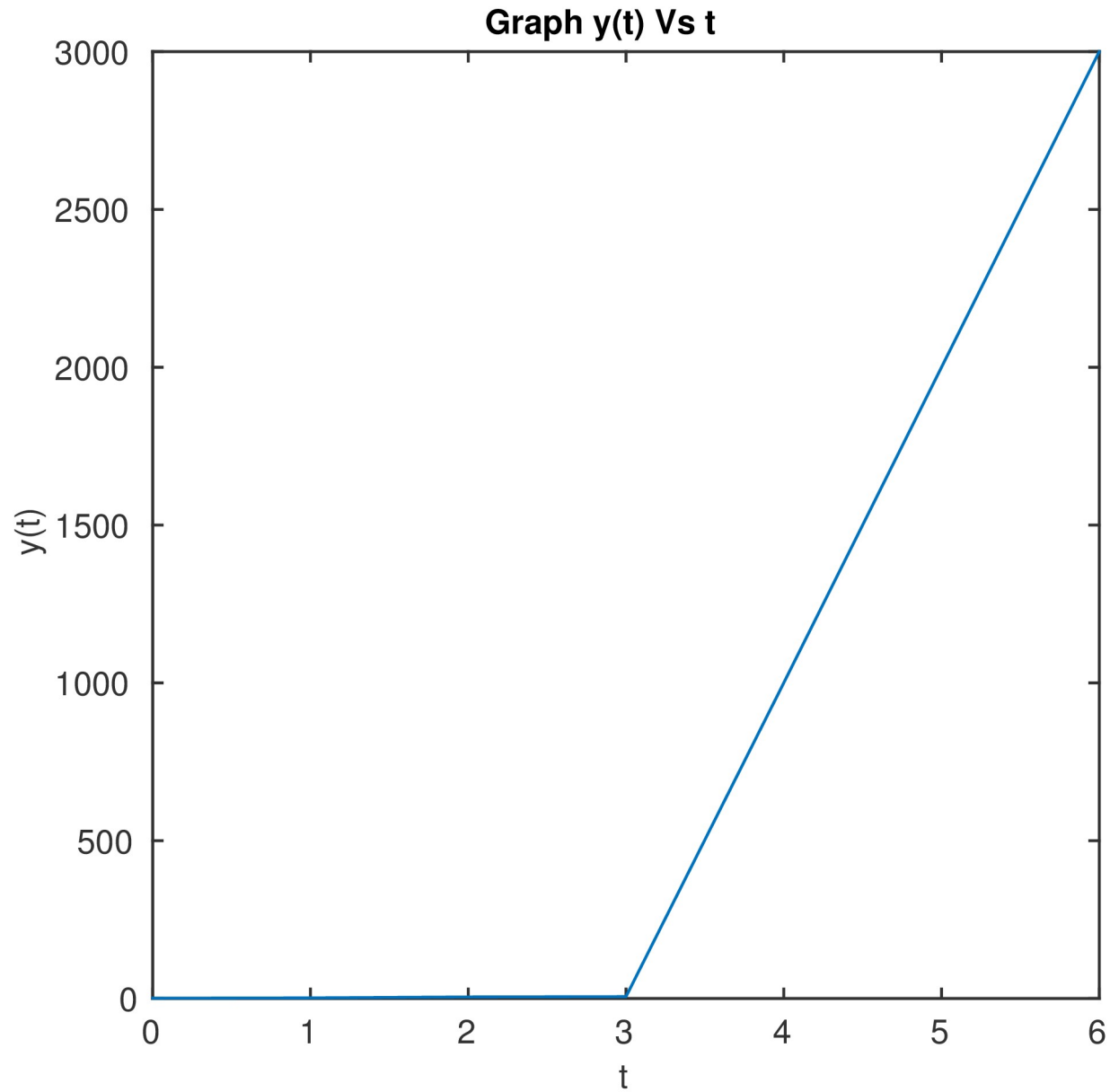


Semilog Graph

Imagine that we have the following data set:

