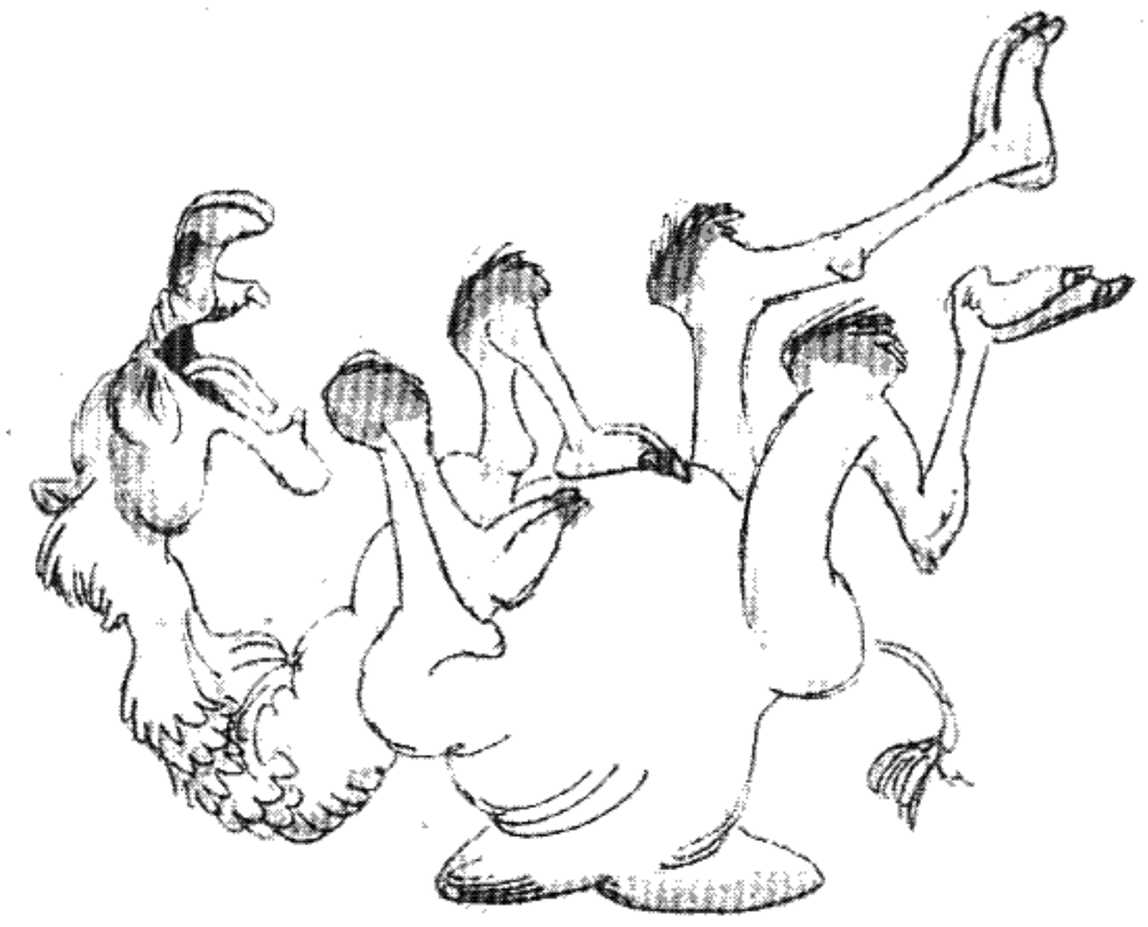
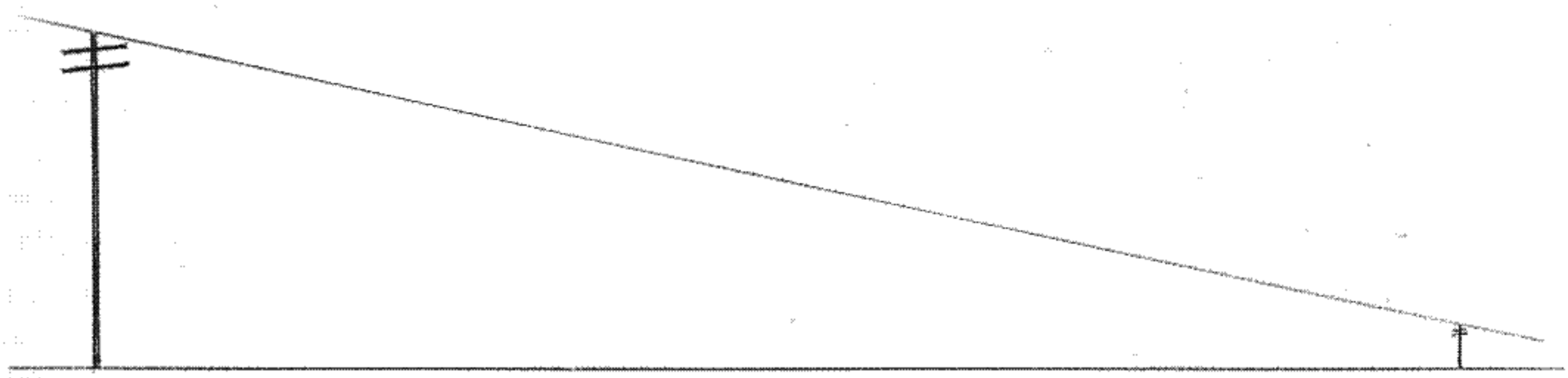


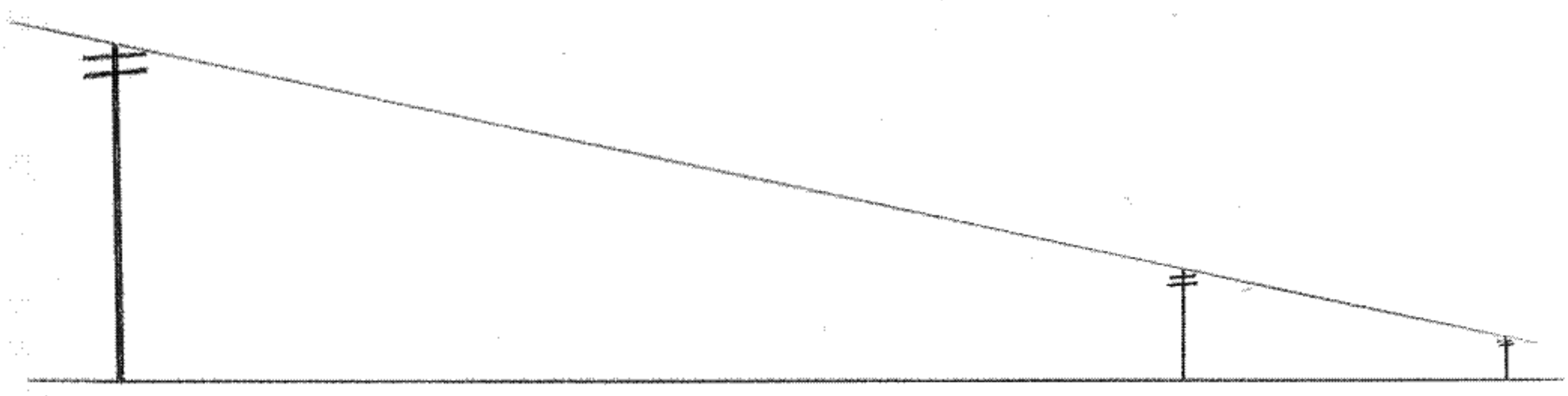
MORE ON SPACING

Somebody once said an animator is something between an artist and a garage mechanic. Here's more nuts and bolts from the garage – but very interesting ones, and it really helps to know them.

Ken Harris showed me this one:



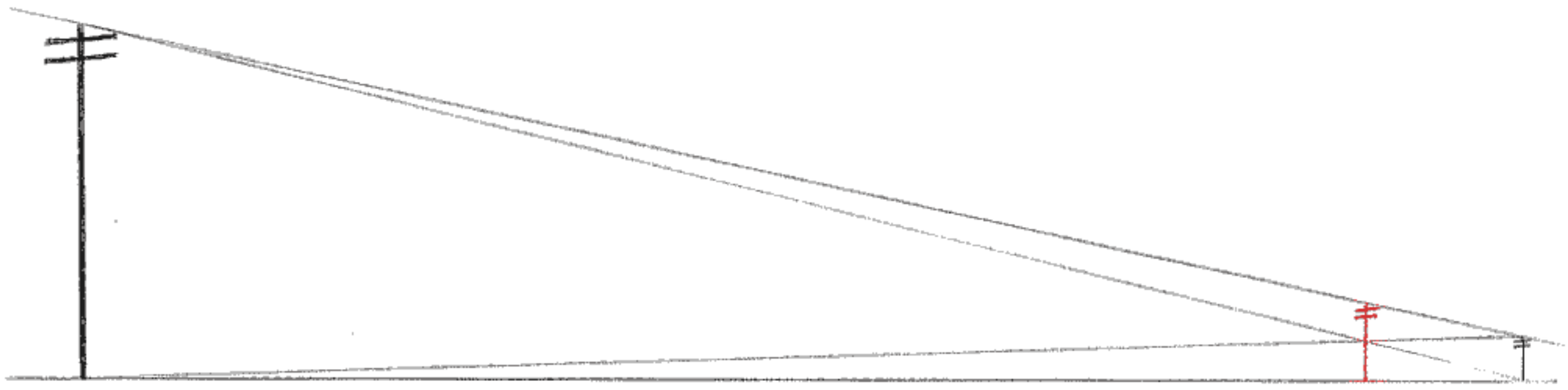
Say we've got a telephone pole moving up quickly in perspective. Where do we put our middle position?



