

UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

COMMISSIONERS:

James M. Mead, Chairman,
Lowell B. Mason,
John Carson,
Stephen J. Spingarn,
Albert A. Carretta.

In the Matter of

PHILIP MORRIS & COMPANY, LTD., INC.,
a corporation

DOCKET NO. 4794

DECISION OF THE COMMISSION
AND ORDER TO FILE REPORT
OF COMPLIANCE

Pursuant to the provisions of the Federal Trade Commission Act, the Federal Trade Commission, on August 5, 1942, issued and subsequently served its complaint in this proceeding upon the respondent named in the caption hereof, charging it with the use of unfair and deceptive acts and practices in commerce in violation of the provisions of said Act. After the issuance of said complaint and the filing of respondent's answer thereto, hearings were held at which testimony and other evidence in support of and in opposition to the allegations of said complaint were introduced before hearing examiners of the Commission theretofore duly designated by it, and said testimony and other evidence were duly recorded and filed in the office of the Commission. Thereafter, the proceeding regularly came on for final consideration by the hearing examiner last appointed on the complaint, the answer thereto, testimony and other evidence, and proposed findings as to the facts and conclusions presented by counsel, and said hearing examiner, on January 23, 1952, filed his initial decision.

Within the time permitted by the Commission's Rules of Practice, counsel for respondent filed with the Commission an appeal from said initial decision, and thereafter this proceeding regularly came on for final consideration by the Commission upon the record herein, including briefs in support of and in opposition to said appeal and oral arguments of counsel; and the Commission, having issued its order granting said appeal in part and denying it in part and being now fully advised in the premises, finds that this proceeding is in the interest of the public and makes this its findings as to the facts and its conclusion drawn therefrom and order, the same to be in lieu of the initial decision of the hearing examiner.

FINDINGS AS TO THE FACTS

PARAGRAPH ONE: The respondent, Philip Morris & Company, Ltd., Inc., is a Virginia corporation with its executive offices in New York City, New York, and its factories at Richmond, Virginia.

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PARAGRAPH TWO: For more than two years prior to the issuance of the complaint, the respondent has been, and now is, engaged in the manufacture of tobacco products including cigarettes under the brand name "Philip Morris." Philip Morris cigarettes have been, and now are, sold and transported in commerce between the various States of the United States and in the District of Columbia. The respondent is now, and for more than two years prior to the issuance of the complaint has been, one of the largest manufacturers of tobacco products in the United States and is now, and has been, in substantial competition with other corporations, persons, firms and partnerships engaged in the sale of tobacco products in commerce between and among the various States of the United States and in the District of Columbia.

PARAGRAPH THREE: In the course and conduct of its business and particularly for the purpose of aiding in the sale of its "Philip Morris" brand of cigarettes in interstate commerce, the respondent disseminated and caused the dissemination of advertisements and advertising material concerning said cigarettes by the United States mails, in magazines of nation-wide circulation, in newspapers of interstate circulation, by radio broadcasts in nation-wide hookups and by other means in commerce. Among and typical of the statements contained in the said advertisements were the following:

"You'll like Philip Morris. Full enjoyment of the world's finest tobaccos - unmarred by throat irritation."

"No worry about throat irritation even when you inhale!"

"No other cigarette can give this proof. No worry about throat irritation even when you inhale!"

"Recognized laboratory tests have conclusively proven the advantage of Philip Morris over other cigarettes, i.e.:

The irritant quality of the smoke of four other leading brands averaged more than three times that of the strikingly contrasted Philip Morris.

Further - the irritant effect of such cigarettes was observed to last more than five times as long."

"On comparing - the irritant quality in the smoke of the four other leading brands was found to average more than three times that of the strikingly contrasted Philip Morris - and that the irritation lasts more than five times as long!

Many smokers don't even know it - but all smokers inhale some of the time. That's why you need Philip Morris' superiority for the nose and throat - recognized by medical authorities!"

"With Philip Morris - you have no opinion - no facts from any private research of our own. Instead we simply call your attention to the findings of an independent group of doctors. You can draw your own conclusions. For the sole benefit of their own profession these doctors report in authoritative medical journals - - -"

"Their findings - written only for other doctors to use - were reported in authoritative medical journals."

"Especially if you inhale, remember - Philip Morris provides such complete enjoyment - plus real protection . . . pleasure without penalties!"

"- - - enjoying the last cigarette of the day as much as the first - their throats as comfortable - their breath as pure and sweet as in the morning."

"Smoking's more fun when you're not worried by throat irritation or 'smoker's cough.'"

PARAGRAPH FOUR: Through the use of these statements and others not specifically set forth herein, disseminated as aforesaid, respondent has represented directly or by implication:

- (1) That Philip Morris cigarettes do not cause irritation of the upper respiratory tract.
- (2) That Philip Morris cigarettes are less irritating to the upper respiratory tract than other brands of cigarettes.
- (3) That Philip Morris cigarettes are less irritating to the upper respiratory tract than the four leading brands which compete with Philip Morris.
- (4) That the irritation produced by other cigarettes is of longer duration than that produced by Philip Morris.
- (5) That certain purported findings and conclusions of physicians based upon purported tests or experiments made by them were made and published for the sole benefit of the medical profession.
- (6) That after a day of smoking Philip Morris cigarettes the throat and mouth of the smoker will be as fresh and comfortable and the breath as pure and sweet as in the morning before smoking.
- (7) That Philip Morris cigarettes protect the smoker from "smoker's coughs," effects of inhaling and throat irritation due to inhaling.

PARAGRAPH FIVE: In the manufacture of cigarettes it is the practice to add a hygroscopic agent or moistener to the tobacco for the purpose of keeping the cigarettes soft, pliable, and in good smoking condition when they reach the ultimate consumer. Historically, glycerine has always been the principal hygroscopic agent used by cigarette manufacturers.

