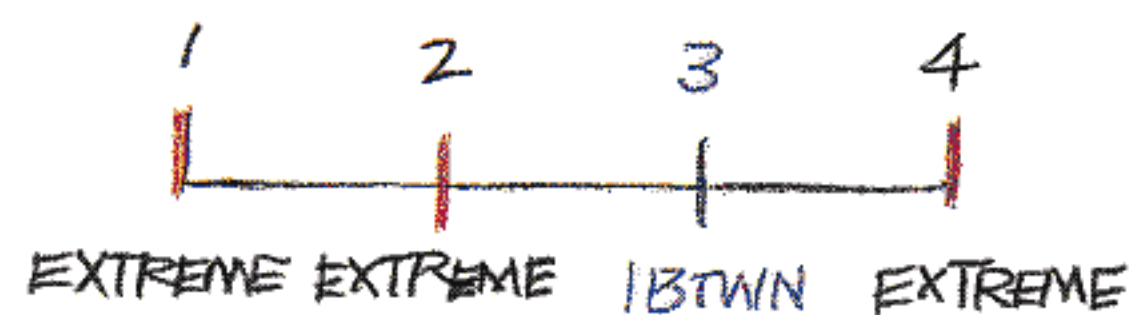


One thing an animator should *never* do is to leave his assistant to make 'thirds'.

