TABLE OF CONTENTS

PART II: PSYCHOPHYSICAL RESEARCHES

APPENDIX

THE ASSOCIATIONS OF NORMAL SUBJECTS[1]

by C. G. Jung and Franz Riklin

1 For some time past, attention has been paid in this clinic to the process of association. In order to produce scientifically useful material for this, my director, Professor Bleuler, has compiled a list of 156 stimulus-words and experimented with them on all types of psychosis. In these experiments a very considerable difficulty soon presented itself. There existed no means of precisely and quantitatively separating association in abnormal subjects from that in normal ones. No work had been done giving any facts on the range of normal subjects and formulating the apparently chaotic coincidences of association into rules. In order to fill this gap to some extent and thereby to pave the way for experiments on pathological associations, I decided to collect more material on association in normal people and at the same time to study the principal conditions involved. I carried out this plan with my colleague, Dr. Riklin.

2 The main experimental methods are as follows: Initially we collected associations from a large number of normal people, with the intention, first, of examining the reactions to see whether they are at all subject to any law; and, next, of

[1] [First published as "Experimentelle Untersuchung über Assoziationen Gesunder," *Journal für Psychologie und Neurologie* (Leipzig), III (1904), 55–83, 145–64, 193–214, 238–308, and IV (1905), 24–67, 109–23. Republished in *Diagnostische Assoziationsstudien: Beiträge zur experimentellen Psychopathologie*, edited by C. G. Jung, Vol. I (Leipzig, 1906; 2nd edn., 1911; 3rd edn., 1915), pp. 7–145 (I. Beitrag). Translated by M. D. Eder in *Studies in Word-Association* (London, 1918; New York, 1919).

[Franz Riklin (1878–1938) was assistant physician on the staff of the Burghölzli at this time. From 1907 to 1913, he and Jung were active in the International Psycho-Analytical Association. For his principal publications, see the Bibliography.]

discovering whether individual patterns occur, i.e., whether any definite reaction-types are to be found. We combined with this a second experiment of a general psychological nature.

3 The mechanism of association is an extraordinarily fleeting and variable psychic process; it is subject to countless psychic events, which cannot be objectively established. Among the psychic factors that exert the main influence on the mechanism of association, *attention* is of cardinal importance. It is the factor that in the first place directs and modifies the process of association; it is also both the psychic factor that can most easily be subjected to experiment and the delicate affective apparatus that reacts first in abnormal physical and mental conditions and thereby modifies the associative performance.

4 Attention is that infinitely complicated mechanism which by countless threads links the associative process with all other phenomena of the psychic and physical domain in consciousness. If we know the effects of attention on the process of association, then we also know, at least in general, the corresponding effects of every psychic event that attention is capable of affecting.

5 These considerations led us to investigate the effects of attention on the process of association, hoping to clarify as precisely as possible the following questions:

1. What are the laws governing the range of association in normal subjects?

2. What are the direct effects of attention on the association process? In particular, does the valency of the association decrease with the distance from the focus of consciousness?

6 Our experiments have revealed a series of facts that not only encourage us to follow the paths on which we have set out into psychological regions but also, as we believe, fit us to do so.

C. G. JUNG

Part One

I. GENERAL EXPERIMENTAL PROCEDURE

7 The experiments were carried out alternately by the two authors so that each one in turn undertook a series of experiments on the subjects concerned. Altogether thirty-eight people took part: nine educated men, fourteen educated women, seven uneducated men, and eight uneducated women; the age-bracket was 20–50 years. Care was taken to use, as far as possible, normal subjects for the experiment. This, however, led to unexpected difficulties, particularly with the educated subjects, as precisely on this level the concept of normality must be very elastic. Nevertheless we hope we have not deviated too far from the norm in our selection of subjects for experiment. We give the numbers of the subjects in detail and in many cases combine with this a short description of the personality, which will facilitate the understanding of possible anomalies. Naturally the two authors have also carried out the experiment on each other.

8 In noting associations we have entirely limited ourselves to those produced by calling out stimulus-words. We used altogether four hundred different stimulus-words. These, grammatically classified, are as follows:

nouns	231
adjectives	69
verbs	82
adverbs and numerals	18

9 The number of syllables was not taken into account (the stimulus-words have one, two, or three syllables). Nor were the stimulus-words arranged in definite categories as Sommer, for instance, has arranged them. On the contrary, as much care as possible was taken to see that stimulus-words of similar

forms or meaning should not follow each other, so as to avoid the subject adapting to a particular topic after one or two reactions. Through an unfortunate coincidence it happened that among the first hundred stimulus-words there were about thirty that can easily be associated according to temporal or spatial co-existence; in the second hundred there are only about twenty of these, which caused a notable difference of the co-existence association in the first and second hundred. The shortage of stimulus-words of this kind is made up by verbs. It was considered important completely to exclude difficult and rare words, in order to prevent mistakes or lengthened reaction-time due to lack of knowledge on the part of the subjects. The stimulus-words were therefore taken as far as possible from everyday life.

10 This consideration was all the more essential for us, as with most of our subjects we had to work under somewhat abnormal linguistic conditions. In German-speaking Switzerland the vernacular consists, as is well known, of the Swiss-German dialect or dialects, which not only deviate considerably from standard German but also show significant phonetic differences among themselves. In the schools children learn standard German as if it were a foreign language. In later life educated people gain a fairly complete knowledge of and facility in the German language. The uneducated man, however, unless he has spent a considerable time in Germany, retains at best those German phrases that he has learned at school and later learns little or no more. Nevertheless, literary German is familiar to him in printed or written form and he also understands it as a spoken language without being able to speak fluent, correct standard German himself. We tried therefore in many cases to call out the stimulus-words in the dialect form, but we soon noticed that the uneducated subjects did not understand dialect words as well as standard German. They reacted to the dialect words more laboriously and tried to react in standard German. This somewhat paradoxical phenomenon can be explained by the fact that Swiss-German is a purely acoustic-motor language, which is very rarely read or written.

