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AN ACCOUNT OF SOME PSYCHOLOGICAL EXPERIMENTS ON THE SUBJECT OF TRADE-MARK INFRINGEMENT

THIS should be regarded as a continuation of an article published in this REVIEW in June, 1910, entitled, "THE UNWARY PURCHASER, A STUDY IN THE PSYCHOLOGY OF TRADE-MARK INFRINGEMENT."¹

In that article it was asserted that while there is no serious dispute about the rule of law in trade-mark infringement cases, the application of it occasions much difficulty. The principle is general and without exception. Infringement occurs whenever two marks resemble each other sufficiently to make it probable that the ordinary retail buyer, exercising no more care than such persons usually do in purchasing, will be deceived.

This rule in various forms of phraseology has been laid down many times; probably never better than Judge Jenkins' expression of it in *Pillsbury v. Pillsbury-Washburn Flour Mills Company*.²

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²"The question, however, is of resemblances, not of differences. A test which applies only after the deviations have been pointed out favors the counterfeit. We think it clear beyond reasonable doubt that the simulation is such as to deceive the ordinary purchaser desiring to buy the flour of the appellee into purchasing the flour thus put upon the market by the appellants. We must remember, in considering this and like cases, that the purchaser of goods, with respect to brands by which the goods are designated, is not bound to exercise a high degree of care. A specific article of approved excellence comes to be known by certain catch-words easily retained in memory, or by a certain picture which the eye readily recognizes. The purchaser is required only to use that care which persons ordinarily exercise under like circumstances. He is not bound to study or reflect; he acts upon the moment. He is without the opportunity of comparison. It is only when the difference is so gross that no sensible man, acting on the instant, would be deceived, that it can be said that the purchaser ought not to be protected from imposition. Indeed some cases have gone to the length of declaring that the purchaser has a right to be careless, and that his want of caution in inspecting brands of goods with which he supposes himself familiar ought not to be allowed to uphold a simulation of a brand that is designed to work a fraud upon the public. However that may be, the imitation need only to be slight if it attaches to what is most salient,

The difficulty which counsel and courts encounter, is not in the acceptance of the rule, but in its application to the instances before them. The arguable question is always presented—is one mark sufficiently like another to make it likely that the ordinary customer will be fooled. Counsel on one side asserts that it is,—opposing counsel asserts that it is not, and the judge has to use his own eyesight and knowledge of people and make up his mind as best he can, because it is an exceptional case where there is evidence of actual confusion.

It was suggested that a search through the literature of modern experimental psychology might disclose some workable method of getting light on this problem, because it is a simple one in the psychology of recognition. Many interesting discussions and records of tests concerning the recognition of colors, tones, pictures, words, nonsense syllables and the like were found, but nothing which bore directly and in a practical way on the subject under investigation. But there seemed to be a well recognized scientific method and technique in dealing with purely psychological and perhaps theoretical problems.

After writing the article in the REVIEW just referred to, I decided to bide my time, and if a case presented itself in which the experiment seemed worth while, to try it,—to have the question of deceptive similarity between marks determined in a psychological laboratory and to see if a court would pay any attention to the results.³

for the usual inattention of a purchaser renders a good will precarious if exposed to imposition." 64 Fed. 841, 847.

³The testimony of experts in trade-mark cases has long been a debated question. Expert witnesses were called compurgators by Lord Justice Fry, (*Turton v. Turton*, 42 L. R. Ch. Div. 128, 61 L. T. 571, 580). Their testimony was adversely commented on in

Hennessy v. Dompe, 19 R. P. C., 333, 339.

Payton v. Snelling, 17 R. P. C., 628, 635.

Alaska Packers Assn. v. Crooks, 18 R. P. C., 129.

Addley Bourne v. Swan, 20 R. P. C., 105, 118.

Singer Mfg Co. v. British Empire Co., 20 R. P. C., 313, 319.

Goodwin v. Ivory Soap Co., 18 R. P. C., 389, 392.

Expert testimony has, however, been received in many cases without objection:

Gorham Co. v. White, 14 Wall., 511, 530.

Morse v. Worrell, 10 Phila., 168; P. & S., 8, 9, 13.

Williams v. Brooks, 50 Conn., 27^o.

In re Worthington's T. M. L. R. 14 Ch. Div. 8.

McLean v. Fleming, 96 U. S. 245, 258.

California Fig Syrup Co. v. Taylor's Drug Co., 14 R. P. C., 341, 346.

Siebert v. Findlater, 38 L. T. (N. S.) 349, 352.

Hennessy v. Keating, 25 R. P. C., 125, 130.

Scottish U. & N. Ins. Co. v. Scottish Co., 26 R. P. C. 105, 110.

It was commented on in *Cook v. Starkweather*, 13 Abb. Pr., 400.

New equity rule 48 expressly contemplates the testimony of expert witnesses in trade-mark cases, though what sort of experts is undisclosed.

It is well known that Mr. Justice Lurton took a prominent part in the drafting of

In 1915 a case arose which seemed to offer a fair field for the attempt to see if the experimental psychologist could shed any light on the situation. The question to be decided was whether the word "Chero-Cola" was enough like the word "Coca-Cola" to come within the prohibition of Act of Congress of February 20, 1905, which provides, Section 5, that no mark shall be registered, "Which so nearly resembles a registered or known trade-mark owned and in use by another and appropriated to merchandise of the same descriptive properties as to be likely to cause confusion or mistake in the mind of the public or to deceive purchasers."

The goods being the same in character, the only question was,—whether the names infringed. There was evidence of actual confusion. Mail, express and freight directed to one party had been delivered to the other. Telephone calls were confused; but the answer to this was obvious,—mail is frequently confused by the stupidity of the postal authorities without reference to resemblances in names. It is a matter of common experience to get the wrong number on the telephone and to get another man's express package. It would add considerably to the weight of the argument that such confusion as did exist was caused by the resemblance between the names, if it could be shown by recognized scientific methods that the names were in fact confusing. Indeed this was the issue in the case.

Richard H. Paynter, Jr., assistant in the laboratory of Applied Psychology at Columbia University, was given the two names and asked to consider the question of resemblance and possible confusion between them, as a problem in experimental psychology, to test the question by recognized laboratory methods and to confine himself in its solution to the use of established technique. Mr. Paynter submitted a report, of which the following is a transcript:—

INTRODUCTION

This is a report of a series of psychological experiments conducted to investigate the deceptive similarity or likelihood of confusion in visual appearance and in sound between the word trade-marks "Coca-Cola" and "Chero-Cola." The report also compares the likelihood of confusion between these words with that found to exist between word trade-marks that have been held in judicial proceedings to conflict and with others that have been held not to conflict. Two

these rules and that he spent considerable time in England in gathering the experience of the English courts under the practice there in vogue; and the probabilities are that what he had in mind in referring to expert witnesses in trade-mark cases were the trade experts so commonly used in English courts in what is known as passing off cases.

distinct methods were employed in the investigation: the recognition or identification method, and the method of relative position. Four separate experiments were conducted, three with recognition and one with relative position. The recognition experiments were on confusion in visual appearance, and the relative position experiment was on confusion in sound. There was found to be actual confusion between "Coca-Cola" and "Chero-Cola" in visual appearance. The likelihood of confusion between them in visual appearance and in sound is greater than the average likelihood of confusion of the non-infringing marks, and of the infringing marks in each of these respects. In visual appearance "Coca-Cola"—"Chero-Cola" ties with a non-infringement pair of marks for third most confusing position; it is less confusing than one non-infringement and one infringement; but it is more confusing than four infringements and two non-infringements. In sound confusion it ties with an infringement for third most confusing position; it is less confusing than two infringements; and more confusing than two infringements and four non-infringements.

