

Remarks prepared for the memorial service for Lee

Rubel - Herbert S. Wilf, April 16, 1995

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There is a nontrivial fourth order algebraic differential equation  $P(y', y'', y''', y'''' )=0$ , where  $P$  is a polynomial in four variables, with integer coefficients, such that for every continuous function  $\phi$ , on the line, and for every positive continuous function  $\epsilon(t)$ , the equation has a  $C$ -infinity solution  $y$  for which  $|y(t) - \phi(t)| < \epsilon(t)$  for all real  $t$ ." So there is ONE equation such that YOU name a continuous function and how close you would like to be to it, and that ONE equation has a solution that is always that close to the function you named." (Lee Rubel, BullAmerMathSoc, 1981)

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So this guy goes to a doctor, who says he has Pfaltzmacher's disease, probably the most contagious disease known. "We'll put you immediately in an isolation unit, and your diet will consist solely of pancakes and pizza," the doctor said. "Pancakes and pizza- will that cure it?" "No," the doctor answered, "it's the only food we can get under the door."

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Call a polynomial  $p$  an  $n$ -nomial if  $p$  contains at most  $n$  nonzero terms, whatever its degree. Lee Rubel exhibited a single explicit algebraic differential equation of degree  $2n$  that is satisfied by all  $n$ -nomials  $p$ , irrespective of the degree of  $p$ . (Nieuw Archief voor Wiskunde, 1988)

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I met Lee Rubel in 1959. I was a newly hatched PhD, and my first job was here at the University of Illinois. We seemed to hit it off well from the beginning, and our relationship consisted of equal parts of discussing mathematics, on the one hand, and telling raucous jokes, on the other.

He was the quintessential mathematical analyst. Every branch of analysis, one of the broadest areas of mathematics, interested him intensely. He devised beautiful examples of phenomena that we scarcely could have imagined existed, and with equal power, proved strong and elegant general structure theorems about the algebraic and analytic properties of the beasts that he studied. His mathematical taste was outstanding. He had no interest in organizations, curriculum reform, or any of the millions of activities that scholars can get themselves into when they don't feel like advancing the frontiers of their subjects. Lee Rubel was thinking about pushing back those frontiers all the time, and succeeding.

But he cannot be understood without considering his marvellous sense of humor and of the absurd, and his wonderful timing, and the way in which he told his jokes: deadpan - right to the punch line, only his bushy eyebrows underscoring the ridiculousness of the situation that was being described.

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A hunter was roasting a bird over a fire in the woods when a forest ranger burst out of the trees and said "That's a loon you're cooking, and it's an endangered species and you're under arrest!" The man said, "This is no loon - it's a duck." The ranger said "I know a loon from a duck, and you're under arrest." The man pleaded that he really didn't know, so the ranger said he would let him off this time. As the ranger was about to leave, he said "Of course, being a forest ranger, I've never tasted loon. What does it taste like?" The hunter replied "Oh, about halfway between trumpeter swan and bald eagle."

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We were close for those few years. Together we taught ourselves a lot of mathematics, proved a lot of theorems, and shared a lot of smiles. Then we stayed in touch for all the years when I was in Philadelphia and he was here. When his final illness struck him, we suddenly became very close again, by e-mail, and a large correspondence of jokes and theorems quickly mushroomed. All of the jokes you are hearing from me today (and dozens more) came to me from him, in the last months of his life, since last summer. The result was that while he was dying he spent a lot of energy cheering me up.

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A Jewish mother is walking along the beach with her twelve year old son, when the skies darken and a huge wave sweeps her son out to sea. She looks up at the heavens and shakes her fist at the dark cloud—Lord, why do you do this to me? I've kept a good kosher house for decades, I go to schul every Friday, and I obey all your laws." The skies get very very black and then a second huge wave comes along and lo! there beside her is her son. She looks at her son, then looks at the skies and shouts "He had a hat!"

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On January 24, 1995, in an e-mail message to me, Lee told me this: "I said to Nina the other night, 'I don't see why I can't be permitted to live forever if I just sit here and smoke my cigar.'"

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There is a single entire function  $f$  such that the set of all derivatives of  $f$  is dense in the space of all entire functions, in the topology of uniform convergence on compact subsets of the complex plane. - Lee Rubel, 1981.

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Some cats and some mice died and went to the Pearly Gates, where Saint Peter greeted them and asked what he could do to make their infinite stay in heaven as pleasant as possible. The cats asked for some easy chairs and a TV, and the mice asked for roller skates. Their wishes were granted. After a few weeks, Saint Peter went to check up, and spoke to the cats first, asking how they liked things. They were sitting in their easy chairs in front of a big TV. "It's really wonderful here!" they said, "and we especially appreciate the meals on wheels."

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We have lost a man who valued, and who practiced, excellence of thought, depth of investigation, brilliance of insight, and thoroughness of scholarship. We have lost a man who brightened the lives of all who knew him with the quality of his mind, with his ability to plumb the depths of his science, with the warmth of his heart and of his infectious laugh.

He had his share of the low cards that are in the deck of life.

He made his share of the high cards: his family, his work, his writings,...

Lee -- we'll miss you.