11 Everything printed or written is in standard German. The Swiss is therefore not used to experiencing words individually but knows them only in acoustic-motor connection with others.

If he has to say a single word without an article he will usually choose the standard German form. We therefore avoided dialect words completely in our experiments. In most cases a correct standard German reaction was given, but any reactions that were in dialect were fully accepted. The reactions were, of course, written down in the form in which they were given. To subjects who had never taken part in such experiments, their significance was first explained and practical examples of how they had to react were demonstrated to them. Not a few of the uneducated subjects thought that it was a kind of question-and-answer game, the point of which was to find an appropriate word connection to stimulus-words, e.g., *house / house-cat, wild / wild cat.* The experiments were never started till it was certain that the subjects understood the experiment. We stress that a case of not understanding never occurred and that general lack of intelligence was much less disturbing than affects, particularly a fairly frequent emotional obtuseness. It is of some significance that many of the uneducated came with a certain "schoolroom" attitude and a certain correct and stiff demeanour.

12 We organized our experiments as follows: The *first two hundred reactions* were noted without further conditions. The reaction-time was measured with a 1/5-second stop-watch, which we started on the accented syllable of the stimulus-word and stopped on the uttering of the reaction.[2] We do not, of course, presume to have in any way measured complicated psychological times by this simple procedure. We were merely concerned with establishing a general idea of a roughly average reaction-time which is in many cases not without importance, being very often of value in the classification of reactions.

13 After two hundred reactions, these were as far as possible classified, with the help of the subjects. With educated subjects this was always done; with uneducated subjects, who only rarely have any capacity for introspection, it was of course impossible. We had to limit ourselves to having the connection explained in particularly striking associations. The results of the experiment were divided into a first and second hundred and

[2] A later paper will report on time-measurements. The times were not measured in all subjects. [See below, "The Reaction-time Ratio in the Association Experiment."]

these were written down separately. During the experiment the psychic state of the subject was as far as possible established, both objectively and subjectively. If for any reason physiological fatigue occurred, we waited till the next day before doing the second experimental series. With the educated subjects fatigue almost never occurred during the first experiment, so that we could continue at once with the second series in nearly every case.

14 The *second series of experiments* consisted of one hundred reactions which were recorded under the condition of internal distraction. The subject was asked to concentrate his attention as much as possible on the so-called "A-phenomenon" (Cordes) and at the same time to react as quickly as possible, i.e., with the same promptness as in the first experiment. By the "A-phenomenon" we understand, with Cordes,[3] the sum of those psychological phenomena that are directly stimulated by the perception of acoustic stimulus. To establish whether the subject had observed the A-phenomenon he had occasionally to describe it after the reaction, and this was noted. On completion of this experiment new classifications were again made. Of course, for this experiment only educated people could be used and of these unfortunately only a selection, because it takes a certain psychological training to be able to observe attentively one's own psychic phenomena.

15 The *third experimental series* was sometimes not carried out till the second day. It consisted of one hundred reactions and was based on the condition of external distraction. The distraction in this experiment was brought about in the following way: The subject had to make pencil marks of about one centimetre, in time with a metronome. The beat for the first fifty reactions was 60 per minute and for the second fifty reactions 100 per minute. The classification results of the first fifty reactions and the second fifty were recorded separately and for ease of calculation brought to one hundred. With a very few subjects the metronome was speeded up at every twenty-fifth reaction in order to exclude an all too quick habituation. The beat was in these cases increased from 60 to 72 and from 100 to 108 per minute.

[3] Cordes, "Experimentelle Untersuchung über Assoziationen" (1899), p. 30.

16 The factor of habituation, in any case, unfortunately plays a large part in these experiments, as one would expect. Many people very quickly get used to a purely mechanical activity in which, in the second phase of the experiment, only the beat changes. It is difficult to introduce other disturbing stimuli of equal continuity and variability without adducing word-images, particularly when one does not wish to make too great demands on the intelligence and will-power of uneducated subjects.

17 In trying to find a suitable disturbing stimulus we were above all intent on excluding that which might have had an excitatory effect on verbal imagery. We think we did exclude such effects by our experimental procedure.

18 From these experiments three hundred to four hundred associations, on an average, were obtained from every subject. We also tried to supplement our material in other directions, in order to obtain a certain connection with Aschaffenburg's results, and for this purpose we took associations from some of our subjects in a condition of obvious fatigue. We were able to obtain such reactions from six subjects. Associations were also taken from one subject in a state of morning sleepiness after a night of undisturbed sleep, in which the factor of fatigue was completely excluded. With one subject associations were taken when he was in a state of acute moodiness (irritability) without fatigue.

19 In this way we obtained about 12,400 associations.

II. CLASSIFICATION

1. General

20 Anyone with practical experience of work on association has been confronted with the difficult and unrewarding task of classifying the results of the experiments. On the whole we agree with Cordes[4] when he says that in earlier association experiments the false assumption prevailed that the fundamental psychological phenomenon corresponds to the stimulus-word and that the connection between stimulus-word and reaction is an "association." This somewhat too simple interpretation

[4] Ibid., p. 33.

is at the same time too pretentious, for it maintains that in the connection between the two linguistic signs there is also a psychological connection (the association). We do not, of course, share this point of view but see in the stimulus-word merely the stimulus in the strict sense of the word and in the reaction merely a symptom of psychological processes, the nature of which we cannot judge. We do not, therefore, claim that the reactions we describe are associations in the strictest sense; we even wonder if it would not be altogether better to drop the word "association" and talk instead of *linguistic reaction,* for the external connection between stimulus-word and reaction is far too crude to give an absolutely exact picture of those extraordinarily complicated processes, the associations proper. Reactions represent the psychological connection only in a remote and imperfect way. Thus, when describing and classifying linguistically expressed connections, we are not then classifying the actual associations but merely their objective symptoms, from which psychological connections can be reconstructed only with caution. Only in psychologically educated subjects is the reaction what it really should be—namely, the reproduction of the next idea; in all others a distinct tendency to construct something is mixed with the reaction so that in many cases it is the product of deliberation, a whole series of associations. In our association experiments we stimulate the language apparatus. The more one-sided this stimulus is, the greater the number of linguistic connections that will appear in the reaction. As we shall see, this is mainly the case with educated subjects, from whom a finer differentiation of psychological mechanisms, and therefore a greater ability for isolated application, can *a priori* be expected. One must therefore guard against the fallacious assumption that the educated subject has in any way more external associations of ideas than the uneducated.[5] The difference will be a psychological one, as in uneducated subjects other psychological factors insinuate themselves. In the second part of this paper we shall refer to this difference.