EXPERIMENTS

A. VISUAL RECOGNITIVE CONFUSION

I. GENERAL PROCEDURE AND TECHNIQUE. The visual recognition or identification method was used because it involves the same mental process as that employed in daily life by the ordinary purchaser in buying a bottle of "Coca-Cola." In ordinary transactions of business where the article is sold across the counter, the purchaser examines the article to see if it is what he wants, or whether it is the same as that which he has known or bought before. In deciding this matter, the purchaser is guided by recognition or identification of the article as a whole, by certain features of it, or by a combination of both these methods. It often happens, however, that a prospective purchaser has heard or seen only the word trade-mark, but not the article itself nor its container. In such cases he has to rely on his memory of just the word trade-mark in identifying the article. Likewise, the observer or individual in the experiment has to rely on his memory of the word trade-mark in order to tell whether or not what is before him now is the original mark that he has just seen. The task assigned to him in the experiment was simply to indicate whether the words before him were just shown to him.

The individual who submitted himself to do the recognition experiment was shown in the presentation 20 slips of paper on each of which was typewritten a word trade-mark, or a word trade-mark

and the name of its commodity. These slips were presented one at a time at the uniform rate of one a second. They were presented by the writer who conducted all the experiments. Fifteen seconds after the exposure of the last slip in the presentation, the test set of slips was given to the observer. The test consisted of 40 slips, and from it the observer was asked to pick out those that he recognized as having just been seen and those that had not been seen. There were two variations of the formation of the test, according to the problem of the experiment. When the problem was to compare the confusion between the words "Coca-Cola" and "Chero-Cola." "Coca-Cola" appeared in the presentation, whereas the imitation "Chero-Cola" appeared in the test together with 19 marks which were duplicates of 19 shown in the presentation, and 20 marks which were new, i. e., they had not been shown in the presentation. When the problem was to compare the confusion of the imitation "Chero-Cola" with that of nine other litigated imitations, "Coca-Cola" appeared in the presentation, whereas "Chero-Cola" appeared in the test together with these nine imitations, ten duplicates of the remaining ten marks shown in the presentation, and 20 new marks. In all these experiments "Coca-Cola" was shown in the presentation, but in the test where it did not appear the observer had to decide whether he had seen "Chero-Cola" which was not shown in the presentation. If he decided that he had seen the imitation he was confusing it with the original; if he decided that he had not seen the imitation he was not confusing it with the original.⁴ Where the comparison was made with other litigated imitations the name of the article or commodity appeared with each trade-mark. There are two experiments where no comparison was made, one showing the trade-marks without, and the other with the names of their articles. It should be stated here, however, that although the words in the recognition experiments entered the mind of the observer through vision, that not only did similarity in visual appearance, but also in sound, linguistic formation, and meaning or significance contribute to confusion.

The following directions were given to each observer before he did the experiment:

"You are going to be shown one at a time a number of ordinary

⁴ These two statements are not strictly accurate, as they do not take into consideration the possibility of the presence of a very small number of observers who would not have been able to recognize "Coca-Cola," and in whom the perception of "Chero-Cola" would not recall "Coca-Cola." Accounting for this factor would introduce no significant change in the data or conclusions. These observers would be guessing in recognizing whether they had seen "Chero-Cola" and would be in error about 50 per cent. of the cases, thereby influencing equally the correct and incorrect recognitions of "Chero-Cola."

word trade-marks like "Uneeda," "Garford," and "Celluloid." (In the experiments where the trade-marks were used with the names of the articles, the observer was told of this and the examples were given as "Uneeda Biscuit," "Garford Automobile," etc.) You are to read all the words on each slip of paper. Read them naturally as though you were reading an advertisement in a magazine or in a street car. Fifteen seconds after you have been shown the last mark, you will be given a second set (the test) and asked to pick out those marks you have just seen in the presentation and those which you have not seen. You will be further asked to sort the marks into six piles, according to the degree of your confidence or certainty of your recognition of the marks. There are three degrees of certainty for the marks that are recognized as seen, and three similar degrees for those that are recognized as not seen. The three degrees are "absolutely certain," "reasonably certain," and "faint idea." (After the observer had indicated his recognitions of all the marks in the test, he was asked how familiar he had been with the word "Coca-Cola"). Would you say you had been "perfectly familiar," "moderately familiar," "just familiar," or "unfamiliar" with the word "Coca-Cola" before you did this experiment?"

Thus, three important facts were obtained from the experiment on each observer. The first fact was, whether or not he confused "Chero-Cola" with "Coca-Cola." The second fact was, how confident he was that he was correct, or whether he was in doubt about his recognition. And the third fact was, how familiar he had been in daily life with the word "Coca-Cola." The question of visual confusion will then be determined by the data from these three sources of information.

Each observer did only one experiment; and he did not do the same experiment more than once. The observer was not informed of the purpose of the experiment, nor did he know beforehand that an original trade-mark would be replaced by an imitation in the test. Furthermore, nothing was done to cause the observer to have any suspicion that a substitution had been made. The task set the observer in the experiment was not arduous, nor unpleasant. The experiment was done with the observer's own free will. No prize or reward was offered for the highest individual record. After each observer did the experiment the marks in both the presentation and test were thoroughly shuffled. As their positions in both series were thus determined by chance, no mark was given undue prominence by its position.

Ninety ordinary individuals were employed as observers in the recognition experiments. They represented more than 60 different professions and occupations. Their ages were generally between 20 and 45. The individuals that did the experiments represent a random picking from ordinary individuals that resided in New York City in the month of July, 1915. No effort was made to obtain exceptionally bright or exceptionally dull individuals.

All the trade-marks or trade-names studied in the experiments are used or have been used in commerce. When the names of the articles are used in the experiments in connection with the marks, they are the names of the same articles or commodities on which the marks have actually been used. The names of the goods represent many classes of goods of various descriptive properties. In the presentation no mark nor name of a commodity was the same as any other. The names of the commodities of the original marks and their respective imitations were identical. The 20 new marks and the names of their commodities were all different from the others, either in the test or presentation.

The marks and names of the commodities were all typewritten in the same kind of type. The experiments did not reproduce the style, coloring, or size of the marks or names of the commodities as used on the goods or in advertisements. The color of the ink used was black; and great care was taken in typewriting the words to keep the blackness of the ink the same for all letters. All the words were typewritten on the same kind of white paper. Each slip of paper was two and three-quarters by four and one-quarter inches in size. When the name of the commodity was used it appeared on the next line directly beneath the mark. All the words appeared in the second horizontal quarter from the top of the slip.

2. RESULTS

a. *Experiment with One Imitation Not Showing the Name of the Article.* The problem in this experiment is to determine the likelihood of visual confusion between the words "Coca-Cola" and "Chero-Cola," when the marks are not accompanied by the common name of the commodity "Soft Drink." The word "Coca-Cola" appeared in the presentation; the test included the word "Chero-Cola," 19 duplicate marks of 19 shown in the presentation, and 20 new marks. Table I presents the number and per cent of 40 observers that confused the word "Chero-Cola" with "Coca-Cola." Eleven or 28 per cent of the group of observers confused or mistook "Chero-Cola" for "Coca-Cola." Approximately one out of every three ob-

servers actually takes the word "Chero-Cola" to be "Coca-Cola." Of the 11 deceived by "Chero-Cola" nine were "absolutely certain," one "reasonably certain," and one had a "faint idea" that they had seen it. Thus most of the observers mistaken were quite confident that they were correct. Moreover, nine of those confused by "Chero-Cola" were "perfectly familiar," and two "moderately familiar" with the original trade-mark "Coca-Cola." It is seen from this that observers even very familiar with the word "Coca-Cola" were deceived by the imitation "Chero-Cola."