PARAGRAPH SIX: During the year 1932, the respondent formulated a blend of tobacco for a new cigarette to be known as "Philip Morris" which was placed on the market on January 23, 1933. The blend of tobacco at the present time used in the Philip Morris cigarette is substantially the same

as that adopted in 1933. The constancy of the blend is as carefully controlled as possible, despite yearly variations in the sources, quality and mildness of the tobacco used. In the new Philip Morris cigarette as introduced on the market, respondent used 2.74 percent of diethylene glycol as the hygroscopic or moistening agent. This agent has been continuously and exclusively used by the respondent in Philip Morris cigarettes from 1933 to date. The base or average percentage of diethylene glycol used in Philip Morris cigarettes to date with adjustments for seasonal changes has remained at 2.74 percent. This amount gives a hygroscopic effect of 3.65 percent glycerine, the amount previously used by respondent.

PARAGRAPH SEVEN: From statements in respondent's advertising with reference to its "exclusive method of manufacture," "vital difference in manufacture," "new method of manufacture," "In Philip Morris Cigarettes only diethylene glycol is used as the hygroscopic agent," the nature of respondent's tests and respondent's answer it is apparent that the various claims which it has made concerning the amount of irritation consequent upon the use of Philip Morris cigarettes are based solely upon its use of diethylene glycol instead of glycerine as a humectant. The case was tried entirely upon the issues of whether (1) the use of diethylene glycol in a cigarette results in a smoke which is non-irritant to the nose and throat and (2) such smoke is less irritant than that of cigarettes in which glycerine is used.

It is upon various tests and observations which the respondent relied as furnishing affirmative proof of the truth of its representations, not only for the purposes of this proceeding but for advertising purposes prior thereto.

PARAGRAPH EIGHT: Respondent's first comparative test was made early in 1934 by Dr. M. J. Malinos and a medical student named Osborne. A blend of tobacco, identical with the regular blend of the Philip Morris cigarette sold to the public, was divided into three parts or batches. To one part was added 2.74 percent diethylene glycol as a hygroscopic agent. In the second, 3.65 percent glycerine was used, while no hygroscopic agent was added to the third part. Each batch of tobacco was then subjected to the other regular processes of manufacture used with the Philip Morris cigarette.

Solutions were made of the smoke of the three different types of cigarettes by bubbling the smoke, produced by a mechanically operated smoking machine, through 3 cc. of either water, saline solution or Ringer's solution. The smoke solutions were then instilled into the conjunctival sacs of rabbits, and the edemas resulting from the different solutions graded, by visual observation, in accordance with a scale which Malinos had used in previous rabbit-eye experiments. Under this scale edemas were given nine classifications for severity ranging from 0 to 4 plus.

The investigators reported as their conclusion that the cigarettes which had been made with diethylene glycol as the hygroscopic agent were less irritating than those with no hygroscopic agent, and much less irritating than those made with glycerine.

PARAGRAPH NINE: Malinos used the salt solution or Ringer's solution because the questions had come up as to "whether water was the same solvent as was found in the eye or elsewhere in the body." Moisture of the membranes of

the throat is due to a water solution of salts very much like Ringer's or saline solutions. It appears that any of the cigarettes may have been used in connection with any of the liquids. No attempt was made to differentiate between the results when the different liquids were used but "most or all the results were pooled." Mulinos was not able to tell whether the results depended upon the solution used, hence, the pooling of the results.

Ringer's solution and saline solution are isotonic, that is, they approximate the salt content of the blood and the body fluids; plain water is not isotonic. In view of the difference in the liquids used, the significance of which was apparently recognized by Dr. Mulinos, his failure to differentiate as between the liquids used is inexplicable. Distilled water is an irritant. If, in fact, Ringer's or saline solutions are less irritant to the conjunctival sac than plain water, it is apparent that the results would be loaded against the cigarette whose smoke was put into solution in water as against a cigarette whose smoke was put into solution in saline or Ringer's fluid. The failure to use identical fluids in the preparation of all solutions casts grave doubt upon the results claimed.

It is further to be noted that Mulinos "had to obtain" a solution sufficiently concentrated "to elicit edema in the rabbits' eyes" and his solutions were so strong that he would not put them in the human mouth because of their large nicotine content. If the solutions contained such a concentration of nicotine, it is fair to assume that there was a correspondingly high concentration of irritants.

Assuming, but not admitting, that a strong solution of smoke from cigarettes containing diethylene glycol was shown by Mulinos' test to be measurably and significantly less irritant to rabbits' eyes than a strong solution of smoke from cigarettes containing glycerine, it by no means follows that a measurable and significant difference would be manifest if weak solutions were used; the work of Dr. Haag, which is in evidence, and the testimony of Mulinos support this conclusion. Neither does it follow that the same readable and significant differences would be manifested in the human nose and throat as a consequence of actually smoking the two types of cigarettes.

The Commission is of the opinion, and finds, that the conclusion that the smoking of cigarettes containing diethylene glycol is less irritating to the upper respiratory tract of humans than the smoking of cigarettes containing glycerine cannot be drawn from this experiment. In this opinion, it is supported, were support necessary, by the statement of respondent's witness, Dr. Samuel J. Kopetzky, who after referring to this test, and others, stated:

"Without discussing in detail those papers, it is very evident that the results these authors present leaves the question open, because the results are controversial."

PARAGRAPH TEN: About July 20, 1934, the respondent made arrangements with Dr. Mulinos to carry his experimental work further by testing, with his rabbit-eye technique, the irritating properties of the smoke of the five leading brands of cigarettes—Philip Morris, Chesterfield, Old Gold, Lucky Strike and Camel, purchased by him on the open market. In a published report the authors compared the average edema resulting from the four different brand cigarettes tested with the results obtained in their first experiment where the cigarettes were supplied by the respondent. The authors concluded that with the glycerine treated cigarettes, regardless of the blend of tobacco, the flavoring material, or method of manufacture, the irritation is substantially the same—and greater than that caused by diethylene glycol treated cigarettes.

