

### **(03) BILL HOWARD - RECOLLECTIONS**

**FORWARD:** *Bill Howard is a noted figure in mathematical logic. Studying under Saunders Mac Lane and Andre Weil, he took his PhD at the U of Chicago in 1956 with the thesis 'k-Fold Recursion and Well-Ordering'. Now Professor Emeritus at UIC, Bill is largely recognized in the mathematical world for his establishment of the relation between intuitionist logic and simply typed lambda calculus, referred to as the Curry - Howard Correspondence.*

*Stemming from their student days at the U of Chicago in the early 50's, Bill was a lifelong friend and intimate of Stan's up until 1991. As such they saw and were in touch with each other frequently in various circumstances (eg U of C, the farm in Michigan, Penn State, Yeshiva U, IAS, UIC).*

*The quintessential 'one who was there', Bill provides a fascinating account of his association with Stan over the years in a fulsome email correspondence during 2015/16. This includes not only his address 'My Life With Stan' delivered at Stan's memorial conference in April 2006 but further a large, wide-ranging, body of recollections, stories, comments, reflections covering among other things Stan's early life, his student days, and his connections with Bettelheim, psychoanalysis, Ray Smullyan, Paul Halmos, Andre Weil, the IAS, John Myhill, the Bourbaki....and so on.*

## (01) BILL HOWARD - MY LIFE WITH STAN

**Subject:** Re: STANLEY TENNENBAUM MEMOIR

**From:** Howard, William A.

**To:** robtully;

**Date:** Tuesday, 25 August 2015, 7:39

Thanks for the memoir. I would recommend that you send a copy to Peter and to Juliette Kennedy if you have not already done so.

Concerning the 1966 Thanksgiving party: 'the smartest man in the world' From Stan's description, it sounds like Jack Towber. Also, Paul Cohen used to say: "Towber is the only person I have ever met who is smarter than I am."

My own relation to the 1966 Thanksgiving party is as follows. I was then living in Chicago. When Stan phoned and invited me to the party, there was something about the way he was talking that made me uneasy. I asked him: "Who is going to be there?" His reply: "Oh, everybody. All your own friends." That made me even more uneasy. Nonetheless, I bought a plane ticket to Rochester, and, at the proper time, set out in my car to O'Hare Airport. I should have taken the Kennedy freeway but, without thinking, took the Eisenhower freeway instead. I did not realize my mistake until I got to the end of the Eisenhower. There was a highway that took me to O'Hare, but I arrived there a few minutes after flight-time. I sat in my car, pounding the steering wheel in frustration, watching the passenger jets taking off and thinking too myself: "The modern world is too complicated for me. I am too old for this." (I was essentially 40 at the time.) Of course, I could still have gone into the airport and arranged to get to Rochester one way or another, but, instead, I just gave up. No doubt my unconscious had been telling me: "Stan is orchestrating something. Stay away."

Here is the talk I gave at the memorial conference.

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**FORTY YEARS OF ADVENTURES WITH STAN**

By William A. Howard

(This is the talk I gave at the Conference in Memory of Stanley Tennenbaum at the Graduate Center of the City University of New York, April 7, 2006.)

I met Stan in the spring of 1950, when we were graduate students at the University of Chicago. Stan was a handsome young man in a Brooks Brothers suit who had an obsession with Gödel's incompleteness theorem. If he spotted you crossing the campus, he would back you up against a tree and compulsively explain Gödel's incompleteness theorem, like the ancient mariner in Coleridge's poem, *The Rime of the Ancient Mariner*. I think he got this bug from Carnap, for whom the incompleteness theorem was a source of great unhappiness. (It refuted the positivistic view that the meaning

of a sentence was to be given by a procedure for determining its truth or falsity.)

During the period 1950-1953, my relationship with Stan was rather casual. I was trying to become a great mathematician like Andre Weil, and I had only a casual interest in logic. In the fall of 1953, Myhill and Dekker had visiting appointments at the U. of C. Stan was occupying Prof. Bergstrasser's house and holding a continuing salon in logic and philosophy. Paul Cohen was living upstairs and frequently came down to heckle. Myhill was living in the basement. I switched to logic and saw a lot of Stan during the period 1953-1956. I am not sure how many hours that amounted to: a few hundred, I would guess.

From associating with Myhill and Dekker, Stan became an expert recursion theorist and decided that he would solve Post's Problem. He became obsessed with this and neglected his career. I became concerned, but he would always reply: "This is a problem I think I can solve." I agreed that if he did solve it, it would be a good career step; but what if he didn't? He moved to an apartment at 57th and Kimbark (spring of 1954, I think). Eventually, he thought that he had solved it. He presented the solution to a small group of us at 1:00 o'clock in the morning, then we all went to Gladys' Restaurant on 55th Street to celebrate, and he held forth on philosophy and the nature of mathematics. When I arrived home about 4 in the morning, I suddenly saw the mistake in his proof; I wrote out an explanation, tacked it to his door, and went home to bed. It was probably in connection with this episode that Mo Schreiber said: "That's Stan. A football is punted high. He runs to receive it. Either he makes a heroic receive, or he trips and falls on his face. Nothing in between."

Actually, he was trying to prove that there were no intermediate degrees. But Friedberg (1957) constructed an intermediate degree by use of an argument that was an order of magnitude more subtle than what anyone else was using (priority argument). So Stan did not solve Post's Problem; but he did make himself an expert in recursion theory, and later made a few good contributions (eg., the idea of retraceable sets). Through my association with Stan, I myself acquired a respectable level of expertise in the field.

