

Factor C from the negative pole was designated Activity and Factor C from the Psychometric Laboratory still has the salient characteristics of fast energetic work combined with social indifference. These characteristics are also evident in Factor G, but there seems to be a greater emphasis in G on placidity. Factor G could be tentatively designated as a combination of Activity and Non-Emotionality. It is the Activity characteristics, however, which are common to these three factors.

Factor D is almost identical in the two rotations.

Factor D (Negative Pole)			Factor D (Negative Pole) Psych. Lab.		
Code Number	Trait	Loading	Code Number	Trait	Loading
1	Disagreeable	+.72	1	Disagreeable	+.70
3	Unco-operative	+.64	3	Unco-operative	+.62
4	Indecisive	-.36	4	Indecisive	-.33
18	Lacking in Confidence	-.29	18	Lacking in Confidence	-.24
21	Detached	-.14	21	Detached	-.26

This factor was tentatively designated as Domineering.

Factor E from the negative pole has been split into Factors E and the eighth additional Factor H in the Psychometric Laboratory rotations.

Factor E (Negative Pole)			Factor E (Negative Pole) Psych. Lab.		
Code Number	Trait	Loading	Code Number	Trait	Loading
19	Socially Uneasy	+.66	18	Lacking in Confidence	+.50
17	Avoids Company	+.51	19	Socially Uneasy	+.47
18	Lacking in Confidence	+.43	20	Spasmodic Worker	-.35
8	Indifferent	-.37	16	Slow Worker	-.30
15	Procrastinator	-.34	Factor H (Negative Pole) Psych. Lab.		
20	Spasmodic Worker	-.33	Code	Trait	Loading
12	Cautious	-.19	Number		
16	Slow Worker	-.17	17	Avoids Company	+.48
			19	Socially Uneasy	+.30
			10	Serious	+.28
			15	Procrastinator	-.36
			8	Indifferent	-.29
			7	Lethargic	-.26

Factor E obtained by the writer was designated Compensation Activity, and it was suggested that the activity in this factor stemmed from maladjustment. In this factor the combination of social unease and lack of confidence was remarked upon. This com-

bination was found in conjunction with active behaviour responses. Factor E from the Psychometric Laboratory has its highest loadings on Lacking in Confidence and Socially Uneasy and includes also active work responses. This factor seems to emphasise the maladjustment elements in the writer's Factor E and is also designated Compensation Activity. Factor H from the Psychometric Laboratory is more like a true Activity factor but differs from the latter in that it still has elements of social unease as indicated by a positive loading of .30 on Socially Uneasy. The true Activity factors (Factor C from the positive and from the negative pole matrices) have elements of social indifference, but neither have loadings on socially uneasy. In short, in Factor F the emphasis is on the maladjustive elements and in Factor H the emphasis is on the activity responses though there are still elements of social unease.

Factor F is a doublet in both rotations.

Factor F (Negative Pole)			Factor F (Negative Pole) Psych. Lab.		
Code Number	Trait	Loading	Code Number	Trait	Loading
2	Depressed	+.63	2	Depressed	+.55
9	Moody	+.61	9	Moody	+.54

The correlations between the factors obtained from the Psychometric Laboratory rotation were calculated by the writer and are given below:

Table XLI.

Correlations between the Primary Factors from the Psychometric Laboratory.

	Adjust- ment with No Affect A	Second- ary Function B	Acti- vity C	Dom- ineering D	Comp- ensa- tion Activity E	De- pressed and Moody F	G	H
Adjustment with No Affect	1.00							
Secondary Function	.49	1.00						
Activity	.28	.37	1.00					
Dom- ineering	-.44	-.14	.13	1.00				
Compensa- tion Activity	-.50	-.43	-.60	.13	1.00			
Depressed and Moody	-.48	-.42	.00	.34	.02	1.00		
	.15	.42	.64	-.02	-.38	-.14	1.00	
	.04	.21	.36	-.03	-.10	.10	.56	1.00

The intercorrelations for the factors A, B, C, D and F have similar signs and are of similar magnitude for both the Psychometric Laboratory Factors and those obtained by the writer. The only discrepancy of any note is in the correlation between Factors C (Activity) and F (Depressed and Moody). For the writer's factors this correlation was a negative one of  $-.247$  (which is a logical relationship) which has been reduced to zero in the table above. It should be noted, however, that the correlation between the other Activity Factor in the above table (Factor G) is  $-.14$  with Depressed and Moody.