21 As long as we still know so little about the connection be-

[5] Ranschburg states that in uneducated subjects inner associations predominate. With Balint, "Über quantitative und qualitative Veränderungen geistiger Vorgänge im hohen Greisenalter" (1900).

tween psychic events, we must refrain from formulating the principles for a classification of external phenomena from inner psychic data. We have therefore confined ourselves to a simple logical classification, to which as a precaution it is in our view essential to limit oneself, till we are able to derive empirical laws from psychic associations.[6] The logical principles of classification must also be adapted to the special experimental conditions, that is, to the verbal reaction. We must therefore, in classifying the associations, take into account not only the logical quality but also, if possible, all those external circumstances occurring as a result of this particular experimental design. The use of the linguistic acoustic brain mechanism naturally is not without influence on the associations. The purely intrapsychic association cannot become the object of another's consciousness without being transformed into the familiar symbolism of language. Thus a completely new element is added to simple association, which exerts a great influence on the latter. In the first place, the results will be determined by the subject's verbal facility; i.e., James Mill's generally valid "law of frequency" directs the reaction even more selectively towards what one is accustomed to. Thus one of the chief principles of our classification will be that of verbal facility.[7]

22 We proceeded with the classification of associations essentially according to the Kraepelin-Aschaffenburg scheme. We preferred this system to others because in our opinion it is heuristically the most valuable. When Ziehen describes the Kraepelin-Aschaffenburg attempt at classification as a failure, this is surely a rather strong term. No one will maintain that Aschaffenburg's classification is exhaustive; Ziehen would not want to claim that even for his own.

[6] Aschaffenburg, too, is cautious about this and confines himself entirely to the relation between stimulus and reaction as it is reflected in speech. He insists on this, since the linguistic reaction does not by any means always tally with the simultaneous inner associations. ("Experimentelle Studien über Assoziation" (1896), p. 220.)

[7] Trautschold says: "First and foremost in this respect is practice or habit, which facilitates certain associations so much that in the end they occur quite mechanically, and there can be no question of other reactions" ("Experimentelle Untersuchungen über die Assoziation der Vorstellungen" (1883), p. 221).

23 Ziehen's classification has certainly opened up most valuable vistas, but it is itself not completely satisfactory. First of all, the differentiation between "jumping association" and "judgment association" is a very doubtful one, if it is completely dependent on the presence or absence of the copula, a fact which Claparède[8] also strongly criticizes. The complete failure of Aschaffenburg's schema should first be proved, but this has in fact not been done; on the contrary, the results based on this classification are very encouraging, so that at present one can still venture to use it, although bearing in mind its one-sidedness. The other schemas of classification are, however, biased in other ways. The criticism that Aschaffenburg's schema is biased on the side of logic is not valid, as it makes sufficient allowance for logical data as well as for sensual and perceptual connection, and also for the linguistic factor. Faced with reactions in the form of sentences, however, the schema is more or less powerless. On the other hand it must be stressed that with normal subjects sentences occur very rarely. One factor of great practical significance deserves to be stressed. Aschaffenburg's schema has been tested on a great deal of material, part of it pathological, and has proved itself of value. His *conditio sine qua non* is not the subsequent questioning of the subjects about the reaction phenomenon, as in the schemas of Ziehen, Mayer and Orth, and Claparède; it also allows at least an approximately correct classification without the help of the subject, which is of particular importance in psychopathological experiments.

24 As we regard this work merely as a preliminary to psychopathological experiments, we have not hesitated to give preference to Aschaffenburg's schema. Those of Münsterberg and Bourdon appear to us as too much weighted on the side of logic; Ziehen's criticism of these, that they are unpsychological because they abstract completely from the context, is valid. Claparède's extremely subtle and penetrating suggestion (p. 226) does, however, deserve serious consideration, but should perhaps first be used on a wider range of material to test its application in practice.

25 In attempting the classification of acoustic-verbal associations one must never forget that one is not examining images

[8] Claparède, *L'Association des idées* (1903), p. 218.

but their verbal symbols. The examination of associations is an indirect one and is susceptible to numerous sources of error caused by the great complexity of the process.

26 In our experiments we examine the resultant of an appreciable number of psychological processes of perception, apperception, intra-psychic association, verbal comprehension, and motor expression. Each of these activities leaves its traces in the reaction. In view of the great psychological significance of motility, particularly of the speech function, one must attribute above all a main role to linguistic facility. It is mainly this factor that is to be considered in classification. This principle of classification can be criticized for introducing an extremely variable and indeterminable magnitude into the calculation. We must admit that verbal facility is an extremely variable magnitude and that in an actual case it often causes difficulties, and that therefore the logical character of the classification also suffers. It introduces an arbitrary element into the classification that one would like to avoid. But, for the reasons stated above, we have nevertheless, *faute de mieux*, decided on this mode of classification, taking as a guiding line certain empirical rules that we shall discuss later.

27 By these restrictions and a thorough consideration of the subject, we hope to have avoided being arbitrary in applying this principle.