If we need to divide the chart into thirds –

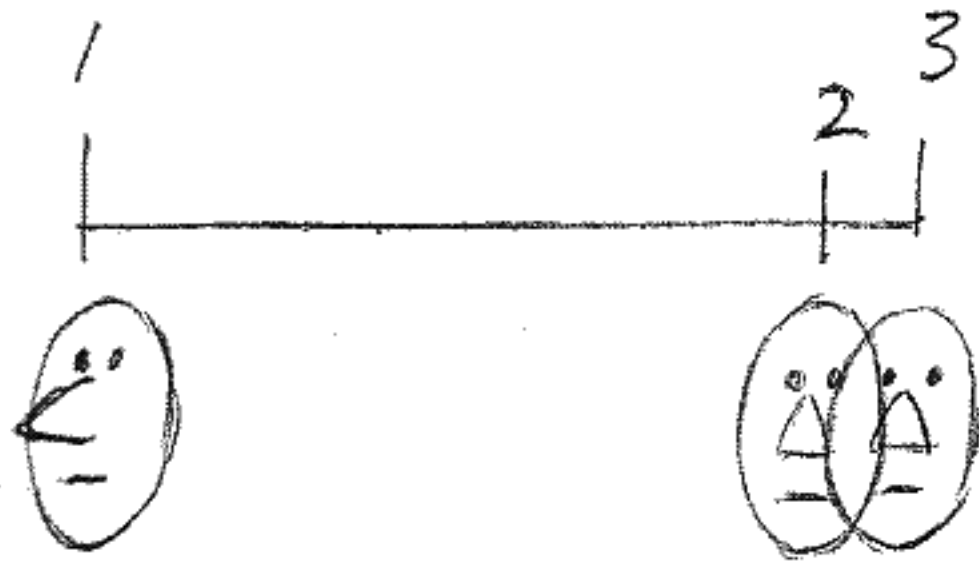


– the animator should make one of the inbetween positions himself –

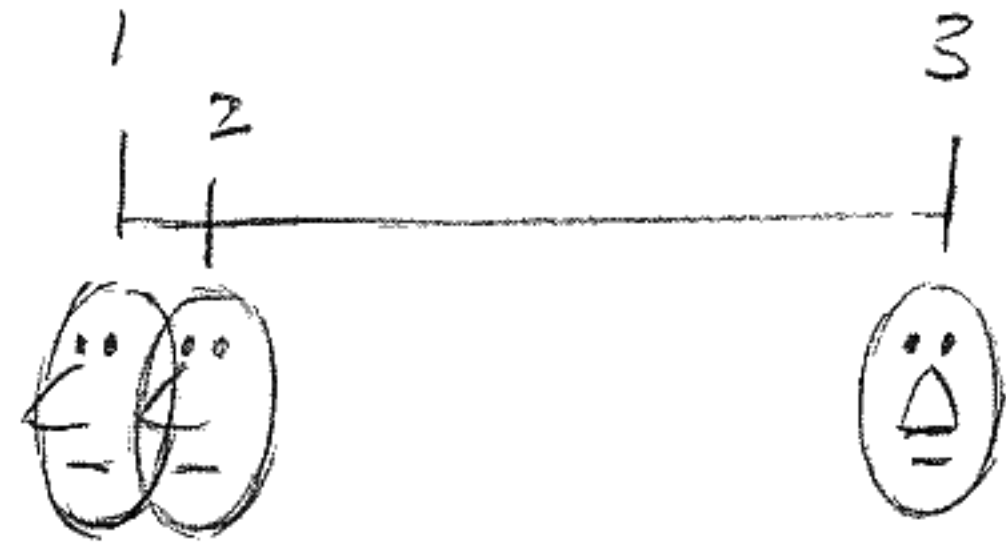


– in order to leave the assistant to put in the remaining position in the middle.

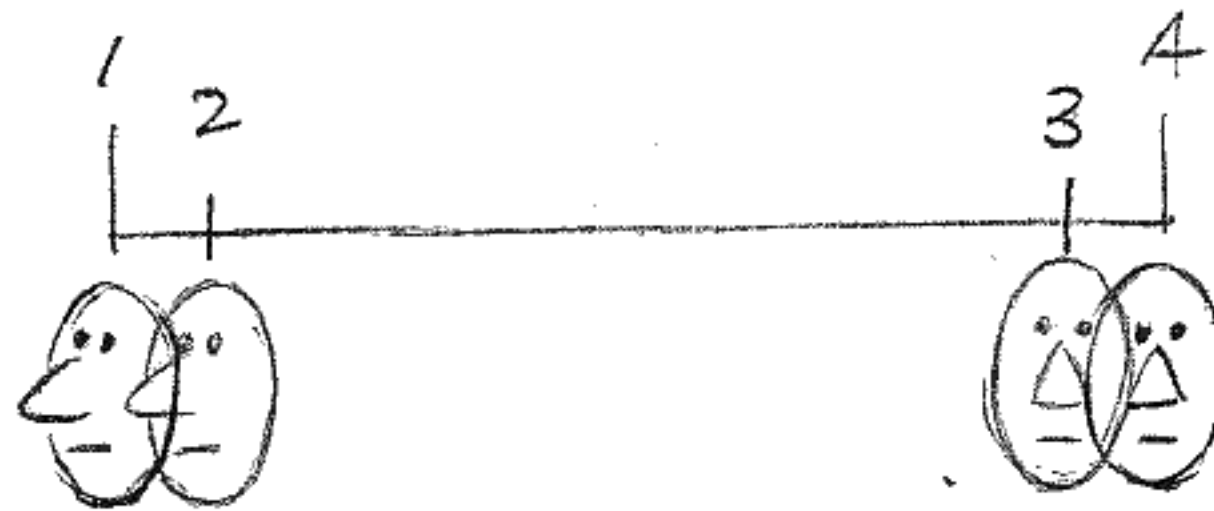
Leaving thirds to the assistant is cruel and is asking for trouble – but it's fair to make a chart like this, calling for an inbetween very close to an extreme:



MAKE ONE INBTWN CLOSER TO 3



MAKE ONE IBTWN CLOSER TO



MAKE ONE IBTWN CLOSER TO 1

MAKE ANOTHER IBTWN CLOSER TO 4

KEYS

And now we come to the Great Circling Disease. For some reason, animators just *love* circles. We love to circle the numbers on our drawings. Maybe it's because, as old Grim Natwick said, 'Curves are beautiful to watch.' Or maybe it's just a creatively playful thing.