Throughout this investigation the figure representing the per cent of the individuals in a group confused by an imitation is not absolute. That is, it does not mean that just this per cent of observers under the multitudinous varying conditions of every day life will be confused. But the percentage of confusion is, however, a scientific measure depending on the observer's memory of the original mark and its similarity to the imitative mark.

TABLE I

The number and per cent of 40 observers that confused the word "Chero-Cola" with "Coca-Cola"

No. of Observers	Trade-marks		Confused	
	Original	Imitation	Number	Percent
40	Coca-Cola	Chero-Cola	11	28

b. *Experiment with One Imitation Showing the Name of the Article:*

TABLE II

The number and percent of 25 observers that confused the word "Chero-Cola" with "Coca-Cola" when they are applied to the words "Soft Drink"

No. of Observers	Trade-Marks		Name of Article	Confused	
	Original	Imitation		Number	Percent
25	Coca-Cola	Chero-Cola	Soft Drink	17	68

The problem of this experiment is to determine the likelihood of visual confusion between the words "Coca-Cola Soft Drink" and "Chero-Cola Soft Drink." There is no other difference in experimental technique between this experiment and the previous one, except that here each mark is used in connection with the name of its commodity. Table II gives the number and per cent of 25 ob-

servers that confused the words "Chero-Cola Soft Drink" with "Coca-Cola Soft Drink."

Seventeen or 68 per cent of the group confused "Chero-Cola Soft Drink" with "Coca-Cola Soft Drink." When used in connection with the words "Soft Drink" two out of every three observers take "Chero-Cola" for "Coca-Cola." Of the 17 deceived by "Chero-Cola" 12 were "absolutely certain," two "reasonably certain," and three had a "faint idea" that they had seen it. Moreover, 14 of those confused were "perfectly familiar," two "moderately familiar," and one "just familiar" with the original mark "Coca-Cola." As in Table I-the observers in Table II were nearly all quite confident of their false recognitions of the imitation, and also very familiar with the word "Coca-Cola."

The figures in Table II show about two and one-half times as much confusion as do those in Table I. It is the addition of the name of the commodity to both the original and imitative marks that furnishes an explanation for this increase. As the observers in the present experiment had to read in the presentation the words "Coca-Cola Soft Drink" in the same time that those in the previous experiment had to read just the word "Coca-Cola," the word "Coca-Cola" in the former group not being so well perceived, was not so firmly established as in the minds of those of the latter group. Having to contend with a weaker mental impression of "Coca-Cola" confusion with "Chero-Cola" was more likely. Furthermore, as the two perceptions "Coca-Cola Soft Drink" and "Chero-Cola Soft Drink" are relatively more similar than the two perceptions "Coca-Cola" and "Chero-Cola," confusion between the former is hence greater.

c. *Experiment with 10 Imitations Showing the Names of the Article.*

The problem in the present experiment is to compare the likelihood of visual confusion between the words "Coca-Cola Soft Drink" and "Chero-Cola Soft Drink," with the likelihood of visual confusion found to exist between other pairs of similar word trade-marks that had been the subject of actual adjudication of infringement or non-infringement. Nine legal decisions⁵ on the similarity of word trade-marks were selected for comparison. Five were ad-

⁵ Holeproof, Knotair, hosiery; *Holeproof Hosiery Co. v. Wallach Bros.*, 190 Fed. Rep., 606 (U. S. Cir. Ct.).

Grape-Nuts, Grain-Hearts, cereal food; *Postum Cereal Food Co., Ltd. v. American Health Food Co.*, 119 Fed. Rep., 848 (U. S. Cir. Ct. of App.).

Cascarets, Castorets, remedy; *Sterling Remedy Co. v. Spermine Medical Co.*, 112 Fed. Rep., 1000 (U. S. Cir. Ct. of App.).

judications of infringement, in which the use of the imitative marks was enjoined, and four were adjudications of non-infringement, in which injunctions against the use of the alleged illegal imitations were refused. In selecting these decisions two principles were followed: First, that the original mark in the decision should be widely known; and second, that no other circumstance or reason than that of similarity between the word trade-marks should determine the point of infringement or non-infringement in the decision.

The first principle was set up because the word "Coca-Cola" is widely known, and is pretty familiar to a great many individuals in New York City, where all the experiments were conducted. And furthermore, because an imitation would cause less confusion in the case of a more familiar original mark than in the case of a less familiar original, a comparison of the confusion caused by their respective imitations would unfairly show relatively greater confusion for the imitation of the less familiar original. Thus, the confusion brought about by the imitation of "Coca-Cola" will be properly compared with the confusion brought about by infringing and non-infringing imitations, if their originals are approximately as well-known as "Coca-Cola." It should be stated here, however, that not all the decisions studied have original marks as well-known as "Coca-Cola." These marks will receive separate treatment.

The second principle was set up for two reasons. The first was that the experiment measures visual confusion of just word trade-marks. The second was that, if various other factors such as the question of the validity of the trade-marks, unclean hands, similarity of the type, color, or other features of the label or package entered in the decisions and operated to influence the point of infringement or non-infringement, we could not properly compare the experimental results of these complicated decisions with each other, nor with simple decisions of confusion of just word trade-marks, nor with "Chero-Cola." It is obvious that decisions determined by con

Gold Dust, Gold Drop, washing powder; *N. K. Fairbanks Co. v. Luckel, King & Cake Soap Co.*, 102 Fed. Rep., 327 (U. S. Cir. Ct. of App.).

Listerine, Listogen, antiseptic; *Lambert Pharmacal Co. v. Bolton Chemical Corporation*, 5 Trade-Mark Rep., 38, 219 Fed. 325 (U. S. Dist. Ct.).

Mother's, Grand-Ma's, waxing pad; *E. A. Bromund Co. v. Columbia Wax Products Co.*, 200 O. G. 1115 (Ct. of App., D. C.).

Sozodont, Kalodont, tooth paste; *K. K. Landespriv. et al. v. Hall & Ruckel*, 1911 C. D., 329, 165 O. G., 732 (Ct. of App., D. C.).

Green River, Green Ribbon, whisky; *Lang v. Green River Distilling Co.*, 1909 C. D., 476, 148 O. G., 280, 33 App. D. C., 506 (Ct. of App., D. C.).

Club, Chancellor Club, cocktails; *In re S. C. Herbst Importing Co.*, 1908 C. D., 383, 134 O. G., 1565, 30 App. D. C., 297 (Ct. of App., D. C.).

fusion of word trade-marks plus certain other reasons are not in the same legal nor psychological categories as those determined simply by the confusion of just the word trade-marks. The decisions in the former categories could not be properly given as authorities governing those in the latter, or vice versa.

Notwithstanding the fact that some selection has been made in obtaining these decisions, no selection was made to obtain decisions whose trade-marks seemed to have only little likelihood of confusion or less than that of the imitation of "Coca-Cola." That is, no judgment was exercised to set forth as very great the confusion caused by "Chero-Cola" by contrast with imitations that might be expected to show only a slight degree of confusion. In this respect the decisions represent a chance or random sampling of infringements and non-infringements, affording thereby a fair comparison of "Chero-Cola" with infringements and non-infringements of well-known original trade-marks in general. In this respect the experimental method gives a scientific comparison, not one biased in advance to argue a decision of infringement against the word "Chero-Cola."

This experiment is the same as the previous one, except for the presence of 10 imitations in the test instead of one. The words "Chero-Cola Soft Drink" were in the test together with nine other imitations, 10 duplicates, and 5 new marks.