28 In the following nomenclature (flight of ideas, associations etc.,) it must be remembered, after what has just been said, that by this we mean primarily speech-phenomena from which we have allowed ourselves to make deductions about psychological events. Here we are fully aware that we are examining a relatively limited area, that is, associations that are for the most part reflected in the speech mechanism. Thus, when we speak of "flight of ideas," we mean by this the speech phenomenon that is an external manifestation of internal processes. Of course, the psychological event is not necessarily reflected *in toto* in the form of word associations, but is only expressed in linguistic signs of that type when it affects the speech mechanism. In the flight of ideas, the actual thinking would naturally present a totally different picture if it could manifest itself directly. Thus, for example, the flight of ideas resulting from predominantly visual parts of images constitutes a special aspect

that can hardly manifest itself adequately enough and is therefore hardly accessible to external examination; particularly in mania, it will as a rule not be accessible to examination, because of the linguistic agitation. We shall find an opportunity in a later publication[9] to discuss the visual form of flight of ideas.

2. Special Classification

A. Internal Association[10]

29 (a) Grouping. We classify under this heading all associations connected by co-ordination, superordination, subordination, or contrast. The perusal of the cases in question leads to the following special classification of co-ordinations:

30 (*a*) *Co-ordination.* The two parts are linked by a similarity of content or nature; i.e., a general idea, in which both parts are contained, underlies them. Examples:

(accumulation of water)
lake ocean

(fruit)
cherry apple

(measurement)
long narrow

(injustice or vice)
unjust faithlessness

[9] [No such publication has been traced.]

[10] Ziehen (*Introduction to Physiological Psychology* (orig. 1891), p. 205), arguing against internal association, gives as examples the following: *guest/chest, pain/rain,* and remarks that these so-called internal associations are purely external and are almost completely limited to the acoustic image of words that have similar sounds. One can readily agree with Ziehen, for surely no one will want to call these examples of inner association.

We consider, with Wundt, that associative affinity is the principle of internal association and practice the principle of external association (or similarity = internal association, contiguity = outer association).

31 Association by co-ordination must take place within the framework of a clear-cut common general concept, but may be the result of more or less vague similarity. The similarity may be very great, so that only a nuance prevents it from being identical, e.g., *to forbear / leniency*. The similarity can also be very remote, so that the common meaning of the two concepts is not an essential one but a more or less coincidental attribute of the stimulus-image. In such cases the reaction appears very loosely connected with the stimulus-word and thus is distinguished from other co-ordinations. The distance of the association is, as it were, greater. Therefore these co-ordinations can to some extent be separated from those already discussed. In the loosely connected associations two categories can be distinguished:

(1) The stimulus-image is linked to the reaction by a meaningful but otherwise coincidental attribute, e.g.:

father (worried)	worry
play (of child?)	youth
War (peace-league)	Bertha v. Suttner[11]
murderer (to hang)	gallows
sentence (contains something)	content
star (romantic, night?)	romanticism

(2) The stimulus-image is linked to the reaction by an unessential, external, mostly quasi co-existent attribute, e.g.:

pencil (long)	length
sky (blue)	colour
sea (deep)	depth
table (particular shape)	style

32 These two modes of co-ordination may be called "the connection of images according to internal or external kinship." The first category contains by far the more significant co-ordinations, and justifies to some extent the terms internal and external. The co-existence of attributes in the second category indicates that the formation of these co-ordinations is due to external association.

[11] [Baroness von Suttner (d. 1914), Austrian writer and pacifist, recipient of the first Nobel Peace Prize, 1905.]

33 As a last category of co-ordination we should like to propose "co-ordination through example." This category primarily contains reactions that are nothing but the inversions of the two previously discussed patterns:

worry	father (e.g., of the father)
content	sentence (e.g., of the sentence)
colour	sky (e.g., of the sky)
misery	old woman (e.g., an old woman is in misery)

34 Now, there is a series of reactions to adjectives and verbs which, although it is true that they are not grammatically co-ordinated to the stimulus-word, can nevertheless perhaps best be grouped with co-ordinations, particularly those of the examples:

to give in	peace-loving	foreign	emigrant
to pay attention	clever man	to pray	pious man
to despise	wickedness	to help	good man

35 These associations can, if the expression be permitted, be called analytical; they are conceptions that are given, so to speak, implicitly with the stimulus-word to which they have been subordinated or superordinated. But as it is difficult, if not impossible, to distinguish this relationship with certainty in concrete cases, and as in addition the concept of the whole and the part cannot be applied to adjectives and verbs, we count these reactions also as co-ordination through example, inasmuch as among the possible nouns certain typical ones always appear in the reactions. The reactions in these cases are always extremely general and closely dependent on the stimulus-word.

36 The special classification of the co-ordinations would then be as follows:

(1) by common general concept
(2) by similarity
(3) by internal relationship
(4) by external relationship
(5) by example

Examples

(1) father	uncle
(2) father	God
(3) father	worry

(4) father — our house
(5) to pay attention — clever man

37 It must be added that with these examples the rich variety of co-ordinations is by no means exhausted. With individuals who associate intensively according to subjective constellations, a whole series of different co-ordinations, which cannot really be placed in any of these categories, is possible. In these cases one can safely admit one's inability and simply content oneself with the classification "co-ordination." One can console oneself with the idea that the individual possibilities are innumerable and that no schema could ever be invented that would make possible a clear-cut classification of all associations. But there is a number of co-ordinations that could without undue strain be placed under different headings, i.e., they have no clearly defined character; one can either leave it at that or perhaps group these reactions with the type they most resemble. The headings set out above are not meant to be absolute, compulsory categories, but merely a name for empirically found types which, on occasion, however, may merge into each other without sharp boundaries. More must not be expected in our present state of knowledge of association.