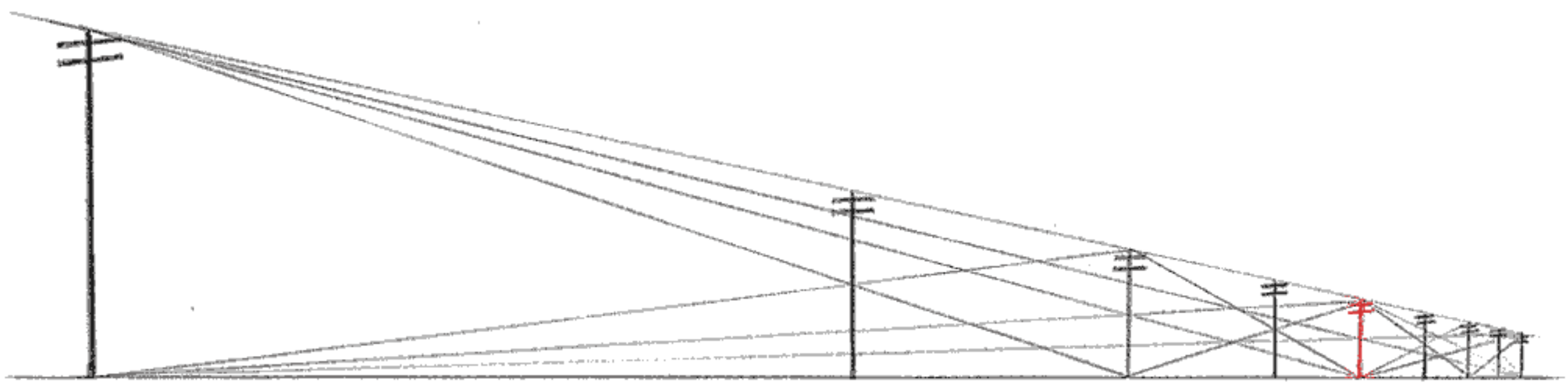
You'd put it in about here, right?

Wrong. Even after fifteen years' experience I got it wrong. And nearly every professional I've asked since has gotten it wrong.

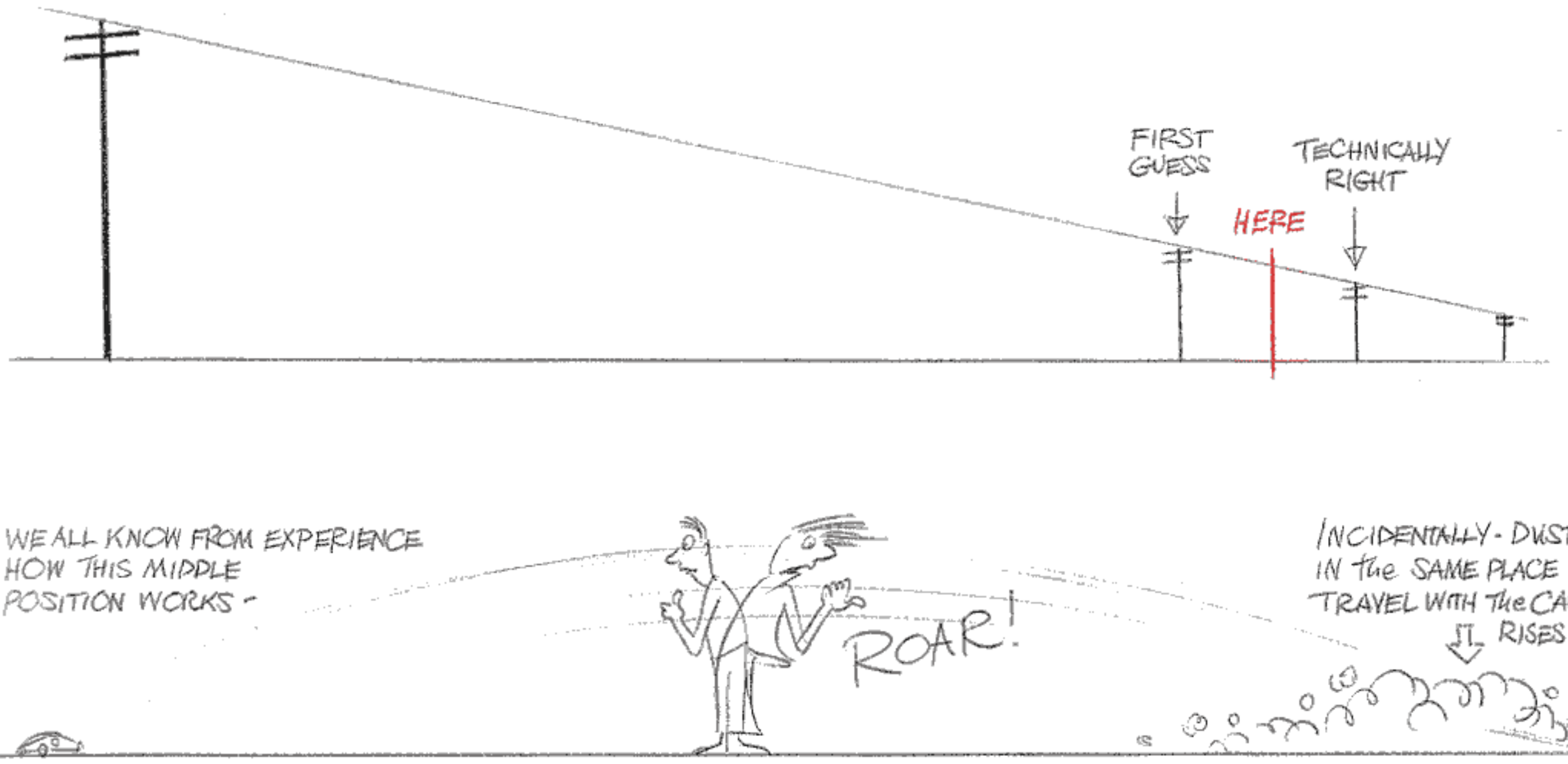
Here's where the middle position is:



Rule in the lines like this and the cross point tells us it's here. At least technically. And just keep doing it:

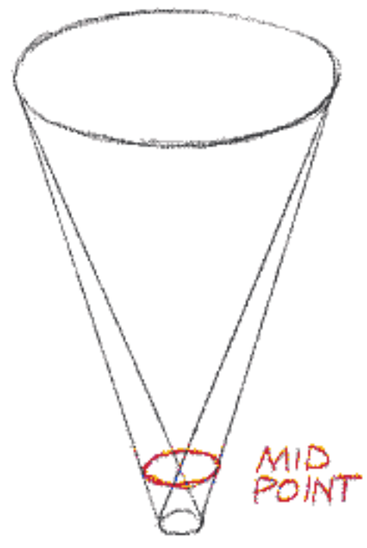


This works well for fast moves. However, for more normal moves it's best to cheat it – split the difference – and come back about half way to where our first guess was. Do that throughout and you'll get a better result.

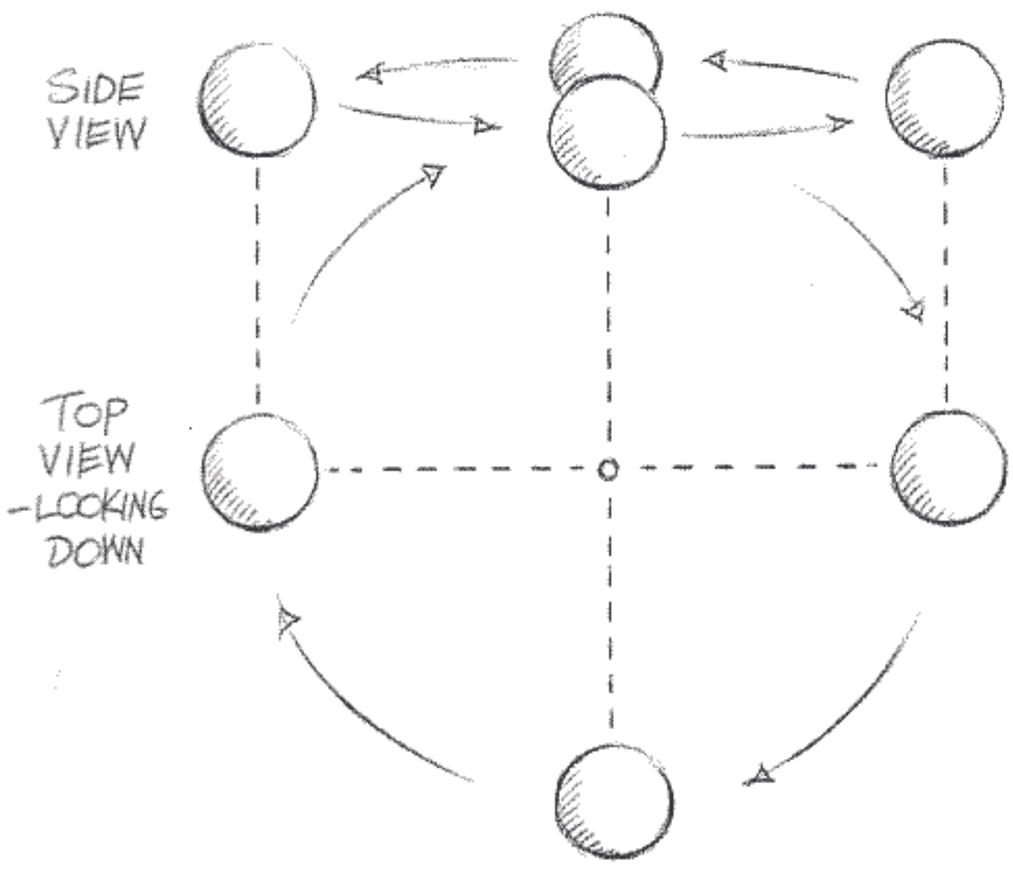


The SAME THING APPLIES TO A FRONT VIEW OF SOMEBODY OR SOMETHING COMING UP AT US - FAST.

