HANF'S EULOGY
9/11/89

Dale MYERS

Thanks to Tom Ramsey for making so many of the arrangements and for his considerable generosity in setting up the William P. Hanf Memorial Fund to which contributions may be made in lieu of flowers. Contributions may be sent to the math department or the UH Foundation.

Son of Mr. and Mrs. Porter Hanf both deceased. Survived by his brother Charles Hanf and his sister Mary Hanf Dawson. He had three doctoral students: Mohamed Amer – Cairo Egypt, Roger Simons – Rhode Island College, and Don Faust – University of Michigan, Upper Peninsula. Although not thesis students, Gary Arakaki and I worked with Hanf as graduate students.

Hanf demonstrated his abilities early. He was one of the top five in the 1954 Putnam exam. This is the nation's most prestigious competition in undergraduate mathematics. He received his bachelor's degree from Berkeley in 1955.

After working a year at Lockheed in Palo Alto and a year for the Stanford University Graduate School of Business as a computer programmer and computer systems analyst he joined IBM and worked there for 10 years from 1958 to 1968. Hanf was responsible for many of IBM's patents on their model 360 computer. He received five major awards from IBM including the 1964 $5,000 Corporate Award plus the IBM Outstanding Invention Award.

Hanf completed his Ph.D. at Berkeley in 1963 while on leave from IBM as an IBM fellow at full salary.

He left IBM in 1968, spent two years as a visiting lecturer at Berkeley, then joined the University of Hawaii Math. Dept. as a Full Professor in 1970. He was the Associate Chairman in 73-74, Graduate Chairman in 86-87, and was a member of the Princeton Institute for Advanced Study 76-77.

In his nonacademic life, he was known primarily for his wheeling and dealing in real estate. He owned and lived in many condo's and houses. One at the end of University Ave. near the Ala Wai canal, one in Nanakuli on the Wainai coast, my favorite, a pole house he built above Pupukea overlooking the north shore, and most recently a townhouse in the Palisades. At the time of his death he owned a house in Palolo, a half interest in a Waikiki apartment and the townhouse in Kaneohe where he died.

Hanf was a bit of a carpenter with a distinctive simple but massive style that I liked. He built walls, tables, stairways, waterbed platforms and the like from large 2 by 8 planks fastened securely with large bolts.

Hanf was an amateur painter, I recall seeing maybe a half dozen or so of paintings. He also liked music and organs, pipe organs in particular. I recall him playing a small organ he had in his Waikiki place. He didn't play well but he clearly enjoyed playing. Curiously, for a nonreligious man, his favorites were the church hymns, "Abide With Me" and "Onward Christian Soldiers".

Hanf did excel in photography. He had good equipment and knew how to use it. At one time he developed his own pictures in a darkroom he set up in an apartment bathroom. He took good pictures; his favorite pictures were of his friends surfing. One of his surfing pictures is used in the Math Department's graduate program brochure.

Bill was about the most unassuming and unpretentious man I've known. So much so that many colleagues were unaware of how famous he was in logic. His work in mathematical logic was brilliant.

Hanf, almost casually discovered that with every language of mathematics, there is a naturally associated, usually rather large cardinal number, now called Hanf's number. The proof of the number's existence was simple but the number turned out to be quite important and the calculation of the number for various languages has often proven extremely difficult. Much research effort is still being expended in the calculation of his numbers. Ironically, although Hanf is more famous for these numbers than anything else, he had almost no interest in them or in any other uncountable objects.

Bill only wrote nine papers. But each one solved a major outstanding problem. He wrote his first paper in 1957 before he received his doctorate; his last was a joint paper with me in 1983.

It's possible that Hanf never read more than a dozen papers in mathematical logic. But he had a knack for recognizing what was relevant to his research. On hearing a lecture by Raphael Robinson about a set of tiles that could tile the Euclidean plane but not in any cyclic way, Hanf announced that that was what he needed to prove a theorem he was after. It took another ten years before he proved his big result but Robinson's tilings were indeed a central part of his proof. In the meantime he extended Robinson's result to show that there was a set of tiles which could tile the plane but not in any computable way.

What he was interested in most and what he devoted his research to almost exclusively was Boolean algebra; he particularly devoted himself to the study of Boolean algebras, called Lindenbaum algebras, associated with various theories of mathematics. The study of these algebras was initiated by Alfred Tarski (Lindenbaum contributed only his name) who solved the problem for the theory of real numbers and Euclidean geometry. No further progress was made until Hanf solved the problem for the theory of equivalence relations. Using his techniques, his student Roger Simons and myself solved the problem for well orders, linear orders, unary functions and abelian groups. However no progress was made on any of the difficult undecidable theories of mathematics. What Hanf was able to show was that all these theories had the same structure as the theory of a binary relation. Hence all attention was concentrated on this one "universal" theory. He, I and his students worked very hard on this problem but it was Hanf who solved it. This was his crowning achievement.

His sister Mary Hanf Dawson will now give some remarks. Then a canoe will be launched to scatter the ashes at sea.