PARAGRAPH ELEVEN: This second experiment also involved the use of the strong smoke solutions referred to above and the use of various solvents for the smoke. Therefore, the finding set out in Paragraph Nine (supra) is also applicable to this experiment.

PARAGRAPH TWELVE: Dr. Mulinos also conducted other rabbit-eye experiments in the same manner, using solutions of the fumes of vaporized glycerine and diethylene glycol, and also the fumes of the same products when incorporated in cigarettes made of ground asbestos.

Again the technique involved the use of solutions of such concentration as to elicit edema.

The finding set out in Paragraph Nine (supra) is applicable to these experiments.

PARAGRAPH THIRTEEN: Early in 1935 the respondent retained Dr. George B. Wallace, Professor of Pharmacology in the New York University Medical School, to undertake the work of repeating the Mulinos experiment. Raymond L. Osborne participated as a co-worker in this experimental work. Dr. Wallace and his co-workers followed the technique of Dr. Mulinos as closely as possible using test cigarettes identical with those supplied to Dr. Mulinos.

Dr. Wallace and his co-workers concluded that the solutions from the diethylene glycol treated cigarettes were less irritating than those from cigarettes with no hygroscopic agents, and much less irritating than those with glycerine.

PARAGRAPH FOURTEEN: The test conducted by Dr. Wallace and Osborne is subject to the same objections as those made by Dr. Mulinos, except that in this test all solutions were made in saline solution. It does not represent a conclusion reached by an independent source since Osborne participated in both series of tests.

In fact, Osborne and one Reinhart, who was a worker around Dr. Wallace's laboratory, made the visual appraisals of edema, which were the basis for the claimed results. Reinhart had been instructed by Osborne in making these readings.

The finding set forth in Paragraph Nine is applicable to this test.

PARAGRAPH FIFTEEN: In July 1934, arrangements were completed for the handling of the clinical phase of respondent's program for evaluating the irritant properties of cigarette smoke. Dr. Wendell Phillips arranged for the services of ten doctors who performed the actual clinical work during the summer and early fall of 1934. Each of the participating doctors selected his own subjects and, within the general plan of the experiment as outlined by Dr. Phillips conducted the clinical work as he saw best.

The cigarettes used were supplied by the respondent and were of two types. The first type was the regular Philip Morris cigarette containing 2.74 percent diethylene glycol as the hygroscopic agent. The second type was the same identical cigarette with the exception that 3.65 percent glycerine was used as the moistening agent instead of diethylene glycol.

Reports of the experiment were submitted to Dr. Frederick B. Flinn of Columbia University for analysis.

PARAGRAPH SIXTEEN: Dr. Flinn made an analysis of the data submitted to him by the doctors selected by Dr. Wendell Phillips. He published this in the form of an article in the February 1935 issue of the "Laryngoscope."

Dr. Flinn later published in the "Laryngoscope" of January 1937 an article entitled "Further Clinical Observations on the Influence of Hygroscopic Agents in Cigarettes." This article was based upon the "clinical work" of two ear, nose and throat specialists. Both of the Flinn reports were favorable to Philip Morris.

PARAGRAPH SEVENTEEN: In June of 1942 the respondent, through the cooperation of Dr. William Wherry, then Secretary of the American Academy of Ophthalmology and Otolaryngology, arranged for a clinical study of the relative irritating effects of the smoke from diethylene glycol and glycerine treated cigarettes. A group of nose and throat specialists from various parts of the United States agreed to participate in the experiment. Test cigarettes supplied by the respondent were of two types—one containing 2.74 percent diethylene glycol as the hygroscopic agent, and the other 3.65 percent glycerine. The cigarettes were in all respects the regular, commercial Philip Morris cigarettes so far as the blend of tobacco, flavoring, paper and methods of manufacture were concerned.

PARAGRAPH EIGHTEEN: The vagaries of subjective observations are well known as are the difficulties inherent in objective observations of the character involved in this procedure, which were conceded by respondent's witness Flinn. It is impossible to tell whether a particular throat condition is due to smoking. The testimony of several of the participating doctors that their conclusions, concerning the relatively less irritating nature of cigarettes treated with diethylene glycol, were not necessarily applicable to all people under all conditions is of great significance in view of the flat and unqualified representations made by respondent. It is, in the opinion of the Commission, an eminently sensible position, and that to apply the results of the observations as reported in a number of cases which is less than trivial compared to the tremendous number of cigarette

smokers in this country would be wholly unwarranted. The throats of people vary in their susceptibility to irritation; in some people cigarettes do not produce irritation; others have throats which are easily irritated by any cigarette; the same cigarette will give different responses in different people; some people develop tolerances for cigarette smoke; the amount of irritation is to an extent influenced by the length of the butt which is not smoked and the rapidity with which the cigarette is smoked; environment, occupation, season of the year, present and previous infections are factors and obviously variable.

The Commission is of the opinion, and finds, that the conclusion that the smoking of cigarettes containing diethylene glycol is less irritating to the upper respiratory tract cannot be drawn from this series of "clinical" observations.

The Commission, for the same reasons, is disregarding other like observations which indicated that there was no significant difference in the irritation produced by these types of cigarettes.

PARAGRAPH NINETEEN: In January of 1944, Dr. Melvin C. Myerson, a physician specializing in diseases of the ear, nose and throat, was retained by the respondent to study the relative irritating effects of smoke from diethylene glycol and glycerine treated cigarettes. Dr. Myerson in this study used Philip Morris, Old Gold, Chesterfield, Camel and Lucky Strike cigarettes, all of which he procured on the open market. The technique and procedure adopted by Dr. Myerson was to examine a subject's uvula before smoking and to pick out a single blood vessel in a definite location. After smoking the condition of the same blood vessel was observed. Relative increase in the size of this blood vessel after smoking was taken as showing the relative irritation produced by the different cigarettes.