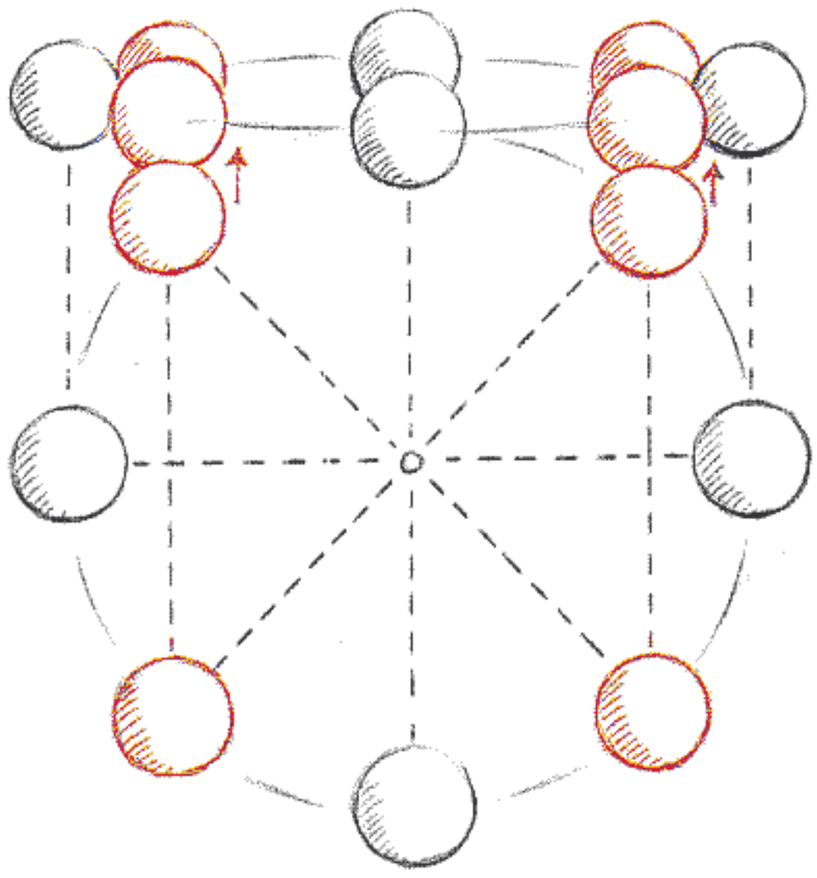
SAY A DISC IS SPINNING UP TOWARDS US -



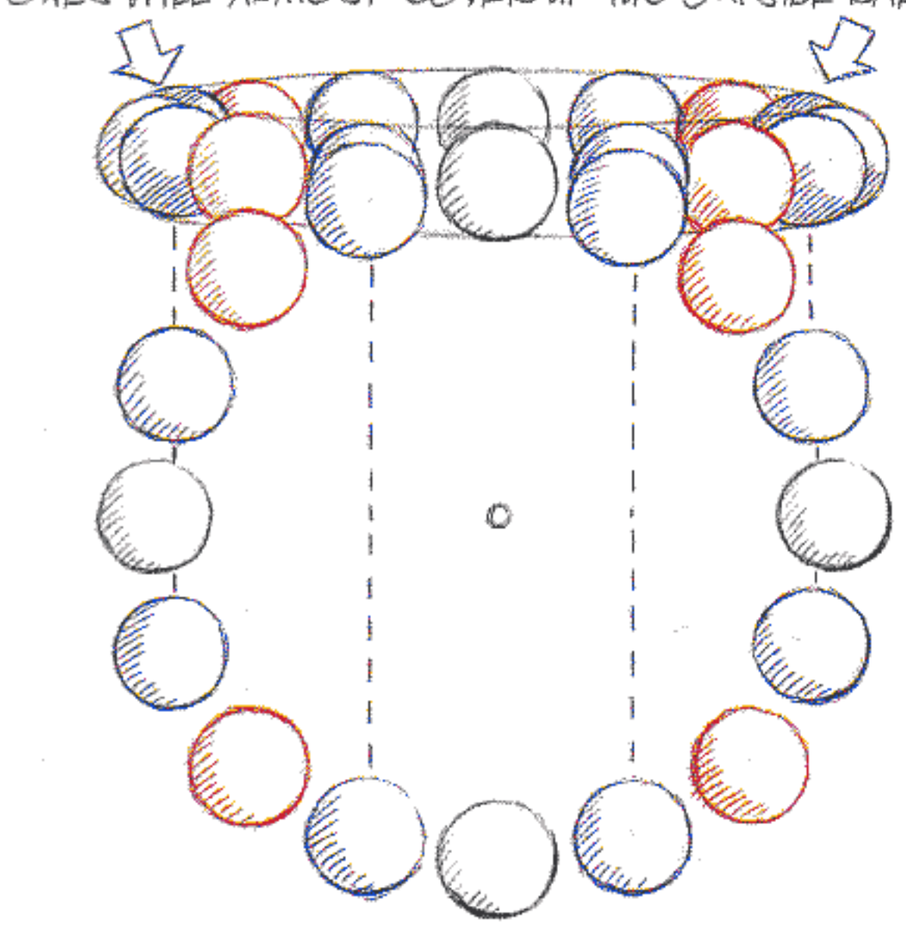
AND TO DO WITH the SAME SORT OF THING: TAKE 4 POSITIONS OF A BALL REVOLVING AROUND A CENTRAL POINT -



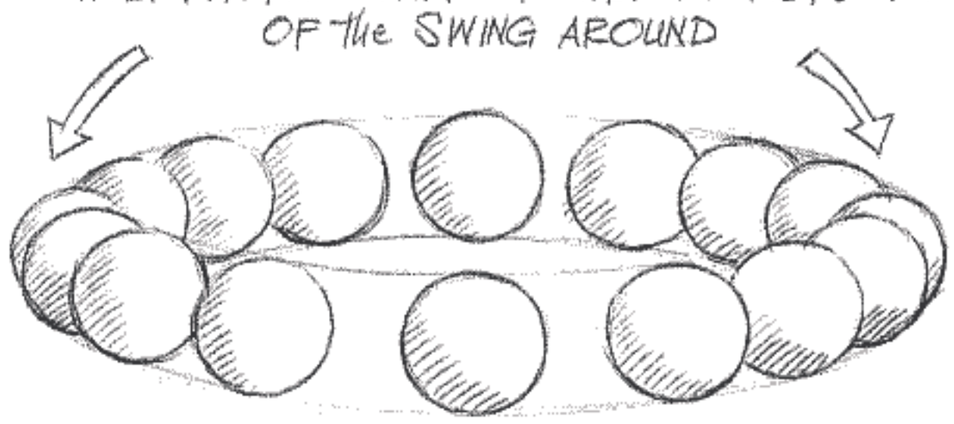
NOW ADD IN the MIDDLE POSITIONS and SEE HOW CLOSE THEY ARE TO the OUTSIDE OF the ARC.



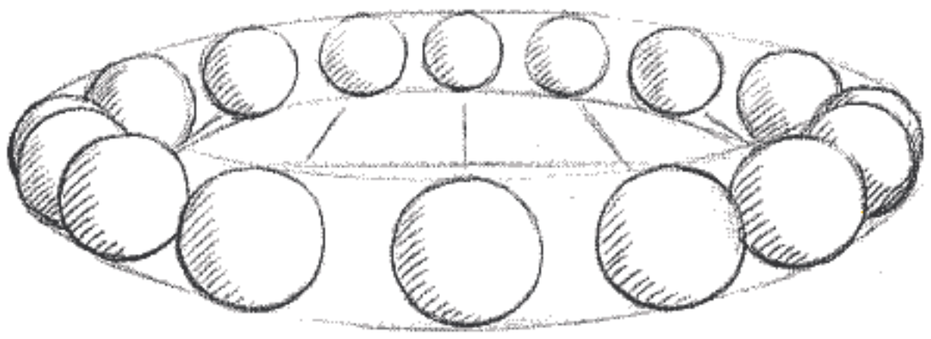
ADD IN the NEXT MID POSITIONS and the FURTHEST ONES WILL ALMOST COVER UP the OUTSIDE BALLS.