38 (β) *Subordination.* The reaction is considered as a part or a minor (subordinated) concept of the stimulus-word, e.g.:

tree — beech

39 Here we include all reactions that specify the stimulus-word, i.e., that represent special instances of the general stimulus-concept, e.g.:

house — house on X street
horse — Mr. X's horse
railway station — Baden

40 In some cases there may be doubt whether the association should be considered as subordination or as predicate, e.g.:

food — today's (viz., food)

41 (γ) *Superordination.* The reaction is considered as the whole or general concept of the stimulus-word, e.g.:

Ofen[12] — town
cat — animal

12 [See infra, par. 423, n. 47.]

Here too the separation from the predicate is difficult, e.g., *thirteen / unlucky number*. Is *unlucky number* in this case a general concept and as such includes thirteen with other unlucky numbers? In our opinion there is a predicate here; on the other hand we would include Aschaffenburg's association *baptism / ancient custom* as a superordination, as *ancient custom* is a general concept that includes many other subordinate concepts.

42 (δ) *Contrast.* The concept can be understood without difficulty. The classification and evaluation of the contrasts is much more difficult, however. Contrasts are as a rule very closely associated images, not only conceptually but also perceptually and above all linguistically. There are even languages in which only one and the same word exists to express typical contrasts. It must have been a considerable psychic achievement in the beginning of language and conscious thought to separate contrasts in speech and concept. Today, however, we have these ancient achievements in thought already formulated in the language; they are taught to us from earliest youth together with the first concepts of speech, with the first songs and reading material. We are verbally very practised in these closely connected concepts, which are very often supported by quotations and rhymes; e.g.:

sorrow	joy	sour	sweet
pain	pleasure	light	dark
good	bad		

Sauersüss and *helldunkel*[13] are even colloquial words in German. For these reasons we have grouped a large number of common contrasts with external associations. Here we only count associations that are not current, such as:

friendly	angry	sense	stupidity
good	sinful	vengeance	to forgive
animal	plant		

43 In spite of this detailed classification of the groupings there are still associations that cannot be put into any of the subgroups. For these there remains simply the general term "coordination," e.g., the association *high / silk*. The stimulus-word

[13] [Sour-sweet and light-dark, i.e., *chiaroscuro*.]

high [German *hoch*] has been understood as a proper name; the bearer of this name [Hoch] has a silk shop; hence the reaction *silk*. This cannot be merely a case of co-existence; the reaction consists of two specific images that are spatially co-existent; it is therefore a rather complicated formation. One could perhaps place it under the heading "co-ordination through external connection," though admittedly on slight evidence. Therefore it is safest, for the moment, to admit that such co-ordination cannot be further classified.

44 Summarizing, we arrive at the following schema:

Grouping
- (α) Co-ordination:
  - (1) by a common general concept
  - (2) by similarity
  - (3) by internal relationship
  - (4) by external relationship
  - (5) by example
- (β) Subordination:
  - (1) Actual subordination
  - (2) Specification
- (γ) Superordination
- (δ) Contrast
- (ε) Groupings of doubtful quality

45 (b) PREDICATE. We include here, in agreement with Aschaffenburg, all judgments, properties, and activities that in any way refer to the stimulus concept as subject or object (summarized by Kraepelin under the name "predicative relationships").[14]

46 It is well known that Kant divides judgments into analytic and synthetic.[15] This principle of logical classification is of value to us only in so far as, in an analytic judgment, a part of the concept (i.e., a predicate) is presented that is necessarily inherent in the concept. Thus only that is given which already implicitly exists. But in the synthetic judgment something is added to the concept that is not necessarily already contained

[14] *Psychol. Arb.*, I, p. 222.

[15] "In an analytical judgment I do not go beyond the given conception, in order to arrive at some decision respecting it. If the judgment is affirmative, I predicate of the conception only that which was already cogitated in it; if negative, I merely exclude from the conception its contrary. But in synthetical judgments, I must go beyond the given conception, in order to cogitate, in relation with it, something quite different from that which was cogitated in it . . ." etc. Kant, *Critique of Pure Reason* (trans. Meiklejohn, 1934), p. 126.

in the concept. As regards associative performance the synthetic judgment is in a way superior to the analytic. If we approach this question practically, we find (in so far as this method of classification can in practice be applied at all) that in simple judgment-reactions the analytic judgment exists mainly in the naming of a co-existent perceptible attribute, while the synthetic judgment is mostly a value judgment with a more or less marked ego-reference. Thus we see here a relationship analogous to that between "co-ordination by external relationship" and "co-ordination by internal relationship." In the association *pencil / length, length* is essentially contained in the concept or is co-existent, while in *father / worry* the concept *worry* adds something new and therefore causes a shifting of concept. We should readily accept the grouping of judgment-reactions into analytic and synthetic if there were not a considerable practical difficulty: we have no way of knowing in the individual case whether the analytic predicate is an essential part of the concept or not. One can only attempt to decide this question if one can differentiate in individual cases between a concrete and an abstract concept. We know that Ziehen considers that he has done this by direct questioning, even of children. We not only consider this method most unreliable, but also find the distinction between concrete and abstract concepts particularly difficult. If I give a name to a mental picture, then the picture consists of a condensation of many memories, whose more concrete or more abstract aspect depends on minimal differences of perceptual vividness. In many cases even psychologically educated people would be at a loss if they had to decide whether, for example, in *house / roof* they had visualized a concrete or an abstract roof. Of course we are far from denying the existence of abstract concepts; but in concrete cases of acoustic-verbal experiments we cannot help suspecting that the so-called abstract concepts are merely words that lack individual content, only not so much because they are abstract concepts as that they are mostly linguistic formations of a motor kind, in which the other sense-impressions participate only very slightly.

47 For the answer to the question whether we are faced with an analytic or synthetic judgment we should have to know exactly whether the thought was concrete or abstract: e.g., *snake / green* is objectively entirely synthetic. It is not necessary

to think of *green* together with *snake*; only in the case of the image of a definite snake must green be already implicit, in which case it would be an analytic judgment. Apart from these reservations, there are other, mainly practical, difficulties which interdict this mode of classification.