TABLE III

The number and per cent of observers confused by the word "Chero-Cola," and each of the five infringements, and four non-infringements, when they are applied to the names of their articles.

Decision	Trade-marks		Name of Article	Confused	
	Original	Imitative		No.	P.C.
N	Sozodont	Kalodont	Tooth Paste	24	48
I	Green River	Green Ribbon	Whisky	23	46
N	Mother's	Grand-Ma's	Waxing Pad	20	40
	Coca-Cola	Chero-Cola	Soft Drink	10	40*
I	Club	Chancellor Club	Cocktails	17	34
I	Listerine	Listogen	Antiseptic	16	32
I	Cascarets	Castorets	Remedy	14	28
I	Gold Dust	Gold Drop	Washing Powder	13	26
N	Holeproof	Knotair	Hosiery	12	24
N	Grape-Nuts	Grain-Hearts	Cereal Food	9	18

*This percentage is reckoned on the basis of 25 observers in the group; all the other percentages are reckoned on the basis of 50 in the group.

Table III gives the number and per cent of observers confused by each of the imitations. The first column in the table shows whether the imitation in the decision was held to be an infringement (I) or a non-infringement (N). The second column gives the original mark in the decision; the third the imitative mark; and the fourth the name of the commodity to which both the original and imitative marks were applied. The fifth column gives the number of observers confused; the sixth and last the per cent confused. The marks are arranged in an order of confusion from most to least.

"Sozodont—Kalodont," a non-infringement case, is the most confusing pair, 24 observers or 48 per cent of the entire group were confused. "Green River—Green Ribbon," an infringement, stands second highest with 46 per cent confused. "Coca-Cola - Chero-Cola" ties with a non-infringement, "Mother's—Grand Ma's," for the third most confusing position with 40 per cent confused. The differences between these four pairs of marks are not large. Of the 10 observers confused by "Chero-Cola" nine were "absolutely certain," and one had a "faint idea" that they had seen it. Nine of those confused by "Chero-Cola" were "perfectly familiar," and one "moderately familiar" with the word "Coca-Cola." As in the two previous experiments, most of the observers confused were very familiar with the word "Coca-Cola," and they were scarcely even doubtful in their errors. Two imitations are more confusing than "Chero-Cola," one of these is a non-infringing imitation and the other an infringing. Four infringements and two non-infringements have lower scores than "Coca-Cola—Chero-Cola." It is six per cent lower than the most confusing infringement "Green River—Green Ribbon;" and 14 per cent higher than the least confusing infringement "Gold Dust—Gold Drop." It is eight per cent lower than the most confusing non-infringement "Sozodont—Kalodont;" and 22 per cent higher than the lowest non-infringement "Grape Nuts—Grain Hearts."

The original marks in the table that are about as well-known in New York City as "Coca-Cola" are perhaps "Gold Dust," "Grape-Nuts" and "Cascarets." The remaining original marks, with the exception of "Sozodont," contain ordinary words which are met with frequently enough in daily life to be perhaps as familiar as the three above marks. It seems that the combination of the two ordinary words in "Holeproof" puts it also under the latter class of marks. Let us now compare the scores of the imitations of the marks of these two classes with the score of "Chero-Cola." It is

more confusing than the imitation of any of the most widely known original marks. Two of these imitations are infringements and one a non-infringement. In order of amount of confusion these marks are:

Coca-Cola—Chero-Cola	40 per cent.
Cascarets—Castorets	28 per cent.
Gold Dust—Gold Drop	26 per cent.
Grape-Nuts—Grain Hearts	18 per cent.

“Coca-Cola—Chero-Cola” has confused 12 per cent more observers than “Cascarets—Castorets;” 14 per cent more than “Gold Dust—Gold Drop;” and 22 per cent more than “Grape-Nuts—Grain Hearts.” Of the less well-known original marks one non-infringement “Sözodont—Kalodont,” and one infringement “Green River—Green Ribbon” are more confusing. “Mother’s—Grand Ma’s” a non-infringement ties with “Coca-Cola—Chero-Cola,” and all the rest are less confusing than it.

It will be observed that in Table III “Chero-Cola” shows less confusion than in Table II. In both experiments the marks were used in connection with the name of the commodity. In Table III the per cent confused is 40, and in Table II 68 per cent., the difference being 28 per cent. The reason for the decrease in Table III was that “Chero-Cola” appeared in the test together with nine other imitations. The fact that the observer was usually confronted with several imitations before the imitation of “Coca-Cola” appeared, was in itself a kind of fore-knowledge and warning to beware of imitations. In the experiment of Table II the presence of one imitation among 39 different marks in the test, 19 being duplicates of what they had seen and 20 new, would find the observer not expecting to be fooled by an imitation. In the experiment of Table-III the presence of 10 imitations in the test together with 10 duplicates and 20 new marks would, on the contrary, act as a warning to be more cautious, wary, and careful in recognizing all marks. The natural result followed this latter condition; that is, there was a cutting down of the confusion caused by “Chero-Cola.”

TABLE IV.

The average per cent of observers confused by the word “Chero-Cola,” the five infringements, and four non-infringements, when they are applied to the names of their articles.

No. of Decision	Decision	Confused Av. P. C.
	Coca-Cola—Chero-Cola	40
5	Infringement	33.2
4	Non-infringement	32.5

If we compute the average percentages of the five infringing marks, and of the four non-infringing marks, as in Table IV., we find that the score of "Coca-Cola—Chero-Cola" is higher than either average. It is about seven per cent higher. The average for the infringements is 33.2 per cent, and for the non-infringements 32.5 per cent. The average of the infringements is only 0.7 per cent higher than the average of the non-infringements.

The most important characteristic of this difference is its small amount. On the other hand, the largest difference between two infringements, "Green River—Green Ribbon" and "Gold Dust—Gold Drop" is 20 per cent; and the largest difference between two non-infringements, "Sozodont—Kalodont" and "Grape-Nuts—Grain-Hearts" is 30 per cent. Returning for a moment to Table III, two non-infringements, three if we include "Coca-Cola—Chero-Cola," are more confusing than four infringements. The most confusing imitation is a non-infringement; and three of the four most confusing imitations are non-infringements, including "Coca-Cola—Chero-Cola." The two least confusing imitations are non-infringements. The differences within both classes of decisions so enormously outweigh the difference between the classes, that for practical purposes the difference in confusion between the infringing and non-infringing imitations may be disregarded. Therefore, these decisions are not entirely reliable or consistent. The experiment, presenting conditions no more difficult or essentially different from those in daily life, find that there is a likelihood of confusion with all non-infringing imitations which the courts held to show no confusion.

d. *Duplicate, and New Trade-Marks and Trade-Names.*

This section of the report is devoted to showing how difficult was the task set the observer in the preceding recognition experiments. It will be remembered that in the experiments with one imitation, the test contained 39 additional trade-marks and trade-names; 19 of which were duplicate marks of 19 shown in the presentation, and 20 were new marks. In the experiments with 10 imitations, there were in the test besides these, 10 duplicate marks, and 20 new marks. By calculating how well the duplicate and new marks were recognized, the difficulty of the task set the observer may be shown.

The following table presents the results of the duplicate and new marks in the experiment in which appeared one imitation, and in which all the marks appeared without the names of their commodities. The data for the imitation "Chero-Cola" are given in Table I. The first column in Table V states the number of marks studied; the second whether the mark was shown to the observer both in the presentation and test (duplicate), or only in the test (new). The third column gives the average per cent of observers that correctly recognized these marks. The duplicates have a score of 80 per cent, and the new a score of 94 per cent.