Dr. Myerson concluded from this experiment that Philip Morris cigarettes produced a much lesser intensity of irritation than that produced by the other cigarettes tested.

PARAGRAPH TWENTY: Subsequent to September 1944, a study was conducted by Dr. C. William Lenth and others of the effects of smoking on the blood vessels of the uvula. The results of this study are more fully considered later herein. In brief it involved the photographing of the subject's uvula before and after smoking and the measuring of all the measurable blood vessels before and after. The Myerson study was made only on a single blood vessel.

The Lenth experiment demonstrated the variation in the response of different blood vessels in the same uvula to cigarettes containing the same humectant, and is conclusive against the drawing of any valid conclusions from observations made on a single blood vessel.

The Commission is of the opinion, and finds, that the conclusion that Philip Morris cigarettes are less irritating than the other cigarettes tested by Myerson cannot be made from his study.

PARAGRAPH TWENTY-ONE: Dr. John H. Lore was employed by respondent to make a study of the relative irritating effects of cigarettes containing glycerine and diethylene glycol as humectants. His study was made of the underside of the tongue and the floor of the mouth; why this area was selected does not appear.

Respondent in its brief disavows this study as being any more than some confirmation of the results noted by other experimenters in animals. Accordingly, it is found that this study does not demonstrate that cigarettes treated with diethylene glycol are less irritating than those treated with glycerine.

PARAGRAPH TWENTY-TWO: Further experimental work dealing with the relative irritating effects of the smoke of cigarettes containing glycerine and diethylene glycol was done, at the instance of the respondent, by Dr. Samuel J. Kopetzky, and at the instance of glycerine producers, by Dr. Axel M. Hjort.

Dr. Kopetzky's experiment involved, in brief, the cutting open of a rabbit's trachea, the insertion of a small metal tube, or cannula, therein, closing the wound, and connecting the cannula to a small reservoir of smoke which the rabbit breathed through the cannula.

From this experiment Dr. Kopetzky concluded that smoke from cigarettes containing diethylene glycol is much less irritating than the smoke from otherwise identical cigarettes containing glycerine.

Dr. Hjort's experiment also involved the insertion of a cannula in the animal's trachea and the breathing of smoke through it.

The Commission is of the opinion that both of these experiments involved the creating of conditions so far removed from those under which cigarettes are smoked by humans that observations made thereunder are of no assistance in determining the issues in this proceeding. They are therefore disregarded.

The same is true of an experiment with dogs conducted by Mrs. Dorothy M. Gullicksen.

PARAGRAPH TWENTY-THREE: Dr. Samuel J. Kopetzky who performed the tracheotomy experiments hereinbefore described also conducted experiments in which he used a pharyngeal colorimeter. Colorimeters for evaluating color are used in various fields and Dr. Kopetzky merely adopted a well-known principle for evaluating the color of the membranes of the throat. The principle further involved is that irritation causes a reddening of tissue and, therefore, the intensity of color would be susceptible to evaluation by a colorimeter. Visual examination of color is dependent upon an observer's reaction, whereas the colorimeter actually registers color intensity.

PARAGRAPH TWENTY-FOUR: The device was submitted to Electrical Testing Laboratories, Inc., for a determination of its response to a series of color chips, and as "equipment designed by the client for the measurement of changes in the pharyngeal wall of the throat."

In making this test of the device:

"Red and white paints with low specular reflection characteristics were secured. Various shades of the red were prepared by mixing the two in different proportions. The mixtures were applied to five wooden blocks, care being taken to assure a uniform surface." (Underlining supplied.)

The readings which were taken indicated "that the instrument is sensitive to changes in red as shown on these blocks."

The apparatus was found to show a decreasing reading with increase of saturation - that is the darker the color the lower the reading.

PARAGRAPH TWENTY-FIVE: Dr. Hans Hirschfeld, a specialist in ear, nose and throat diseases, an assistant of Dr. Kopetzky, carried out the routine experimental work involving the use of the Kopetzky pharyngeal colorimeter for measuring the irritant effects of smoking. The procedure was basically the measurement of the redness of the subject's throat before and after smoking by the use of this device.

Subsequently, Dr. Kopetzky performed additional experiments using essentially the same procedure.

As a result of this new work, instead of a trend as shown in his previous colorimetric experiment, Dr. Kopetzky concluded that cigarettes moistened with glycerine are more irritating than cigarettes moistened with diethylene glycol and that the difference in reaction can be picked up by the colorimeter.

In a later test conducted by Drs. Lenth and Andrews also using a colorimeter and human subjects two series of readings were made on the throat of each subject before any smoking was done. The two series were made 15 minutes apart, and each consisted of four readings made at 10-second intervals. These readings showed different degrees of redness within a 30-second period and also different degrees of redness in the two periods in the same individual.

These observations as well as Dr. Kopetzky's clearly demonstrated that the color of the individual throat is far from static even without exposure to an irritant; they also demonstrate the unsoundness of relying upon single observations before and after smoking, as Kopetzky did in both of his tests.

In the Lenth experiment a series of four readings at 10-second intervals were made on each subject after smoking. These readings also showed different degrees of redness within a 30-second period.

When it is considered that a difference of a very few points in the readings on the scale upon which they were made would change the entire picture,

the demonstrated capacity of the throat to change color almost from moment to moment must be a vital consideration. Conclusions based on single readings before and after smoking cannot be regarded as valid.

The Commission is of the opinion, and finds, that no conclusions can be drawn from the two Kopetzky colorimeter tests and they are disregarded.

PARAGRAPH TWENTY-SIX: The foregoing is predicated upon the assumed accuracy of Dr. Kopetzky's colorimeter as a measuring device.

In testing the colorimeter used by Dr. Lenth which duplicated as nearly as possible Dr. Kopetzky's device it developed that its registration of color on wet surfaces was quite erratic. Dr. Lenth rectified this by the use of polaroid filters. The Kopetzky machine was tested on surfaces of low specular reflection. However accurate it may have been under those circumstances, it does not follow that it would be accurate on wet surfaces, such as the human throat, where specular reflection is present to a considerable degree. Furthermore, the polarizing filters which were found to be essential to consistent readings of redness were not used.

