Scan ~~A3477~~
A3471
(delicate) + many

John Riordan

~~[illegible]~~ 2 letters + 2 pages
1974

5 pages

add to 8 ~~many~~ sequences
of many

(8) f91 N98

A3471 ~~2083~~ 2083
A316 3470
A459 3481
A1788 3482
Oct. 24, 1974 A1818
A3472 A248
A245094 A1792
A259859 A1333
A129
A59300
A1858
A138464
A1862

Neil Sloane, Esq.
Bell Laboratories
Murray Hill, New Jersey 07974

Dear Neil:

Thanks for sending the Lucas pages so promptly. In trying to make sense of them, I ran into the following, for the Handbook

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1. The number of permutations of n [illegible] the [illegible] main diagonals ($A_n(0)$ of I.C.A, prob 9 [illegible]) is one of Lucas' and does not appear in [illegible]. It starts

3168
459
3471

n	3	4	5	6	7	8			
$= A_n(0)$	0	4	16	80	672	4752	48768	440192	5380160
		1	4	20	168	1188			

$A_7(0)$ is given incorrectly in ICA as 528

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2. Some time ago, working over Cayley on partitions, I ran into the sum $\binom{n+1}{n} = \sum a_{nk} \binom{n}{n-k}$, which entails $a_n(x) = 2a_{n-1}(x) + x\, a_{n-2}(x)$, $a_0(x) = 1$, $a_1(x) = 1 + 2x$. $a_n(1)$ is sequence 1064 A1333; $a_{n0} = 2^n$ and $a_{n1} = (n+1) 2^{n-2}$ is sequence 1100. [illegible] be noticed that 1100 is $(n+1) 2^{n-2}$ [illegible] "A1792

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3. The same polynomial with $a_0(x) = 1$, $a_1(x) = 2$, has $a_n(1)$ as sequence 552, $a_{n1} = (n-1) 2^{n-2}$ as 1318, $a_{n2} = \binom{n-2}{2} 2^{n-4}$ as 1729 A129, $\binom{n-3}{3} 2^{n-6} = a_{n3}$ as 1116, $a_{n4} = \binom{n-4}{4} 2^{n-8}$ does not appear: 1, [illegible], 10, 60, 280, 1120, 4032, 13440 = A3472

[illegible] these have are [illegible] and $a_n(x) = \sum \binom{n-k}{k} 2^{n-2k} x^k$

[redacted]

[redacted]

[redacted]

J. Riordan

N297 = 2083

3470
3481
3482

Nov. 4 - 1974

~~2083~~

N. J. A. Sloane, Esq.
Bell Laboratories
Murray Hill, New Jersey 07974

Dear Mr. Sloane:

Here are some more sequences (promised in my letter of [illegible] 1974).

N297

1. Random Tournaments sequence 297. I ran into the paper by Capell & Narayana which you reference and found they had neglected the simple recurrences implicit in their definitions. If T_n is the number, their definitions may be compressed to

$T_1 = T_2 = [illegible]$, $T_3 = T_4 = [illegible]$, $T_{2n} = [n/2][n/n]$ [illegible] which implies $T_{2n} = 2T_{2n}$ [illegible] $n \geq 2$

$T_{2n+1} = T_{2n+2} = 2T_{2n} - T_n$ [illegible], making the table

n	1	2	3	4	5	6	7	8	9	10	
T_{2n}	1	2	[illegible]	12	[illegible]	34	[illegible]	52[illegible]	20[illegible]	8[illegible]	(A245094)
$2T$	2	4	[illegible]	24	168	66[illegible]	2616	10[illegible]	415[illegible]	[illegible]	
T_n	1	1	1	2	3	6	11	22	4[illegible]	84	A2083
T_{2n+1}	1	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]598	4155[illegible]	[illegible]116	

91

[illegible] 2[illegible]

2. [illegible] $d_{n+1} = 2d$ [illegible]

91

[illegible] d_2 [illegible] $d_n = D_n = nD_{n-1}$ [illegible]

[illegible]

[illegible] d_n [illegible] $+ d_{n-1}$ [illegible]