The POINT IS THAT the SPACING OF the INBETWEENS WILL CLUSTER AT the EDGES OF the SWING AROUND

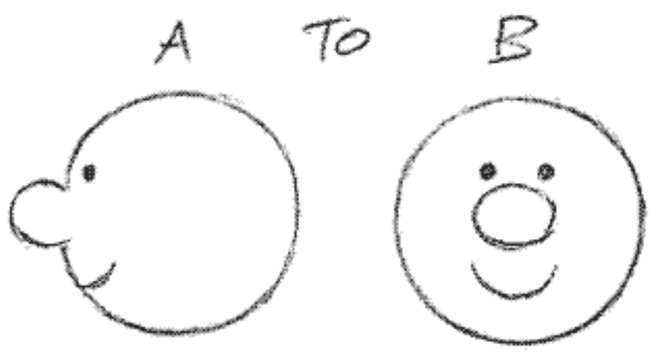


WE CAN INCREASE the PERSPECTIVE BUT IT STILL CLUSTERS AT the EDGES OF the ARC AROUND



So when we're going to turn a head, it's going to be the same kind of thing:

ART BABBITT SHOWED US THIS –



IF WE JUST INBETWEEN IT – IT WILL LOOK LIKE the FEATURES SLIDE AROUND the HEAD WHILE the HEAD REMAINS STATIC –

SO WE DISPLACE THE MIDDLE POSITION TO MAKE IT CONVINCING –

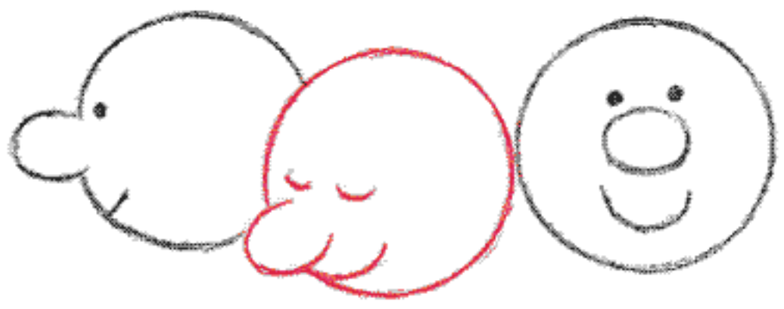
ALSO WE TEND TO LOWER OUR HEAD ON A TURN.

(PULLED APART FOR CLARITY)

Incidentally – on a head turn, Ken Harris showed me this:

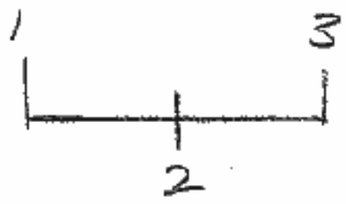
Do it yourself or have somebody else hold up two fingers. Look first at one, relax, then turn the head round to look at the other finger. During the head turn, something interesting will happen. The person will blink. The eye, switching focus from one side to the other, will blink en route. (Unless they're frightened – then the eyes will stay open.)

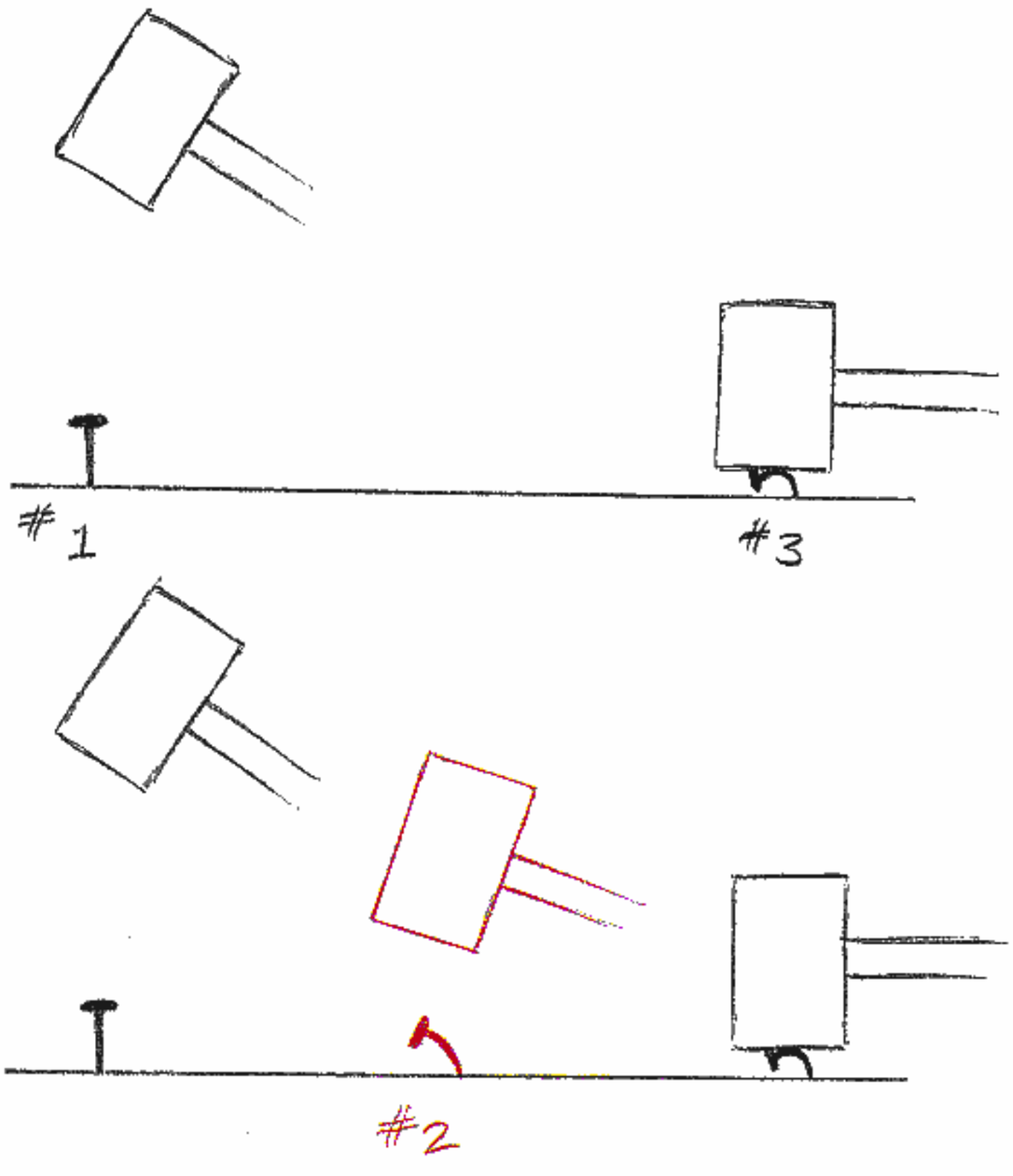
SO WE'LL PROBABLY BLINK DURING the TURN –



CLASSIC INBETWEEN MISTAKES

A MALLET HITS A NAIL
WHICH BENDS -
AND WE WANT ONE INBETWEEN
RIGHT IN THE MIDDLE.

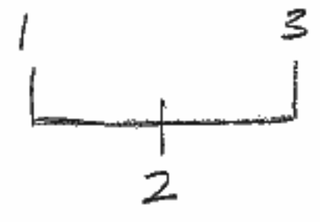


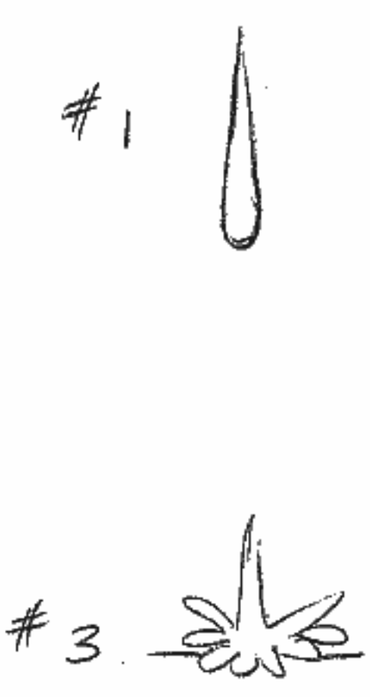


OUR HELPER, WHO IS
PLUGGED IN TO A CD,
PHONE OR WHATEVER,
DOES PRECISELY
WHAT'S REQUESTED AND
PUTS IT RIGHT
IN THE MIDDLE...

"WELL, I FOLLOWED
YOUR CHART."

LATER THE SAME
PLUGGED-IN PERSON
PUTS IN A DROP OF
WATER BETWEEN
THESE TWO POSITIONS.





