Publications by D. R. Kaprekar

Books

No.	Title		Rs.	nP.
(1)	Demlo numbers	...	6	0
(2)	Cycles of recurring decimals Volume I	...	5	0
(3)	Cycles of recurring decimals Volume II	...	6	0
(4)	Thirteen cuts in Calculations	...	1	75
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(10)	A new approach to mathematical constant 6174 (in Press)			
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(13)	Demlo numbers Volume II	,,		
(14)	Division of a rectangle into maximum compartments by only six straight lines	,,		
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The Mathematics of the New Self Numbers

(The first six monthly Report of the research work in mathematics done under U. G. C. scheme)

D. R. Kaprekar,

Price Rs. 1–50

1963

PREFACE

I have great pleasure in publishing this 1st six monthly report of my work. I am entirely devoted for the last 30 years in my original research on numbers and their peculiar properties. I could publish my works like " Demlo number " " cycles of recurring decimals Volume I " " cycles of recurring decimals Volume II " before about 15 years, I got for it some money (some portion of actual cost) through the University of Bombay. Further I published my books like " The new constant 6174. " The puzzles of the self numbers " through some grant of the University of Poona, I have expressed my indebtedness to the two Universities in the preface of those books. Further, also published about 20–30 articles on my researches in several Indian and foreign mathematical Journals. Now I am very glad to get completely devoted for my work as the University grands commission has given me a fine grant for continuing my work.

I am much grateful to Dr. D. S. Kothari, Dr. Ram Behari, Professor Hansaray Gupta and Several others who were kind enough to sanction this grant for me and I am sure I will publish various new interesting results in future.

This is the first six monthly report of my work. Though it was submitted in about February 1963. It could not be published earlier for various difficulties. The other six monthly reports will also follow soon.

Again expressing my gratefulness to all the authorities of the University grands commission at Delhi and with best regards to all of them. I declare this printing copy of the 1st report open to all on 1–11–63.

I remain
your truthfuly
D. R. Kaprekar.

All remarks over this work may please be sent to the address.

D. R. Kaprekar,
311 Devlali Camp.
DEVLALI
1–11–63.

This copy annotated by N. J. A. Sloane,
Oct 30 2014

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For all publications of D. R. Kaprekar see the last cover (botb sides)

The First Six Monthly Report of The Research Work In Mathematics

(I) If N_1 is a number in which the sum of the digits in it is D_1 then $N_1 + D_1$ will be called the generated number of N_1 and N_1 the generator of the new number $N_1 + D_1$. This new number $N_1 + D_1$ will be called N_2

Examples:— $N_1 = 35$ $D_1 = 3 + 5 = 8$

(1) $N_1 + D_1 = 35 + 8 = 43$ 43 is the new number generated from 35. 35 is the generator of 43

(2) $N_1 = 86$ $D_1 = 8 + 6 = 14$

$N_1 + D_1$ $86 + 14 = 100$

100 is generated from 86. 86 is the generator 100 and 100 is the generated number from 86.

If N_1 has D_1 as the sum of the digits $N_1 + D_1 = N_2$ is that the generated number. Similarly if the digits of N_2 are such the sum of all digits in it is D_2 then $N_2 + D_2$ will be the next generated number, and if $N_2 + D_2 = N_3$ then N_3 will be the generated number from N_2. Similarly $N_3 + D_3 = N_4$ Next $N_4 + D_4 = N_5$ and so on.

$N_1\ N_2\ N_3\ N_4\ N_5$ .... form a series. This series will be called the digit-adition series. Thus if we start
A36228 from 35 the digitadition series will be as 35, 43, 50, 55, 65, 76, 89, 106, 113, 118 and so on. The series will go on till infinity. Similarly from 60 as starting number we will get
A249043 the series 66, 78, 93, 105, 111, 114, 120, 123 and so on series will go on to infinity. The above two are the examples of digitadition Series going till infinity.

(II) Many times the digitadition series starting from 2 different numbers meet at one common point. This common point is called the junction number. Thus take the numbers 7 and 86 and prepare the digitadition series of both. They have one common number 107. Here 107 is called the junction Number. It has got the immediate predecessors numbers as 94 from the starting of 7, and 103 as from 86.