TABLE V.

The average per cent of observers that correctly recognized the duplicate and new marks, with one imitation without the name of the article.

No. of Marks	Kind of Mark	Average P. C.
19	Duplicate	80
20	New	94
	Average	87

It is thus easier to tell the marks that have not been seen before than those that have. The final average 87 per cent represents the difficulty of the task set the observers. That is, excluding the results of the imitation, the average per cent of correct recognitions of all the other marks is 87 per cent. The task was perhaps not more difficult than that which the prevailing conditions in daily life would offer, nor so easy that it could be reacted to without error.

TABLE VI.

The average per cent of observers that correctly recognized the duplicate and new marks, with one imitation with the name of the article.

No. of Marks	Kind of Mark	Average P. C.
19	Duplicate	66
20	New	91
	Average	79

Table VI presents the results of the duplicate and new marks in the experiment in which one imitation appeared, and in which the marks were used with the names of their commodities. The data

for the imitation "Chero-Cola Soft Drink" are given in Table II. The duplicates have a score of 66 per cent, and the new marks a score of 91 per cent. In Table VI., as also in the preceding table, the average of the new marks is higher than that of the duplicates. There is, however, in Table VI. a lower score for the duplicates than in Table V.; those for the new marks are about the same.

This decrease in per cent of correct recognitions for the duplicates with the name of the article is explained by the fact that in the same length of exposure more material in the presentation had to be taken in than when the mark alone was shown. A weaker mental impression for the duplicates in Table VI. thus caused a drop in the per cent of correct recognitions. But, adding the name of the article to the new marks made just a slightly lower change in ability to discriminate them. We have already seen above in Table II. that the relatively shorter time to receive the impression of the original with the name of the commodity aided in causing more confusion than did the original mark without it, as in Table I. The final average in Table VI. is 79 per cent. Although it is eight per cent lower than the final average in Table V, the task is still of fair difficulty.

TABLE VII.

The average per cent of observers that correctly recognized the duplicate and new marks, with 10 imitations with the name of the article.

No. of Marks	Kind of Mark	Average P. C.
10	Duplicate	68
20	New	94
	Average*	85

*This average was obtained by dividing the sum of the 30 separate scores by 30; it is slightly higher than the average obtained by dividing the sum of the averages of the duplicate and new scores by two.

Table VII. gives the average per cent of correct recognitions of the duplicate and new marks in the experiment in which 10 imitations appeared, and in which the marks were used with the names of their commodity. The scores of the imitations are given in Tables III. and IV. The duplicates have a score of 68 per cent, and the new marks a score of 94 per cent. As in Tables V. and VI. the average of the new marks is higher than the average of the duplicates. The scores in Tables VI and VII. are for both kinds of marks about the

same. The final average 85 per cent in Table VII. represents the difficulty of the task.

The average of the duplicate and new marks in Tables V., VI., and VII., show that the task set the observer in the experiments is of moderate difficulty. In the experiment with the one imitation, "Chero-Cola," and when the marks are used without the names of the articles the average of the correct recognitions of the duplicate and new marks is 87 per cent. In the experiment with one imitation "Chero-Cola Soft Drink," and when the marks are used with the names of the articles the average of the correct recognitions of the duplicate and new marks is 79 per cent. In the experiment with 10 imitations, and when the marks are used with the names of the articles the average of the correct recognitions of the duplicate and new marks is 85 per cent.

B. SOUND CONFUSION OF THE 10 IMITATIONS MEASURED BY RELATIVE POSITION

The method of relative position was used to compare the likelihood of confusion in sound between the words "Coca-Cola" and "Chero-Cola" with that between the litigated marks of the previous experiment. This method does not state 'how many' are confused in sound by the various imitations, but it does give a measure of their relative differences in confusion of sound. It required the observer to arrange the 10 pairs of litigated marks in a list according to the amount or magnitude of confusion that the imitation is likely to cause. Any pair is then measured by its position in the list. In the comparison of "Chero-Cola" with the nine imitations, and in the psychological criticism of their legal decisions it is recognized that the decisions were not rendered entirely on sound confusion.

Measurement by relative position was adopted: first, because it is a different method from that used in the previous experiment; second, because there is a certain analogy between the mental processes of the observer judging relative differences and the mental processes in the minds of the court judging the question of infringement or non-infringement; and third, because confusion between the words "Coca-Cola" and "Chero-Cola" is especially likely to occur under certain actual business conditions in respect to their sounds.

As regards the first point, it would obviously be of much importance if a method different from that employed in visual cognitive confusion should show that confusion in sound between the words "Coca-Cola" and "Chero-Cola" was above that of the averages of

the infringing and non-infringing marks. Confirmation of greater likelihood of confusion than infringements and non-infringements in two different respects by two different methods is certainly significant.

As regards the second point, the mental processes of the observer comparing relative differences in sound confusion are essentially and very similar to those in the minds of judges comparing the sound confusion of a pair of marks in a case in court with that of marks adjudicated infringement and non-infringement. Although there are resemblances between the mental conditions that give the experimental data and those that give the legal decisions, there are differences between this experimental method and the legal procedure that have greater significance. With measurement by relative position the accuracy or mathematical validity is higher. In employing a far greater number of observers the arrangement is much less likely to be the result of chance bias of a few individuals. In the average of a large number of judgments chance bias in any one direction is cancelled, and the result represents the general tendency of all the observers.

Furthermore, the observers are entirely disinterested in the outcome of the experiment. They do not know which marks have been adjudicated infringement or non-infringement, nor that any pair of marks is being especially investigated. Not knowing that the experiment is conducted for a pending case the judgments of the observers are consequently without prejudice to either plaintiff or defendant. On the other hand, with legal procedure not more than a few judges pass on the decision; and their judgments tend to some extent to be influenced by the abilities of contending counsel to magnify the differences and increase the similarities of the trade-marks. Measurement by relative position gives an exact measure, whereas a judicial decision throws a case into one of two categories, ill-defined and without quantitative significance. It is thus clear that this experimental method is far superior to the present legal procedure.

As regards the last point, the probability of confusion in sound or pronunciation between the words "Coca-Cola" and "Chero-Cola" is considered because it is in this respect that a purchaser asking for a glass of "Coca-Cola" from the dispenser of the drink at the fountain is likely to be fooled. The purchaser under these conditions does not usually see the label on the bottle or its crown, and he can not identify the drink by its trade-mark. Assuming that the dispenser

is acting honestly in listening to his customer's request, and in fulfilling what he believes to be that request, confusion between the words "Coca-Cola" and "Chero-Cola" is most likely in sound or pronunciation alone.

Each observer was given an envelope and a sheet of directions. Enclosed in the envelope were 10 slips of white paper, on each of which appeared two trade-marks. The slips of paper were the same size as those of the previous experiments; and the marks were all typewritten in black ink. The name of the article or commodity did not appear with the trade-mark. The directions are as follows:

"Please arrange in serial order as well as you can the enclosed slips of paper according to the following instructions:

"Each slip contains two trade-marks of a common article. The upper is the original trade-mark, and the lower is the imitation of it.

"The different pairs of trade-marks on the different slips vary in their likelihood of confusion, or in their deceptive similarity, or in the likelihood that the imitation trade-mark will be mistaken for the original. *This confusion may be due to the appearance of the trade-marks, their sound, their linguistic formation, their meaning or significance, or any combination of these four factors.* Neglect, however, all of these four factors except that of *sound*.