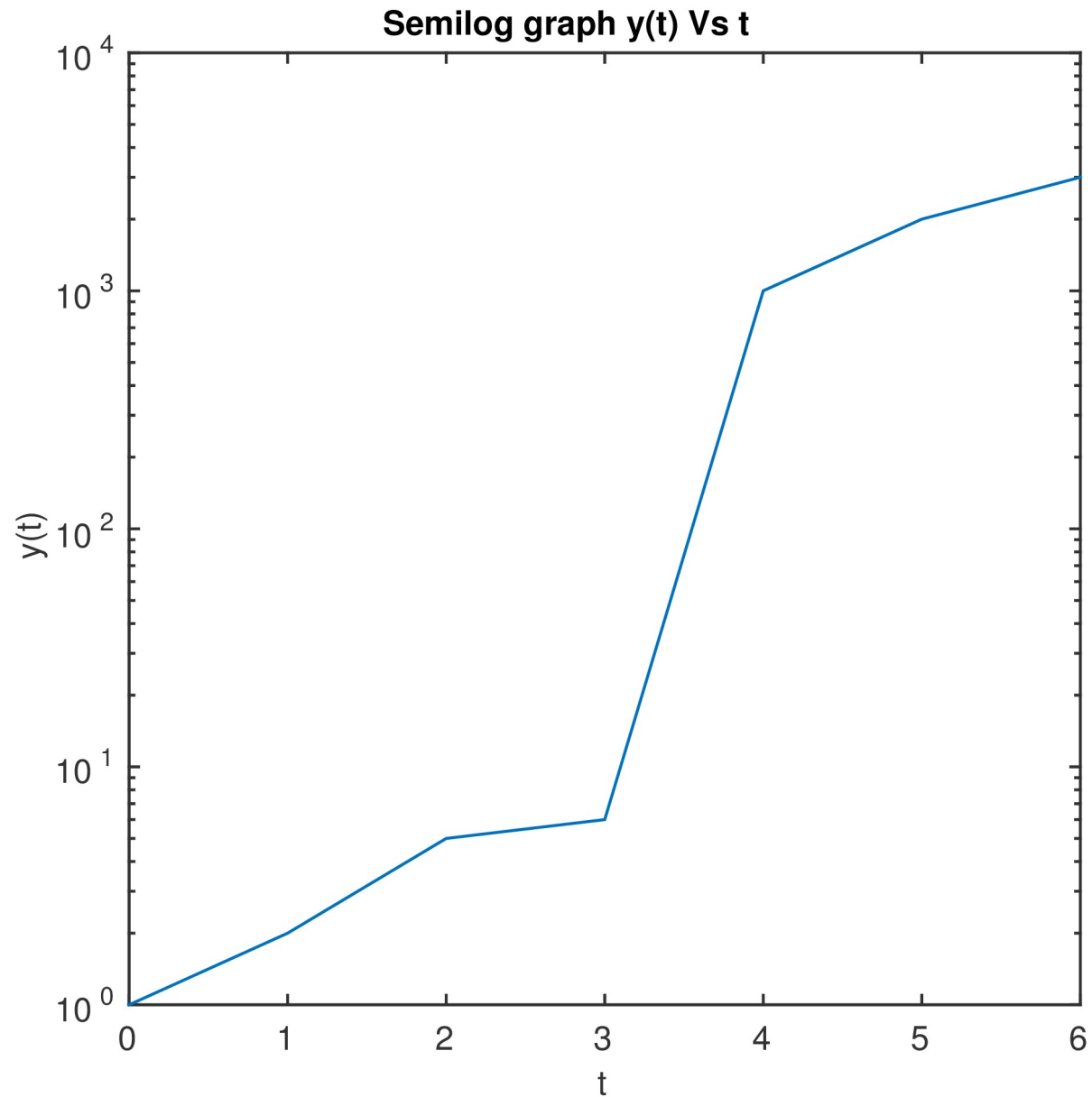
t	y(t)
0	1
1	2
2	5
3	6
4	1000
5	2000
6	3000

The variable $y(t)$ spreads over a wide range of values. It will be difficult to visualize. We will use semilog graph to solve this problem.