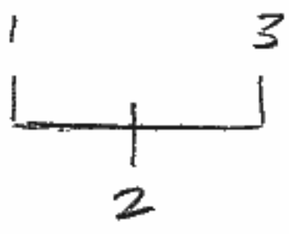
AND PUTS IT
RIGHT IN THE
MIDDLE →
AGAIN

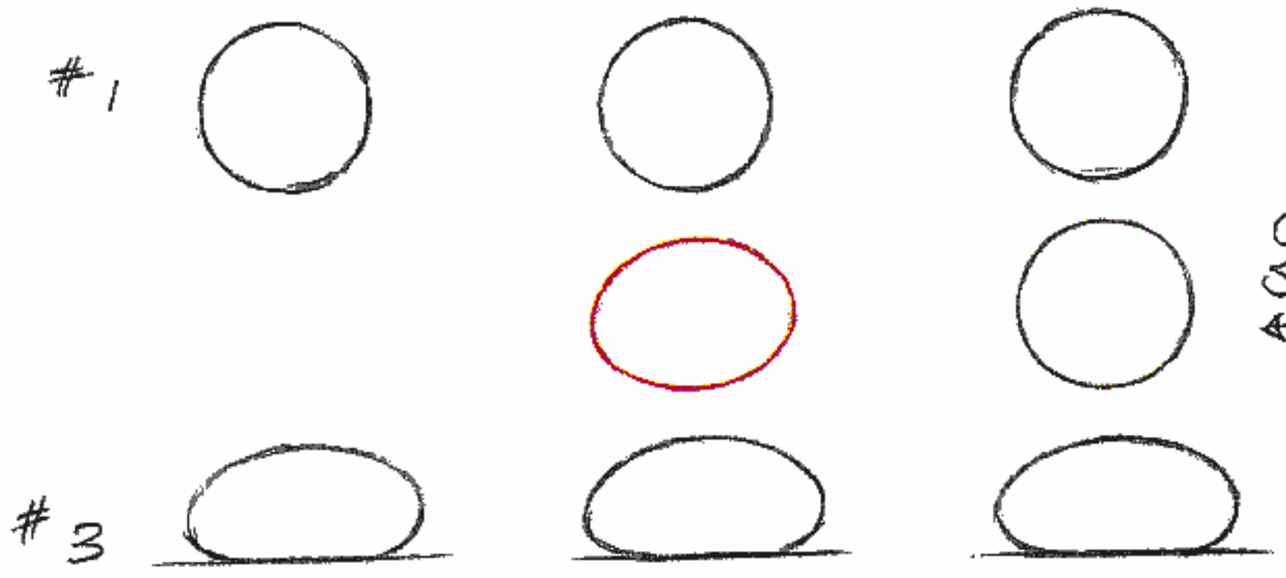
OBVIOUSLY
THE CHANGE
ONLY TAKES
PLACE ON THE
CONTACT.

GOT TO USE
COMMON
SENSE.

IT GOES ON AND ON:

SOFT RUBBER
BALL FALLING -

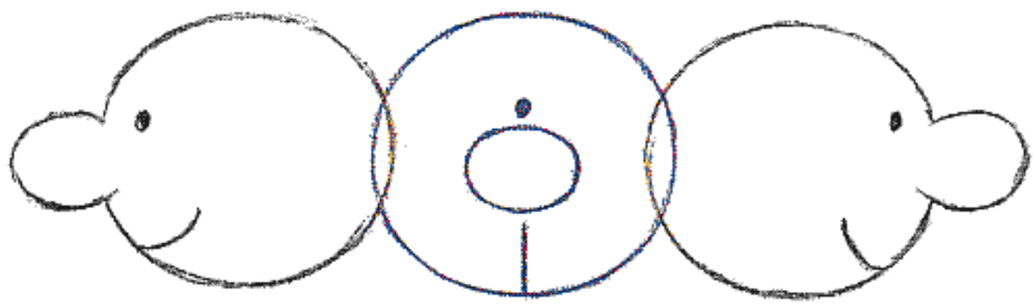




OF COURSE
SHOULD BE..
←

OFTEN WHEN FACED WITH A BREAKDOWN HALF WAY BETWEEN -

WE GET THIS -

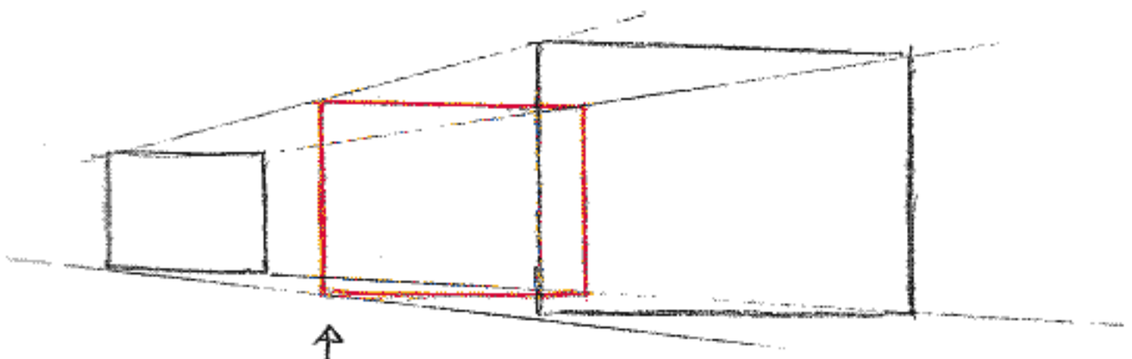


'WELL, I PUT IT RIGHT IN the MIDDLE LIKE YOU SAID'-

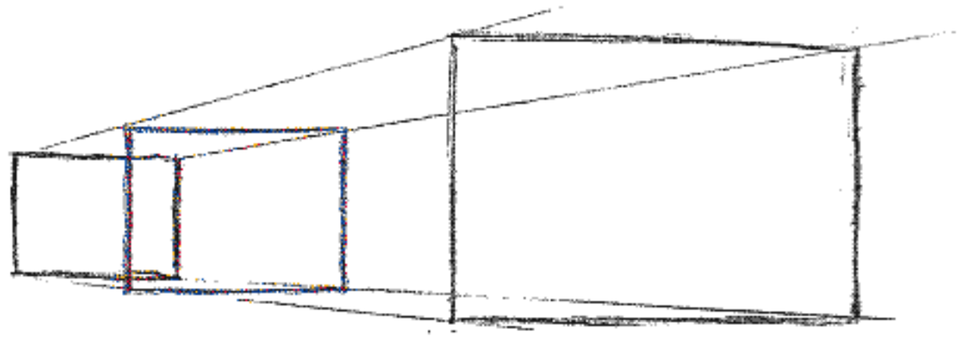
THIS IS RIDICULOUS BUT the EQUIVALENT OFTEN HAPPENS WITH COMPLEX INBETWEENS.

Every **drawing is important. We can't just have brainless drawings joining things up. In one sense there *are* no inbetweens – all the drawings are on the screen for the same amount of time.**

AND, IGNORING OUR TELEPHONE POLE PRINCIPLE...

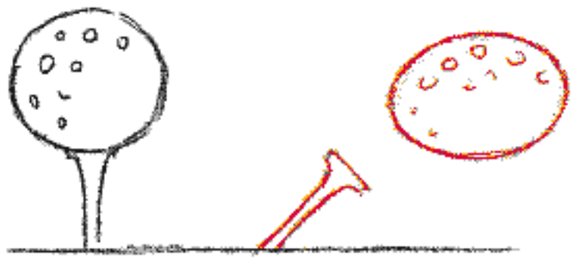


'BUT I PUT IT RIGHT IN the MIDDLE'...

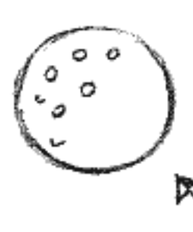


IT'S NOT LINES - GOT TO THINK IN TERMS OF MASSES!

WHEN A GOLF CLUB HITS A HARD GOLF BALL-

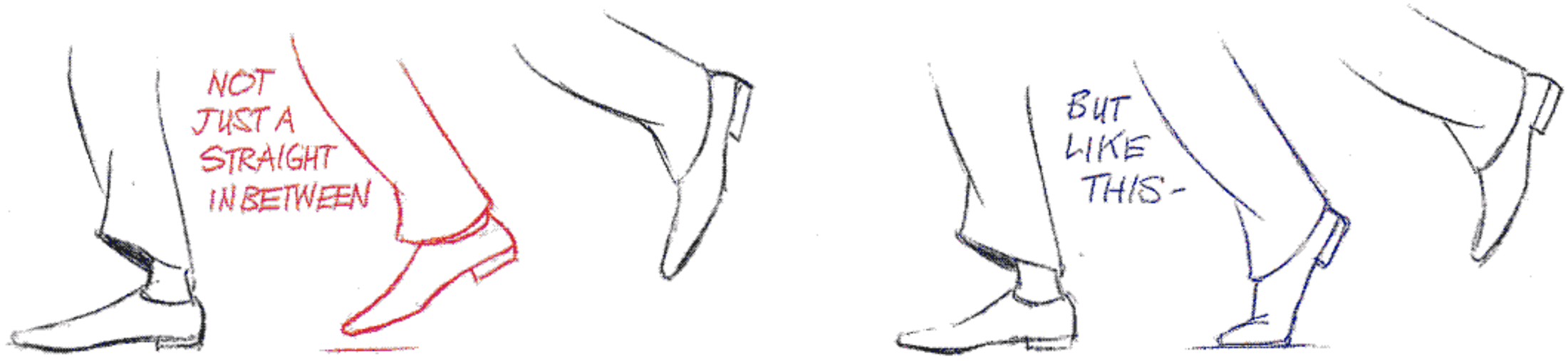


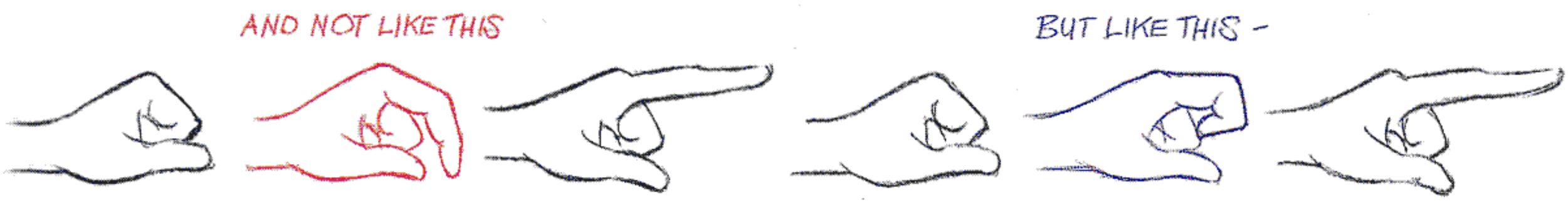
AT the MOMENT OF IMPACT WE MIGHT DISTEND the SHAPE



BUT IT WOULD GO BACK TO IT'S OWN SHAPE WITHIN VERY FEW FRAMES.