"Arrange the slips according to the likelihood of confusion in just the *sound* of the trade-marks: Put on the top of the pile the slip containing the imitation which shows the greatest likelihood of confusion in *sound* and on the bottom the slip containing the imitation which shows the least likelihood of confusion in *sound*. Between the top slip and the bottom put in order those slips containing imitations which show intervening degrees of likelihood of confusion in *sound*.

"In arranging the slips consider the trade-marks as if you have had no previous experience with them."

In addition, the observer was told that there was no time limit, and that he could take as long as he wished to make the arrangement, and further that he was allowed to rearrange the order until it satisfied him. To do the experiment usually required about five minutes. No information was given as to the purpose of the experiment.

Fifty observers assisted in the task of judging the trade-marks. They were mostly students of psychology at Columbia University, during the month of October, 1915. Some were under-graduates studying psychology, some were graduate students with special training in it, and a few were assistants and instructors of psychology.

Only four observers had not gone to college, but all these had been acquainted with psychological experiments. No observer that took part in any of the recognition experiments acted again in this experiment.

TABLE VIII.

The grades and probable errors of the word "Chero-Cola." Each of the five infringements, and four non-infringements.

Decision	Trade-Mark		Av.	P.E.
	Original	Imitative		
I	Cascarets	Castorets	1.2	.03
I	Green River	Green Ribbon	3.3	.13
	Coca-Cola	Chero-Cola	3.6	.17
I	Listerine	Listogen	3.7	.15
N	Sozodone	Kalodont	5.1	.20
I	Gold Dust	Gold Drop	5.2	.12
N	Grape-Nuts	Grain-Hearts	7.0	.13
I	Club	Chancellor Club	7.8	.11
N	Mother's	Grand-Ma's	8.6	.09
N	Holeproof	Knotair	9.5	.08

Table VIII. gives the grades and probable errors of the word "Chero-Cola," each of the five infringing, and four non-infringing imitations. The first column in the table shows whether the imitation in the decision was held to be an infringement (I) or a non-infringement (N). The second column gives the original mark in the decision; and the third the imitative. The fourth column gives the grade; and fifth and last the probable error of the grade. The marks are arranged in an order of probable confusion from most to least. The pair of marks which received the smallest average was judged to have the greatest likelihood of confusion in sound; the one which obtained the largest average was judged to have the least likelihood of confusion in sound.

"Cascarets-Castorets" an infringement has been selected out of the 10 pairs of trade-marks as being the most confusing. It was placed in the first position by 42 observers, and in the second position by 8. Its average grade or position is 1.2. "Green River-Green Ribbon" stands second with a grade of 3.3. "Coca-Cola-Chero-Cola" with a grade 3.6 ties with the infringement "Listerine-Listogen" with a grade of 3.7 for the third most confusing position. The grade of "Coca-Cola-Chero-Cola" is 0.3 lower than that of "Green River-Green Ribbon," and 0.1 higher than that of "Listerine-Listo-

gen." These differences are not large. The grade of "Coca-Cola—Chero-Cola" is 2.4 lower than the grade of the most confusing infringement "Cascarets-Castorets"; and it is 4.2 higher than that of the least confusing infringement "Club-Chancellor Club." It is 1.5 higher than the most confusing non-infringement "Sozodont-Kalodont"; and it is 5.9 higher than the grade of the least confusing non-infringement "Holeproof-Knotair." The arrangement shows that "Coca-Cola—Chero-Cola" is equally confusing with one infringement, less confusing than two infringements, and more confusing than two infringements and all four non-infringements.

A consideration of the probable errors will show that the grades of confusion of the different pairs of trade-marks have a high degree of validity. Moreover, the validity itself of the order can be measured. The probable error of the grade 1.2 is 0.03, i. e., the chances are even that this grade is correct within three hundredths of a unit. It must, however, be remembered that the chances of the true grade being far outside this range decreases very rapidly. The probable error of a measure states the unreliability of the measure, or the probable approximation of the true measure (calculated from an infinite number of cases) to the obtained measure (calculated from 50 cases in this investigation). That the grade 1.2 of "Cascarets-Castorets" is due to chance is entirely negligible. Although all the remaining probable errors are somewhat larger, they indicate a high degree of validity of the average grades. The larger probable errors indicate that the order is less certain, and the difference in confusion between one pair of trade-marks and the next on the list is less. The probable error of the grade 3.6 of "Coca-Cola—Chero-Cola" is 0.17, or the chances are even that this grade is correct within about one fifth of a unit.

The probable error of the difference 0.3 between the grade 3.6 of "Coca-Cola—Chero-Cola" and the next higher grade of "Green River-Green Ribbon" will show the chances that "Coca-Cola—Chero-Cola" deserves a grade as high as that of "Green River-Green Ribbon." The probable error of the difference 0.3 is 0.21. As the difference 0.3 is 1.4 times greater than the probable error of the difference 0.21, the chances are about 2 to 1 that "Coca-Cola—Chero-Cola" does not deserve a grade as high as that of "Green River-Green Ribbon." As the difference 0.1 between the grade of "Coca-Cola—Chero-Cola" and the next lower grade of "Listerine-Listogen" is covered by the probable errors of the grades, the chances are even that "Listerine-Listogen" deserves a grade as high as that of "Coca-Cola—Chero-Cola." The probable error of the difference

1.5 between the grade of "Coca-Cola—Chero-Cola" and the second lower grade of "Sozodont-Kalodont" is 0.26. As the difference 1.5 is 5.8 times greater than the probable error of the difference 0.26, the chances are over 10,000 to 1 that "Coca-Cola—Chero-Cola" does not deserve a grade as low as that of "Sozodont-Kalodont." Therefore, the chances are 2 to 1 that "Coca-Cola—Chero-Cola" does not deserve a grade as high as that of "Green River-Green Ribbon"; the chances are even that "Listerine-Listogen" deserves a grade as high as that of "Coca-Cola—Chero-Cola"; and the chances are over 10,000 to 1 that "Coca-Cola—Chero-Cola" does not deserve a grade as low as that of "Sozodont-Kalodont."

Of the very well-known original trade-marks "Cascarets-Castorets" alone stands higher than "Coca-Cola—Chero-Cola," and "Gold Dust-Gold Drop" and "Grape-Nuts-Grain-Hearts" are both lower. Of the less well-known original trade-marks "Green River-Green Ribbon" stands higher than "Coca-Cola—Chero-Cola," "Listerine-Listogen" about the same, and all the rest lower. In this relative position experiment the comparison between these two classes of trade-marks is not really necessary as the instructions required the observer to disregard the factor of familiarity with the trade-marks. In only three cases did the observer report any difficulty in so doing it.

TABLE IX.

The average grades and probable errors of the word "Chero-Cola," the five infringements, and four non-infringements.

Number of

Decisions	Decision	Av.	P. E.
	Coca-Cola—Chero-Cola	3.6	.17
5	Infringement	4.2	.12
4	Non-infringement	7.6	.11

Table IX. gives the average grades of "Coca-Cola-Chero-Cola" of the five infringements, and of the four non-infringements. "Coca-Cola-Chero-Cola" has a higher rank than both the average of the grades of the infringements and the average of the grades of the non-infringements. It is 0.6 higher than the average of the infringements, and 4.0 higher than the average of the non-infringements. The average of the infringements is 4.2, and that of the non-infringements 7.6; their probable errors are 0.12 and 0.11 respectively.

The probable error of the difference 0.6 between the grade of "Coca-Cola-Chero-Cola" and the average of the five infringements

is 0.21. As the difference 0.6 is 2.9 times greater than the probable error of the difference 0.21, the chances are 19 to 1 that "Coca-Cola-Chero-Cola" does not deserve a grade as low as the average of the five infringements. The probable error of the difference 4.0 between the grade of "Coca-Cola-Chero-Cola" and the average of the four non-infringements is 0.20. As the difference 4.0 is 20 times greater than the probable error of the difference 0.20, there are practically no chances that "Coca-Cola-Chero-Cola" deserves a grade as low as the average of the four non-infringements. "Coca-Cola-Chero-Cola," therefore, stands with high validity above the average of the five infringements, and the average of the four non-infringements.

