

Sketch

Volume 23, Number 3

1957

Article 8

Limit

Bill Johnson*

*Iowa State College

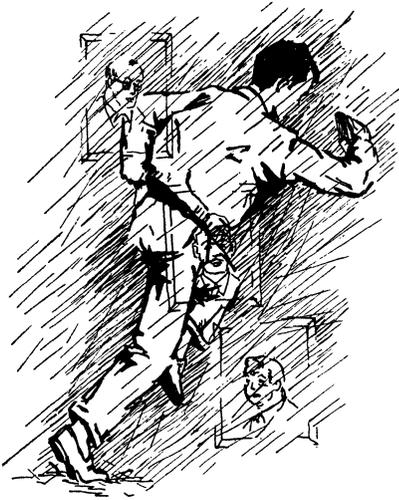
Copyright ©1957 by the authors. *Sketch* is produced by The Berkeley Electronic Press (bepress).
<http://lib.dr.iastate.edu/sketch>

Limit

Bill Johnson

Abstract

He walked down through an April world of majestic winds and high-blown skirts and shaded buildings and children sending cheerful kits of red and yellow and orange into a flawless sky, and fountains splashing time-flowing mists across shattered ponds, and drooping old men with blurred and distant eyes,...



LIMIT

HE WALKED down through an April world of majestic winds and high-blown skirts and shaded buildings and children sending cheerful kites of red and yellow and orange into a flawless sky, and fountains splashing time-flowing mists across shattered ponds, and drooping old men with blurred and distant eyes, and ivy smell, and ambitious boys who hadn't yet had their dreams knocked out of them, and bright broad expanses of concrete and brick and new grass. This was the University, the World of Knowledge, the world of synchronized electric clocks that made time run too fast, the world of mid-terms and grade points and "what is the ration of twiddle to diddle?" and girls who smoked and coughed and talked too loudly of sex and marriage, the question and answer world of "given x determine y " and "who in hell wrote whatever we were talking about if you can remember where in hell we were in the first place."

The school was unreal to him. He had long ago decided that the figures that scurried past him on the campus were only machines and if he were to stop one of them and press his head to its chest all he would hear would be a tiny metallic clicking sound and perhaps the quiet whir of gears. The campus was merely a colossal painted Hollywood backdrop that would collapse, if he were to push against it, into a jumbled mass of torn canvas and wires and broken struts and frames, leaving all the emptiness of the world behind.

He turned left and took the short-cut through the Engineering Building. The small rear door squeaked as he pushed through into the dark corridor beyond. His heels clicked against the mosaic steps as he made his way to the main floor and stood for a moment at the end of the hall where the pictures were. The pictures, the great small hollow pictures of men dead but still dying, ran the length of the hall in a double row, scrutinizing each passing student with perfectly photographed eyes and marking the hurrying footsteps with carefully retouched ears. He always paused at the end of the corridor before he started down, though he didn't know why. Something always seemed to hold him back, like a hand on his shoulder and a reassuring voice out of nowhere that said, "Not yet boy." He had decided that it was to give the men who moved the magic scenery from place to place time to get the hallway all set up for him, carefully consistent, never anything out of place. It was an amusing fantasy to think that if he were to push on, thrusting the retaining hand away, and walk down without waiting, then soon he would see signs of unfinished work — a lop-sided picture here, an incomplete floorboard there — until finally he would come to a place where the whole thing ended and there was nothing beyond, only the exposed frames and struts showing from behind. Then he would turn and walk back laughing.

He started to walk past the long lines of portraits, glancing at each as he passed it — here the former Dean of Boys, there the last president, here the football coach had led his team through a winning streak of thirty-three (33! — COUNT'EM — 33!) games in '29, there the first Dean of Engineering bedecked in a long neatly trimmed mustache, here the president during who's administration not one student had committed suicide (though of course, that was just after the depression when people were tired of doing away with themselves) and there the professor who had spent twenty years writing a paper on "The Effects of the Resistivity Coefficient on Internal Voltages". He walked rapidly, the eyes following and seeming to stare at the books he held in his hand as if they detected something that

shouldn't have been there. Then the great revolving glass doors were in front of him and he spun through, light breaking into whirling shards that slashed the length of the hall in a kaleidoscope of broken images and faces that spent the day clinging to walls.

As usual, when he left the building he was struck by the loneliness of their existence, pinned into exact, even lines by neatly carved wooden prisons, waiting for the day when they were forgotten altogether, and removed to let someone else's picture take their place. And this realization awakened a sympathetic loneliness in himself that remained long after the faces were left behind and forgotten. It never went away, that loneliness. It never ever went away, as long as he could remember.