48 In order to arrive at a special classification of the predicate we must consider the different possibilities:

(1) The stimulus-word is a noun, the reaction an adjective.

(2) The stimulus-word is an adjective, the reaction a noun.

49 We have no reason to separate these two cases, any more than the other forms of predicative connection:

(1) The stimulus-word is the subject, the reaction its active or passive activity.

(2) The stimulus-word is the active or passive activity of the reaction. Or:

(3) The stimulus-word is the object, the reaction is the activity referring to it.

(4) The stimulus-word is an activity, the reaction is its object.

50 Let us consider the first forms: the predicative connection of noun and adjective. Two main possibilities are to be distinguished:

51 (*a*) The adjective describes an essential and internally meaningful characteristic of the stimulus-image. One can call this type of predicate "internal." It can easily be divided into two groups:

(1) Objective judgment, e.g.:

snake	poisonous	war	bloody
glass	fragile	grandmother	old
mild	spring	winter	raw
thirst	intense		

These predicates describe an essential and meaningful addition to the stimulus. Their purely objective character distinguishes them from the second group:

(2) Value judgment, e.g.:

father	good	pupil	good
to stink	unpleasant	soldier	brave
to ride	dangerous	wood	useful
mountain	beautiful	murderer	base
book	interesting	water	refreshing

In these reactions the personal element is more or less prominent; but where the ego-reference is clearly expressed in the form of wish or rejection, one can speak directly of "egocentric predicates." We do not however want to separate such reactions from value judgments as a distinct group, for reasons stated below. We also count the following as value judgments:

iron	useful metal
water	one of the most interesting chemical substances
scoundrel	disgrace

52 Value judgments expressed in the form of an activity, e.g.:

smoke	stinks
apple	tastes nice

are best placed with the predicates.

53 We also count as value judgments reactions in which a value is not stated but demanded, e.g.:

good	one should be
diligent	the pupil should be
to threaten	one must not

54 Such reactions are not frequent in normal subjects; we merely mention them for the sake of completeness.

55 (β) The adjective refers to an external, less significant, possibly co-existent, and perceptible characteristic of the stimulus. For this type of predicate we should like to use the term "external":

tooth	protruding	exercise-book	blue
water	wavy	salt	granular
tree	brown	etc.	

56 We assess the predicate-relation between adjective as stimulus-word and noun as reaction according to the principles explained above. Thus, in classifying, we evaluate *green / meadow, meadow / green,* as more or less equivalent.

57 Aschaffenburg has with some reason considered interjections as predicates, but we have interpreted them differently (see below).

58 A further sub-group of predicates is made up of the "relationships of noun and verb."

59 (α) *The subject relation.* The noun as the stimulus-word or the reaction is the subject of a definite activity:

resin	sticks	to cook	mother
hunter	to shoot		

60 (β) *The object relation.* The noun as the stimulus-word or the reaction is the object of a definite activity:

door	to open	to clean	brass
to recruit	soldiers	throat	to strangle

61 The predicates so far discussed cannot easily be distinguished from the above-mentioned "co-ordination by example," if the attributive part is the stimulus-word. For this diagnosis we consider decisive the subject's evident effort to find a reaction-word (i.e., a noun) as appropriate as possible to the stimulus-word and with a general validity, as in:

to pray	pious person
to despise	wickedness
to give in	peace-loving

Thus we count *to clean / brass* as an object relation and *to clean / shining metal* as co-ordination by example.

62 Specifications of place, time, means, and purpose are somewhat loosely connected with the group of predicates (Ranschburg's[16] "end-defining association").

place: to go	into town
time: to eat	12 o'clock
means: to beat	with a stick
purpose: wood	for burning

63 One can sometimes, with these reactions, be in doubt about whether perhaps they are to be interpreted as specification and therefore belong to subordinations. But in most cases the decision will be easy, so that error will not be too great. Definitions or explanations of the stimulus-word, which in general occur very rarely, have a certain connection with the group discussed above, for which reason they too have been placed in the group of predicative relations. Examples:

door	noun	star	heavenly body
blue	adjective		

[16] Ranschburg and Balint, p. 715.

64 The predicative relations are thus made up of the following groups:

- Predicative Relations
  - I. Noun and adjective
    - (α) Internal predicate
    - (β) External predicate
      - (1) Objective judgment
      - (2) Value judgment
  - II. Noun and verb
    - (α) Subject relation
    - (β) Object relation
  - III. Determination of place, time, means, and purpose
  - IV. Definition

65 (c) CAUSAL RELATIONSHIP (Münsterberg). Stimulus-word and reaction are linked by a causal connection. Examples:

pain	tears
to cut	painful

B. External Associations

66 (a) CO-EXISTENCE. The connection of co-existence is *contiguity or simultaneity*, i.e., the link between the two concepts is not exclusively similarity or affinity but also temporal co-existence or immediate succession. Spatial co-existence is included in temporal contiguity as spatial co-existence results from succeeding sense-impressions. Examples:

ink	pen	pupil	teacher
exercise-book	knife	table	chair
table	soup	lamp	family
Christmas	Christmas tree	mother	child
Sunday	church	institution	warder

We also include here reactions like:

to ride	horse	to ride	saddle
eye	to see	ear	to hear
pencil, paper, exercise-book, to sing, to calculate, school	to write		

The associations with *to write* are complexes of school-memories, the connection of which is conditioned by simultaneity; the other examples concern reactive images associated with the stimulus images by co-existence.

67 (b) IDENTITY. The reaction contains no shift or development of the sense, but is a more or less synonymous expression for the stimulus-word.