In Table VIII., among the infringements the greatest difference is 6.6, between "Cascarets-Castorets" with a grade of 1.2, and "Club-Chancellor Club" with a grade of 7.8. Among the non-infringements the greatest difference is 4.4, between "Sozodont-Kalodont" with a grade of 5.1 and "Holeproof-Knotair" with a grade of 9.5. In Table IX. the average of the five infringements is 3.4 higher than that of the four non-infringements. Thus, the differences within either class of decisions are greater than between them. Two non-infringements, three if we include "Coca-Cola-Chero-Cola," are more confusing than the lowest infringement. The two most confusing imitations are infringements, and the two least confusing non-infringements. In sound confusion the results point consequently as did those in visual recognitive confusion to the unreliability and inconsistency of the legal decisions and of the present legal procedure. The difference, however, between the averages of the infringements and non-infringements in sound confusion by relative position is greater than in visual recognition confusion, and indicates a greater accuracy of the decisions.

It should be noted here that we can not say that grade 1.2 is three times as high as grade 3.6, or that the 2nd grade from the highest plus the 5th is equal to the 3rd plus the 4th. Ordinary arithmetic does not apply to measures by relative position.

A comparison of Tables III. and VIII. will show that the positions of the same pairs of marks in the two lists have changed in most cases. "Green River-Green Ribbon" is the only pair that did not change its position. "Coca-Cola-Chero Cola" changed only one-half of a position, "Holeproof-Knotair" changed one position, "Listerine-Listogen" and "Gold Dust-Gold Drop" two positions, "Grape-Nuts-Grain-Hearts" and "Club-Chancellor Club" three, "Sozodont-Kalodont" four, "Mother's-Grand-Ma's" five and one-half, and "Cascarets-Castorets" six. The average of the number of positions changed

for the 10 pairs of marks is 2.7. The lack of exact correspondence between the positions of the same pairs of marks in both lists does not mean that the methods or results are contradictory or inconsistent. Though in both experiments presentation of material was through vision, each experiment principally affected two different senses. Exact correspondence would most likely have existed between the two lists if they were both concerned with measuring the same thing.

CONCLUSION.

1. The word "Chero-Cola" shows a likelihood of visual confusion with the word "Coca-Cola." With one imitation in the experiment and when the mark is used without the name of the commodity, 28 per cent. of all the observers confuse in visual recognition the word "Chero-Cola" with "Coca-Cola." With one imitation in the experiment and when the mark is used with the name of the commodity, 68 per cent. of all the observers confuse in visual recognition the words "Chero-Cola Soft Drink" with "Coca-Cola Soft Drink." With 10 imitations in the experiment and when the mark is used with the name of the commodity, 40 per cent. of all the observers confuse in visual recognition the words "Chero-Cola Soft Drink" with "Coca-Cola Soft Drink." Thus, either with or without the name of the commodity added to the trade-mark, with or without other imitations present, the word "Chero-Cola" shows a likelihood of confusion in visual recognition with "Coca-Cola." It should be observed that the per cent. of likelihood of confusion is not an absolute number representing the exact per cent. of individuals that would be confused in daily life. The per cent. holds approximately only under the simple standardized conditions of the experiment.

2. Most of the observers confused are "absolutely certain" that they had seen the word "Chero-Cola," and only a few are either "reasonably certain" or have a "faint idea." That is, most of the observers put the greatest confidence in their wrong recognitions, and in so doing testify to or affirm their great belief that they are right.

3. Most of the observers confused state that they were "perfectly familiar" with the trade-mark "Coca-Cola" before they saw it in the presentation of the experiment, and only a few were either "moderately familiar" or "just familiar"; none were "unfamiliar" with it.

4. The confusion in visual recognition caused by "Chero-Cola" is greater than that caused by the imitations of the other three very well-known original marks; it is 12 per cent. greater than the confusion caused by the infringing imitation of "Cascarets," 14 per

cent. greater than that of the infringing imitation of "Gold Dust," and 22 per cent. greater than that of the non-infringing imitation of "Grape-Nuts." "Chero-Cola" has a score of 8 per cent. less than the most confusing non-infringement, 6 per cent. less than the most confusing infringement, ties with another non-infringement, and has a higher score than four infringements and two non-infringements. The confusion in the case of "Coca-Cola-Chero-Cola" is seven per cent. greater than that of the average of the five infringing pairs of marks or of the four non-infringing. The average of the infringements is only 0.7 per cent. higher than that of the non-infringements; practically this is no difference.

5. As determined by the average per cent of observers that correctly recognized the duplicate and new marks, the task set the observer in the experiment is of moderate difficulty. In the three recognition experiments the average per cents of correct recognitions of the duplicate and new marks is 87, 79, and 85 per cents. The figures indicate then that the task is not too arduous nor exceedingly easy.

6. In measurement of confusion in sound by relative position "Coca-Cola—Chero-Cola" with a grade of 3.6 (P. E. 0.17) ties with an infringement for the third most confusing position in the list of 10 pairs of litigated trade-marks. It is ranked equally confusing with one infringement, less confusing than two infringements, and more confusing than two infringements and all four non-infringements.

7. "Coca-Cola—Chero-Cola" has a higher rank of confusion than both the average of the grades of the infringements, and the average of the grades of the non-infringements. It is with high validity above the average 4.2 (P. E. 0.12) of the five infringements, and above the average 7.6 (P. E. 0.11) of the four non-infringements.

This report, for the purpose only of dispensing with formal proof, by stipulation and subject to objection, was made part of the record. It was of course objected to on every ground which diligent counsel could think of, and was treated in the argument with much ingenious pleasantry; but nevertheless it was received, and the court in its opinion handed down on March 25, 1919, commented on the results as follows:

"With reference, however, to the testimony of Paynter found on pages 497-531 of opposer's record, the examiner is unable to agree with the criticisms made by the applicant. This testimony was included by stipulation of the parties, and in effect consists of various

psychological experiments conducted by Paynter for the purpose of investigating the likelihood of confusion in visual appearance and in sound between the marks "Coca-Cola" and "Chero-Cola." These experiments proceed on the assumption that the question of likelihood of confusion in trade is for the most part a question of psychological fact rather than a question of law, and as such should lend itself to experimental determination. It is seemingly not claimed by Paynter that these experiments are the equivalent of the actual conditions that obtain in trade. But it is sought to simulate as near as practicable these conditions in the laboratory. These experiments are so conducted that (1) the element of personal bias and interest should be absent; and (2) the law of averages is utilized for the purpose of ascertaining the least probable error of the observer. This mathematical law of averages, as is well known, is the common scientific method used to detect errors involved in making observations of fact. These two factors alone should greatly tend to justify careful consideration of the method used to obtain them.