Ideally the inbetweener should understand and be able to complete eccentric actions.

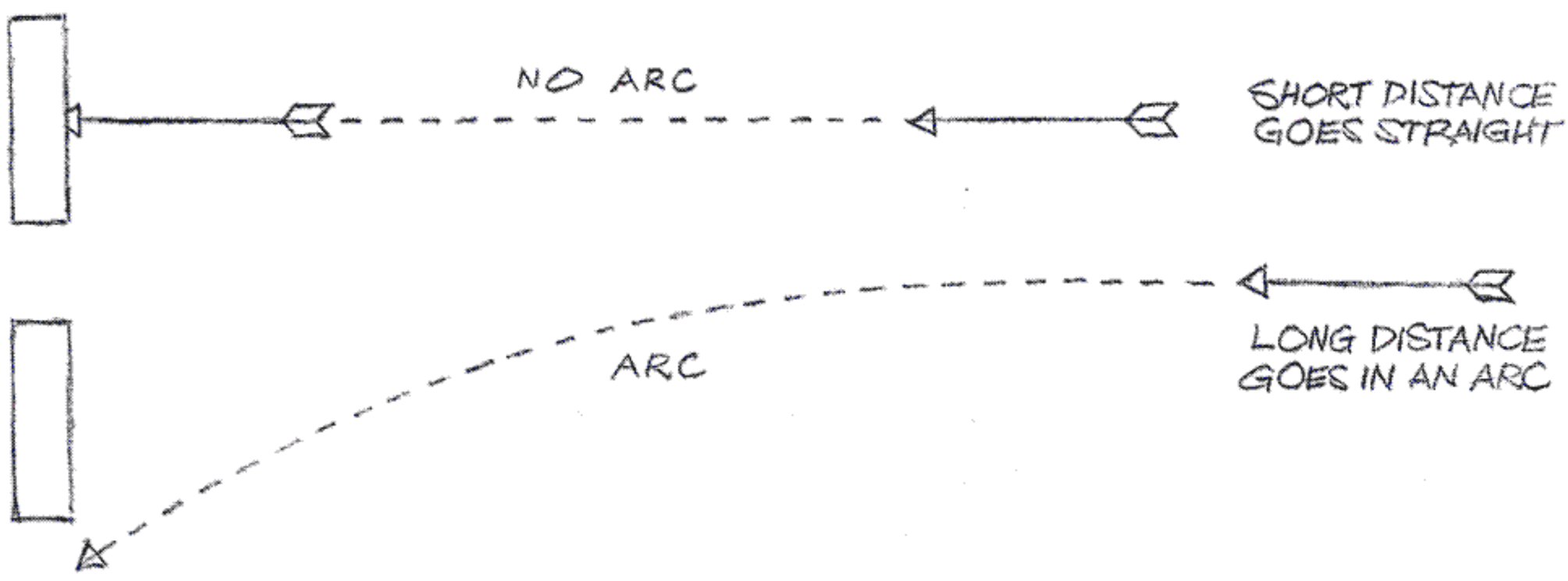




WATCH YOUR ARCS

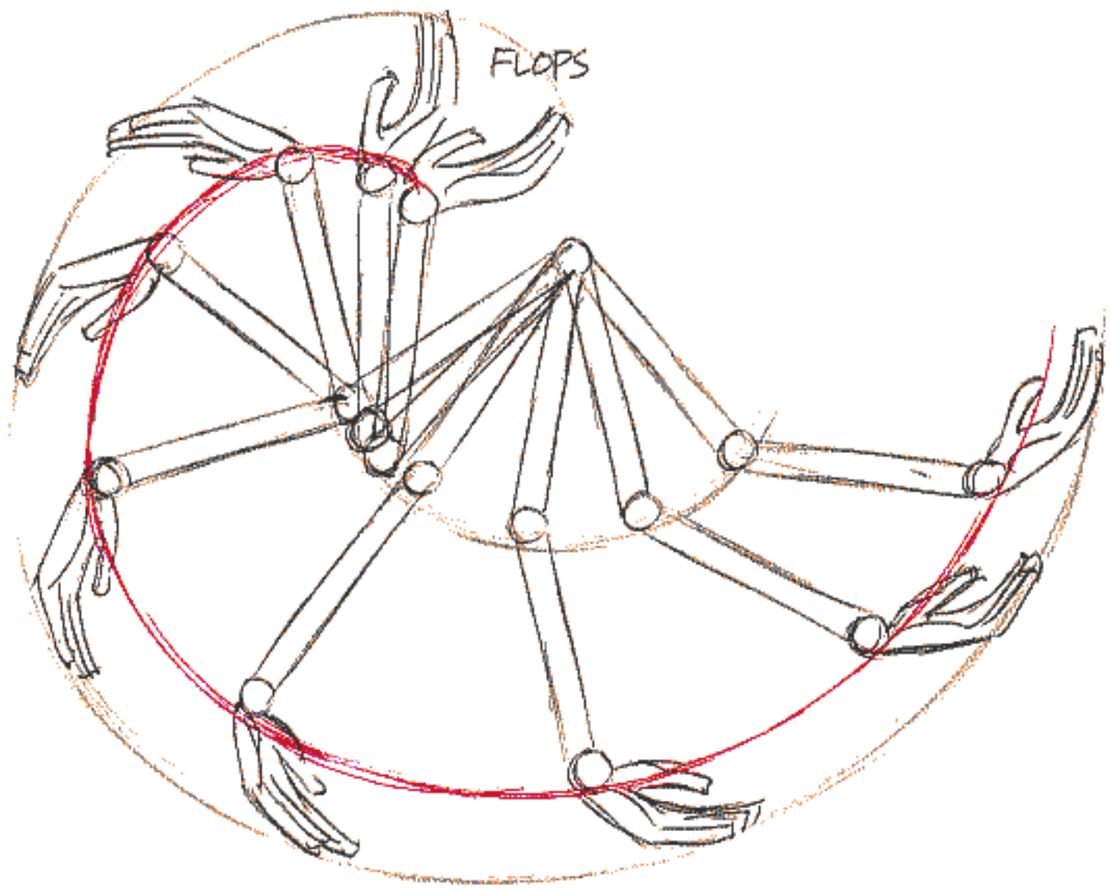
Most actions follow arcs. Generally, an action is in an arc. Most of the time the path of action is either in a wavelike arc or in a sort of figure 8:

But sometimes it is angular or straight. Straight lines give power.

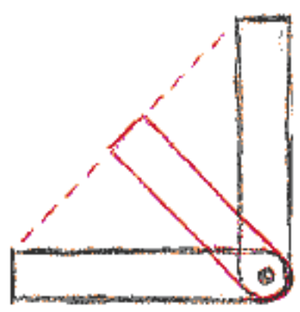


THE ARC OF THE ACTION GIVES US THE CONTINUOUS FLOW

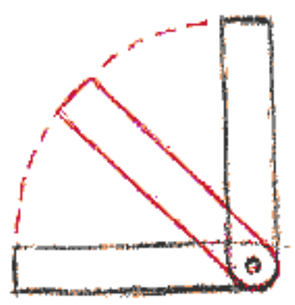
IN THIS ARM SWING THE WRIST IS LEADING THE ARC AND THE HAND DRAGS.