Conversations with Stan could last quite long. I remember getting into a philosophical discussion with him one afternoon on the corner of 57th and Kimbark. People were passing us, going home from work. The sun set in the west. Some time later, the sun rose in the east. Then the same people passed us on the way to work. "You are still here?" Actually, I doubt that we stood there the full 16 hours; we probably went to an all night restaurant; but, at 8 o'clock in the morning, the same discussion was going on. Most of our discussions did not last that long, but some did go on for a several hours. Years later, Stan used to come through Chicago once or twice a year, and we still had those marathon sessions. Once we ended up sitting on the rocks at Belmont harbor at 6 or 7 in the morning with Stan telling me about someone's early, overlooked work in set theory

(scales, rates of growth) that he was using for a radical simplification of the continuum problem. I don't know what came of this.

From 1959 to 1965 I was at Penn State. I saw Stan several times during that period. I visited the farm in Michigan a few times (1960-1962). There was a dog, Violet, who hid under the table, also a male collie, also a cat and several kittens. In one visit, Kreisel was there. In another visit, Stan explained to me his solution to Mostowski's problem (no recursive nonstandard models of arithmetic) and I liked that very much. Stan's time on the Michigan farm struck me as a happy time.

During 1962-1963, when he was at Yeshiva University, I encountered him when visiting Princeton. On the spur of the moment, he had me accompany him to his farmhouse in Connecticut. I cannot remember what we talked about, except for some remarks about his colleagues and students at Yeshiva. It was summery weather and there were ticks in the woods. I loved the house because it reminded me of a mountain lodge. I slept on Jonathan's bed, which had a wonderfully comfortable horsehair mattress. A year later, he was at Stony Brook, and I drove there from State College. He talked to me at length about his work on Souslin's problem. It was either then or later that he gave an hour address to the ASL in Manhattan. At the end of the talk, Tarski stood up and said: "Who ARE you? Who ARE you?" He meant: You have done magnificent work but I don't know who you are. High praise.

Stan got me to go to the University of Illinois at Chicago (1965), which did not take much doing, since I wanted cosmopolitan surroundings and they needed faculty for the new university. His idea was that he and I and my pal Norman Hamilton (and Verena Dyson?) would be there. He was in a manic phase, with vast schemes. He had one of the deans eating out of his hand. He was acting out his role as Robert M. Hutchins.

I saw a lot of him during my year at the Institute for Advanced Study (1972-1973). As usual, there were long, interesting conversations about a wide range of topics (eg., John Nash; the fight between Carl Kayson and the Math Dept); but there was something compulsive about his behavior. He was psychologically inaccessible in the sense that he would not talk about the details of his own life. He took me down into one of the utility tunnels, where the maintenance staff had a nest where they relaxed, played cards, and so on. I said: "Stan, what are you doing down here?" He replied: "I am organizing them to rise against their oppressors." He was sleeping in Sue Walker's office, which (I think) was Einstein's (or Gödel's) old office. She had the office by virtue of being Whitney's assistant (in a math education project). A bright spot is that I got to know the Whitneys, with whom I got along very well. I met with Gödel a few times, and Stan would wait outside; then we would go over the meeting line by line. I was just as eager as Stan to understand what had gone on.

In subsequent years, up through 1991, I had long conversations with him whenever he came through Chicago. Once in the 1980s, I had to bail him out

of jail. He had been sleeping with the homeless in the bus station on Randolph Street; they had slept too long into the morning and the police had rounded them up. The decline of his physical health and psychological condition from (say) 1972 onward distressed me more than I can say; but we did have some interesting conversations.

Gödel showed that, given any nontrivial system of mathematics, there are truths inaccessible from within the system. One has to go outside the system and apply a diagonal argument. Stan could not operate inside a social system: he had to stay outside and diagonalize it. This led to insights, but at a heavy price.

Sometime between 1965 and 1991 he gave a lecture at the University of Chicago math department: "On Current Attempts to Destroy Set Theory." McKeon, very old, was there. This was mainly an attack on Mac Lane, whom Stan accused of trying to replace set theory by category theory. Mac Lane really enjoyed it, saying: "It is just like old times." The U. of C. math department had indeed become a tamer place, and Stan's lecture livened it up a bit.

The last time I saw Stan was in the spring of 1991. I had a large lecture section: finite math for business students. He came to the lecture; afterward he gave me his analysis: I was in a situation that was bad for me. On the grounds of mental health, I should ask the dean to relieve me of these classes; I should offer to clean latrines instead. I agreed with his analysis, though not with his specific solution. As usual, we talked about a variety of topics for the next several hours. We ended up standing on Diversey Street near Sheridan at 7 o'clock in the morning. He was being particularly demanding about something, I cannot remember what. I was having a physical reaction to my psychological stress. Not entirely Stan's fault: I was having problems in my own life. I told Stan that I had to go home to bed. That is the last time I saw him.

#### WHAT DID STAN AND I TALK ABOUT?

I have been asking myself: What did Stan and I talk about in all those conversations between 1950 and 1991? Roughly: up to 1972 it was mainly about mathematics, logic, and philosophy. Also educational issues: the universities, and, later, what goes on in the high schools (when Jonathan was going to high school). Also psychoanalysis and related topics (in particular the use of psychoactive medication). From 1972 onward, Stan talked a lot about political and social issues. I listened reluctantly.

For example, in the fall of 1972, when Nixon devalued the currency:

Stan: "You are now 25% poorer."