68 (*a*) The synonymous expression is taken from the same language as the stimulus-word. Examples:

grand	magnificent
to pay attention	to take notice (in Swiss-German usage, essentially synonyms)
to squabble	quarrel

69 (*β*) The synonymous expression is taken from a language other than the stimulus-word, i.e., it is a *translation*. Examples:

stamp	timbre
Sunday	dimanche

70 (c) LINGUISTIC-MOTOR FORMS. (Ziehen:[17] "Current word-compounds and associative word-complements." Kraepelin-Aschaffenburg:[18] "Linguistic reminiscences." Trautscholdt:[19] "Word association.") In this sub-group of external associations we collect together all connections of images, which have been canalized through verbal practice, although logically and historically they may have a different meaning and therefore could be put into one of the types mentioned above. In dealing with *contrasts* we have already mentioned a series of reactions that we interpreted as being of such common verbal practice as to be canalized. We classify them as

71 (*a*) *Canalized verbal associations.*

(1) Simple contrasts. Examples:

dark	light	white	black
sweet	sour	like	unlike

[17] Ziehen, "Die Ideenassoziation des Kindes" (1898), p. 29; *Sammlung von Abhandlungen aus dem Gebiete der pädagogischen Psychologie*, I (1898), p. 6.

[18] *Psychol. Arb.*, I, p. 223.

[19] "Experimentelle Untersuchungen über die Assoziation der Vorstellungen," p. 213.

(2) Current phrases. Examples:

hunger	to suffer	something	more
house	and home[20]	force	to apply
of age	to come	bread	to earn
goods	and chattels[21]	head	to bow
thanks	to give	bird	bush
gallant	to be	water	to drink
trials	and tribulations	to swim	to be able to
world	and people	tram	to ride
old	frail	to go	for a walk
right	to do	revulsion	to arouse
to come	(and) go	cat	mouse
place	time	to break	the news

72 (β) *Proverbs and quotations.* Examples:

everywhere	and nowhere	war	and peace
liberty	equality	more	light[22]
everywhere	I am at home	meat	drink
eye	tooth		
do's	and don'ts		

73 (γ) *Compound words.*

(1) The reaction-word complements the stimulus-word and forms a compound word. Examples:

table	leg	frog	blood[24]
needle	case	book	marker
mat	hanging[23]	head	scarf
piano	player	tooth	ache
vengeance	to thirst for	institute	women's

The reaction may also be such that the stimulus-word is repeated in the reaction, e.g.:

tears	tearduct[25]	foot	football[27]
to knock	to knock at	star	starlight
to hear	to hear out[26]	sweet	sweetmeat

[20] [In German, *Grund/und Boden* (bottom/and ground), an expression referring to the hospital grounds.]

[21] [In German, *Kind/Kegel* (child/bastard); *Kind und Kegel* is a folk expression for "the whole family."]

[22] [Goethe's dying words.]

[23] [*Matte/Hänge* = *Hängematte*, 'hammock,' originally a hanging mat. Some of these compounds are untranslatable.]

[24] [Referring to someone who is "cold-blooded."]

[25] [The actual example, *Tränensack*, refers to the lacrymal sac.]

(2) The reaction is essentially only a grammatical variation of the stimulus-word (Wreschner:[28] "Association with inflexional form").

to die	dead	to find	found
kindling	to kindle	love	to love
to hammer	hammer	cab	cabby
school	scholar	murderer	to murder

74 (δ) To this should be added a small group of reactions that can be termed anticipatory. Examples:

dark red	light	grandiose	small
slow	short		

75 (ε) Interjections, which only rarely occur, have been placed in the category of "linguistic-motor connections" although, as Aschaffenburg stresses, they represent a predicate. We justify our interpretation by pointing out the highly imperfect linguistic form of the reaction, which moreover contains a very strong motor component. Examples:

grand	ah!	to love	oh!
to stink	pooh!		

C. Sound Reactions[29]

76 The content of this group corresponds to Aschaffenburg's group of "stimulus-words acting only by sound."

77 (a) WORD COMPLETION. We interpret these words in agreement with Aschaffenburg, only including here reactions that together with the stimulus-word, form an indivisible word. Examples:

wonder	-ful	modest	-y
love	-ly	friend	-ly

[26] [The German, *aufhören*, means to listen attentively.]

[27] [In the German language there is the generic term *Spielball*, meaning a ball used for any game.]

[28] Wreschner, "Eine experimentelle Studie über die Assoziation in einem Falle von Idiotie" (1900), p. 241.

[29] ["Sound" = German *Klang*, also translated in the *Coll. Works* as "clang."]

We also consider addition to the stimulus-word, to form a name, as word-completion. Example:

Canter	-bury
Winter	-bourne[30]

78 (b) SOUND. The reaction is conditioned solely by the sound of the whole stimulus-word or its beginning.[31] Examples:

enchain	enchant	intention	intestine
mercenary	merciful	to roast	roast beef
		humility	humidity

79 (c) RHYME.[32] Examples:

dream	cream	king	ring
heart	smart	crank	plank
leave	grieve		

80 To divide sounds and rhymes into "meaningful and meaningless," as Aschaffenburg does, is not worthwhile, owing to the rarity of the "meaningless" ones. We have therefore refrained from doing this.

D. Miscellaneous

81 This not very large group comprises reactions for which no place can be found in the rest of the schema, but which have only a very limited connection with each other.

82 (a) INDIRECT ASSOCIATION. Aschaffenburg, as is well-known, contrasts the indirect mode of reaction with all other reactions, which he regards as "direct" ones. We have rejected this quantitatively most disproportionate contradistinction, because with uneducated subjects one can never know how many different contents of consciousness stand between stimulus-word and reaction. We cannot even *ourselves* always state how many conscious, half-conscious, or unconscious constellations affect our reactions. We will not enter here into the academic contro-

[30] [The examples given by Jung are *Laufen* (to run)/*burg* and *Winter*/*thur*, both giving the name of a town.]