I once worked with a Polish animator who circled every single drawing he made!



'Is animation, man! Circle! Circle! Circle!'

You'll notice that so far I haven't circled *any* extreme positions. In this clear working system and method developed by the 1940s, the extremes are *not* circled, but the key drawing *is*. The drawings which *are* circled are the 'keys'.

Question: What is a key?

Answer: The storytelling drawing. The drawing or drawings that show what's happening in the shot.

If a sad man sees or hears something that makes him happy, we'd need just two positions to tell the story.



KEY



KEY

These are the keys and we circle them.

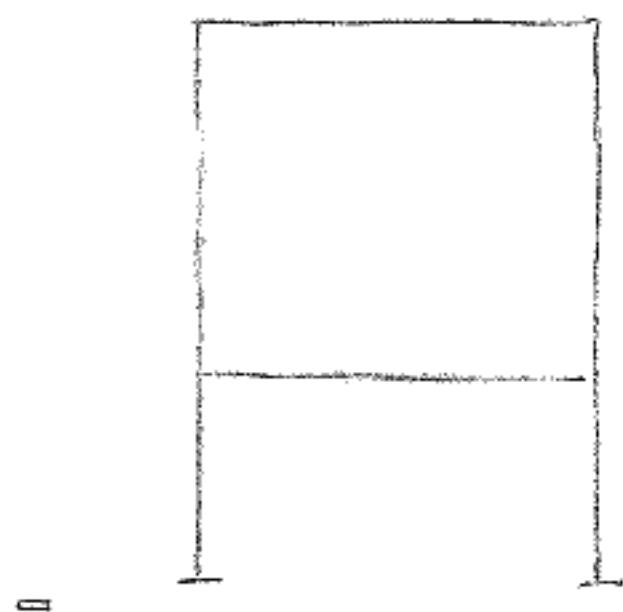
These are the drawings we make first. How we go interestingly from one to the other is what the rest of this book is about.

Take a more complex example:

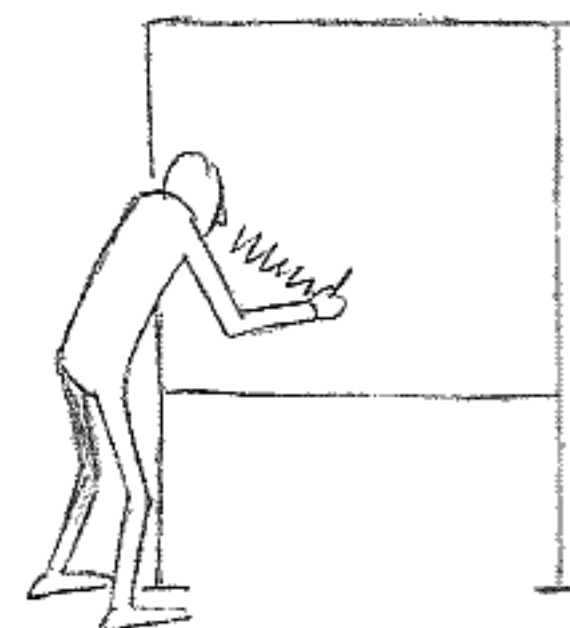
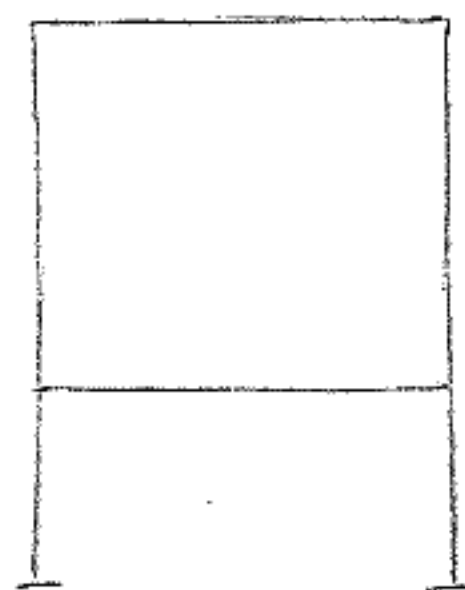
Let's say a man walks over to a board, picks up a piece of chalk from the floor and writes something on the board.



