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Herman Müntz: a mathematician's odyssey.

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From the text: In 1885 *K. Weierstrass* [Berl. Ber. 1985, 633–640, 789–806 (1885; JFM 17.0384.02)] proved that every continuous function on a finite interval can be uniformly approximated by algebraic polynomials. In other words, algebraic polynomials are dense in $C[a, b]$ (for any $-\infty < a < b < +\infty$). This is a theorem of major importance in mathematical analysis and a foundation for approximation theory.

One of the first outstanding generalizations of the Weierstrass Theorem is due to Ch. H. Müntz (1884–1956), who answered a conjecture posed by *S. N. Bernstein* in a paper [Proc. 5. Int. Math. Congr. 1, 256–266 (1913; JFM 44.0475.04)] in the proceedings of the 1912 International Congress of Mathematicians held at Cambridge, and in his 1912 prize-winning essay [Belg. Mem. (2) 4, 104 pp. (1912; JFM 45.0633.03)]. Bernstein asked for exact conditions on an increasing sequence of positive exponents α_n, so that the system $\{x^{\alpha_n}\}_{n=0}^{\infty}$ is complete in the space $C[0, 1]$. Bernstein himself had obtained some partial results. On p. 264 of the above cited paper of Bernstein wrote the following: "It will be interesting to know if the condition that the series $\sum 1/\alpha_n$ diverges is necessary and sufficient for the sequence of powers $\{x^{\alpha_n}\}_{n=0}^{\infty}$ to be complete; it is not certain, however, that a condition of this nature should necessarily exist."

It was just two years later that Müntz [Schwarz-Festschr. 303–312 (1914; JFM 45.0633.02)] was able to provide a solution confirming Bernstein's qualified guess.

Today there are numerous proofs and generalizations of this theorem, widely known as the "Müntz Theorem." Searches in Math-Databases (JFM, Zentralblatt MATH, MathSciNet) show 163 papers with the name Müntz in the title. All these articles mention Müntz's name in reference to the above theorem, except one referring to his thesis. Müntz's name with his theorem appears in numerous books and papers. In addition there are Müntz polynomials, Müntz spaces, Müntz systems, Müntz type problems, Müntz series, Müntz-Jackson Theorems, and Müntz-Laguerre filters. The Müntz Theorem is at the heart of the Tau Method and the Chebyshev-like techniques introduced by Cornelius Lanczos [cf. *E. L. Ortiz*, Stud. Numer. Anal., Pap. Honour Cornelius Lanczos, 73–93 (1974; Zbl 0325.41004)]. In other words, Müntz has come the closest a mathematician can get to attaining a little piece of immortality.

Notwithstanding, a quick search of the mathematical literature will also show that essentially nothing is known about Müntz, the person and the mathematician. The purpose of this paper is to try to redress this oversight. Müntz's life, mathematically and otherwise, makes for an illuminating and dramatic journey through the first half of the twentieth century. It is unfortunate it was not a more pleasant journey."

A very well documented and highly informative and readable article on the life of Ch. H. Müntz with a list of his publications. The life is a mirror of the 20s and 30s of the last century in Europe, especially Germany, Russia and finally Sweden. During his stay in Berlin while seeking for an academic position he was (a.o.) a very active editor of the Jahrbuch writing more than 800 reviews for it. *Olaf Ninnemann (Berlin)*

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