BH: "So?"

Stan: "The rulers have decided to teach your social class a lesson. For 25 years, after WWII, your class has been lifted up. But now your class has become unruly, so they have given you a little drop, as a reminder of who is in control."

By "my class" he meant: people in the academic world.

I did not know what to make of this. It sounded a bit too conspiratorial to me.

Once, in the 1980s:

BH: "Stan, you tend to see conspiracies behind various situations."

Stan: "Often it is useful to see a situation \*as if\* it is the result of a conspiracy."

Sometimes we talked about educational issues. In 1959 I began teaching at Penn State. Visiting Stan in Michigan, I complained of the restricted framework in which I was expected to teach.

Stan: "Teach the way you think you ought to. You are the professor."

This was good advice. Sometimes it led to problems; but, over the years, it has often been helpful.

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Best regards,  
Bill

## **(02) BILL HOWARD - FURTHER THOUGHTS, STAN'S EFFECT**

**Subject:** Re: Stan  
**From:** Howard, William A.  
**To:** robtully  
**Date:** Tuesday, 15 September 2015, 23:30

Dear Rob,

A few years after Stan's memorial, I was talking to Juliette Kennedy, who was a close friend of Stan, and, in fact, had been responsible for the memorial itself. I told her that my presentation at the memorial had not mentioned an essential aspect of Stan's influence on me; namely, that he had expanded my horizons. Here are two examples:

(1) The liberal education. He had gone through the U of C College during its prime (actually, it was still at its prime when I arrived in 1949). Great Books and all that. From him I learned all about the liberal education. I am not saying that the liberal education is suitable for state universities, but knowing what it is all about has given me a valuable perspective on the academic world and education as a whole.

(2) Psychoanalysis. He spent a few months at Bettelheim's Orthogenic School (a school for really really disturbed kids), and from Bettelheim he acquired a deep understanding of psychoanalysis. So he taught me some of this, indicated how it helped to understand various people. He occasionally analyzed a dream of mine or the people we hung out with. I was so impressed that I made a thorough study of Freud's book, "The interpretation of dreams."

Actually, I think I have put my finger on the two most important ways in which he expanded my horizons. Good.

Item #2 did not have much effect on my career, but it helped me understand who I am, so it would go under the heading: metaphysical journey. Item #1 helped me understand who I am academically, and this has been a great help in my career.

But the above is just a summary. In regard to item #1, you have given an excellent summary in the Spring 1965 - Fall 1965 section of your memoir, starting with "When you entered Stan's class, you entered the totality of his Cardinal Newman's 'Idea of a University' scholastic world, ..." and ending with "one of the most interesting episodes being when Stan asked Bonnie Gold in a number theory course whether she would bet her life on something she had just stated, ..." Incidentally, I met Bonnie in the summer of 1968 (the month-long conference at Buffalo university); very smart, very nice.

Also relevant to #1 are the two paragraphs in in the Spring 1965 - Fall 1965 section of your memoir, starting with "I always had the impression that Stan's life started at 16 at the U of Chicago, ...".

As I say in my memorial presentation: the decline of his physical health and psychological condition from (say) 1972 onward distressed me more than I can say. I have often pondered this change in Stan. I find the following passage, in the first of your two paragraphs mentioned above, particularly interesting: "I also had the feeling that it was here that he 'constructed' himself, block by block, building an intellectual, philosophical, metaphysical foundation, of course informed by the Chicago curricula, out of his own rational thought". The result was certainly impressive, but maybe he was trying to do something impossible.

Let me end this email with the following story bearing on educational matters. In the spring of 1991 (or possibly a year or two earlier), Stan suddenly appeared on campus (U. of Illinois, Chicago). I was running to teach a class, a large lecture section on Finite Math for Business Students. Stan asked if he could sit in. I was happy to have him do so. He sat in the back and observed.

It was a typical lecture. Halfway through, a couple of students decided to leave, causing a commotion by making their way across the aisle (auditorium style lecture room). A few minutes later, someone dropped an empty Coke can: clank, clank, clank as it made its way down the tiers. And so on. Afterwards, I said to Stan: "I don't know how to handle this. Will you be a guest lecturer in Friday's class so I can pick up some pointers as to what to do?"

Stan's reply was: "Sure, under two conditions. First, the students' parents need to be present, so that they will see how immature their children are. Secondly, the Dean needs to be present, so he can see what the educational situation is at his university"

ME: "Okay, Stan, I get your point. But I really need advice. Tell me something practical."

STAN: "Bill, this course is bad for your mental health. You should go to the chancellor and ask, on grounds of mental health, that you be relieved from the duty of teaching this course, and, to make up for this, that you will spend an equivalent amount of time cleaning latrines."

I did not take this specific advice, but it helped me understand that courses of this kind were indeed bad for my mental health. One way or another, I managed to avoid them for the next ten years, at which time the math. dept. administration was beginning to catch on, so I retired.

One strategy was to concentrate on the math. ed. courses. The math. dept. had an excellent program of courses for prospective or already practicing high school teachers, and I had already found these courses pleasant to



teach, in particular because they were taught in small classrooms holding at most 32 students. In fact, on the same day as the above episode, I taught one of these classes in the evening and Stan came along. He got so excited that he could not restrain himself and took over the class. It was a typical Tennenbaum performance; I don't know what the students thought. What I thought was: Well, it was good for them.