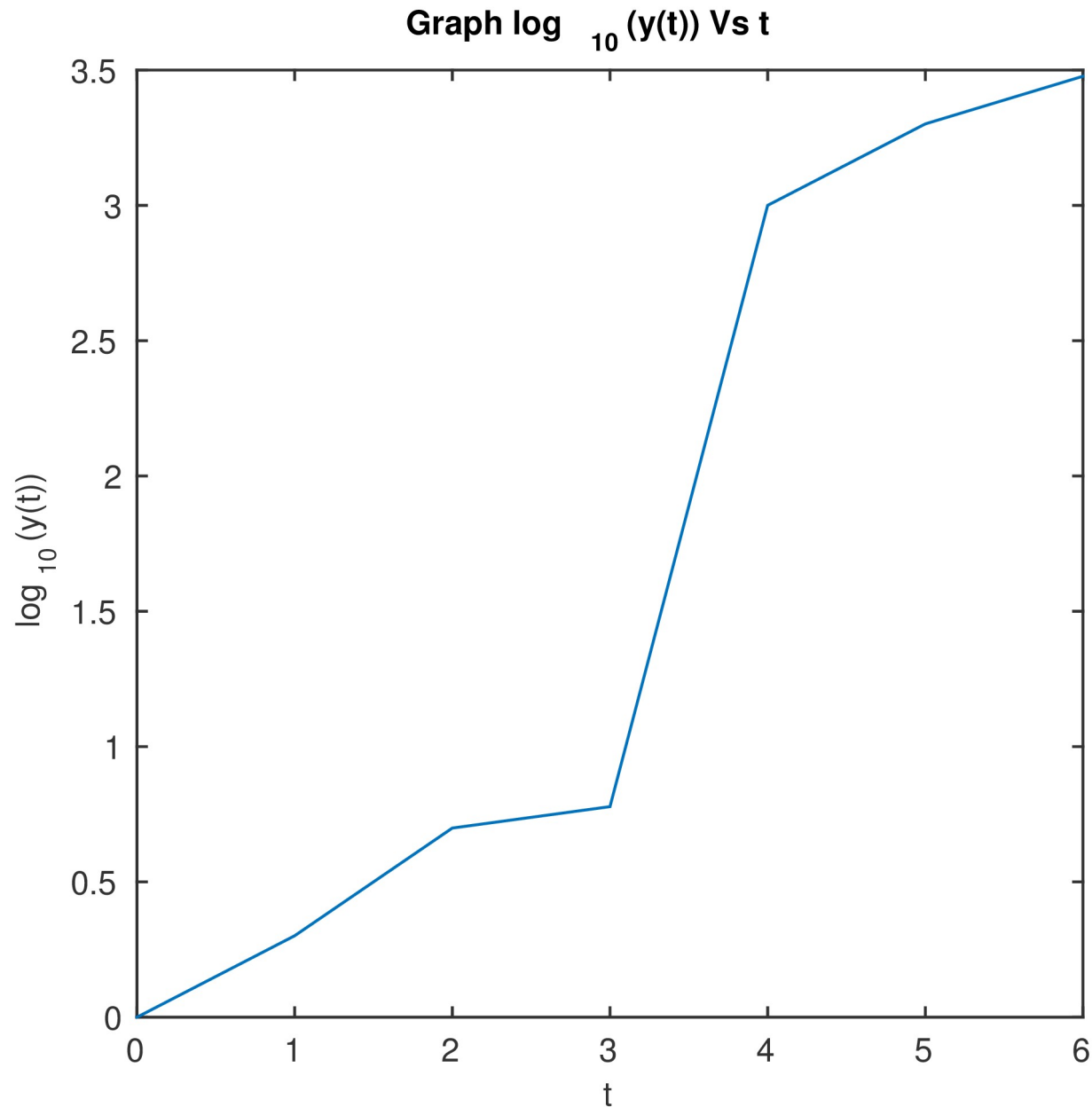


We do not see what happens at $t = 0, 1, 2, 3$. Apparently the value is 0.

If we represent the y axis in a logarithmic scale we can see what happens at $t = 0, 1, 2, 3$. We just transform the axis, not the function $y(t)$.