AND OF COURSE THE BONES DON'T SHRINK AND GROW - THEY MAINTAIN THEIR LENGTH

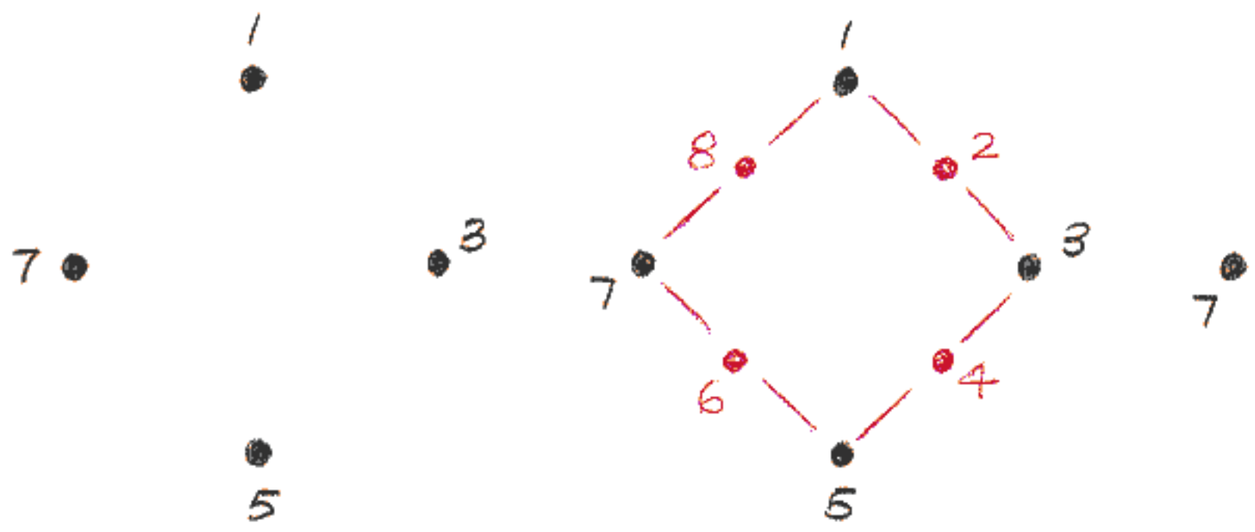


OBVIOUSLY WRONG

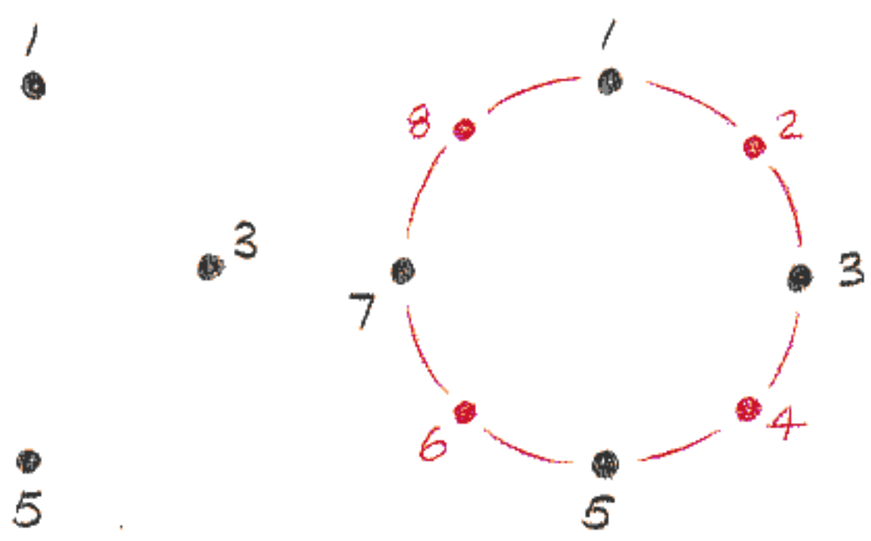


OBVIOUSLY RIGHT

THE ARC IS SO IMPORTANT! SAY WE HAVE POSITIONS 1, 3, 5 AND 7 -



DO WE JOIN THEM UP LIKE THIS?



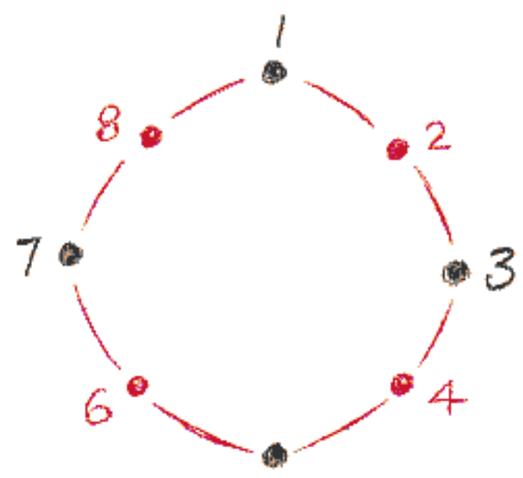
—OR LIKE THIS?

WE'LL GET AN UTTERLY DIFFERENT RESULT - SO WE ROLL OR FLIP THE DRAWINGS TO MAKE SURE WHAT THE ARC OF THE ACTION OR PATH OF ACTION SHOULD BE.

OFTEN WE GET THIS -

USUALLY WE GET THIS -

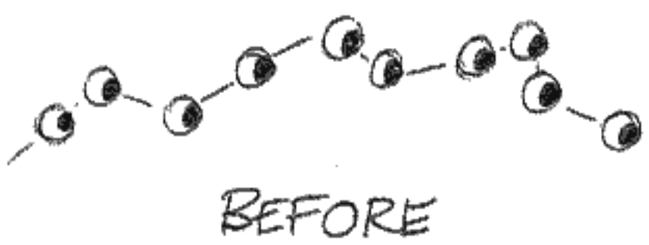
NEITHER ONE THING NOR THE OTHER

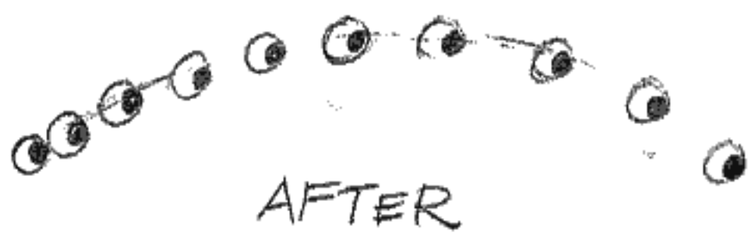


IF IT ISN'T IN THE ARC OR PATH OF ACTION - THE ANIMATION WILL NOT FLOW. GOT TO GO WITH THE FLOW, USING ARCS (UNLESS A STRAIGHT IS REQUIRED.)

The stuff on these pages looks awfully simple set out like this – 'Oh, I knew that.' But as soon as we get into sophisticated images and actions this all tends to go out the window.

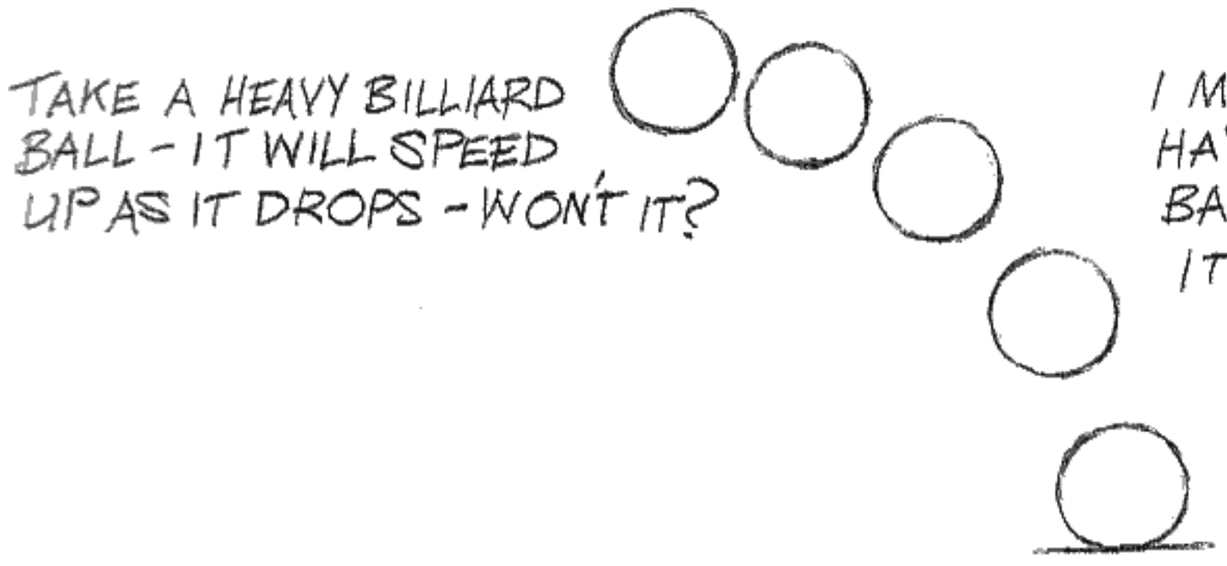
I recently heard about a Hollywood assistant, a talented draftsman who was working on realistic horses (about the hardest thing there is to animate). He drew the stuff beautifully, but he just couldn't get the hang of keeping things in the right arcs. His directing animator, James Baxter, finally suggested he take a blue pencil and just trace the horse's eye positions separately and look what was happening to the flow. Clink! The penny dropped.





So we're back to the old bouncing ball again.

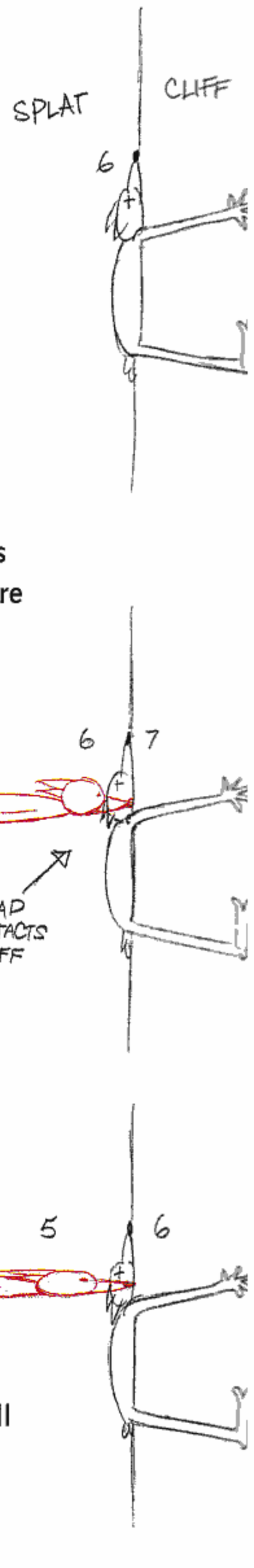
These basic things are so important. Most animators would say scornfully – 'Oh sure, the bouncing ball – everyone knows that.' But do they?



GETTING MORE MOVEMENT WITHIN THE MASS

Now we can start getting more sophisticated. We're going to keep finding ways to get movement *within* movement, action within action – getting more 'change', more bang for the buck.

Ken Harris showed me how to exaggerate a hit.
Say a creature shoots through the air to hit a cliff:



We'd need about five drawings – even spacing on the head – to get him over to the cliff. The figures overlap slightly to help carry the eye – on ones, of course, because it's a fast action. No inbetween between 5 and 6.