It was suggested that the Activity characteristics were common to the Psychometric Laboratory Factors C and G and the correlations between these factors in the table above is  $+.64$ . Furthermore, they have similar correlations with the other factors in the table. For the sake of convenience these are reproduced below.

	A	B	C	D	E	F	G	H
Factor C	.28	.37	1.00	.13	-.60	.00	.64	.36
Factor G	.15	.42	.64	-.02	-.38	-.14	1.00	.56

It is apparent that there are some elements common to these two factors.

It was suggested that Factor E in this analysis emphasized the maladjustive elements in the writer's Factor E and it will be seen in Table XLI that the former has high negative correlations with all the factors that facilitate adjustment. In order of size these are  $-.60$  with Factor C (Activity),  $-.59$  with Factor A (Adjustment with No Affect),  $-.43$  with Factor B (Secondary Function) and  $-.38$  with Factor G (Activity and Non-Emotionality). It is of interest to note that for the writer's factors the correlation between E and C was only  $-.190$ . The change in this correlation to  $-.60$  in this analysis is very satisfactory in terms of the discussion of the factor.

Factor H was more like a true Activity factor but still had elements of social unease. The fact that the only high correlations with this factor are those of  $+.58$  and  $+.26$  with the two



Activity factors (Factors G and C respectively) and that there is a zero correlation with Factor A which was designated Adjustment with No Affect fits in well with the interpretation of this factor.

As was to be expected, the extraction of two additional factors did not materially affect the interpretation of the factors, many of which remained entirely unchanged. As was to be expected also, it was not necessary to introduce new concepts for the interpretation of the additional factors. The explanation for the splitting of a primary factor would seem to be that, of the (say) 10 trait elements which are included in the original factor, a small number (say) 4 are more closely related to each other than they are to the rest of the trait elements in the factor. It is this small additional variance which allows of another factor being extracted. It seems reasonable to state that the "tail end" factors in an analysis should be interpreted with some caution. Certainly the mere fact of having obtained a personality factor does not ensure that a significant behaviour pattern has been isolated. It is only when a factor has been verified in a number of different analyses that there is some justification for claiming that it represents a stable pattern of behaviour or that the trait elements covary in a variety of situations.

The summary and general conclusions of this investigation will be given in the following chapter.



## CHAPTER VIII.

### CONCLUSION.

- (a) Résumé of experimental results.
- (b) Suggestions for further research.

In this treatise certain views concerning personality diagnosis were expressed as a result of which the experimental investigations developed. A résumé of the arguments advanced and of the conclusions drawn from the experimental investigations is given below.

The need for personality diagnosis in applied psychological work and in particular in such fields as vocational guidance and personnel selection was stressed. In a discussion of the instruments employed in vocational guidance it was contended that the development of intelligence, special ability and achievement tests had followed a clear-cut pattern, that their usefulness had been established and that they were generally applied. On the other hand, instruments to aid in the diagnosis of personality had not yet achieved this status. The explanation advanced for this state of affairs was that personality diagnosis covers a wide and diversified domain, and concepts were employed which were open to a variety of interpretations. In particular, the ideal condition of the validation of the concepts used against some external criterion usually presented considerable difficulty.

The more generally used techniques employed in personality diagnosis were surveyed, but it was considered that the particular technique employed was not of fundamental importance (provided it conformed with the usual technical requirements of all testing instruments and the practical requirements of applied psychological work) but rather the theoretical background against which it was employed.

For this reason a survey was made of some current theories of personality. The psychoanalytic, the physiological,

the wholistic and the cross-sectional approaches to theories of personality were studied. Each emphasised a different aspect of the personality structure and contributed to general psychological knowledge. Each had some bearing on applied psychological work but it was considered that the cross-sectional approach was the one most easily adapted to the requirements of applied psychology. In general, the other approaches found their greatest application in a long-term clinical investigation of the individual, whereas the cross-sectional approach was best suited for obtaining information, in a relatively short period of time, concerning the specific attitudes and behaviour characteristics regarded as essential for adjustment in a particular occupation.