PARAGRAPH TWENTY-SEVEN: Subsequent to July 8, 1950, some new experimental work dealing with the irritative qualities of cigarette smoke was done by Dr. Kurt Lange, an Assistant Professor of Clinical Medicine at the New York Medical College, who was employed by the respondent for this purpose.

The method used by Dr. Lange was to apply either whole smoke or smoke solutions to the eyes of rabbits and objectively to measure the resulting irritation by the fluorescein-dermofluorometer technique. The experiment was based upon the theory that the greater the irritation, the greater the permeability of the mucous membrane and consequently the greater the concentration of the fluorescein.

Fluorescein is a dye which when irradiated by a long wave ultraviolet light emits a yellowish-green fluorescence of high intensity. This occurs even when the dye is present in very low concentrations. The dye is non-toxic and when injected intravenously it diffuses readily into interstitial tissue space where its intensity can be detected by visual observation or by objective measurement with a dermofluorometer. The dermofluorometer consists of a long wave ultraviolet light source and is rigidly aligned at a definite distance from the area under investigation. The search unit of this instrument consists of a phototube (attached to the light source), the sensitivity of which is limited to the reflected light rays emitted by fluorescein. The degree of deflection of the microammeter is directly proportional to the concentration of fluorescein.

PARAGRAPH TWENTY-EIGHT: In making this experiment three main comparisons were made by Dr. Lange:

(a) Two lots of cigarettes containing tobacco of uniform composition were made. One lot contained as the hygroscopic agent 2.74 percent diethylene

glycol; the other lot contained 3.05 percent glycerine. The smoke from these two types of cigarettes was tested and compared on twenty animals, and the results were tabulated.

(b) Solutions produced from the same cigarettes above were tested and compared on seven animals and the results were tabulated.

(c) Philip Morris, Old Gold, Chesterfield, Camel and Lucky Strike cigarettes were purchased in the open market. In a series of tests the smoke, sometimes from the commercial Philip Morris cigarettes and sometimes from specially made Philip Morris, was compared with the smoke from each of the four other brands.

At the conclusion of these experiments Dr. Lange prepared certain tabulations showing the results of his experiments which were ultimately delivered to Dr. Herbert Arkin for statistical analysis.

In evaluating Dr. Lange's data Dr. Arkin stated in his report that the nictitating membrane, which is the so-called third eyelid of the rabbit, was much more responsive to smoke irritation and, therefore, a better index of the differences between cigarettes and based his analyses on the nictitating membrane data. His report was favorable to Philip Morris as less irritating to the nictitating membrane.

PARAGRAPH TWENTY-NINE: In 41 rabbits which were used only once in the comparison tests the highest readings were found in the conjunctiva in 36 instances and in the nictitating membrane in 46 instances. (There were two readings in each eye, one for the conjunctiva and one for the membrane, and thus two high readings for each rabbit.)

In the 19 other rabbits so used more than once the highest readings were found in the conjunctiva in 33 instances and in the nictitating membrane in 64 instances out of 97 readings.

The Commission sees no reason for discarding the readings on the conjunctiva which constitute one-half of the observations made because in someone's opinion the nictitating membrane is more responsive to smoke irritation when in 38 percent of the observations the conjunctiva appeared to be the more sensitive.

"In order to show that with identical irritation of both eyes closely parallel results are obtained, 6 rabbits were subjected to smoke according to Method A from cigarettes of the same brand (Table 4). No evidence of any significant difference resulted. * * * (Dr. Lange's report, Resp. Ex. 93.)

This table shows a variation in readings between the right and left conjunctiva of the same rabbit, so subjected to the same smoke, of 10 percent, a variation which Dr. Lange stated to be insignificant. It follows, therefore, that in comparing conjunctiva readings in the right and left eyes, of the same animal, which have been exposed to different smokes, any variation of 10 percent or less may be attributed to the rabbit and not to the smoke.

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In only 6 instances did the comparison of the glycerine treated cigarettes and those treated with diethylene glycol show a percentage difference of over 16 percent. Of these six, two favored the cigarettes treated with glycerine and four favored the other.

When one eye was exposed to smoke supposedly from a Philip Morris brand cigarette and the other to smoke from an Old Gold cigarette, only nine out of twenty comparisons on the conjunctiva showed a percentage difference in excess of 16 percent. Of the nine, three favored Old Gold and six favored Philip Morris.

In a like test where Chesterfield cigarettes were used instead of Old Gold, only three out of ten comparisons on the conjunctiva showed a percentage difference in excess of 16 percent. Of these, two favored Philip Morris and one favored Chesterfield.

In a like comparison of Philip Morris brand cigarettes with Camel cigarettes, only five out of ten comparisons on the conjunctiva showed a percentage difference in excess of 16 percent; of these, four favored Philip Morris and one favored Camel.

In a like comparison of Philip Morris cigarettes (four "brand" and six "special") with Lucky Strike cigarettes, only two out of the ten comparisons showed a percentage difference in excess of 16 percent; of these, one favored Camel and one Philip Morris brand.

The Commission is of the opinion, and finds, that the results of this test upon the conjunctiva of rabbits form no basis for a conclusion that cigarettes treated with diethylene glycol are less irritating to the human respiratory tract than cigarettes treated with glycerine, or that Philip Morris cigarettes are less irritating to the human respiratory tract than Old Gold, Chesterfield, Camel or Lucky Strike cigarettes.

PARAGRAPH THIRTY: The readings on the nictitating membrane, which is found only in animals, were used by respondent because it was more responsive to smoke irritation, and respondent, by submitting this test as evidence of the truth of its representations, in effect, asks that its claimed results be regarded as applicable to the human upper respiratory tract.