. . . warm . . . so warm

god, that breeze feels good — too good a day for a test . . . damn that Kaylor and his calculus . . . he could have given more warning as to when he was going to throw one of his quizzes at us.

but o no, he has to wait till the day before he plans to give it to us to let us in on his little secret.

and I like a fool haven't cracked the book in two weeks

grrrrr damn the dadblasted cotton-picking luck

(life gets tasteless, don't it?)

you said it, fool

but the crib notes should help if I managed to copy the right equations . . . you never can tell what he's going to toss in

let's see what've we got here

a function of x is continuous at x equals a if the limit of the function of x as x approaches a equals a

now what in hell does that mean

lessee, the function of x is an equation and function of a is the value of that equation when a is substituted for x , and the limit of the equation as x goes to a . . .

why sure it is, even a fool like me can see that

why'd they even put it in I wonder

must be trying to confuse things

(and succeeding, if you will remember your first test)

sure but I just can't see how there could be anything very hard on this test

(maybe you're right)

let's hope so anyway

I couldn't cram all of it last night though lord knows I tried

where does all the time go to

tickety-tock and poof there goes perspiration . . . just like that all my time drains away, and I'm left sitting with a puzzled look and a sheet of crib notes that I don't understand like they always say if you don't know it now you never will

Edwards used to say that

I'd see him going in to take a test and ask him if he knew it cold, and he'd make a long face and say if I don't know it now I guess I never will

good old Edwards, we used to have a lot of fun together back at the old alma mater . . . like that time when old Judge Thompson was running for reelection and we doctored up the billboard so that it didn't read quite like it originally did
hah I can still see it

VOTE FOR

JOHATHAN "FIX" THOMPSON

Municipal Judge

in letters a foot and a half high, what a sight

and that car coming over the hill just as Edwards was finishing up, so we waved for him to hurry, and he came flying so fast that he spilled his can of paint all over his slacks . . . gad I wish I had thought to have brought a camera with me

that might have been called vandalism if it hadn't been for the fact that it was true, that was just after the big fix scandal in which the judge's name had been conspicuously prominent, though no one bothered to pin anything on him

Edwards was always dreaming up something like that

he was quite a playboy being an only child and such

never had anything to worry him, his parents are loaded, so he's doing the same thing here

all he does is party

I could probably make as good grades as he does if I didn't have to work to get some spending money . . . I wonder how it feels to party your way through school

I know it isn't anything like setting pins

that is Pure Hell (government certified)

but here we are at the time when all good men must offer up their sanity to a god called Calculus Test and this must be the place

(everyone get into line and pick up one (1) test sheet and one (1) answer sheet, take a seat and commence working as soon as you can find a good place for your crib notes)

ain't it the truth

well we might as well look at the exam and find out what dear Kaylor has thought up out of his sweet little head this time

if I take that seat in the back he shouldn't be able to see me peek once in awhile . . . better watch it though

I swear he's got x-ray vision

this first one looks like a doozler

find the derivative of $y = 5(x^3 - 2x/1/2) / 1/2$ by the increment process

sure I will

right away

now he gave that in lecture a week or so ago . . . what'd he do . . . let's see he said that if you increase y by an increment Δy than x increase by the increment Δx , well let's put that down

five times the quantity x plus Δx cubed plus two times the quantity x plus Δx to the one-half the whole thing to the one-half power

then you carry out the indicated arithmetic

but damn it you can't 'what's that Kaylor think of'

I can't get the entire y out from under the radical,

he's crazy

try the next one

find the inflection points of $100y = x^4 - 8x^3$

ok

first find the derivative

that will be $\frac{4x^3 - 24x^2}{100}$ and if he wants the inflection

point I've got to get the second derivative and set it equal to zero which is $\frac{12x^2 - 48x}{100}$ so x equals zero and four and

substituting that gives y equal to zero and -2.56 the third

derivative won't be equal to zero so those are my points

crazy

what's next

replace x by $1 + h$ in $3x^2 + 5x - 8$ and deduce that $3x^2 + 5x - 8$ is less than e if e is less than one and $x-1$ is less than $0.01e$.

god did we have something like that

its got to do with the definition of a limit, and I've got that in my notes somewhere, here it is

The limit of a function of x as x approaches a is L if for any positive number e , however small, there exists a positive number h such that the function of x minus L is less than e when zero is less than x minus a is less than h

there it is but what do I do with it

I dig it all but that h

the first expression merely says that the difference between the function of x and function of a is very small, but the second part says that this is only true when the difference between x and a is less than h

but what is h

there doesn't seem to be any relationship between h and e furthermore it says that the difference between x and a cannot be zero

then how can it be the limit

you'd think that the limit would be when the function of x was equivalent to the function of a , so x would have to equal a

but they say that that is impossible

how can they say that

this is nowhere

get to work

if I substitute one plus h into the equation in place of x I get three h squared plus eleven h is less than e

but that's not doing anything

h

what is h

what in hallowed hell is h

skip it

the fourth problem wants the proof for finding the limit of sine theta over theta as theta goes to zero . . . that is also on the sheet somewhere

let's take a look . . . I don't think he's looking for anyone to try anything out of line today, and I got away with it last time

it requires a figure I guess

sketch it out real quick

then it says that this triangle is less than this sector which in turn is less than that triangle

so one-half r times r sine theta is less than one-half r squared theta is less than one-half r times r sine theta then I'm supposed to divide by

"What've you got there?"