A3470 ✓

imply [illegible] $d_n(x) = d_{n-1}(x) - x d_{n-1}$ [illegible] $d_{n-2}(x) + x^n + (-1)^n$, $d_n'(1) = d_n(1) + d_{n-1}$ [illegible]

and $d_n(1) = d_n = nd_{n-1} - d_{n-2} + 1 + (-1)^n$, $d_n'(1) = d_n + d_{n-1} - 1$

n	1	2	3	4	5	6	7	8	9	10	
d_n	1	3	3	8	3[illegible]	147	8[illegible]	[illegible]824	46741	405845	[illegible] A3470
[illegible]	3	18	3[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	3	[illegible]	[illegible]	[illegible]	494	A259859					

3470 =
N1109.5
~~[illegible]~~

[illegible]

f91

N297 2083

SW

f91

cut'd

3470

f91

from Riordan's letter but not used ?

.null.)

DO

Lib.

3. A paper by SM Tanny and M Zuker ... Discrete ... 1974, 1978 ... contain

... the

k	3	4	5	6	7	8	9
	143	986	6764	46367	317816	2178308	14930351
	36	272	1865	12...	...	...	

$3451^2 =$ N83785

$3452 = $ ... N16.

... I found

5 $r_{n+2} = r_n \ldots + 4 \ldots$

... the Tanny Zuker result that ...

... the ...

$r_{k+2} = 7r_{k+1} - r_k + 4, \; k = 1, 2, \ldots$

8 + I enclose two tables which might have been included in ... First is ... First ... Second ... least heights ... energy ... the first

A1818

1997 1818 5. Your sequence 1997, for which the ... Central Factorial Numbers (... Identities, 215) ... $[(2\ldots)(2n-1)]^2$ ... which appears in ..., p. ... Curiously its ... the table for odd cycles (Handbook #1137) ...

7. ... Once you mentioned not having some of my ... don't know which ones. If you let me know, be...

Yours

John

... ramid coeff ... table ... I hope I can find something ... with you folk ... Of course ... recurrences ...

3-2 (12-55)

R[redacted]otch and [redacted] trees of [redacted] $\Sigma \binom{n}{k} p^{n-k} x^k$

$L_n(x) = Y_n(\alpha, 2$ [redacted] $, nx)$

$L_n^*(x) =$

	$L_n(4)$ [redacted]	1	1	3	10	[redacted]
	h [redacted]	D	1	1	3	[redacted]
	0 [redacted]	1				[redacted]
	1 [redacted]		1	2	3	[redacted]
#1729	2 [redacted]			1	6	[redacted]
Not in H	3 [redacted]				1	[redacted]
" H	4 [redacted]					[redacted]
"	5 [redacted]					[redacted]

$L_n^*(4)$ [redacted]				
1 [redacted]		1	2	7
2 [redacted]				
3 [redacted]	1	1	3	
4 [redacted]		1	3	
5 [redacted]			1	

$L_n^*(1)$

[redacted]

— Rare N 1148 [redacted]

— Rare N 1729 [redacted]

A 18 [illegible] [redacted]

— Rare

— [illegible] A 1862 [redacted]

when corrected

[redacted]

25

26

553-2 (12-55)

For [illegible] $B(x)$ [illegible] $(x+B(x))$ [illegible]

A^x_n [illegible] $(xT_1, \ldots, xT_n)$ $T_n = n^{n-2}$ $A^x_0 = 1$

$A^x_{n,1} = n^{n-2}$

$A^x_{n,2} = \frac{1}{2}(n+6)(n-1)n^{n-4}$

A1858

A138464

$A^x_n(1)$	1	2	7	38	291	2932	3[illegible]	[illegible]	[illegible]	[illegible]
k\n	1	2	3	4	5	6	[illegible]	[illegible]	[illegible]	[illegible]
1	1	1	3	16	125	1296	1[illegible]	[illegible]	[illegible]	[illegible]
2		1	3	15	110	1080	13[illegible]	[illegible]	[illegible]	[illegible]
3			1	6	45	435	5[illegible]	[illegible]	[illegible]	[illegible]
4				1	10	105	1[illegible]	[illegible]	[illegible]	[illegible]
5					1	15	[illegible]	[illegible]	[illegible]	[illegible]
6						1	21	378	7056	[illegible]
7							1	28	430	14[illegible]
8								1	36	99[illegible]
9									1	[illegible]