We say 94 and 103 are the cogenerators of 107. we write this as :—

$$107 \begin{cases} 94 \\ 103 \end{cases}$$

The complete working is shown below :—

A6507

7	
14	
19	
29	
40	
44	
52	
59	86
73	100
83	101
94	103
107	107

107 is the Junction Number, 94 and 103 are the cogene rators which are just above 107 and the starting numbers are 7 and 86.

i. e. $107 \begin{cases} 94 \\ 103 \end{cases}$

Now let us look at the series again. 94 is derived from the top most No. 7. Can we go beyond it ? No. So 7 is called the Self–Number ; similarly 103 has got the top most No. 86. Can we go beyond 86 ? Is there any generator for

86 ? The answer is No. Can we imagine 73 to be the generator of 86 ? No. because 73 + (3+7) = 87 and not 86. Can we think 80 to be the generator of 86 ? No Because 80 + (8 + 0)=88 and not 86. It will be seen by several trials that there is no generator for 86. 86 is the Self-Number. It is really Self-born. it is a स्वयंभू

(III) A number which has no generator is called a Self–Number. 1, 3, 5, 7, and 9 are the Self–Numbers between one and ten (1 and 10) After 10 the next self-numbers is 20. If we count further till 100 then the following are the self-numbers after Nine (9) 20, 31, 42, 53, 64, 75, 86 and 97. Thus between one to 100 here are in all 13 Self–Numbers.

A3052 They are 1, 3, 5, 7, 9, 20, 31, 42, 53, 64, 75, 86 and 97. All other numbers except the above have only one generator. Let us see some examples.

Find the generator of 37. It will be observed that it is 32 because 32.+ (3 + 2) = 37.

What is the generaror of 83 ? Answer :— 73

Because 73 + (7 + 3), 83

What is the generator of 10 ?	Answer :—	5
,, ,, ,, ,, ,, 8 ?	,,	4
,, ,, ,, ,, ,, 6 ?	,,	3
,, ,, ,, ,, ,, 2 ?	,,	1
,, ,, ,, ,, ,, 25 ?	,,	17

What is the generator of 64 ? It is a Self--Number. 64 is a square number. it is slso a Self--Number. It will be called Self--Square--Number. Next such Self--Square-Number is 400 (No, 121 is next)

A171671

A6378 *1,3,5,7,31,53 and 97 are not only self numbes but they are prime numbers. They will be called Self--Primes while

A249044 Numbers like 42, 75 are Composite-Self-Numbers. A Self Number can be a Prime Number or a Composit--Number or

* Not 1!

a Square Number. Only thing becomes evident that they have no generators.

For additional information on Self-Numbers see page No. 14 of appendix.

(IV) All the numbers between 1 to 101 are either Self or have only one generator. After 101 there are many numbers which have two generators thus 206 has 2 generators 193 and 202. Because both these numbers give 206 as the generated number from them.

193 + (1 + 9 + 3) = 206 and also 202 + (2 + 0 + 2) = 206 We write this in the notation

206 < 193, 202 — 206 is the junction Number and its co-generators are 193 & 202.

Similarly 707 has 2 generators 700 & 691

This can be shown as

707 < 691, 700 — 707 is the Junction Number and its co-generatos are 691 & 700

In my book " Puzzles of Self-Numbere " a table is given giving all the numbers with 2 generetors between 101 and 1013 at pages 16 and 17, Als o a list of Self-numbers between 1 to 1199 is given at page 15. A230094

Now see page 15 for a list of numbers with 2 generators for ready reference and detailed information on the subject.

(v) The three separate planes of working for three sorts of numbers.

The following are the three varieties.

A – All numbers which are non multiples of three like 7, 23, 811, 593 etc. A249047

B – All numbers which are multiples of 3 only but not of 9 thus 3, 15, 21, 42, 66, 645 etc. (but not 63, 72, 45 which are also multiples of 9). A249046

C – All numbers which are multiples of 9 only. A249048

A, B. and C Types as described above are the three separate planes for the three varieties of numbers. The meaning of this will now be explained.

It we take any number of numbers of the same group and form the digitadition series from them, they will have some common point or related series of junction to meet at some common point. That means all numbers of sort A have some common joining at a nearer or distant place. But the numbers of A sort will not have any common Joining with B or C sort. Similarly, numbers of B sort will never have any common Joining to C and A sort and numbers of C type will never have any common Joining to numbers of A and B sort. The three sorts of numbers have their own separate three working planes.

Explanation :—Take Nos. 1, 64, 110 and 187. They belong to A type. Next page gives the digitadition series of these Nos. and shows that they have one common point 218.