Best regards,

Bill

### (03) ROB TULLY - REPLY TO BILL, FREUD AND BETTELHEIM

**Subject:** Re: Stan  
**From:** Rob Tully  
**To:** Bill Howard  
**Date:** Monday, 21 September 2015, 15:46

dear bill,

it was with great pleasure that i received your account of the effects and influences stan had on you, those so in concert with those he had on me.

leaving the house one morning to go to the U of R campus, apropos of i forget what, he commented over the top of the car, he getting in one side, me the other, on the genius of freud's 'interpretation of dreams', 'real science' as he put it, a book that would take a minimum of two years to really comprehend. i of course immediately put it in my mental 'to do' list (though as yet have not set aside the demanded two years).... his regard of freud (as you note, through bettelheim) might have been responsible for my taking later a freud seminar though i can't be sure of that..... he spoke often of bettelheim which did indeed cause me to (1) read much of bettelheim's work and (2) seek summer employment at the orthogenic school (it turned out that bettelheim would not be there that summer)..... a few years later dick cavett on his talk show was hosting bettelheim followed by a very minor comedian, doc something or other. coming on after bettelheim and sitting next to him, the comedian, abject fool, tried with lame arrows at psychiatry to elicit some cheap laughs at

bettelheim's expense. within two or three scathing sentences, bettelheim demoralized the pretender to such an extent he ended up staring at his shoes, head bowed, for the remainder of his interview, from which position he never recovered. i was astonished. when i mentioned this to stan who had also seen the segment in 1971 (the last time i saw him), he said 'see, an expert' ..... many many years later i saw a lecture by bettelheim at the u of new mexico, not too long before he committed suicide.

i hugely regret not being in touch with stan in his later years, not least because of his financial straits which by that time i could easily have helped with and would have very happily done so. lamenting this on a visit to peter in rochester, peter said no, it was far better that i didn't know stan then as he had markedly deteriorated physically and psychologically, peter noting that he was having all of the john nash symptoms of schizophrenia, reading arcane messages into everyday events and so on. perhaps his pot habit might have had some effect. indeed, looking at peter's wedding pictures, i had to ask who a certain man was in the photos, only to be told that it was stan, shockingly unrecognizable to me..... my friend john flavin, a couple of years ahead of me, after talking to stan at length one morning in '67 or '68 when stan was through rochester, said that stan was deeply haunted by something which would never let him be deeply at ease.

i have a particularly hard time trying to imagine stan when he was young, a student with you at chicago.....i

knew him when he was a mature 39, masterfully assured in all aspects, a mantle of intellectual virtuosity lying easily about his shoulders.....if you would like to relate something of him during this time, i would be gratified.....

at some point (in the 70's?), stan lived with bonnie gold and her husband until that point the he and the husband had an irreconcilable contretemps.

though i did write to juliette kennedy, i've not heard from her. should it not be presumptuous, i would be appreciative if you mentioned the existence of the memoir to her.

my best wishes,

rob.

## **(04) BILL HOWARD - TO JAZMIN ARELLANO, THE BOURBAKI**

**Subject:** Re: Bourbaki  
**From:** Howard, William A.  
**To:** jazmin  
**Cc:** robtully  
**Date:** Thursday, 24 September 2015, 10:35

Dear Jazmin,

Maybe you are referring to Tully's passages:

Spring 1965 - Fall 1965 "distrustful of Lang (or at least Lang was of him), who was at the University of Chicago at the same time, perhaps because of his association with the Bourbaki, red rag to a bull anathema to Stan."

Spring 1966 - Winter 1966 "For Stan mathematics should be concrete, hands-on, the proof of any statement, no matter how complex, could, if the keys were found, be written on a single sheet, most often attended with the right 'picture' ..... it was this persuasion, prejudice if you will, that leaned him towards Klein, Hilbert (Geometry and the Imagination), Courant, Polya, Poincare, made him dismissive of, distrustful of the Bourbaki, an effort he philosophically opposed as being inimical to the creative and continuing flowering of mathematics. (Andre Weil, at Chicago when Stan was there, was the purported head of the Bourbaki. Much of his life spent trying to solve the Riemann Hypothesis, Stan claimed that he used to walk around the commons room asking new students how old they were, and if they were over 21, used to cackle 'Ha!! ... It's too late for you!!')"

Bourbaki's approach emphasizes abstractions: no diagrams or pictures. As V. I Arnold says at the beginning of (\*) <http://math.sun.ac.za/wp-content/uploads/2013/03/Bourbaki.pdf> it is left-brained, no right brain. Also no concrete examples. So Stan did not like this.

The Bourbaki group wrote a number of volumes intended for students at about the first year of graduate school. The style is very austere. I did not like them much, except for the historical passages (obviously written by Weil), which are superb. As indicated in the second paragraph of page 2 of (\*), this series of volumes was meant to do for today's mathematics what Euclid's Elements did for the mathematics of his time, an impossible goal. The next couple of paragraphs describe one of Bourbaki's pranks. By "the truth", Weil meant that Bourbaki was an actual person. As Mac Lane says in his autobiography (p. 202): "Wow!" Mac Lane goes on to say, "I wrote an ambiguous letter to the editor; fortunately, Weil did not stop speaking to me." Bourbaki then spread the rumor that Boas did not exist;

rather Boas was an acronym, B.O.A.S., for a group of American mathematicians. I was a student there at the time, and we were all gossiping about it. My impression at the time was that Boas was quite peeved. Maybe he got over it; he talks about it in an article, Bourbaki and Me, in the Mathematical Intelligencer, 1986 (use to be available for free online; now they want to charge for it; so to hell with them).