The question before the Commission is a practical one: "Are Philip Morris cigarettes less irritating to the human upper respiratory tract than others?" It is not an abstract scientific problem. As a matter of pure science, the question of the relative irritancy of the products of combustion of glycerine and diethylene glycol might, perhaps, be determined by minute differences in the response of the rabbits' nictitating membranes thereto. Not so here. Apparently this membrane is, or at least was regarded by respondent's witnesses as being, more sensitive to smoke than the conjunctiva of the rabbit. It seems fair to assume that it is also more sensitive to such irritation than the human upper respiratory tract. In order for the Commission to apply the claimed results of this test to the question before it, it would have to find (1) that the response of the human upper respiratory tract to the various smokes was in some fashion proportional to the response

of the rabbits' nictitating membrane, and (2) that the difference in this proportionate response is significant. The Commission does not so find.

The Commission is of the opinion, and finds, that the results of this test upon the nictitating membranes of rabbits form no basis for a conclusion that cigarettes treated with diethylene glycol are less irritating to the human respiratory tract than cigarettes treated with glycerine or that Philip Morris cigarettes are less irritating to the human respiratory tract than Old Gold, Chesterfield, Camel or Lucky Strike cigarettes.

PARAGRAPH THIRTY-ONE: In September of 1944, the Glycerine Producers retained C. William Lenth, a consulting chemist of Wilmette, Illinois, to supervise some experimental work concerning the relative irritating properties of cigarette smoke. Dr. Lenth was instructed to repeat the experiments offered by the respondent and to make such improvements in methods and techniques as were possible in order to obtain completely objective information.

PARAGRAPH THIRTY-TWO: The Glycerine Producers made arrangements with the R. J. Reynolds Tobacco Company, manufacturers of Camel cigarettes, to prepare special experimental cigarettes. These cigarettes were of three types as follows: one lot contained 3.65 percent glycerine as the hygroscopic agent, one lot contained 2.74 percent diethylene glycol as the hygroscopic agent, and the third lot contained no hygroscopic agent. These cigarettes were shipped in November of 1944 to Dr. Lenth in Chicago, who distributed them for use in the experimental work.

PARAGRAPH THIRTY-THREE: A colorimeter experiment was conducted by Dr. Albert H. Andrews of Chicago, Illinois, a specialist in broncho-esophagology and laryngological surgery, in which Dr. Lenth actively participated. The colorimeter used in these experiments was constructed by John Staunton, a research physicist and development engineer, and duplicated as near as possible the machine used by Dr. Kopetzky and Dr. Hirschfield in the experiments above described. Mr. Staunton has had wide experience in the development of instruments, involving the use of electrical and optical science, for making measurements, many of which related to color measurements.

PARAGRAPH THIRTY-FOUR: In preliminary tests Dr. Lenth found that there was a great deal of variability obtained on any one subject in a matter of minutes. It was determined that this was due to the moisture on the subject's throat causing a specular or reflected glare when the colorimeter was used.

There is an increase in the salivary flow induced by cigarette smoking which in turn increases the moisture present on the pharyngeal wall.

PARAGRAPH THIRTY-FIVE: Due to the moisture present in the pharyngeal wall there is considerable percentage of specularly reflected light collected by the phototube of the colorimeter. Such light being reflected without penetration from the surface of the pharyngeal wall will not show the hue of the material underlying this surface, but will be of the same hue as the illumination. Consequently, while it will be affected by the condition of the surface, it will not serve to give a measurement of the hue or saturation of the underlying material.

As the purpose for which the colorimeter was intended was to ascertain the redness of the tissues in the throat, a purpose requiring the measurement of color saturation of the tissues underlying the pharyngeal surface, a measurement which includes a considerable proportion of specular reflection would be only of doubtful value as it would be affected by factors which bear no relation to either saturation or hue of the underlying tissues. Such factors would include wetness of the surface, roughness of the surface, and reflectivity of the surface. The relative influences of these factors may be very great compared to that of red saturation because the light reflected without color discrimination from the surface contains wave lengths which may affect the blue sensitive phototube used in this apparatus far more strongly than the red-colored light which it is proposed to measure.

PARAGRAPH THIRTY-SIX: Mr. Staunton determined the difficulties of specular reflection could be overcome by the use of polarizing filters located in the beam and so oriented as to stop the specularly reflected light. The colorimeter was tested with these filters and they were found to be effective; without them the device was unreliable.

PARAGRAPH THIRTY-SEVEN: The significant difference between this test and those of Dr. Kopetzky is that in this case Lenth and Andrews made two series of readings before smoking and one series after, as described in Paragraph Twenty-five.

PARAGRAPH THIRTY-EIGHT: In this test thirty-three subjects were used of whom thirty-one smoked both cigarettes treated with glycerine and with diethylene glycol.

Respondent's witness Dr. Kopetzky has supplied one method for interpreting the data acquired from these colorimeter readings. This he did by dividing the post-smoke reading for each individual by the ante-smoke reading, for each cigarette tested. The cigarette whose readings produced the larger quotient was classified by him as causing the lesser "redness" and consequently the lesser irritation.

It has been demonstrated that the color of the individual throat is far from static, even without exposure to an irritant. Thus in interpreting the Lenth data the lowest ante-smoke reading (highest redness) may be taken as showing the maximum of redness which that individual's throat will manifest spontaneously at that time. Similarly in the post-smoke readings the lowest reading indicates the maximum redness induced by the cigarette.

Using these lowest readings and the method of calculation employed by Dr. Kopetzky, it appears that in thirty-one subjects, one was equally affected by both cigarettes, the throats of twelve became "redder" after the cigarettes treated with diethylene glycol, and those of the remaining eighteen "redder" after the cigarettes treated with glycerine.

Calculations made by Dr. Lenth on the basis, which Kopetzky used, of single readings, ante-smoke and post-smoke, showed that in seventeen instances throats were "redder" after the diethylene glycol treated cigarettes and in fourteen "redder" after the glycerine treated.