It was emphasised, however, that the specific behaviour traits or characteristics studied by means of the cross-sectional methods of personality assessment should play a significant role in the structure of the personality. It was considered that isolated behaviour traits which were not seen in the light of a theoretical framework of personality were of restricted value.

Cattell's description of a behaviour trait was adopted. A behaviour trait was described as a pattern of behaviour composed of a number of trait elements which constitute a functional unity, or in other words, of a number of trait elements which covary in a wide variety of possible situations. It was considered that a factor was an analytical interpretation of the underlying covariation of the trait elements.

Cattell attempted to cover the entire personality sphere in one factorial study. Reasons were given for doubting whether this would ever be accomplished or whether the different personality factors isolated by different investigators would ever be co-ordinated in this way. It was suggested that the sub-areas of personality be investigated first, and that the co-ordinating studies consist in investigating the relations obtaining between the primary factors which describe the sub-areas.

Table XLII.

Correlations between the Positive Pole and the Negative Pole Scores of the 22 Behaviour Characteristics.

Code Number	Positive Pole Trait	Negative Pole Trait	r	S.E.
1	Agreeable	Disagreeable	-.67	.04
2	Cheerful	Depressed	-.26	.07
3	Co-operative	Unco-operative	-.69	.04
4	Decisive	Indecisive	-.76	.03
5	Demonstrative	Undemonstrative	-.81	.02
6	Emotionally Stable	Emotionally Unstable	-.86	.02
7	Energetic	Lethargic	-.38	.06
8	Enthusiastic	Indifferent	-.24	.07
9	Even-tempered	Moody	-.52	.05
10	Happy-go-lucky	Serious	-.50	.05
11	High-strung	Placid	-.62	.04
12	Impulsive	Cautious	-.54	.05
13	Lively	Sedate	-.21	.07
14	Persevering	Quitter	-.60	.04
15	Prompt Starter	Procrastinator	-.58	.05
16	Quick Worker	Slow Worker	-.76	.03
17	Seeks Company	Avoids Company	-.74	.03
18	Self-confident	Lacking in Confidence	-.79	.03
19	Socially at Ease	Socially Uneasy	-.90	.01
20	Steady Worker	Spasmodic Worker	-.63	.04
21	Sympathetic	Detached	-.16	.07
22	Talkative	Uncommunicative	-.59	.05

For  $N = 200$  a correlation should be at least .18 to be significantly different from zero at the one per cent level. Except for trait 21 these correlations are all greater than .18. However, there is a range in the correlation coefficients from -.16 (trait 21) to -.90 (trait 19) and under these circumstances exactly comparable factors could not be expected from the positive and negative pole matrices.

These correlations show the relationship between the trait and its postulated opposite, but before definite statements can be made about the opposite poles of the specific behaviour continua, comparisons should be made between the intercorrelations of the particular trait and the rest of the behaviour traits in the series and the intercorrelations between the postulated opposite of the particular behaviour trait and the rest of the behaviour traits in the series.

It is suggested that if information concerning the opposite poles of specific behaviour characteristics is desired for the construction of rating scales, the intercorrelations for the positive



pole of the traits and the negative pole of the traits be subjected to one analysis. If it should occur that whenever a particular trait had a positive saturation for a particular factor and its postulated opposite had a corresponding negative saturation for that factor or vice versa, it could be concluded that these traits represented the opposite poles of a behaviour continuum.

This analysis would involve a 44 x 44 matrix and should rather be undertaken by a team of workers than by an individual, or by some institution specifically interested in the compilation of behaviour rating scales.

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APPENDIX.

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# AN INVENTORY OF FACTORS S T D C R

Name..... Sex..... Date.....

Scores: S..... T..... D..... C..... R.....

INSTRUCTIONS: Below you will find some questions which are to be answered by encircling either "Yes," "?," or "No." Read each question in turn, think what your behavior has usually been, and draw a circle around the answer that describes your behavior best. Encircle the "?" only when you are unable to decide between the "Yes" and the "No." BE SURE TO ANSWER EVERY QUESTION. There is no implication of right or wrong in any of these questions.