[31] [Jung's examples (except for *to roast*/*roast beef*), being untranslatable, have been replaced by similar pairs of English words.]

[32] [Some of the rhyming pairs have been replaced by English equivalents.]

versies about indirect association (that is, whether the intermediate link is conscious or unconscious) but confine ourselves to stating the phenomenon of the indirect mode of reaction within the framework of our cases. We call "indirect association" that mode of reaction that is intelligible only on the assumption of an intermediate link different from the stimulus-word and the reaction. We distinguish five forms:

83 (α) Connection by common intermediate concept. Examples:

white far	dozen 144
snowfield	heap
false blonde	turbid shallow
Miss X is false and blonde	water
repentance black	red scent
mourning	flower
to close round	bicycle round
to turn	wheel
to disgust odourless	to walk pear
to stink	under pear-trees
fast to whistle	to turn earth
locomotive	to rotate
hay green	rich 5-franc piece
grass	roll of money

84 It must be noted that in these associations the intermediate link is usually clearly conscious. Such reactions are very rare and occur almost entirely in individuals of markedly visual type.

85 (β) *Centrifugal sound-shift* (Aschaffenburg's "paraphasic indirect association"). There is an inner reaction that is to a greater or lesser extent clear and meaningful, which, however, in the process of articulating it, is replaced by a canalized association with a similar sound. We therefore designate this

group of indirect associations as "centrifugal sound-shift." Examples:[33]

decision to slide (to decide)	to dress excessive (overcoat)
stubborn foolish (mulish)	society unit (union)
to quarrel to shoot (dispute)	earth house (heap)
hair blue (blonde)	medal fastness (fastened)
sacrifice to castrate (casket, sacristy)	love crate (hate)
ears typhus (tubes)	pair hoot (boot)

86 Cordes wants to exclude these reactions from the indirect ones, admittedly, from his point of view, with some justification. The direct inner association appears to be a genuine association and not a sound reaction; so there exists an entirely appropriate and direct intention which, however, at the moment of enunciation, is shifted towards a similarity of sound to the detriment of the meaning. Such shifts can only occur when the inner image to be expressed does not command the intensity of attention necessary to set going the appropriate speech-mechanism. Deviations into by-ways only occur when what has to be enunciated is not intense enough, i.e., it does not reach a sufficient degree of consciousness. Therefore we also assume that, in spite of correct intention, the intermediate link has remained abnormally obscure, which agrees completely with the accounts of subjects who can observe themselves. Some had no more than a feeling that they had not said the right thing, without being able to point to the intermediate link. Whether in such cases the shift towards similarity of sound occurs at the sending station or the receiving station seems to us irrelevant to the evaluation of the reaction.

87 (γ) *Centripetal sound-shift.* The stimulus-word is internally replaced by a sound similarity, which in its turn determines the reaction. Usually the intermediate link is in that case half-con-

[33] [Most of the original examples are not translatable, so equivalents have been found.]

scious or unconscious. It must be noted that in all cases here classified the stimulus-word has been correctly understood, so that it is not merely a case of misunderstanding. Examples:[34]

to ride slip
(slide)

to wallow bird
(swallow)

strong sin
(wrong)

malt pepper
(salt)

politics hefty
(policeman)

stroke knot
(string)

to hit to bite
(to smite)

malt vinegar
(salt)

lazy mist
(hazy)

to rust fair
(just)

room to caw
(rook)

stroke cigar
(smoke)

to wallow throat
(swallow)

to love turtle
(dove)

pleasure tape
(measure)

88 In our experience by far the largest number of indirect associations are shifts through sound similarity. What we have said in the preceding paragraph about the consciousness of the intermediate links also applies here. The occurrence of a sound association points to a stimulus-word with an inadequate feeling-tone.[35] Reaction to the intermediate sound-link is likewise a result of insufficient feeling-tone of the stimulus-word. In this case the sound association is, in our experience, as indistinct as the stimulus-word, and at first the subject is even unsure of the kind of stimulus-word. The reaction is innervated before the act of apperception has taken place.[36]

[34] [Many of the original examples, being untranslatable, have been replaced by English equivalents.]

[35] Intensity of attention; see above, par. 86.

[36] Münsterberg maintains that, in order to stimulate associations, the external excitation does not first have to be converted into a conscious process, but that, between external excitation and conscious central excitation, there is a non-conscious stage in which an association-process takes place that does not reach consciousness (*Beiträge zur experimentellen Psychologie*, IV (1892), p. 7). Nevertheless, Münsterberg denies the occurrences of indirect associations through conscious intermediate links (ibid., p. 9).

89 (δ) *Centrifugal and centripetal shift through word-completion or linguistic-motor association.* Examples:

standard filter (solution)	head block (blockhead)
false faithfulness (faithful)	angel heart (hard)
rats poisonous (poison)	clean flea (unclean)
to cook coachman (the cook)	painter beautiful (painting)
avarice patient (pathological)	lockjaw teeth (jaw)
armlet foot (arm)	permanently to certify (deranged)
horrible grey (gruesome)	to roll round (roller)
look-out strike (lock-out)	fox finger (foxglove)

90 (ε) *Shift by several intermediate links.* The intermediate links may be associations that are mechanical yet of high valency. The reactions in this category are very rare and are mostly of abnormal origin. All the types described above can of course be found among these reactions. Examples:

ink	acid	revenge	rector
(red	litmus)	(right	rectify)
bird	mouse		
(flutter	bat [*Fledermaus*])		
lithe	big	tough	headache
(lice	small)	(tooth	ache)

91 We shall not at present look further into the theory of indirect association in acoustic-verbal experiments. For the moment let us simply say that these associations are closely connected with variations in concentration.

92 (b) MEANINGLESS REACTIONS. In moments of emotion or embarrassment reactions are sometimes given that are not words or are not associations.

93 We of course separate assonances as sound reactions from

(continued...)

INDEX

A

D

E

J

K

L

S

T