101, 103, 107, 115, 218 are all Junction numbers. All these numbers are belonging to plane A only. There is no number of plane B and C anywhere in the whole working 208 is a junction number from 187 and 110 as starters of the series. This junction meets 218 as the next junction.

Here all the Self-numbers are marked with the symbol ⌒ above them. Thus $\widehat{1}$, $\widehat{53}$, $\widehat{86}$, $\widehat{7}$, $\widehat{64}$, $\widehat{110}$, $\widehat{187}$ means that they are self-numbers ; and the Series starts from them separately.

Common point 218 for A Type Numbers: (Within a certain limit)

1 AH207
2
4
8
16
23
28
38
49
62
70
77
91

101 100 86
103 92, 82, 68, 61, 53 110
107 94, 83, 73, 59, 52, 44, 40, 29, 19, 14, 7 112

115 98, 85, 74, 64, 116
122 124
127 131
137 136
148 146
161 157
169 170
185 178
199 194

218 208, 203 187

Now in the above chart the digitadition series of 1 and 110 are shown vertically till 218 and 208 respectively. The series from the self numbers 86, 53, 7 and 64 are taken horizontally and they meet the first vertical series at the points

101, 103, 107 and 115. These four are the Junction Numbers. The last line is the horizontal series taken from 187. It has the first junction 208 with the vertical series 110 and the next junction 218 with the 1st vertical series of the self number 1. There is a distance kept between 208 and 218 to obviate the confusion with the horizontal series.

See here how 218 is related to all the numbers. In the 1st vertical series between 122 and 199 there is no Junction with any other number. Again 218 can be regarded as common point for all these numbers. 64 is related to 218 via 115 as Junction. 86 is related to 218 via 101, 103, 107 and 115 as junction numbers. And 187 is related to 218 (in the last line) via 208 at the 1st junction from the series 110 and then next term 218 common to series from the self numbers 1 and 187. The series starting from 1 and going till 218 is called *the Grand Trunk Line of the A Type Numbers.*

All numbers belonging to A Type plane meet to this Grand Trunk Line either directly or via certain other junctions. The Grand Trunk Lines is further continued for about 200 numbers and various properties are investigated in it. They will be described later.

Now let us see the junction numbers in relation to the foregoing chart.

J will be called a Junction Number.
J 101 has 91 and 100 as co-generators,
J 103 has 92 and 101 as " "
J 107 has 94 and 103 as " "
J 115 has 98 and 107 as " "
J 218 has 199 & 208 as " "
J 208 has 194 & 203 as " "

Thus it will be seen from above that all numbers are related to 218 via certain junctions and there is no number of B and C Planes in any of the workings. F

Common Point for B Type Series from Self Numbers.

A16052 3 Here the digit-adition series
6 have started from self numbers
12
15 3, 42, 75 and 132
21
24 The common point for all is 210
30
33
39 42
51 48
57 60
69 66
84 78
96 93
111 105 102 87 75
132
114
120 138
123
129 150
141
147 156
159
174 168
186
201 183 Co-generators of 111 are 96 and 105
204 ,, ,, ,, 105 ,, 93 and 102
210 ← 195 ,, ,, ,, 210 ,, 204 and 195
213
219 111, 105, 210, are the Junction Numbers.
231
237
249

3 to 210 is the grand Trunk Line of the Series B Type Numbers. Its extension to further terms will be described later.

All numbers of the Plane B at last come to emerge in Grand Trunk Line starting from 3 via, some junction or directly. These numbers have no common point with any number of A and C Type.

A16096 **Common point for C Type Numbers.**

9
18 The Self numbers of the C Type 9, 108,
27 288 and 378 have been selected for their
36 digitadition series. And 414 is at last
45 the common point till here,
54
63
72
81
90 The Co-generators of 117 are 99 and 108
99 ,, ,, ,, 315 ,, 297 and 306
117 108 ,, ,, ,, 414 ,, 405 and 396
126 ←
135
144 *9 to 414 is the Grand Trunk Line of the*
153 *C Type numbers.* All the numbers of C
162 Type at last emerge in grand trunk line
171 of 9 via. some junction or directly.
180
189
207
216
225
234

243
252
261
270
279
297
315 306 288
334 ←——
333
342
351
360
369
387
405
414 396 378
←

See how the numbers of the plane C will never have any common point to numbers of Planes A or B. All the 3 Type of numbers of the Planes A. B, & C have their own planes of working. Each plane has one common grand trunk line connection all the numbers in that plane either directly or via. other junctions.

