

Dr R. S. Wetherington

Just add to list 591

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Dear Mr Sloane

A Handbook of Integer Sequences

I have only just been able to get your book which is of great interest to me as in 1970 I did a fair amount of work on the ~~con~~ history of the concept of irrationality & became interested in the triangular numbers & Pythagorean numbers etc. I got so far as to derive an algorithm for certain solutions of

$$a^3 = b^3 + c^3 + d^3 \quad (\text{in integers})$$

for the Sueno Museum in Durban; I did this in 3 days flat whilst earning my living. I have not published it other than by sending it to Durban (S. Africa) so I can't give you a reference for what otherwise could be called a sequence of ~~integers~~ <sup>cubes</sup> which are sums of 3 cubes.

I am surprised that, according to the references you cite, it seems to have been overlooked that your sequence 552 is obtained by combining  $802 + 1630$ , & that 1869 is alternate values of 1064. The 50<sup>th</sup> rank of series 552 is

$$201587494941428904$$

(tho I have ~~to~~ checked in various ways). I must consult your references to see the longest published table of  $2^n$ . I have calculated  $2^n$  up to  $2^{121} = 2658455991569831745 - 807614120560689152$ .

but clearly others have gone much farther. However I do claim to have invented an original method for checking such calculations.  $2^2$

$$2^{n+10} = 2^n \cdot 10^3 + 2^{n+1} \cdot 10 + 2^{n+2}$$
$$= 2^n \times 2^{10}$$

because  $2^{10} = 1024$

$$= 2^0 \cdot 10^3 + 2^1 \cdot 10 + 2^2$$

Until I discovered this, I had no means of checking my successive doublings. All one has to do, then, to check such a table is to write down 3 consecutive lines & add them up — the result should equal a line lower down. For that matter if you give me  $2^{1000}$ ,  $2^{1001}$ ,  $2^{1002}$  I will tell you  $2^{1010}$  in a matter of seconds.

I have not so far found any published ~~table~~ series in my notes not known to you. I have however several unpublished series of interest & I really ought to publish them. Until I got your book I had no means of checking what had been published & what not. Now I can get to work. It looks as if the Fibonacci Quarterly is the best journal for me (most of my series are analogous to Fibonacci).

I have not subscribed to this journal. Can you please give me the address & can you please put me on your mailing list for supplements? If all goes well you'll be able to quote my work in due course.

Your book is a real milestone. Until now I have been quite at sea even though I have a carefully chosen collection of about 50 titles in number theory & history of mathematics, including Dickson, Theory of Numbers in 3 volumes

Robert J. Hetherington