I got a kick from Grothendieck's remark, col. 1, page 2 of (\*), near bottom.

Tully (above) reports that Stan claimed that Weil used to walk around the commons room asking new students how old they were, and if they were over 21, used to cackle 'Ha!! ... It's too late for you!!')" Maybe this was Stan's version of the following story, which I undoubtedly told him. In the fall of 1953, when Weil and I were walking in the park, he suddenly had a thought:

WEIL: "How old are you?"

ME: "26."

WEIL: "When Newton was 26, he had already discovered the theory of gravitation, invented the calculus, etc., etc."

I wondered what this was all about. I already knew that Weil had been a child prodigy, and in his teens had been told that he was expected to be Poincaré's successor. When I arrived at the U. of C., there was gossip that Weil was unhappy at not having reached the level of creativity of Poincaré, and that this explained some of Weil's behavior. So, I thought at the time: maybe that was it. The explanation is plausible, but, in pondering this episode in subsequent years, I felt that this was not the whole explanation. In 2003 or 2004, I recounted the episode to Jill. Her reply: "How old was he?" I made a quick calculation and replied: "46 or 47" (actually, he was 47). Then I immediately thought: Well, of course, the retirement age for membership in the Bourbaki group is 50! Jill's intuition about what was on Weil's mind was correct. He was thinking that his own time was running out.

Actually, in 1967 he came up with the Taniyama–Shimura–Weil conjecture (which eventually led to Andrew Wiles' proof of Fermat's Last Theorem in 1994); so there was still some life in the old horse.

It is past my bedtime, so I'll stop here

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Bill

## (05) BILL HOWARD - THE EARLY STAN

**Subject:** Re: The early Stan  
**From:** Howard, William A.  
**To:** robtully  
**Cc:** jazmin  
**Date:** Friday, 25 September 2015, 7:58

Dear Rob,

Stan did not speak very much about his early life. He grew up in Cincinnati; his father owned a large furniture store or company, already established by the grandfather. He spoke to me about this a couple of times. My impression is that there was quite a bit of money in the family. I met his mother when she paid a visit to Chicago in the mid 1950s. Cincinnati socialite, very domineering.

He was on his high school's football team. I remember him telling me that when they played against the local Catholic high school, he would be out on the field and the members of the opposing team would be calling to one another: "Get the Jew-boy."

After the following episode, there was no doubt in my mind that he had been a serious player in the high school football scene. In the fall of 1953, we were walking down the street. There was a group of young kids (around age 12) playing football in the middle of the street. STAN: "Give me the ball. I'll show you how it should be done." He punted the ball expertly, high in the air. While we were leaving, the kids were saying, "Who is he?"

So, at age 16 there was a big step in Stan's life: from Cincinnati bourgeoisie to the Hutchins program. In your memoir, Spring 1966 - Winter 1966, you say: "I always had the impression that Stan's life started at 16 at the U of Chicago, that an unknown world yawned before him, one courtesy of Hutchins' vision, .... I also had the feeling that it was here that he 'constructed' himself, block by block, building an intellectual, philosophical, metaphysical foundation, of course informed by the Chicago curricula, out of his own rational thought."

I find your observation very perceptive. It may help explain the changes in his behavior that began to manifest in the late 1960s. He had built one personality on top of another that was radically different, and the contradictions began to make themselves felt.

He had a sister approximately his own age. Here is an amusing story. I met him through his pal Raymond Smullyan in, I think, 1951. Raymond also had a sister approximately his own age. Raymond knew a lot about psychoanalysis (it is my impression that he himself had undergone psychoanalysis for a

number of years, but I don't know this as a fact). Shortly after Raymond had introduced me to Stan, I witnessed the following conversation between Raymond and Stan.

RAYMOND: "Do you think that it would have been therapeutic if you had slept with your sister?"

The discussion went on for some time, considering the therapeutic pros and cons for sleeping (ie., having sex) with one's sister. Unfortunately, I cannot remember the details because I was sitting there open-mouthed. I had never seen anything like this. I was a hick from the sticks, having grown up in the mountains near Vancouver. So, for me, this was very avant garde. Of course, after a few months of conversation with Stan, in which he passed on some of the knowledge of psychoanalysis he had acquired from Dr. B., I would have regarded the above conversation as completely normal. I'll break off here. I assume that you got the cc of my email to Jasmin. She is a friend of mine, on the humanistic side of the cultural divide, interested in the Weil, Bourbaki, and my relationship with Stan.

Bill



## **(06) BILL HOWARD - JONATHAN, STAN AND EDUCATION**

**Subject:** Re: Jonathan's paper  
**From:** Howard, William A.  
**To:** robtully  
**Date:** Friday, 17 June 2016, 8:37

Dear Rob,

Thanks for Jonathan's paper. I had not seen it before. There was nothing about it at the memorial conference. I hope Juliette has a copy.

I am still pondering the paper. As an initial step, I have zeroed in on some items that call up concrete memories.

"Another very important influence was my father's experience working as a voluntary assistant in Bruno Bettelheim's school for autistic and schizophrenic children in Chicago. By understanding the extreme case of the damage done to those children, and how they could be helped, and comparing with many other experiences, he gained an extraordinary insight into the emotional side of education generally."

