f11

2387

HERMAN P. ROBINSON
31 DIABLO CIRCLE
LAFAYETTE, CA. 94549
(415) 283-1861

20 December 1983

Dear Neil,

According to my records I haven't corresponded with you for over two years. That is too long.

Much of my time (when grandchildren are not around) has been taken up by programming the Apple for multiprecision computations. I now have it where I can make all kinds of calculations to 600 significant figures (floating point), although most of my work is to 45 or 50D. All the programming is in machine language, and I can either write a program to make a calculation or use the Apple as an ordinary calculator. In addition to the usual functions, I can find roots with an algorithm similar to the Newton-Raphson method, without having to write a formula for the derivative. A very useful program incorporates the van Wijngaarden transform for summing slowly convergent series with all positive terms. As you know, that can be a headache with conventional methods. The only objection is that it is slow, but the Apple can use its time for it. No integrals or derivatives are needed. I used the method to calculate Khintchine's constant to 205D, checking Wrench's 155d value exactly. His method was faster but more complicated. I'll probably repeat it sometime using his method. The total time it took the Apple was 13 days, but I used daughter Anne's Apple, so it didn't tie up mine. The machine also has the room in RAM to store many constants to 600D, and I have 28 stored at the present time; those which I am likely to use now and then. The time to calculate a log to 55S is two seconds, which is not too bad. The Wang took 30 seconds for 55S. Also stored are more than 9000 primes, and they can be accessed in 200 microseconds each. I'll add 1024 Möbius numbers sooner or later, which will be useful with the primes. After a little more programming I should be able to spend most of my time calculating.

Early this year I added a word processor to this machine, and it is a tremendous help. I'm a terrible typist, and the processor allows me to correct the mistakes as I make them or later if I find them. I sometimes miss a few errors.

No sequences of any consequence have come to my attention lately. I rarely get to the math library on the UC campus, and I miss it. Parking is a major problem. I have a few notes: There is a note to tell me to see Seq. 810, but I don't know why. Then there is another note saying to interleave the partial quotients of pi and e. Maybe you can make sense out of that. There is a final note saying to write you about Seq. 1385. Following the last term (272400600) in your book for Seq. 1385, I have written two more terms in red, 740461601 and 2012783315. It has been so long since I have written those notes that I have forgotten what prompted them.

The weather has a little bite at 10C, but it is clear today, and nothing like the weather some parts of the country are having.

Our best regards, and have fun in '84.

Esther & Herman

(See over)

P.S. I found some more notes:

Seq.1935, one additional term for pi gives

1, 8, 61, 5020, 128541455, 162924332716605980

Similar sequences can be written for other constants:

e 1, 2, 5, 55, 9999, 3620211523, 25838201785967533906

1/e 1, 3, 29, 15786, 513429610, 339840390654894740

1/pi 1, 4, 15, 609, 845029, 1010073215739

These were calculated on the Wang, and I can extend them on the Apple if you desire.