KEY



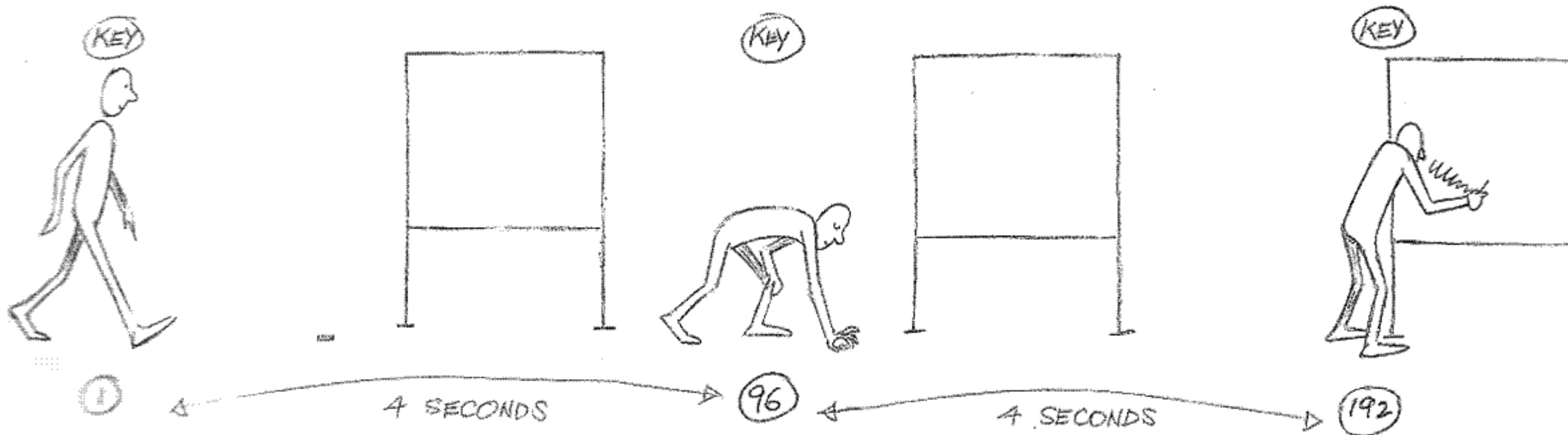
KEY



KEY

If it was a comic strip or if we wanted to show what's happening on a storyboard, we'd need only three positions. We'll keep it simple and use stick figures so we don't get lost in detail. These three positions become our keys and we circle them.

The keys tell the story. All the other drawings or positions we'll have to make next to bring the thing to life will be the extremes (not circled): the foot 'contacts', the passing positions or breakdowns and inbetweens.