1. Do you express yourself more easily in speech than in writing?.....Yes ? No 1
2. Are you inclined to limit your acquaintances to a select few?.....Yes ? No 2
3. Do you generally prefer to take the lead in group activities?.....Yes ? No 3
4. Are you ordinarily a carefree individual?.....Yes ? No 4
5. Do you like work that requires considerable attention to details?.....Yes ? No 5
6. Are you inclined to be moody?.....Yes ? No 6
7. Do you usually have difficulty in starting conversations with strangers?.....Yes ? No 7
8. Are you inclined to act on the spur of the moment without thinking things over?.....Yes ? No 8
9. Do you work much better when you are praised?.....Yes ? No 9
10. Do you like to change from one type of work to another frequently?.....Yes ? No 10
11. Are you self-conscious in the presence of your superiors?.....Yes ? No 11
12. Do you daydream frequently?.....Yes ? No 12
13. Do you subscribe to the philosophy of "Eat, drink, and be merry, for tomorrow we die?".....Yes ? No 13
14. Are you inclined to worry over possible misfortunes?.....Yes ? No 14
15. Are you frequently somewhat absent-minded?.....Yes ? No 15
16. Are you relatively unconcerned about what others think of your actions?.....Yes ? No 16
17. Are you inclined to keep in the background on social occasions?.....Yes ? No 17
18. Are you more interested in athletics than in intellectual things?.....Yes ? No 18
19. Are you impatient when waiting for a member of your family or for friends?.....Yes ? No 19
20. Do you like to speak in public?.....Yes ? No 20
21. Are you inclined to live in the present, leaving the past and the future out of your thoughts?.....Yes ? No 21
22. Do you have frequent ups and downs in mood, either with or without apparent cause?.....Yes ? No 22
23. Are you inclined to be slow and deliberate in movement?.....Yes ? No 23
24. Are your feelings rather easily hurt?.....Yes ? No 24
25. Do you enjoy getting acquainted with most people?.....Yes ? No 25
26. Are you inclined to keep quiet when out in a social group?.....Yes ? No 26
27. Do you adapt yourself easily to new conditions, that is, new places, situations, surroundings, etc?.....Yes ? No 27
28. Do you express such emotions as delight, sorrow, anger, and the like, readily?.....Yes ? No 28
29. Are you inclined to think about yourself much of the time?.....Yes ? No 29
30. Are you inclined to analyze the motives of others?.....Yes ? No 30
31. Do you usually keep in close touch with things going on around you?.....Yes ? No 31
32. Do you often have the "blues"?.....Yes ? No 32
33. Do you "get rattled" easily at critical moments?.....Yes ? No 33