Yes, sometime before I met him, Stan worked for a few months as a counselor in Bettelheim's Orthogenic School. We talked about it quite a lot. From his experience as a counselor, and from Bettelheim himself, Stan became an expert on psychoanalysis; and I learned a lot from Stan, studied Freud's "Interpretation of Dreams", and in fact use a version of this (due to Ira Progoff) at appropriate times in my own life. Also, Stan analyzed two or three of my own dreams. Very impressive.

Agreed that what Stan learned from the Bettelheim experience strongly influenced his ideas about education.

"Indeed, one could say, that the greater part of scientific education at the University of Chicago in the 1950s, did not go on in classrooms, but rather in places like Steinway's coffeehouse on 57th Street, where my father used to hang out a lot of the time, often with me tagging along; and where young people could learn most of their physics, mathematics and chemistry by just sitting at the table with scientists, many of them already famous ones, arguing and fighting over ideas."

Yes indeed. I was there. It was Stineway's drugstore with tables for snacks and coffee, corner of 57th and Kenwood. More generally, both the undergraduates and the graduate students learned more from their informal interaction with the faculty and with each other than they did from actual classroom experience. The educational environment at the Univ. of Chicago at that time was very unusual.

High school math textbooks: "incoherent, kaleidoscopic, broken up with countless colored boxes, irrelevant cartoons and arbitrary symbols, supposedly to make them "interesting" (i.e. distracting) to the child."

I remember, on the farm, Stan showing me one of them. It was, indeed, pretty bad.

"But then, in Michigan, I fell into trouble, especially in mathematics, and the teachers got to me. I did not have my father's defiant character. Instead of fighting back, I caved in. My father was furious! He saw me being destroyed and finally decided to take me out of school entirely. That brought him into serious conflict with my mother, ..."

I visited Stan's farm in Michigan a few times, 1960-1962. Jonathan was being "home schooled". It did not seem like such a big deal to me. I did not realize that his mother, Carol, had misgivings about the situation.

"I was lazy and rather spoiled, and spent most of my time running around outside on the farm."

He is exaggerating. He was a serious person, mature for his age (9-11). The last time I saw Jonathan was when I visited Stan at Stony Brook. This was probably 1964.

"(In the sequel, I hopped and jumped in and out of school and home, without finishing either grade school or high school, sat in on some university courses, finally got interested in mathematics -- particularly Riemann's theory of functions of a complex variable and analytical number theory --, learned to work hard, finished a doctorate at the University of California and left, at the age of 22, for a teaching position in Europe. ... )"

Jonathan got his doctorate under Bishop in 1973. I would like to know more about his experience with Bishop. Stan was talking a lot about Bishop during those years, in particular in connection with the project of creating a new university. Stan recounted some of this to me (ie., his conversations with Bishop) during the late 1960s.

"One of the people who felt particularly resentful and threatened by my father was the wife of a faculty colleague, who was trying to build herself a career in "computer science". The particular colleague, while very brilliant, had a history of mental illness. Now, his wife went to my mother and confided to her, that she recognized the same symptoms of "manic-depressive psychosis" in my father, as her own husband had suffered from! ...

To make a long story short, my mother demanded that he go with her to see a university psychiatrist for "consultation". Smelling an attempt by Wallis et al. to obtain a pretext for removing him from his tenured position at the University -- mental illness being one of the two legal

justifications for such a move -- my father demanded that I go along as a witness ..

." Wow! Reads like a novel; but also has the ring of truth.

The educational films: Stan talked to me about this but I found it hard to relate to; it was not the sort of thing that I was very interested in. I remember him recounting a conversation with Gödel, who said, concerning the opposition he would encounter from the entrenched commercial interests, "They will destroy you \*instantly\*."

Concerning the importance of fostering the ability of children to "think things through by and for themselves -- the sovereignty of their minds --": well, of course. I don't recall Stan emphasizing this, but he probably did; it is just so obvious to me that I would not have noticed.

The fight at the IAS: As mentioned in my talk to the memorial conference, I was there during the year 1972-1973. Lots of memories from that year.

I have not had any contact with Jonathan since Stony Brook, 1964. I should send him an email. Could you give me the address?

Bill

## (07) BILL HOWARD - PAUL HALMOS

**Subject:** Halmos  
**From:** Howard, William A.  
**To:** robtully;  
**Cc:** fthulin  
**Date:** Wednesday, 27 July 2016, 8:41

Dear Rob,

Re your mention of the tension between Stan and Paul Halmos (Winter 1966 section of your memoir): it goes back to (at least) the fall of 1953, when Halmos was giving a course on a method of subsuming Gödel's Completeness Theorem into a variant of Tarski's cylindrical algebras. Stan's reaction to this was: "Paul is trying to destroy logic by subsuming it into ordinary mathematics. In this, he is being egged on by Saunders Mac Lane."

Also, in the fall of 1953, Jim Dekker was giving a seminar on recursion theory. I was not interested in Paul's course or Dekker's seminar but I often came around when the seminar let out. One day, I heard Halmos down the hall say: "There go the logic cadets." Maybe he was annoyed that most of the seminar participants were ignoring his course. Also, he told me that he thought that logic attracted some pretty weird people; e.g., Stan, Smullyan, Myhill.

Re your remark in Winter 1966 section, "Logic students included Bill Howard, Ray Smullyan, and Anil Nerode": Michael Morley should be included. When I mentioned to him, in 2004, "We had an exciting logic group at U. of C. in the 1950s," his reply was, "We had logic students but no logic professors."