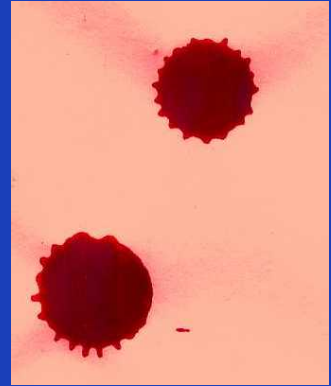
Alternatively, we can plot $\log(y(t))$ instead of $y(t)$...
(but then we will have to undo this change to know the real value $y(t)$...)



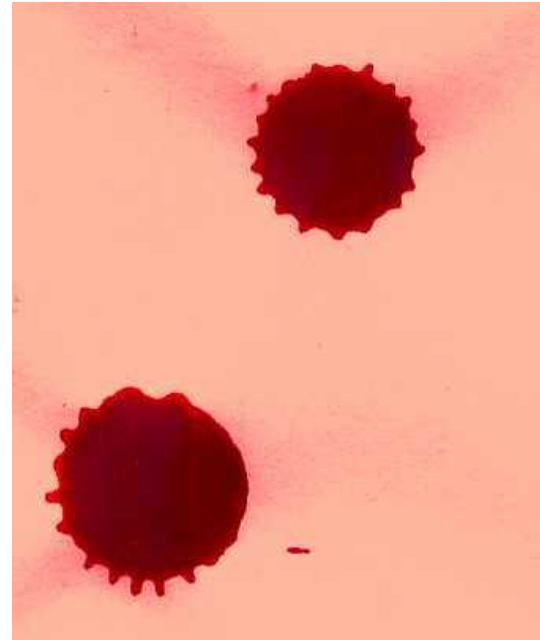
The spike trains in each input group were generated from the group's input intensity function. These are defined for each group of oscillatory inputs as

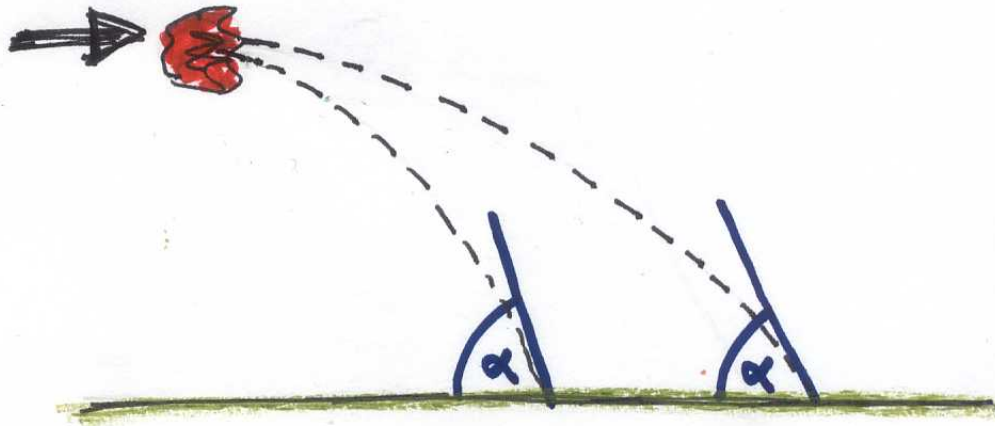
$$\begin{aligned}\hat{\lambda}_1(t) &= \hat{v}_0 + a \cdot \cos[2\pi f_m(t + \hat{d})], \\ \hat{\lambda}_2(t) &= \hat{v}_0 + a \cdot \cos[2\pi f_m(t + \hat{d} + \hat{d}_{\text{lag}})],\end{aligned}\tag{33}$$

where \hat{v}_0 is the mean input rate (in spikes/s), a is the amplitude in the oscillations (in spikes/s), f_m is the modulation frequency of the oscillations (in Hz), \hat{d} is the delay of inputs in the first group (in seconds), and \hat{d}_{lag} is the time lag between the oscillations of the two input groups (in seconds).