To get more impact, more power to the hit, add in another drawing where he just touches the cliff, just contacting it before he's flattened on the following frame. This will give more 'change' – action within action.

Now to give it yet more impact, we take out drawing number 5, throw it away, and *stretch out* the drawing that's touching the cliff. It becomes our new number 5.

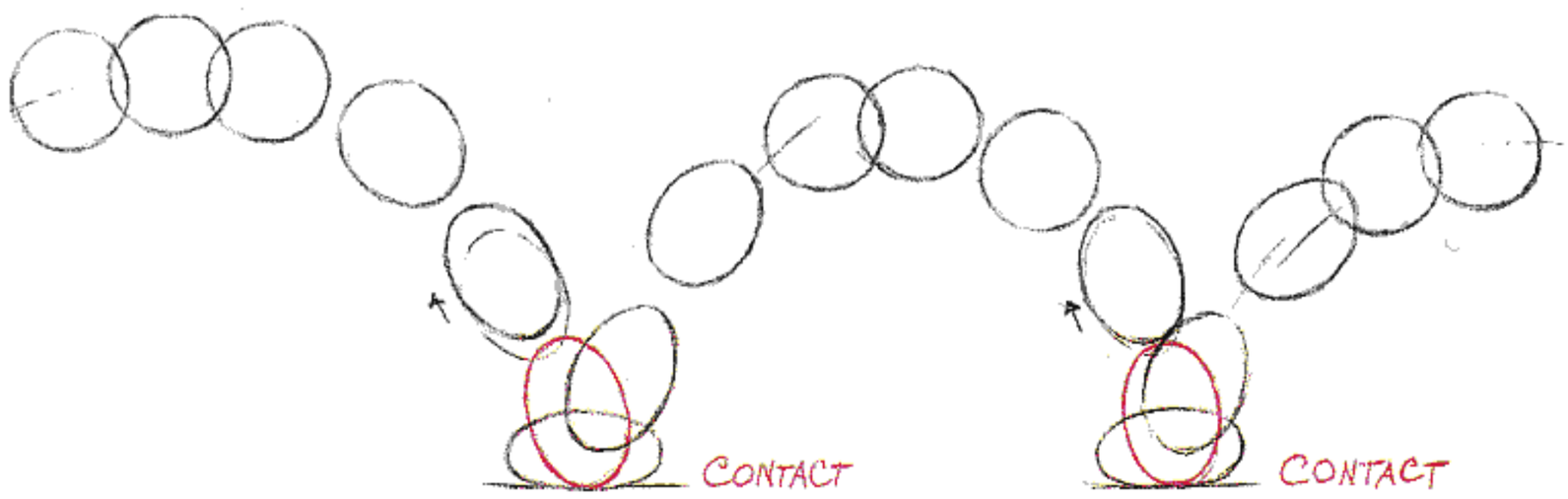
Now our action kind of leaps a one frame gap. We won't see it, but we'll feel it and it will give a much stronger impact to the hit.

There's an interesting thing here which takes us right back again to the bouncing ball.

In 1970 I showed Ken an early edition of Preston Blair's animation book when I was questioning whether we need that amount of squashing and stretching of things. (You can gather by now that I'm not too keen on 'rubber duck' stretching around – although twenty-five years later that was what was required on *Who Framed Roger Rabbit*, a cartoon of a cartoon.) I noticed that Ken, though famous as a broad action animator, used squash and stretch rather sparingly.

I had the page open on the bouncing ball. It was like this – which certainly works OK.

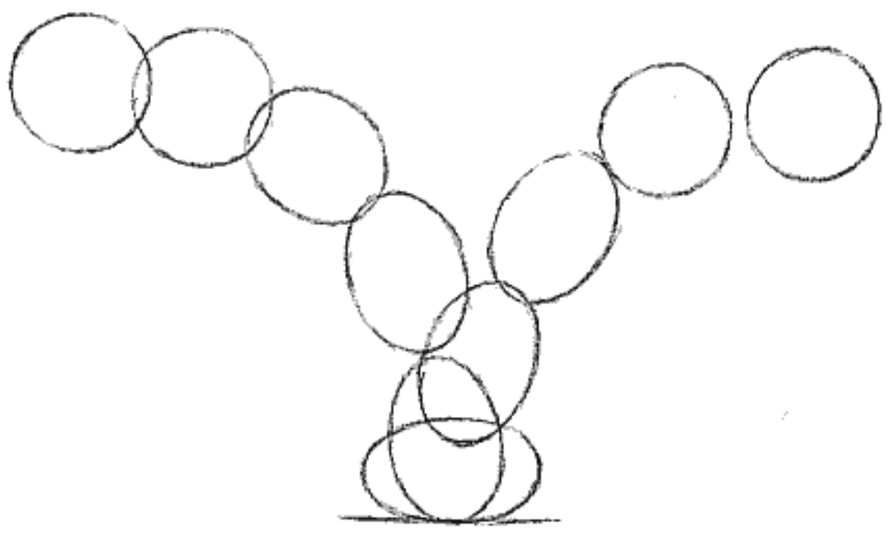
Ken said, 'Yeah, sure, but wait a minute – never mind that. We can make this much better. We need to have a contact in here before the squash.'



'Put in a contact where the ball just touches the ground and *then* it squashes. That'll give it more life.' (Move the preceding drawing back a bit to accommodate it.)

'And do we do the same when it takes off again?' Answer: 'Not in this case – just when it contacts. You get the "change", then it's off again.'

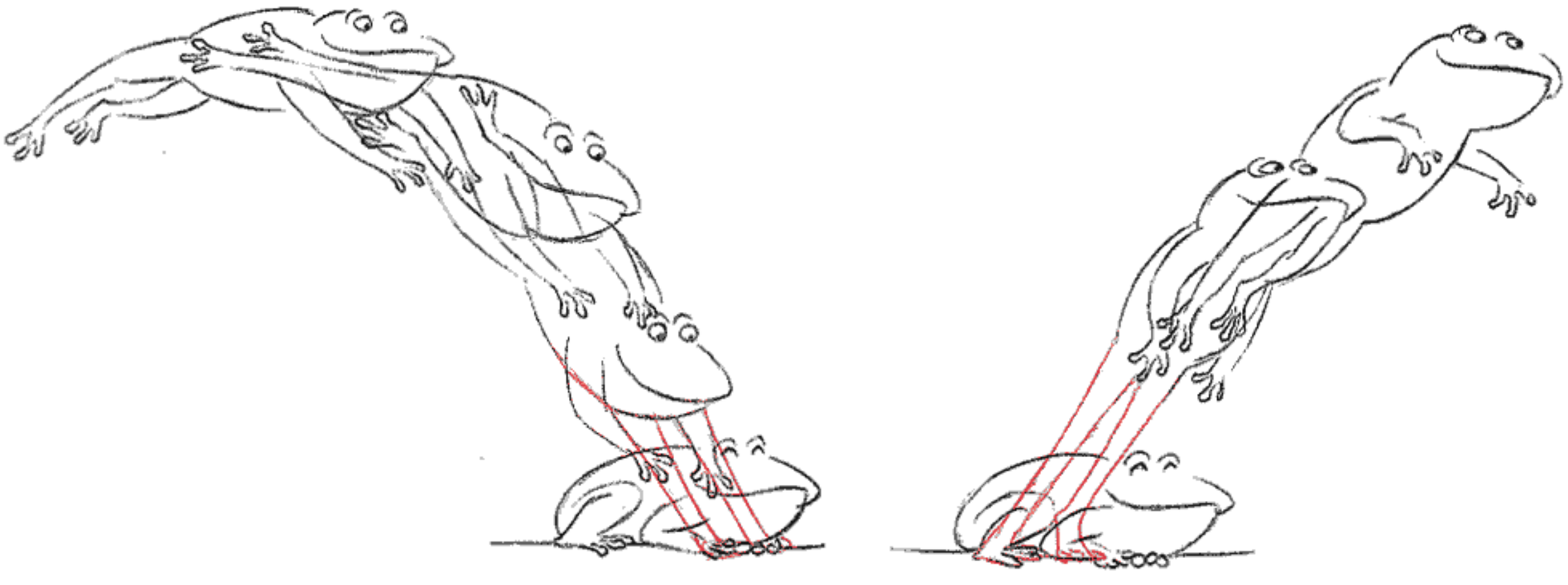
The animation grapevine flows like lightning: 'Did you know Ken Harris in London has corrected Preston Blair's bouncing ball?' Preston's next edition came out like this:



Perfect.

This is not done to show disrespect for a skilled animator like Preston, who was the first classical animator to make real animation knowledge accessible, or to put him down in any way. Ken was just showing an important device to get more action within the movement.

Ken continued, showing the same idea with a frog.



'Have him contact the ground before he squashes down. Then keep his feet contacting the ground as he takes off. That'll give more change to the action.'

Next, a jumping figure.

'Have at least one foot contacting the ground before the squash down, then leave at least one leg still contacting the ground as he takes off again.'

This is great because we're getting more 'change' – more contrast – straight lines playing against curves. We're doing it with bones as well as round masses. We can use straight lines and still get a limber result. More on this later. We don't have to be stuck with rubbery shapes to get smooth movement. This will also free us from having to draw in a prescribed cartoony style because it 'suits animation' and is 'animatable'.

I'm using crude drawings here because I want everything to be crystal clear. I just want to show the structure and not get lost in an overlay of attractive detail.