Other calculations made by Dr. Lenth, using averages of all the readings, showed nineteen favorable to the glycerine treated cigarettes and twelve to those treated with diethylene glycol.

A further calculation based on the averages of the highest and lowest ante-smoke and post-smoke readings showed seventeen favorable to the glycerine treated cigarettes and fourteen favorable to those treated with diethylene glycol.

PARAGRAPH THIRTY-NINE: Early in 1935 the American Tobacco Company retained Dr. Harvey B. Haag, head of the Department of Pharmacology at the Medical College of Virginia, as a consultant with a view to studying the differences in irritation from smoke solutions prepared from diethylene glycol treated cigarettes and glycerine treated cigarettes. Dr. Haag set out to duplicate as far as possible the prior technique of Mullinos and Osborne though he introduced several variations. He used test cigarettes furnished by the American Tobacco Company which contained 2.74 percent diethylene glycol and 3 percent glycerine. He did not use cigarettes to which no hygroscopic agents had been added. Dr. Haag obtained only 32 puffs from each cigarette which was smoked for 5/6ths of its length, while Mullinos and Osborne obtained 60 puffs from each cigarette which was smoked to the greatest extent possible. His smoke solutions were all made in physiological salt solutions.

PARAGRAPH FORTY: Dr. Haag, upon instillation of his smoke solutions into the rabbits' eyes, was unable to obtain edema of the area except in a few instances—and consequently adopted hyperaemia or redness as his criterion of irritation. In all, 50 separate tests were made, equally divided between the two types of cigarettes used, which formed the basis for Dr. Haag's reported conclusion that there was no significant difference either as to the intensity or duration in the irritation produced by the instillation into the rabbit's eye of the two types of smoke solutions employed.

PARAGRAPH FORTY-ONE: The solutions used by Dr. Haag were weaker than those used by Mullinos; they were strong enough, however, to produce edema, in some instances, and redness. They would certainly more closely approximate the irritation to the human throat caused by smoking than would Mullinos', which he would not have put in the human mouth.

PARAGRAPH FORTY-TWO: In December of 1935, Dr. Carl Miner of the Miner Laboratories, on behalf of the Glycerine Producers, made arrangements with Dr. Anton J. Carlson, Professor of Physiology at the University of Chicago, to make an investigation of the physiological effects of diethylene glycol, especially under conditions resulting from its use as a hygroscopic agent in cigarettes.

Dr. Carlson was assisted by one of his pupils, Harold G. O. Holck. Dr. Carlson studied the salivary responses of 28 subjects to the puffing of air, lighted cigarettes without hygroscopic agent, lighted glycerine treated cigarettes and lighted diethylene glycol treated cigarettes. Each subject was tested three times on each cigarette.

PARAGRAPH FORTY-THREE: Carlson's report shows that in the twenty-eight individuals observed the increase in saliva flow during the smoking periods was greater when the glycerine treated cigarettes were used in thirteen subjects than when the cigarettes treated with diethylene glycol were used, and less in fifteen subjects.

A comparison between the pre-smoke and post-smoke flow is particularly interesting. In the post-smoke flow it is apparent that the non-irritant factors in the smoke which affect the flow are no longer present and that any increase over the pre-smoke flow may be attributed to the continued irritation. In twenty of the subjects, increases of 20 percent or more were observed in the post-smoke period. In twelve individuals the percentage of increase of flow during the post-smoke period, over the ante-smoke flow, was greater when glycerine-treated cigarettes had been used than when those treated with diethylene glycol had been used, and less in thirteen individuals.

Dr. Carlson concluded from this work that there was essentially no difference in the irritation from the smoke of the three types of cigarettes as measured by the secretion of saliva.

That this measuring of flow of saliva is a valid means of appraising irritation is questioned by respondent. However, respondent introduced evidence concerning a test conducted by its witness Dr. Kopetzky which involved the insertion of tubes in rabbits' tracheae, passing smoke through them and evaluating the irritation. In evaluating the results, Dr. Kopetzky considered "salivary secretions in the mouth" as one of "the factors governing irritation during smoking sessions." In view of this it does not lie in the mouth of respondent to raise this question.

PARAGRAPH FORTY-FOUR: For the purpose of duplicating and extending the experimental work of Dr. Myerson, relating to the blood vessels of the uvula, Dr. Lenth, a consulting chemist employed by the Glycerine Producers, decided to employ photographic methods.

The general method was to take a photograph, using Kodachrome film, of the uvula and soft palate of a human subject both before and after smoking in such a manner that images of the blood vessels in that area could be measured from the photograph.

The cigarettes used in this experiment were special test cigarettes, one lot containing 3.05 percent glycerine, one lot containing 2.74 percent diethylene glycol, and the third lot containing no hygroscopic agent. Brand cigarettes purchased on the open market were also used.

PARAGRAPH FORTY-FIVE: Dr. L. H. James, a bacteriologist, developed a method, at Dr. Lenth's suggestion, for the measurement of the blood vessel images of the uvula and soft palate as they appeared upon projection of the films. The technique employed was to use a projector to enlarge to 20 times actual size the blood vessels shown on the film upon a ruled chart hung upon a wall. Measurements of the blood vessels were then made.

PARAGRAPH FORTY-SIX: As in the Myerson test, enlargement of the blood vessels was taken as a criterion of irritation. The records of this test show that the percentage of enlarged blood vessels was not significantly different after the smoking of special test cigarettes, Philip Morris, Old Gold, Chesterfield, Camell or Lucky Strike cigarettes.

PARAGRAPH FORTY-SEVEN: For several years the respondent made to the public the representations to which this proceeding relates based substantially, if not fundamentally, upon experiments in which smoke solutions were instilled into rabbits' eyes as proof that Philip Morris cigarettes were less irritating than other cigarettes.