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34. Is it usually difficult for you to make decisions?	Yes ?	No	34
35. Do you ever feel that the world is distant and unreal to you?	Yes ?	No	35
36. Is it difficult to "lose yourself" even at a lively party?	Yes ?	No	36
37. Do you shrink from speaking in public?	Yes ?	No	37
38. Do you have difficulty in making new friends?	Yes ?	No	38
39. Would you rate yourself as an impulsive person?	Yes ?	No	39
40. Were you ever the "life of the party"?	Yes ?	No	40
41. Are you frequently in low spirit?	Yes ?	No	41
42. Does it bother you to have people watch you at your work?	Yes ?	No	42
43. Do you frequently find yourself in a meditative state?	Yes ?	No	43
44. Are your daydreams frequently about things that can never come true?	Yes ?	No	44
45. Are you inclined to be shy in the presence of the opposite sex?	Yes ?	No	45
46. Are you inclined to be overconscientious?	Yes ?	No	46
47. Do you often crave excitement?	Yes ?	No	47
48. Do your interests change very quickly?	Yes ?	No	48
49. Are you inclined to ponder over your past?	Yes ?	No	49
50. Do you ever feel "just miserable" for no good reason at all?	Yes ?	No	50
51. Are you often troubled about feelings of     it?	Yes ?	No	51
52. Do you often experience periods of loneliness?	Yes ?	No	52
53. Are you much depressed when others criticize you?	Yes ?	No	53
54. Are you worried about being shy?	Yes ?	No	54
55. Would you rather spend an evening reading at home than to attend a large party?	Yes ?	No	55
56. Do you worry over humiliating experiences longer than the average person?	Yes ?	No	56
57. Would you like a position in which you changed from one kind of task to another frequently during the day?	Yes ?	No	57
58. Do you often find that you have made up your mind too late?	Yes ?	No	58
59. Would you rate yourself as a tense or "high-strung" individual?	Yes ?	No	59
60. Does your mind often wander while you are trying to concentrate?	Yes ?	No	60
61. Do you nearly always have a "ready answer" for remarks directed to you?	Yes ?	No	61
62. Are you inclined to "jump at conclusions"?	Yes ?	No	62
63. Do you usually prefer to let some one else take the lead on social occasions?	Yes ?	No	63
64. Do you ever daydream?	Yes ?	No	64
65. Do you ever change from happiness to sadness, or vice versa, without good reason?	Yes ?	No	65
66. Do you usually derive pleasure from being "in the limelight" on social occasions?	Yes ?	No	66
67. Is it difficult to hurt your feelings, even when the joke is on you?	Yes ?	No	67
68. Do you often try to find the underlying motives for the actions of other people?	Yes ?	No	68
69. Are you inclined to stop and think things over before acting?	Yes ?	No	69
70. Do you generally feel uncomfortable when you are the center of attention on a social occasion?	Yes ?	No	70
71. Do you consider yourself less emotional than the average person, that is, less easily upset?	Yes ?	No	71
72. After a critical moment is over, do you usually think of something you should have done but failed to do?	Yes ?	No	72
73. Would you rate yourself as a lively individual?	Yes ?	No	73
74. Are you philosophically inclined?	Yes ?	No	74
75. Do you often have a feeling of unworthiness?	Yes ?	No	75
76. Can you usually keep cheerful in spite of troubles?	Yes ?	No	76
77. Do you like to play pranks upon others?	Yes ?	No	77
78. Do you often feel that people are observing you on the street?	Yes ?	No	78
79. Do you feel lonesome even when with other people?	Yes ?	No	79
80. Are you troubled with feelings of inferiority?	Yes ?	No	80
81. Would you rather be a scientist than a politician?	Yes ?	No	81
82. Are you inclined to take life too seriously?	Yes ?	No	82



academic interest, though confidence in the test as such will depend upon them. Validity figures of the latter type will be derived from widely scattered sources, will have practical usefulness, and will be subject to interpretation and evaluation in the light of practical considerations apart from the test itself.

When rating-scale data (ratings by self and by others) were used as criteria, the validities of the scores for S, D, and R were of the order of .6, .5, and .5, respectively.<sup>1</sup> Estimates of the reliabilities of ratings by others based upon a very limited sample were of the order .7, .7, and .5, respectively. Ratings for T and C factors proved to be too questionable to use as criteria.

The Inventory has been used in a wide variety of practical situations, chiefly in connection with counseling services in the following situations: high school and college personnel; penal institutions; family relations; hospitals for the insane; speech clinics; industrial plants; retail stores; in addition, in connection with a variety of research activities. Many expressions concerning the usefulness of the scores have been made in private communications. Few publications have presented data that can be quoted to indicate validity for one purpose or another.<sup>4</sup>

**Norms.**—In this revised Manual a new policy of presenting norms based upon recent statistical developments will be followed.<sup>5</sup> A common C-scale of 11 units, and corresponding centile (generally redundantly called "percentile") levels are given. Another change which should be noted is that the high ends of the scale (C-scale scores of 10 and centiles of 99) universally stand for the socially approved ends of the personality dimensions—extraversion on the one hand and freedom from emotionality on the other. The raw scoring scales were unchanged in order to avoid the production of new keys and the confusions that might result therefrom. The C-scale system normalizes all distributions. In view of no information to the contrary regarding the true form of the distributions, this arbitrary decision seems desirable for practical reasons. The percentages of the norm groups (after smoothing of cumulative frequency distributions) which fall within each unit are as follows: 10, 1%; 9, 3%; 8, 7%; 7, 12%; 6, 17%; 5, 20%; 4, 17%; 3, 12%; 2, 7%; 1, 3%; 0, 1%. The norm tables are used by locating the obtained raw score in its appropriate group and then reading the corresponding C-score. The corresponding centile position may also be read but in most cases it lies within a given range. A single centile value can be obtained by interpolation.