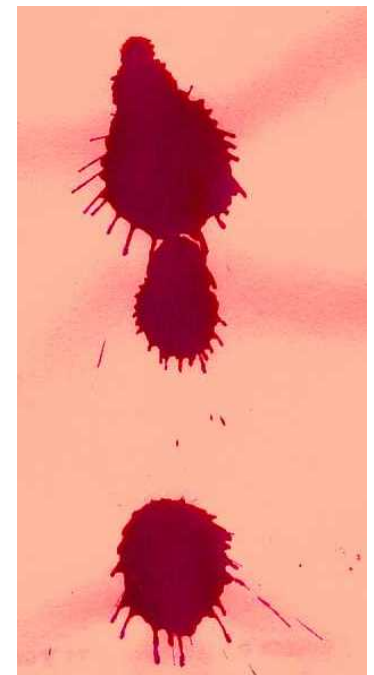
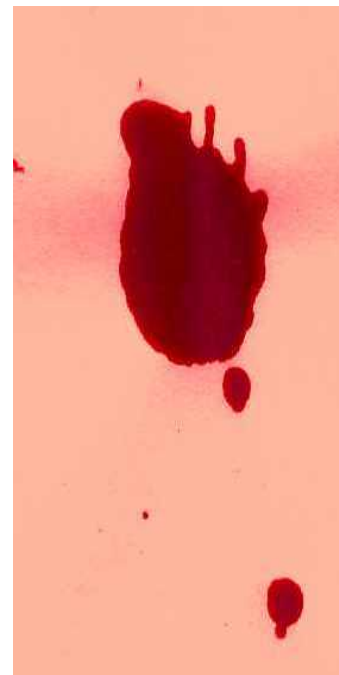
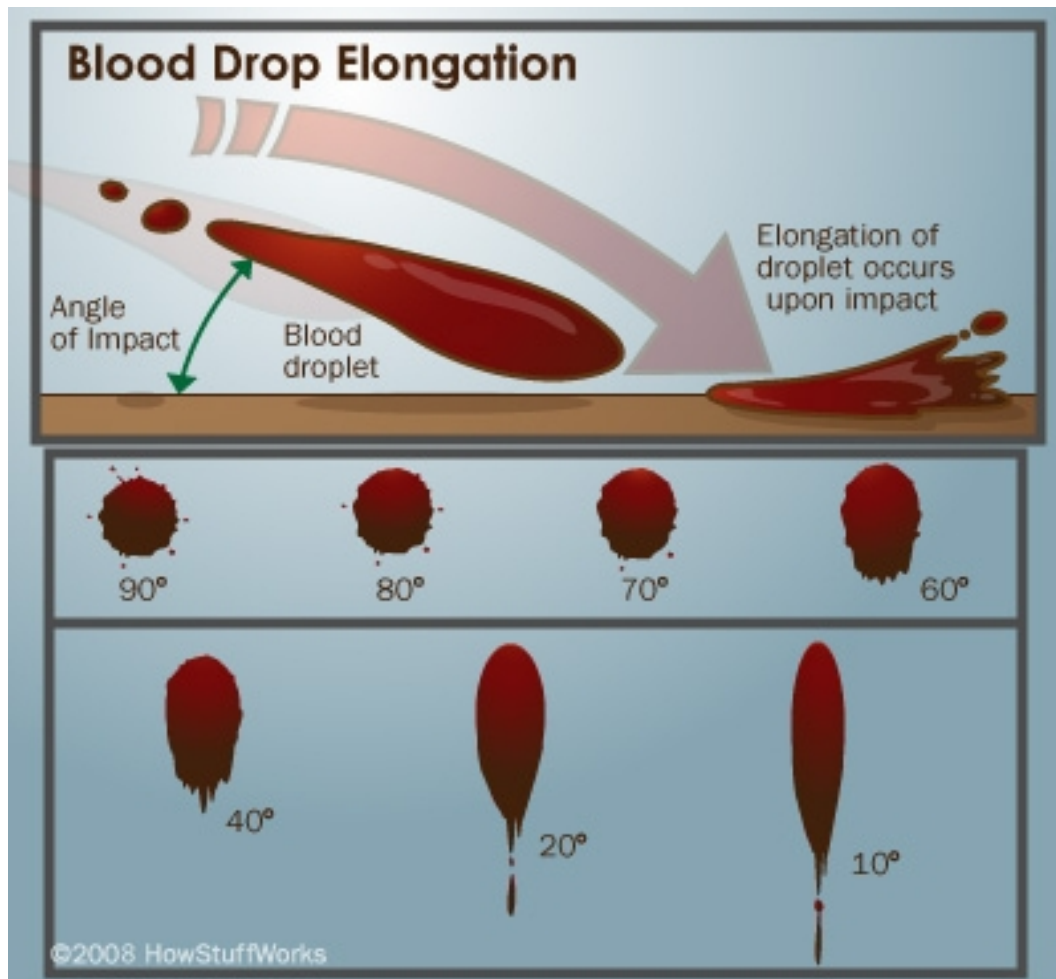