As for Halmos' book (1960), 'Naïve Set Theory', I did not understand why Stan's reaction against the book was so negative. I seem to remember him saying: "It's fraudulent. He does not know what he is talking about." My explanation now would be twofold: (1) Stan did not like Halmos very much, and (2) he thought that the book was unphilosophical. In reply to #2, I would say that it was not meant to be philosophical; it was just an exposition, meant for a certain audience. Apparently, even today, this audience has found it helpful:

[http://www.goodreads.com/book/show/558194.Naive\\_Set\\_Theory](http://www.goodreads.com/book/show/558194.Naive_Set_Theory)

Halmos was Errett Bishop's thesis adviser. Stan talked to Bishop a lot about his plans for a new university. I got to know Bishop pretty well. Jonathan got his Ph.D. under Bishop in 1973. Small world!

I am sending a cc. to my colleague Fred Thulin, who is interested in these matters. Reminder to Fred: The memoir, on Google, is "Stanley Tennenbaum: American Original."

Best,

Bill

## (08) BILL HOWARD - LOGIC ACCORDING TO HALMOS AND WEIL

**Subject:** Logic according to Halmos and Weil  
**From:** Howard, William A.  
**To:** fthulin  
**Cc:** robtully  
**Date:** Saturday, 30 July 2016, 8:30

Dear Fred,

After Friday's conversation I remembered another Halmos episode.

Sometime in 1954 I mentioned to Halmos that I was working on a finitary consistency proof for Peano arithmetic. From then on, for months afterward, whenever I passed Halmos in the hallway, he would say, with a show of anxiety, "Bill, have you proved the consistency of mathematics yet? We need to know, so we can get on with our research without being afraid that it is all inconsistent."

Also, he liked to go around saying, "Intuitionistic mathematics? Doing mathematics without the use of the law of the excluded middle is like taking a centipede, cutting off all but one its legs and seeing how far it gets." I wonder what he thought when Errett Bishop, one of his best students, from 1965 onward devoted his life to developing constructive mathematics which avoids use of the law of the excluded middle?

Here are a couple of Weil episodes. In the fall of 1951 I mentioned to him that I was taking a course from Carnap on The Axiomatic Method. From that time onward, Weil kept asking me, "Well, are you through with your axiomatic nonsense yet?" Once, when we were out for a walk, he said, "I hope you are not involved with Brouwer's intuitionistic mathematics, which is an \*abomination\*." He said "abomination" with great emphasis, stamping his foot on the sidewalk.

So that was logic at the U. of C. in the 1950s. Not that I found episodes of this sort discouraging. It just increased my resolve to keep doing what I was doing.

From the above, and also Stan's remarks quoted in my email of 7/27/16 to Rob Tully, one would conclude that Halmos was unfriendly towards logic. A different perspective is provided by Nerode in his obituary of Hartley Rogers in the Bulletin of Symbolic Logic, June 2016, p. 295. Nerode is talking about what led to the five week NSF Summer Institute in Symbolic Logic at Cornell in August, 1957. He says that it was this meeting that created the mathematical logic community. Halmos played a crucial role: "Halmos, then at the University of Chicago, had the motto, `Mathematics is

a social science', and suggested to Tarski a meeting of all those doing research in mathematical logic." Tarski and Rosser then got funding, etc. But I found a much more detailed account of this:

<https://math.stanford.edu/~feferman/papers/cornell.pdf>

Alfred Tarski and a watershed meeting in logic: Cornell, 1957, by Solomon Feferman.

Feferman says that Halmos got the ball rolling when he contacted Edwin Hewitt in 1955. In his letter to Hewitt, he says:

"In regard to the non-availability of other support, I think little need be said. Although logic is one of the oldest subjects of mathematical interest and although I am convinced that its continued study is of tremendous mathematical value, the subject is not such as to capture the imagination of an admiral of the navy or a tycoon of industry."

Hey Paul, right on!

As ever,

Bill

## (09) BILL HOWARD - STAN, MYHILL, WEIL, AND ME

**Subject:** Stan, Myhill, Weil and me.  
**From:** Howard, William A.  
**To:** robtully  
**Date:** Thursday, 18 August 2016, 8:47

Dear Rob,

Feel free to make use of my emails about Stan and company in any way you want (unless there is something that might offend somebody, but there is nothing of that sort in the emails I have sent you up to now).

You mention Weil and Bourbaki in your section Spring 1966 - Winter 1966. Here is something that will amuse you, especially since it includes Myhill and (in a separate story) Mac Lane. It is a post, by my colleague John Baldwin, of a couple of emails I sent him.

<http://homepages.math.uic.edu/~jbaldwin/pub/howonbour.pdf>

Recollections of some connections of Bourbaki with logicians, by William A. Howard, July 27, 2013.

I don't know how much personal contact Stan had with Weil during our student days, but in the late 1960s, when Weil was at the IAS, Stan had established a personal relationship with him. At U. of C., Weil pronounced his name as in "Vile" but later changed it to Vey, possibly to avoid confusion with Hermann Weyl; also there was his famous sister, Simone, but that is another story. In any case, in the late 1960s and early 1970s, Stan used to go up to Weil and say, "Oy, it's Mr. Oy Vey!" They got a kick out of each other.

Weil's learning was formidable. He studied Sanscrit in India, could quote Plato in the classical Greek, etc., etc. One day, in the fall of 1972, Stan and I were at the IAS tea, when Weil and a group of formally dressed elderly men came through the door. Stan said to me, "That's the archaeology seminar. They are terrified of him."