"Counsel for applicant objected to these experiments for various reasons given at the time the testimony of Paynter was introduced. In effect, applicant contends that the testimony of Paynter and the experiments identified by him are inadmissible as evidence in this case. These reasons have been carefully considered by the examiner. Every one of them, however, seems to him to be no more applicable to these experiments than to an experimental test of a machine made by interested parties to demonstrate its operativeness or inoperativeness, such, for instance, as is disclosed in the case of *Mark v. Greenawalt*.⁶ Tests of machines for this purpose are recognized as admissible evidence. These objections on this ground are not sustained since they seem to the examiner to go to the weight of the evidence and not to its admissibility. In tests of machines this office reserves to itself the right to form its own opinion on the value, if any, of such evidence, and it is not bound to accept the results stated to have been obtained. The same procedure seems to the examiner to be proper here. The analogue of the experimental machine test is helpful in considering the objection by the applicant that these experiments were performed during the absence of counsel for applicant. Doubtless when this circumstance exists in connection with the test of a machine it is a factor tending to detract from the proba-

⁶ 138 O. G. 965.

tive force of the testimony offered relative to this test. But the effect of this factor should depend upon the nature of the test and the amount of expense to the other party involved in duplicating the machine test. For if a duplicate test can easily be made, and if made by the other party would rebut the effect of this testimony relative to the experimental test of the machine made *in camera* by the other party, the absence of the opposing party at these tests should have less significance than if a test by the opposing party is not practicable, or if practicable, only with great expense or by overcoming unusual difficulties. Here, however, the experiments could have been easily reproduced or varied in many ways by the applicant. The examiner therefore attaches less significance to the absence of the counsel for applicant at these experiments than does the applicant.

"The examiner regrets that applicant did not reproduce these experiments or vary them to meet some of the conditions suggested in some of the objections recited on pages 528-531 of the opposer's record. If they had been made they might have thrown considerable light on a number of questions to which these experiments naturally give rise in the mind of anyone who has studied them carefully. Some of the results of these experiments seem to the examiner to be at variance with those that he is accustomed to regard as correct. Thus, for instance, in the first two paragraphs found in the table on page 511 involved, "Coca-Cola" and "Chero-Cola" are stated to be 40 per cent. confusing and "Cascarets" and "Castorets" only 28 per cent. confusing. It would seem to the examiner that if the percentages were interchanged they would approximate more nearly with what would be obtained from the use of the ordinary methods. The examiner recognizes, however, that if experiments of this character are capable of establishing accurate and true results, they would probably show variations from those obtained from the imperfect methods now used. It therefore follows that such variations are not necessarily satisfactory evidence that the results of the method used are erroneous. At the same time, ordinary caution and prudence require that the accuracy of the methods involved in these novel experiments be demonstrated by repeated use and test under various conditions before it would be safe for this office to conclude that these variations should be ignored. If so tested and used the results may be given a probative force greater than that which it seems safe to now attach to them. Some appreciable weight is, however, believed to inhere in and attach to these experiments for the purpose of showing that there is some reason-

able likelihood of confusion in trade involved in the concurrent use of the words 'Coca-Cola' and 'Chero-Cola.'"⁷

⁷ The attorneys for the Chero-Cola Company filed a petition for rehearing, contending among other things that Paynter's testimony was incompetent. The rehearing was granted, the case reargued and an opinion handed down by the Examiner reaffirming his previous conclusion. The Examiner's opinion in part is as follows:

"With reference to the testimony filed by the opposer, the testimony of Paynter is especially criticized (see page 15) because the persons whose acts are referred to by Paynter were not called as witnesses. It is noted, however, that the applicant failed either to identify or call as witnesses the persons referred to by the dealers who testified in its behalf. This circumstance, however, does not make incompetent the testimony of either these dealers or the testimony of Paynter as to the acts of others (see page 15 of brief).

"By reason of the conditions under which these acts are performed the latter possess inherent evidential value. This value is disclosed by the conduct of the person and not by any testimonial assertions of the latter. In this respect such conduct somewhat resembles spontaneous declarations of persons made under conditions that give to such declarations the significance of verbal acts. A typical case is an exclamation or statement of an injured person made immediately after the injury. Such conduct is a fact and like any other fact may be established by the testimony of others, as for instance the testimony of Paynter. The significance of the fact so established is determined by the surrounding circumstances. These are disclosed by the test conditions under which the act was performed. In proportion as these conditions approximate or simulate those actually existing in trade in the same proportion is the increase of the significance of these facts.

"The circumstance that the test is *ex parte* in nature goes to the question of the weight of the evidence and not to its competency (Greenleaf on Evidence, 16th Edition, Par. 162, p. (3), page 275). As previously pointed out (see page 10 of the decision of March 24, 1919), this is an adverse factor but its significance here seems to the examiner to be small because (1) of the ease with which similar experiments could be made by the applicant for the purpose of rebuttal, and because (2) of the possibility of disclosing by cross examination of the witness Paynter circumstances tending to lessen the evidential significance of these acts and which may have been incident to such *ex parte* presentation. In the mind of the Examiner there is no doubt whatever that, other things being equal, the act of any such persons, referred to in the Paynter testimony, possesses an intrinsic evidential value far in excess of any assertion made by the same person, to the effect that he either would or would not be likely to be confused by the marks under the condition of the test. The substitution of acts for assertions in the nature of conjecture is the first step toward certainty. These last mentioned conditions should eliminate personal bias and collateral circumstances that are irrelevant to the mere question of similarity of the marks. Such circumstances, for instance, are the appearance of the goods, the address on the packages, and the like. Any one experienced in reading testimony in trade-mark cases is familiar with the baneful influence of these factors and the inherent difficulty of making any proper allowance therefor, even when it definitely appears that these factors are present.

"The elimination of personal bias and influence of collateral circumstances of the character just set forth is another important step in the direction of attainment of certainty.

"With reference to the liability of actual confusion between marks by any single individual experience shows that it varies between quite wide limits. This variability inherent in the individual is made to closely approach the conduct of the average person by the application of the law of averages. This conduct of the average purchaser varies between relatively narrow limits and consequently seems to the examiner to be the only just and practical basis for an adjudication of trade-mark rights which turn solely on the question of similarity of marks that lie in the twilight zone. The utilization of variable individual conduct as a starting point to obtain a standard of reference for individuals generally is illustrated by mortality tables that are in use by all life

The foregoing is submitted, not as a thesis in favor of the universal application of laboratory methods to the solution of such problems as this case presented, but as a suggestion of a possible way of meeting a difficulty which every lawyer of any experience in this class of cases has found a serious one, and upon which the courts thus far have shed very little light.

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insurance companies. The certainty between very narrow limits inherent in these tables is well known and this certainty is made the basis of business transactions of great magnitude. This utilization of the law of averages applied to individual acts of this character constitutes another important step in the direction of certainty.

"Sufficient has been indicated to make it seem that the method under consideration should appeal to those persons who are interested in and know the great value of any practical method that could assist those who are compelled to decide doubtful questions of similarity and who consider the novelty of a method no necessary obstacle to its possession of intrinsic merit, but only a reason for closer scrutiny to ascertain whether it possesses this merit. The great value of certainty and uniformity on questions of similarity is easily perceived by considering the injurious effect on trade if uncertainty were injected into the law of negotiable instruments.

"From what has been said it should be clear that the inability of the examiner to give a greater weight to the results of the acts of the persons referred to by Paynter, resides primarily in the difficulty of ascertaining with certainty the question of how close the conditions of the test approximate those existing in actual trade. These test conditions are necessarily simulations of conditions actually existing and therefore involve empirical factors. The presence of the latter do not necessarily render the test conditions unsuitable or unreliable. In this respect these test conditions somewhat resemble tested formulae in which empirical factors are also present. Such formulae after proper tests are extensively used by engineers on hydraulic and mechanical construction work. In the absence of an experimental determination of the value of these empirical factors in the Paynter test, however, some uncertainty in the probative force of the results obtained seems to be necessarily involved. An allowance has therefore been made by the examiner. These test conditions, however, involve too many of the fundamentals found to exist in actual trade to warrant the results of the test being ignored by the examiner."