Certainly such conduct constitutes, not merely a concession, but an affirmative representation that such tests constitute a valid method for the determination of the relative irritancy of different cigarettes.

In presenting its defense respondent introduced other tests as evidence of the truth of its claims. By so doing it has a fortiori represented to the Commission that the reaction of the blood vessels of the uvula and colorimeter readings of the throat constitute methods by which the relative irritancy of cigarettes can be validly determined. The introduction by respondent of the Kopetzky test in which increased salivary flow was used as an index of relative irritation establishes this as one of the methods of appraisal sanctioned by respondent. Not only has respondent approved these methods, but affirmatively urges the results of those tests as substantial evidence.

Whatever opinion may be held as to the substantiality and probative value of the Carlson saliva test, the Haag smoke solution test, and the Lenth uvula and colorimeter tests in the abstract, they are nevertheless the same sort of evidence which was regarded by respondent as of sufficient substance and probative value to warrant the making of categorical and unqualified representations based thereon concerning its cigarettes to the public for many years and to warrant the Commission in making findings favorable to respondent. The Commission is of the opinion that under such circumstances it is not held to higher standards of substantiality or probative value in dealing with respondent than respondent has observed in dealing with the public. Respondent has invoked the test as a medium of proving truth; the Commission may invoke the test to prove falsity.

Upon this basis the Commission is of the opinion that the record as a whole and the results of the Haag rabbits-eye test, the Lange observations on the conjunctiva, the Carlson saliva experiment and the Lenth uvula and colorimeter experiments in particular, warrant the following findings, which are made, i. e.:

(a) The smoke of all cigarettes, including Philip Morris cigarettes, is an irritant, and the extent of such irritating effect depends upon numerous factors, including the tolerance of the individual smoker, the frequency of smoking, the extent to which the smoke is inhaled, the rapidity with which the cigarette is smoked, and the length to which it is smoked.

(b) Philip Morris cigarettes are irritating to the human upper respiratory tract.

(c) There is no significant difference in the irritation of the human upper respiratory tract produced by Philip Morris cigarettes and Old Gold, Camel, Lucky Strike, or Chesterfield cigarettes.

(d) The use of diethylene glycol instead of glycerine as a humectant in cigarettes has no significant effect upon the irritancy of the cigarettes.

(e) The studies and experiments referred to by respondent in its various advertisements were not made for the benefit of the medical profession but were, in fact, made at the instance of respondent as a basis for, and in support of, its advertising claims.

(f) Philip Morris cigarettes will not protect the smoker from "smoker's coughs," the effects of inhaling or from throat irritation due to inhaling.

PARAGRAPH FORTY-EIGHT: Respondent's claim that the irritation produced by cigarettes treated with diethylene glycol was of shorter duration than that produced by those treated with glycerine was essentially based on the work of Mulinos and Wallace referred to above.

The Commission is of the opinion that the record does not support respondent's claim. In view of the Commission's finding (c) (supra), the Commission, as a corollary, finds that there is no significant difference in the duration of the irritation attributable to the humectant.

PARAGRAPH FORTY-NINE: Respondent in its answer admits that "throats and mouths of smokers of Philip Morris cigarettes, after a day of smoking cigarettes, are not as fresh and comfortable nor the breath as pure and sweet as in the morning before smoking such cigarettes."

It is, therefore, found that Philip Morris cigarettes do affect the breath and leave an aftertaste.

PARAGRAPH FIFTY: The foregoing statements and representations used by respondent in connection with the offering for sale, sale and distribution in commerce of its Philip Morris cigarettes had the capacity and tendency to mislead and deceive members of the public into the erroneous and mistaken belief that the said statements and representations were true and into the purchase of substantial quantities of said cigarettes by reason of said erroneous and mistaken belief.

CONCLUSION

The acts and practices of respondent as herein found were all to the prejudice and injury of the public and constituted unfair and deceptive acts and practices in commerce within the intent and meaning of the Federal Trade Commission Act.

The Commission has considered the record in connection with the other issues presented by the pleadings and has concluded that the allegations of the complaint with respect thereto have not been proved.

ORDER

IT IS ORDERED that the respondent, Philip Morris & Company, Ltd., a corporation, its officers, agents, representatives and employees, directly or through any corporate or other device in connection with the offering for sale, sale and distribution of its "Philip Morris" brand of cigarettes in commerce, as "commerce" is defined in the Federal Trade Commission Act, do forthwith cease and desist from representing directly or by implication:

(1) That Philip Morris cigarettes, or the smoke therefrom, will not irritate the upper respiratory tract.

(2) That Philip Morris cigarettes, or the smoke therefrom, are less irritating to the upper respiratory tract than cigarettes, or the smoke therefrom, of any of the other leading brands of cigarettes.

(3) That the irritation caused by smoking other leading brands of cigarettes is of longer duration than that caused by smoking Philip Morris cigarettes.

(4) That the use of diethylene glycol as a humectant in cigarettes renders, or significantly contributes to rendering, the smoke therefrom less irritating to the upper respiratory tract than the smoke from cigarettes in which glycerine is used as a humectant.

(5) That Philip Morris cigarettes, or the smoke therefrom, will not affect the breath or leave an aftertaste.

(6) That the use of Philip Morris cigarettes protects the smoker against smoker's coughs, the effects of inhaling or throat irritation due to inhaling.

and from:

(7) Misrepresenting the reasons for which any study, survey, experiment, test or the like was made.

IT IS FURTHER ORDERED that the charges of the complaint, other than those to which this order relates, be, and the same hereby are, dismissed.

IT IS FURTHER ORDERED that the respondent shall, within (60) days after service upon it of this order, file with the Commission a report in writing setting forth in detail the manner and form in which it has complied with this order.

By the Commission, Commissioner Carretta not participating for the reason that oral argument in this proceeding was heard prior to his becoming a member of the Commission.

S E A L

ISSUED: December 29, 1952.

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D. C. Daniel,
Secretary.

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