Jonathan describes the fight at the IAS against Kaysen's plan to create a new "School of Social Science" alongside the existing three faculties of mathematics, physics and history, with Robert Bellah as head. Weil was in the vanguard of the opposition. In an interview with the New York Times, Weil said, "Yes, I have read Bellah's worthless book," etc. It was probably "Tokugawa Religion: The Values of Pre-Industrial Japan." Weil could be impulsive, at times.

Stan used to tell me what went on in the faculty meetings; e.g., Gödel got up and made a convoluted analysis of Bellah's theory, the upshot being (in Stan's words, not Gödel's): "It is wrong." I asked Stan, "How do you know what went on in these meetings?" His answer: "I have spies." Later it became clear to me that Hasler Whitney was giving him a detailed report. Through Stan, I got to know the Whitneys and we became good friends.

At the IAS Stan had a good friend, Sue Walker (now Sue Walker Toledo). She was Whitney's assistant in a math education project, and in that capacity had an office (it was, I think, Gödel's old office). Stan often slept there. I would go there in the morning and the office would be a shambles: coke cans, remains of sandwiches, cigarette butts all over the place. We spent a lot of time in Sue's apartment. Stan's daughter Susan (then about 17) was staying with Sue; Susan had befriended a young woman who was pathologically shy (who typically sat in a corner with her hair over her eyes), and Stan was trying to help her; also Domingo Toledo (whom she later married) was often there. I remember once when Stan became uncontrollable, Susan shut him down by saying, firmly, "You will not disrupt this domesticity."

I met Sue Walker through Stan at the month-long conference on intuitionism and proof theory at Buffalo University, summer of 1958, and we became good friends. You say in your memoir, "Uncharacteristically [Stan] met Ayn Rand, complimented her work, but was unable to engage her further than that." I wonder in what venue? Wikipedia says that throughout the 1960s and 1970s she gave talks at various universities.

[https://en.wikipedia.org/wiki/Ayn\\_Rand](https://en.wikipedia.org/wiki/Ayn_Rand)

In any case, I'll bet Stan sought her out because of Sue Walker, who was much taken by Ayn Rand's Objectivist philosophy and talked about it a lot at the Buffalo meeting.

There were various episodes with Stan at the Buffalo meeting. Here is one of them (I am excerpting it from my reminiscences for Smullyan's 90th birthday). One evening, Stan wanted us to hear his son, Peter (who was then 9 or 10), play the organ. We got into the concert hall. This involved somebody climbing in the window to get the door open, as I recall. Peter played nicely. This was backstage. Then Raymond spotted a grand piano on the stage. We took seats in the auditorium (there were eight or ten of us) and Raymond played Schubert's A-Major Sonata: a massive forty-minute piece. About halfway through, the janitor appeared.

"What are you doing here?"

WE: "Listening to Schubert's A-Major Sonata."

HE: "You can't do that!"

WE: "Sure we can. We're professors."

He left. Then all the lights went out. The janitor had, no doubt, pulled the master switch.

That did not faze Raymond; he played the second half of the A-Major Sonata in the dark. A magical performance.

But I am flying off of the original topic (Weil, etc.), so I'll end here.

Best,

Bill



## (10) BILL HOWARD - STAN AT THE IAS

**Subject:** Stan, IAS  
**From:** Howard, William A.  
**To:** robtully  
**Date:** Saturday, 20 August 2016, 5:35

Dear Rob,

Here are a few more stories from 1972-1973 at the IAS. Stan was impressed by the following remark by Kaysen in response to a reporter's question as to how he could expect to run an institution when significant faculty members were against him. Kaysen's reply: "They can be replaced."

Stan loved that remark as exemplifying the managerial mind. Not suitable for the IAS or a university, of course. A School of Social Sciences was installed at the IAS; but Kaysen was gone by 1976, and, since then, the directors have been genuine scholars: a historian, one straight physicist, two mathematical physicists, and one straight mathematician. So far, no social scientist. In fact, the social science operation is relatively small: 20 visiting members, as opposed to 50 or 60 in mathematics. As far as I can see (mainly by following the IAS Newsletter), the IAS is still much as I knew it in 1972-1973.

The faculty and visiting members of the IAS lead privileged lives. Stan's daughter, Susan, was much impressed by this. She always referred to the place as The Institsnoot for Advantaged Studies.

Here is an episode that sticks in my mind. One day, Stan said to me, "You have often said that you are curious as to what schizophrenics are like. Well, now you have the opportunity to meet one. There is a topologist, John Nash, who hangs out in Firestone Library; they have given him an office there. A genuine paranoid schizophrenic. Let's go see him."

Me: "No, No."

Stan: "He won't hurt you. He is harmless."

Me: "No, no, no."

I was afraid that I would be contaminated. (The schizophrenic is inhabited by a demon. Watch out!)

When Sylvia Nasar published her brilliant book (A Beautiful Mind) in 1998, I immediately knew who she was talking about.

By 1974 Gödel's health was deteriorating (enlarged prostate, catheterization, in and out of hospitals; see Dawson's biography of

Gödel), but Stan must still have seen him quite a lot. Siobhan Roberts, in her biography of Conway, "Genius at Play", p. 212, mentions that Gödel made a list of the topics he discussed with Stan in 1974: Nixon, McGovern, hippies protesting the middle class, drug addicts, Vietnam, riots and the decay of the U.S., Cohen and Dedekind, Coxeter and modern geometry, Nash and games, Chomsky and the "linguistic aspect of math ed". Very impressive.

Best,

Bil