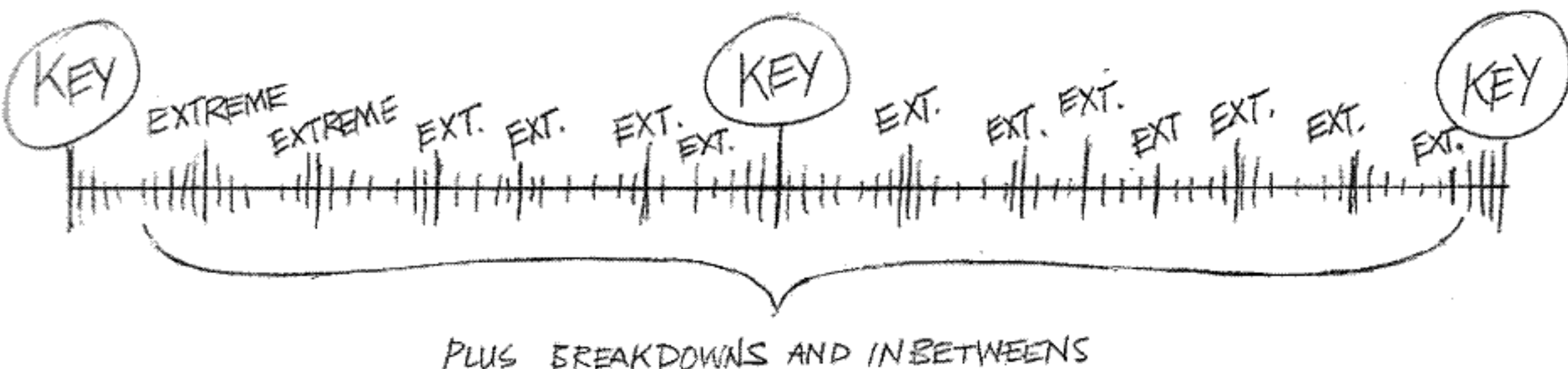
If we time this action out with a stopwatch, we might find that our first key position at the start will be drawing 1. Say it takes him 4 seconds to walk over and contact the chalk on the floor – we'd circle the second key drawing as 96. And when he's stood up, stepped over and written his stuff, it might take another 4 seconds – so our third key could be the last drawing in the shot – 192. The whole shot would then take 8 seconds.

Of course, we don't need to time it all out first, but before we dive into animatorland with all that stuff, we have to clearly set out with our keys what it is we're going to *do* – and we can test our three drawings on film, video or computer.

We haven't dealt with how he or she moves – whether the character is old or young, fat or thin, tall or short, worried or happy, beautiful or ugly, rich or poor, cautious or confident, scholarly or uneducated, quick or slow, repressed or uninhibited, limping or fit, calm or desperate, lazy or energetic, decrepit or shaking with the palsy, drunk or frightened, or whether it's a cold-hearted villain or a sympathetic person – in other words all the 'acting' stuff, plus all the trimmings – clothes, facial expressions etc.

But what we *have* done is made it very plain what *happens* in the shot before we start.

If we were to make a diagrammatic chart of the whole scene, it would end up looking something like this:



Important animators are called key animators, and word got round that they just draw the keys – anything that they draw is a key – and slaves fill in the rest according to the little charts provided by the key animators. Wrong. A key animator is simply like a key executive – an important one.