analyzing blood stains

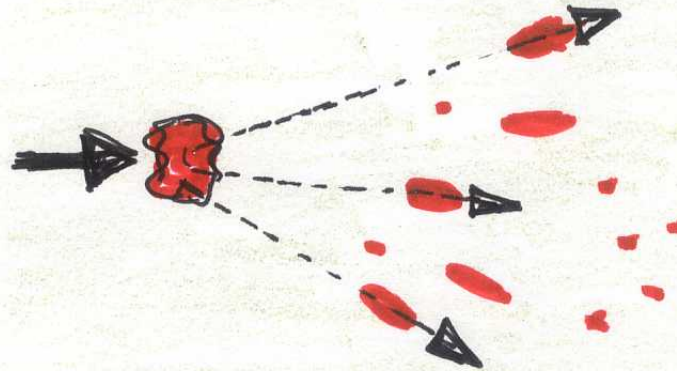


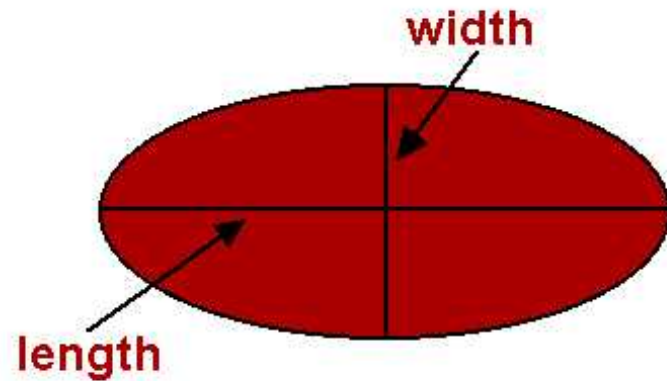


α = IMPACT ANGLE



VIEW FROM ABOVE





$$\text{IMPACT ANGLE} = \arcsin \frac{\text{WIDTH}}{\text{LENGTH}}$$

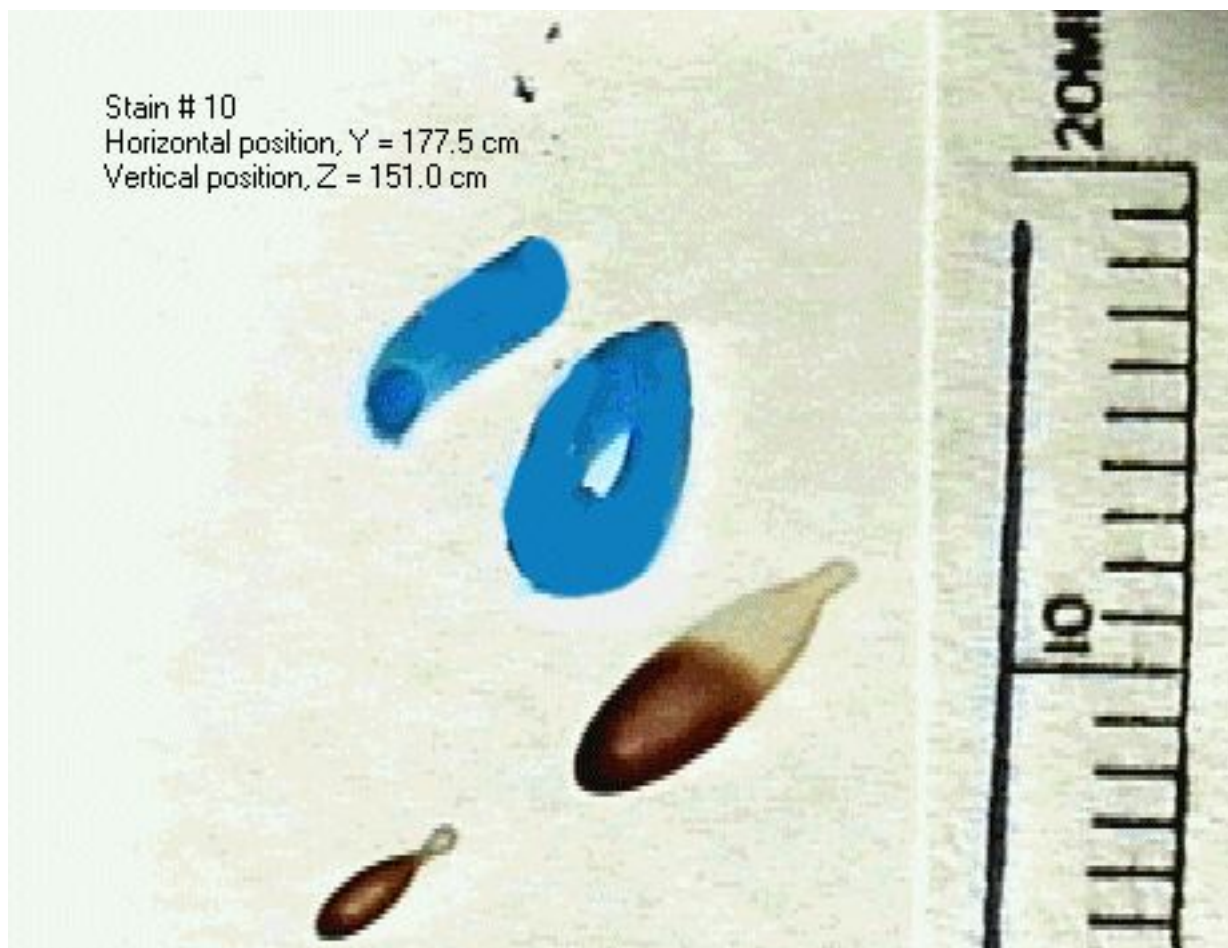
$$\text{WIDTH} = \text{LENGTH}$$

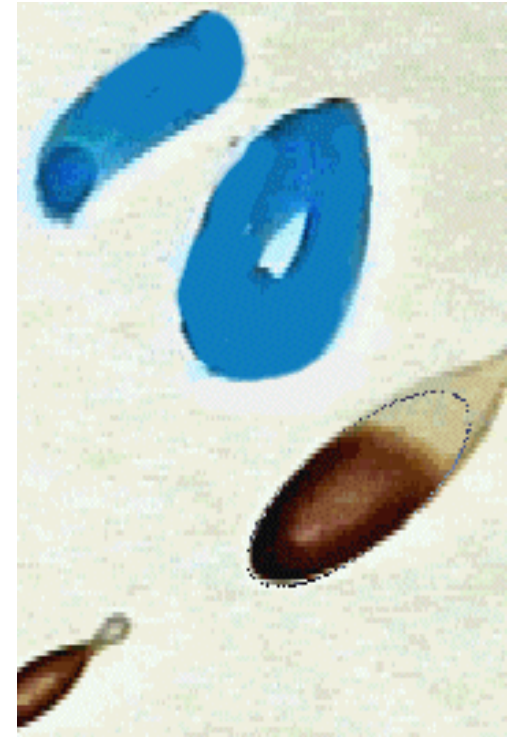
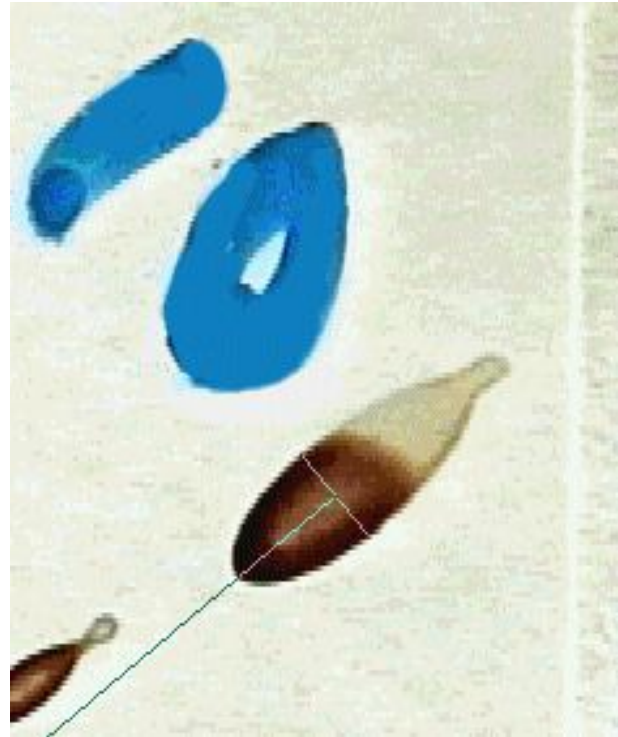
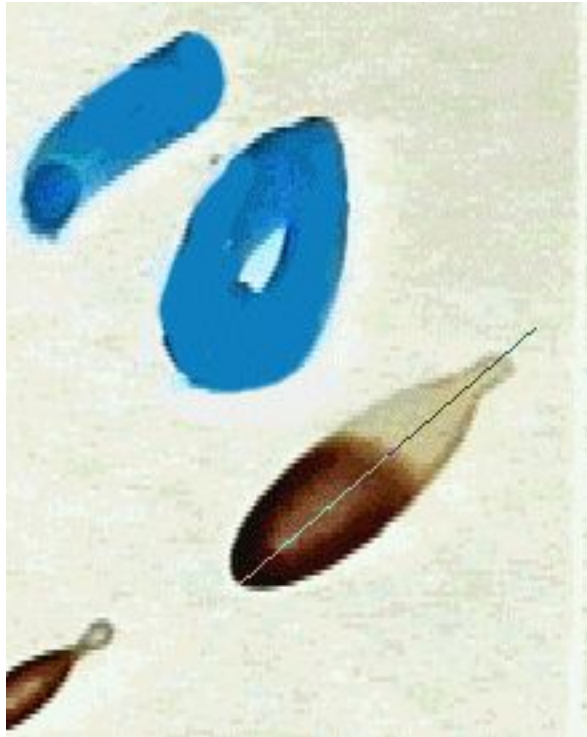