(VI). Rise and Fall in the Series of the Generated Numbers Corresponding, to any series of numbers in Natural Numbers.

To understand this rise and fall of the generated numbers let us take some actual series of natural numbers and prepare a corresponding new generated number in the next column. For example we take natural numbers 416, to 433 in the 1st column and their corresponding generated numbers in the next column. Now see the chart on the next page. It will be seen that as the natural numbers go on increasing by 1 the corresponding generated numbers go on increasing by 2. The exception to this rule occurs when the units place in the natural number series is 0. At this time instead of increase by 2 there is decrease by 7. From 416 to 419 the generated numbers went on increasing by 2 in the corresponding column. But from 419 to 420 the generated

series went down in the next column from 433 to 426 i. e. decreased by 7. Then further from 421 to 429 the generated series went on increasing by 2 i. e. from 428 to 444 in the corresponding column. However, as soon as we go from 429 to 430, the series fall from 444 to 437 i, e. there is a decrease of 7. These fluctuations go on further as the series is continued. The following in the general rule :— Except when a natural number is ending in a 0, as the numbers go on increasing by 1 the corresponding generated series goes on increasing by 2 and when a number is ending in 0 the corresponding new generated number in the series is decreased by 7 instead of increasing by 2.

The following Table will Clarify this.

Natural Numbers	Generated Numbers		
416	427		) As the natural) Numbers in the) first column in-) creases by 1 the
	+ 2		) correspond-
417	429		) ing generated
	+ 2		) number incre-
418	431		) ases by 2 in the
	+ 2		) next column.
419	433		) But there is a
	− 7	(exception)	) change when the
420	426		) number in the
	+ 2		) Unit's place is
421	428		) 0. Then there
	+ 2		) is a decreases
422	430		) by 7 in the gene-
	+ 2		) rated column.
423	432		)
	+ 2		)
424	434		)
	+ 2		)

425	436		
		+ 2	
426	438		
		+ 2	
427	440		
		+ 2	
428	442		
		+ 2	
429	444		
		− 7	(again exception)
430	437		
		+ 2	
431	439		
		+ 2	
432	441		
		+ 2	
433	443		

Again the Series of Natural Numbers 87885 to 87919 is given in the next page and the corresponding generated numbers in the opposite column to show that the Principle is constant irrespective of the size of the numbers. But the Exceptional places have got some peculiar behaviour.

Natural Numbers	Generated Numbers		
87885	87921		
		+ 2	
87886	87923		
		+ 2	
87887	87925		
		+ 2	
87888	87927		
		+ 2	
87889	87929		
		− 7	
87890	87922		(exception to the rule)

		+ 2	
87891	87924		
		+ 2	
87892	87926		
		+ 2	
87893	87928		
		+ 2	
87894	87930		
		+ 2	These are Junction numbers
87895	87932		
		+ 2	
87896	87934		
		+ 2	
87897	87936		
		+ 2	
87898	87938		
		+ 2	
87899	87940		
		− (7 + 9)	
87900	87924		(Exception to the rule)
		+ 2	
87901	87926		
		+ 2	
87902	87928		
		+ 2	
87903	87930		
		+ 2	
87904	87932		
		+ 2	These are Junction numbers
87905	87934		
		+ 2	
87906	87936		
		+ 2	
87907	87938		
		+ 2	
87908	87940		
		+ 2	
87909	87942		
		− 7	

87910	87935	(Exception to the rule)
	+ 2	
87911	87937	
	+ 2	
87912	87939	
	+ 2	
87913	87941	

We can see the following laws from the above illustration in addition to the laws already described.

First Law. Whenever a number increases by 10 the corresponding generated number-increases by 11. Thus 87885 has the generated number 87921 and 87895 has the generated number 87932 i. e. increased by 10 in the first number has produced an increase by 11 in the generated number. This rule is true even for the series 416 to 433 as described in last page.

However the Rule fails when the increase by 10 produces the digit 9 in the original number to 10. Thus 87889 gives 87929 while $87889 + 10 = 87899$ gives $87929 + 11 = 87940$. This is alright because the number has increased by 10 and the generated number increased by 11. *But if you go further to 87890* and increase it by 10 the new number is 87900. Here one 9 disappears and so there is corresponding decrease in generated numbers by 9,

Thus 87890 gives 87922 and

87900 ,, 87924 (instead of 87933 by the general rule)

Rule Two: Whenever a number is increased by 9 the corresponding generated number is also increased by 9. This rule has exceptions when the first number ends in 0 and in that case it increases by 18 instead of 9.