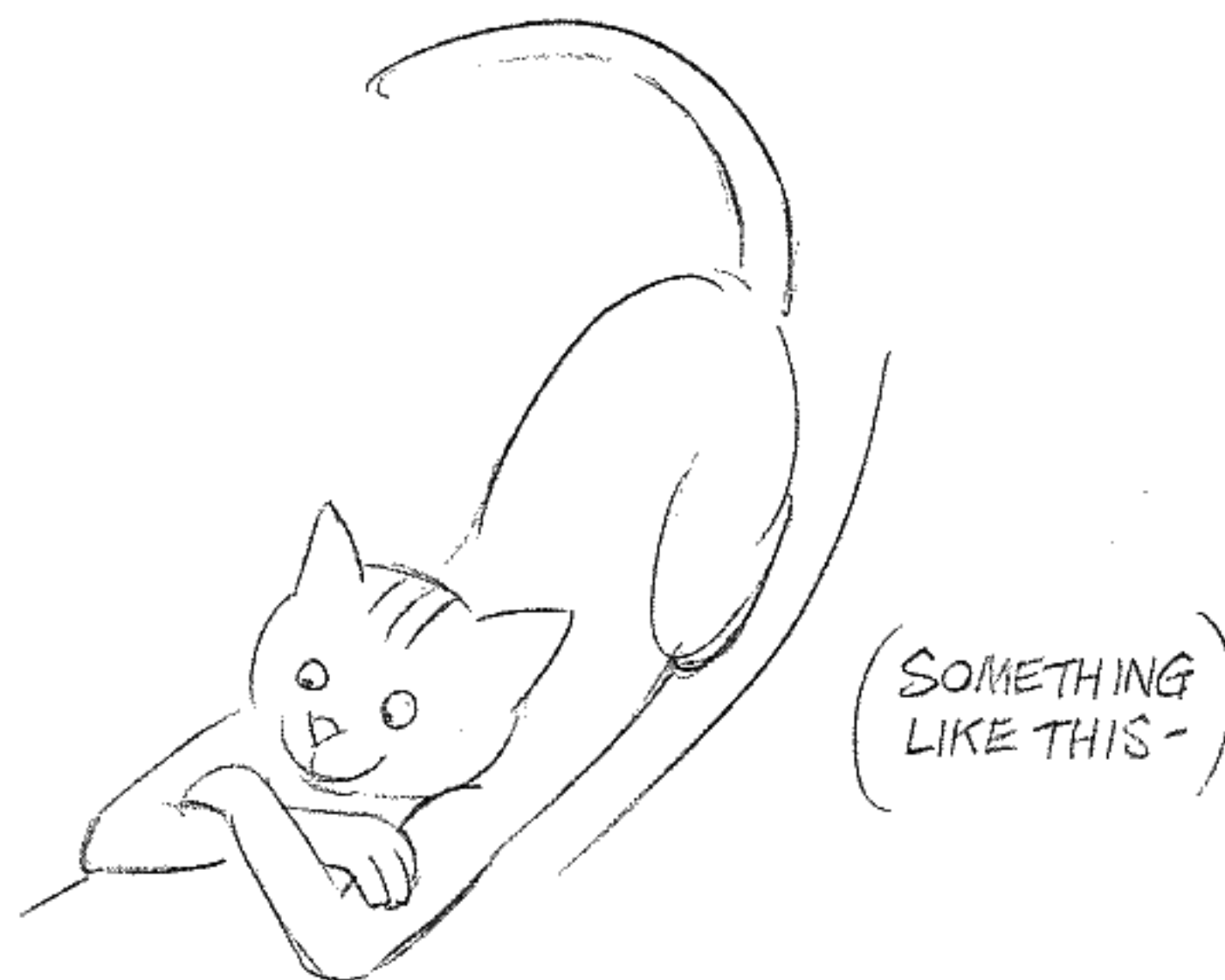
Many good animators call all their extremes 'keys' – I sure used to. But it makes life so much clearer and easier if you separate the keys from the extremes. Actually, I never heard Ken Harris ever call a drawing a key, but he would say, 'Draw *that* one first. *That's* an important drawing.' And it was a key, really.

I've worked every system, good, bad or half-baked, and experience has convinced me that it's best – even crucial – to separate the storytelling keys from the extremes and all the other stuff. (Of course, as in our example above, the three keys will also function as extremes.) Separating them out stops us getting tangled up and missing the point of the shot, as we vanish into a myriad of drawings and positions.

There may be many keys in a scene – or maybe just one or two – it depends on what it is and the length of the scene. Its whatever it takes to put it over, to read what's to occur.

You can spend time on these keys.

I remember once visiting Frank Thomas and he was drawing a cat. 'Dammit,' he said. 'I've been working all day on this damn drawing – trying to get this expression right.'



I was shocked. All day! Wow! That was the first time I ever saw anyone working so hard on a single drawing. How was he ever going to get the scene done? Finally, the penny dropped. 'Of course, stupid, its his *key*!' It's the most important thing in the scene! He's got to get *that* right!

And it was encouraging to see anyone that great struggling to get it right!