$$\Leftrightarrow \text{IMPACT ANGLE} = \arcsin 1 = \frac{\pi}{2} !$$

Stain # 10

Horizontal position, Y = 177.5 cm

Vertical position, Z = 151.0 cm





The Physics of Blood Stain Analysis

Drop #	Status	Width	Length	Alpha	Gamma	BL	BR	BLR
1	0	0.7	0.8	1.065436	25	45	12	0.785
2	0	0.25	0.5	0.523599	21	25	42	0.436111
3	0	0.35	0.6	0.622827	43	16	36	0.279111
4	0	0.13	0.2	0.707584	32	13	33	0.226778
5	0	0.16	0.43	0.381263	35	15	27	0.261667
6	0	0.45	0.73	0.664211	37	28	24	0.488444
7	0	0.62	0.84	0.830243	26	32	20	0.558222
8	0	0.46	0.55	0.990616	41	33	14	0.575667
9	0	0.52	0.63	0.970905	29	40	19	0.697778
10	0	0.32	0.41	0.895446	31	37	65	0.645444

Formulas Used:

Alpha = $\text{Arc Sin}(\text{Width}/\text{Length})$

Gamma = Angle

BL = Beta left angle with wall

BR = Beta right angle with wall

BLR = $\text{BL} * 3.14 / 180$

BRR = $\text{BR} * 3.14 / 180$