Thus:	Take 87886	gives	87923)	Increase by 9
	and 87895	,,	87932)	
But	87890	,,	87922)	Increase by 18
	and 87899	,,	87940)	

The following is the very important observation:

See the Number marked by this sign namely { in the generated number column. These are 87924, 87926, 87928 etc. till 87940 and again they are repeated below as 87924, 87926, 87928 etc. till 87940. However the natural numbers in the first column have always been increased by 1. This shows that 87924 has 87891 as the generators from the 1st series and also 87900 in the lower series. Similarly, 87926 has 87892 as generator from the first series and again 87901 as generator from the new series. Thus all these numbers marked by { have 2 generators.

Thus it is seen that 87924 to 87940 is a series of junction numbers, and they can be represented in our previous notation as :—

87924 < 87891, 87900		87930 < 87894, 87903
87926 < 87892, 87901		87932 < 87895, 87904
87928 < 87893, 87902		87934 < 87896, 87904
	And so on till finally	87940 < 87899, 87908

(VII) To show how the repeatation of digit 9 brings exception to that General Rule.

Our general rule is whenever a number is increased by one the corresponding generated number is increased by 2·

This rule has the exception when the number ends in 0 or series of zeroes. See the table below where the numbers 99996 to 100000 are considered :

Number	Generated Number.	
99996	100038	
		+2
99997	100040	
		+2
99998	100042	
		+2
99999	100044	
		−(7 + 36)
100000	100001	

See above how the generated numbers went on increasing by 2 but in the last column there was sudden decrease by 43 = (7 + 36) because there are four nines behind the first nine. And for every nine there is a change by 9 and four nines bring change of 36 and plus seven according to our last rule, See page 7 (last 2 lines),

(VIII) Special cases of numbers where the Generator of the Number can be found very rapidly.

Case I. Whenever the sum of the digits of a number is 11 then the generator of such numbers is found by deducting 10. Thus 83 has 8 + 3 = 11. Therefore the generator of 83 is 83 − 10 = 73

Verification 73 + (7 + 3) = 83

Similarly 551 has 5 + 5 + 1 = 11

∴ The Generator of 551 = 551 − 10 = 541

Verification 541 + (5 + 4 + 1) = 551

Similarly, the generator of 72011 is 72001

and Generator of 4232 is 4232 − 10 = 4222.

The number taken must be such that the zero in it should not be in the unit's or Ten's place. It can be beyond ten's place anywhere thus 60041 or 300232 are numbers which have sum of digits = 11 and zero beyond ten's place. So the generator can be found, by decrease of 10. (*If, however, the numbers are like 2009 or 31007 where the sum of the digits is 11 but the zero occurs in the second place the rule will fail.*) Thus Generator of 2009 is not 1999 and that of 31007 is not 30997.

Case II. Whenever a number ends only in one zero and has the sum of the digits in it equal to 11 then also the generator is found by substracting 10. Thus 5420 satisfies the condition. Therefore the generator is 5420 − 10 = 5410.

Similarly.

Generator	of	14510	is	14500
,,	,,	12311120	,,	12311110
,,	,,	830	,,	820
,,		11111111110	,,	11111111100
,,		33320	,,	33310

Case III. If a number ending in 00 has the sum of the digits in its equal to 13 then the generator of such numbers is found by substracting 20 from the original numbers.

Thus :—	48100	has generator	=	48080
	9400	,,	,,	9380
	7600	,,	,,	7580
	432400	,,	,,	432380
	52221100	,,	,,	52221080

Case IV. If a number ending in 00 has the sum of the digits in it equal to 14 then generator is found by substracting 25 from the original number.

Thus :—

8600 has generator = 8575
37400 ,, ,, = 37375
444200 ,, ,, = 444175
222223100 ,, ,, = 222223075
192200 ,, ,, 192175
66200 ,, ,, 66175

Note: All the numbers on the right have the sum of digits equal to 25 while all the numbers on the left side has sum of the digits equal to 14.

From the above observation, some rules can be found to prepare series of rules for generators for numbers of fixed type.

Case No V. Whenever a number has four Zeroes at the end and has the sum of the digits equal to 17 its generator is found by substracting 40 from it.