He looked up, saw that faces were turned toward him and realized that Kaylor was speaking to him.

"What do you mean?"

"Let's see that paper that you just looked at."

"You mean this?"

"No, not your exam paper. I mean that one under your book."

Numbly he handed the paper to the instructor. Kaylor took it, glanced at it, and walked away.

"You can leave *with* your test paper anytime you want," he said.

The boy sat bewildered for a long silent minute; then he put on his jacket, picked up his books, and walked out. A few heads turned to watch him go. He made his way through the cold, deserted hall and out the front door of the building. It wasn't till he stood at the bottom of the last step that he realized that all during that long moment he had not thought at all — everything had been mechanical as if he had been transformed to a machine. Now he thought feverishly, frantically. He considered going back in and talking to Kaylor in the hope that he wouldn't turn his name in to the college, but he knew that it would be useless and he didn't want to face the staring eyes and, worst of all, the amused sneers. He started walking again to give himself something to do. He didn't notice the world passing on either side of him. He stared ahead and shuffled as if asleep, absorbed in his jumbled searing thoughts.

Fool!

oh thou curs-ed damn-ed imbelilic FOOL!

do you know what you've done

is it within your comprehension to realize that you've
ruined your best chance to do something with your life —
that you've taken it and spit on it and tromped on it
what will mom and dad say
they always thought you were so beautifully pure
they won't believe it
not their son
no he's a good boy he wouldn't
but he did didn't he?

(do you remember when you were young and you used
to play all those crazy games? like blindman's bluff or johnny
may I cross your river? or may I take six scissor steps? or
step-on-the-crack-and-you'll-break-your-mother's-back?)

do you remember the time when you took that check
from the teacher's desk because you had seen dad with so
many of them and you didn't know they were worth any-
thing? and how you stuffed it down the sewer when you
found out that you were in trouble? but Eddy had seen you
with it and told them when they asked him so you were given
a note to take home — do you remember how the kids fol-
lowed you that night chanting

Tom, Tom, the piper's son,
Stole a pig and away he run,
The pig he did eat,
So bad Tom was beat,

And away he went crying down the street.

the moral was that the pig got the royal shaft
besides that doesn't apply here . . . I haven't stolen any-
thing

(haven't you?)

He started to take the shortcut through the Engineering
Building and stopped short, as usual, at the beginning of the
hall. He stared at the portraits on the walls and turned back.
He knew that he couldn't walk past those faces again. The
sunlight whirled and slanted and laughed along the circling
door as he went out. He took the long way around.

He turned left at the Navy Building. A little girl was
coming down the street toward him, her long pencil legs mov-
ing beneath a short dress and a tiny red coat. She didn't
notice him — her attention was absorbed in a broken red
rubber balloon that she held in her hands. She made a

bubble out of the fragments and was engrossed in twisting it so no air could escape. He watched her with interest. He wanted desperately to philosophize, and he seized on the picture of the little girl as material.

we used to call those cherries when I was a kid
 you stretched the shattered balloon in front of your teeth
 and sucked in and twisted.

and that was a cherry if the balloon had been red
 or a grape if it had been purple
 that's the way it could be with me

I've blown my balloon to bits but I've still got enough of
 the pieces to make a bubble if I want to
 but it'll take some doing I guess

The girl passed him, her eyes fixed in a kind of intent
 glee on her fragile sphere, her small bony finger twisting and
 twisting and twisting . . .

When he had walked a few feet further he heard a small
 pop behind him. He stopped but didn't look back. He knew
 that the girl's bubble had burst, that she had twisted it too
 far, that somewhere a limit had been reached and exceeded.

Then suddenly he was running, because from somewhere
 out of that bright and flawless sky a soft, warm rain was fall-
 ing, smearing the tumbling world into a blurred, soggy liquid
 that undulated, mixed within itself, and flowed down before
 his eyes, washing his cheeks and hands in gentle, compassion-
 ate streaks, then dropped through his fingers to whirl away
 in dull, shattered lifelessness.

On a wind turned strangely cold.

— *Bill Johnson, E.E., Soph.*