Three sets of norms representing different general age groups are given. It has been found by experience that different college groups yield results comparable to those provided in the first form of this Manual so they are repeated here in revised form. The three groups exhibit certain interesting trends related to age, most outstanding of which is a decreasing rathymia with increasing age. When the Inventory is administered to prospective employees or to other groups in which there is motivation to make the best possible appearance, the norms given will not apply too well. Such individuals will appear in ranked order, however, so that their status relative to their group will be known. The ability of individuals to outguess the scoring key is often overrated but should always be taken into consideration as a possibility where personal motives are suspected as a factor.

**Interpretation of Scores.**—While high scales scores are generally regarded as the more socially desirable in these traits, exceptionally high scores may be indications of maladjustment in some kinds of situations. A person can be too socially extraverted, too extraverted in terms of thinking habits, too optimistic, too temperate in mood, or too happy-go-lucky for his own good or for the comfort of others around him, depending upon the circumstances. Scores of 10, and sometimes of 9 should therefore receive some concern. In general, scores in the range from 5 to 7 are probably indicative of best mental health and ease. Scores of 2 and 3 at the other ends of the scales probably indicate need for corrective measures of some kind, depending upon the circumstances, and scores of 1 and 0 may indicate something bordering on the pathological. The pathological extreme of introversion has been regarded as the schizoid disposition which borders on

schizophrenia. The pathological extreme of emotionality borders on the manic-depressive psychosis. It should be emphasized, however, that low scores on any of the five factors are insufficient in themselves to justify any type of pathological diagnosis. A use of The Guilford-Martin Temperament Profile Chart in connection with the interpretation of scores is recommended. Its norms are based upon a composite of those presented in this Manual plus others.

Norms based upon 800 Senior High School Students  
(400 boys and 400 girls, Lincoln, Nebraska)

C-Score	S	T	D	C	R	Centiles
10	0-2	0-8	0-5	0-8	69+	99
9	3-5	9-12	6-8	9-11	64-68	96-98
8	6-9	13-17	9-10	12-15	60-63	89-95
7	10-13	18-22	11-15	16-20	54-59	77-88
6	14-18	23-27	16-20	21-26	49-53	60-76
5	19-23	28-32	21-26	27-33	43-48	40-59
4	24-28	33-37	27-32	34-39	37-42	23-39
3	29-33	38-42	33-38	40-45	30-36	11-22
2	34-38	43-46	39-42	46-50	24-29	4-10
1	39-43	47-51	43-49	51-55	16-23	1-3
0	44+	52+	50+	56+	0-15	0

Norms based upon 388 University of Nebraska Students

C-Score	S	T	D	C	R	Centiles
10	0-1	0-9	0-1	0-5	75+	99
9	2-3	10-15	2-4	6-9	66-74	96-98
8	4-7	16-21	5-8	10-15	61-65	89-95
7	8-9	22-26	9-12	16-20	53-60	77-88
6	10-13	27-32	13-17	21-24	46-52	60-76
5	14-19	33-38	18-23	25-31	38-45	40-59
4	20-26	39-44	24-31	32-38	30-37	23-39
3	27-34	45-48	32-38	39-46	23-29	11-22
2	35-37	49-53	39-44	47-53	15-22	4-10
1	38-40	54-57	45-49	54-59	10-14	1-3
0	41+	59+	50+	60+	0-9	0

Norms based upon 80 Adults

(40 men and 40 women, aged 22 to 54 years, Los Angeles, Calif.)

C-Score	S	T	D	C	R	Centiles
10	0	0-17	0-4	0-4	63+	99
9	1-3	18-21	5-8	5-7	56-62	96-98
8	4-7	22-25	9-13	8-11	48-55	89-95
7	8-12	26-31	14-19	12-16	42-47	77-88
6	13-19	32-37	20-26	17-22	37-41	60-76
5	20-25	38-42	27-30	23-30	32-36	40-59
4	26-30	43-46	31-34	31-37	25-31	23-39
3	31-35	47-51	35-41	38-45	20-24	11-22
2	36-39	52-55	42-49	46-52	16-19	4-10
1	40-44	56-59	50-53	53-59	14-15	1-3
0	45+	60+	54+	60+	0-13	0

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**Name of thesis** An Investigation Into The Determinants Of Temperament. 1987

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