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Drittes Physikalisches Institut Universität Göttingen

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5300 Bonn 3

Göttingen, May 7, 1991

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Dear Neil,

thank you very much for your letter of April 18, 1991. The sequence that I sent you was the running sum of every third term of the Morse-Thue sequence (in the ± 1-alphabet). See J. Coquet: A Summation Formula Related to the Binary Digits. Inventiones mathematicae 73, 107-115 (1983). The sequence was originally "discovered" by D. J. Newman (On the Number of Binary Digits in a Multiple of Three. Proceedings A.M.S., 21, 719-721 (1969).

This sequence (and others similarly constructed) have exceedingly interesting selfsimilar, "fractal" growth and spectral properties. A student of mine, Gerriet Müller, also discovered an interesting recursive formula for generating this sequence.

Why don't you come and visit us in Göttingen while you are in Germany? Anny and I would be delighted to see you - as would some of our mathematicians.

Best regards,

5599

## Drittes Physikalisches Institut Universität Göttingen

Geschäftsführender Leiter: Prof. Dr. Manfred R. Schroeder

Drittes Physikalisches Institut · Bürgerstr. 42 - 44 · W - 3400 Göttingen 1

Göttingen, March 18, 1991

Dr. Niel Sloane AT&T Bell Laboratories 600 Mountain Avenue Murray Hill, NJ 07974 USA

Dear Neal,

Congratulations on your 1987 IEEE Information Theory Society Paper Award with John Conway. Why did it take so long?

I stumbled upon a new sequence with interesting "fractal" and spectral properties, see the enclosure. I cannot find it in your book *Handbbok of Integer Sequences*. Do you recognize it? It is very simple to construct, but how? It is related to another, even simpler sequence: 1 2 2 3 3 3 4 5 5 5 6...

Perhaps Colin Mallows has an idea. (I saw his article "Conway's Challenging Sequence" in the *Am. Math. Monthly* 98, 5-20. The new  $n_o = 608$  301 0090 is again a U.S. telephone number. I called it from Göttingen, but the answer is still the same: "Try again...")

My book Fractals, Chaos, Power Laws: Minutes from an Infinite Paradise (W.H. Freeman, New York 1991) just appeared and the second printing is already being prepared. I am glad I went with W.H. Freeman.

Anny and I will be back in New Jersey after July 15 (for a few months).

All the best.

Prof. Dr. M. R. Schroeder

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AT&T Bell Laboratories

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April 18, 1991

Prof. Dr. Manfred P. Schroeder Drittes Physikalisches Institut Universität Göttingen Bürgerstrasse 42-44 W-3400 Göttingen 1 GERMANY

Dear Manfred:

Thank you very much for your letter of March 18. I will put that sequence in the second edition of the sequence book if you tell me how it is defined!

I will be at the Max Planck Institute for Mathematics in Bonn (c/o Hirzebruch) May 6-27.

Best regards,

N. J. A. Sloane