Thus: 980000, 7730000, 45440000 and 722330000 are the numbers of this type. And for finding their generators, we have to substract 40. Thus the generator of 980000 is equal to 980000 − 40 = 979960

Similarly generator of 7730000 = 7730000 − 40 = 7729960
and that of 45440000 = 45440000 − 40 = 45439960
and that of 272330000 = 272329960.

Case No VI. When the sum of the digits of a number is 29 and is followed by 10 Zeroes the generator is found by substracting 100 from it.

Thus :— 99920000000000) These are numbers of this
4656350000000000) type, and the generator is
888500000000000) found by substracting 100
7722332300000000000) from each of them.

Thus :—99920000000000 − 100 = 99919999999900
= 9991 $(9)_8 00$

Similarly the generators of the other three numbers will be 465634 $(9)_8$ 00, $(8)_3$ 4 $(9)_8$ 00 and 77223322 $(9)_8$ 00 respectively.

Case No. VII. A number having 00 at the end and having the sum of the digits equal to 17 has its generator found by substracting 31 from ft.

Thus: 88100, 9800, 4335200, 724400 and 171123200 are the numbers of his type.

Generator of 88100 = 88100 − 31 = 88069
Similarly generator of 9800 = 9769
,, ,, ,, 4335200 = 4335169
,, ,, ,, 724400 = 724369
and ,, ,, 171123200 = 171123169

Case No. VIII. Whenever a number ends in 00 and has the sum of the digits in it = 20 its generators is found by substracting 28 from it.

Thus :— 99200, 88400, 723800, 71145200, 6661100 are the numbers of this type.

Generator of 99200 = 99200 − 28 = 99172
,, ,, 88400 = 88400 − 28 = 88372

and similarly of the other numbers the generators will be 723772, 71145172 and 6661072 respectively.

(VIII) Special cases where the selfness of a number can be easily detected.

Case No. 1. If the sum of the digits of a number is 15 and ends in 00 then it is a self number.

Thus: 84300, 286,00, 9600, 6900, 8700, 3833300 66300 and 7800 are the numbers of this type. [These are prepared from self number 86.]
These are all self numbers.

Case No. 2. If a number has sum of the digits equal to 4 and ends in oo then it is a self number.

The smallest such number is 400. It is a self number, Other such numbers are 3100, 2200, 1300, 111100, 20200 these are all self numbers.

Case No. 3. If a number ends in oo and has the sum of the digits equal to 26 then it is a self number.

Thus 99806, 888200, 789200, 98900 and 89900 are the numbers of this type. They are all self numbers.

Case No. 4. If a number ends in 00 and has the sum of the digits equal to 37 then it is a self number.

Thus 8888500, 9999100, 77777200, 666666100 and 57939400 are all self numbers.

(These are prepared from self number 64.)

Appendix No. 1. (also refer page 3)

Some other Self-Numbers are given here for more careful thinking. 1000000 (i.e. One Lakh) is a self-number.

1111 is a self-number.

187, 176, 165, 154, 143, 132, 121, 110 are self Demlo numbers.

Generator of 100 in 86 . 86 + (8 + 6) = 10

" of 1000 is 977 . 977 + (9 + 7 + 7) = 1000

Similarly " 10000 is 9968

and of " 100000 is 99959

But the generator of 1000000? No, it has no generator. It is a Self-Number.

1952 was a Self number and the present *year 1963 is a self-number.* 111 111 111 111 111 11 or $(1)_{17}$ is a self-number.

333 333 333 3 = $(3)_{10}$ is a Self-number.

The Methods of proving all this subject of self-numbers will be described later.

APPENDIX No. II

A list of Junction Numbers with their two Generators is given here for Understanding this item in this work Clearly, (by Checking)

1308 < 1293, 1302

1308 has 2 generators 1293 & 1302 for 1293 + (1 + 2 + 9 + 3) = 1308 and 1302 + (1 + 3 + 0 + 2) = 1308

14514 < 14493, 14502

Similarly the other Junction Numbers given below can be observed and checked.

917 < 904, 895

812 < 893, 802

7018 < 6992, 7010

27342018 < 27341982, 27342000

1963100020 < 1963099964, 1963100000

All the numbers from 1 till 10000000000001 are either self or have only one generator or two generators. There is no number with three generators till 10000000000001. The first number with three generators has 14 digits and is the same which is described above. A230100, A6064

The first number with four generators has twenty-five (25) digits and it is 1000000000000000000000102 or

$= 10^{24} + 102$

A6064

All this will be described in next report.

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