THE EFFECT OF ORAL PRACTICE IN THE PRESENCE OF DIFFERENT CONDITIONS OF SIDE-TONE UPON THE RATE AND SOUND PRESSURE LEVEL OF THE SPEECH OF A GROUP OF STUTTERERS

DISSERTATION

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by

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CHAPTER I

INTRODUCTION

"Language, traditionally, has been regarded as the 'vehicle of thought' with the thought attracting far more attention than the vehicle," states Sanford (56). Speech, a dynamic process, is one form of the use of language that includes both thought and vehicle. Eisenson (26) has defined speech as that which, "Causes responses of thoughts, feelings, or actions to occur in some one." It has also been pointed out that speech is a mirror of personality and is involved in the individual's daily adjustments (56). Speech is, however, not only a mirror of personality, but also of one's acoustic environment. The effectiveness of speech may be influenced by internal or external factors or a combination of both (27). Looking at speech from its physical aspects, pitch, sound pressure level, duration, etc., it has been shown by Black (7, 9, 10) that speech is influenced by acoustic stimuli or external factors. Internal factors, such as organic abnormalities of the mouth, larynx, brain injuries, and impairment of the hearing mechanism also may result in the distortion of speech and a consequent loss of effectiveness.

The production of speech is possible because of: (A) the use of the organs of respiration and digestion,
(B) sufficient hearing to allow speech reception, transmission of sound, and interpretation of sound by a listener, (C) a high degree of complexity of the nervous system, and (D) an endocrine system which supplements the functioning of the nervous mechanism (27). Speech production is one example of a "feedback system," as outlined by Wiener (70, 71). With reference to this "system" speech production is controlled not only by an individual's previous and present speech activities but also by his experiences and present expectations about his speech. The stutterer's speech, as well as the normal speaker's speech, is determined in this manner.

In the case of the stutterer, however, his experiences and expectations about his own speech are, in many instances, different from those of the normal speaking individual. Studies by Johnson (38, 40) and Van Riper (67, 68) have shown that the stutterer's attitude toward his speech (and his expectations about his speech) is highly correlated with the severity of his stuttering. Solomon (56) in a study on the attitudes of stutterers found that the stutterer's attitude toward his own speech determined in part the severity of his stuttering. This result is similar to ones found by Johnson and Van Riper.
In addition, Knott and Johnson (48) observed that the stronger the attention of the individual to his stuttering, the more severe the stuttering became. Anticipation of what he expects to hear is also important in determining the speech pattern of the stutterer, i.e. the severity of his stuttering. This phenomenon is noted by Johnson et al (39) in several studies on the psychology of stuttering. The results of studies by Van Riper (66) and Steer and Johnson (59) also indicate the positive relationship among expectancy of penalty, size of audience, and the severity of stuttering. Speech patterns are not fixed, in the final analysis, but are a function of the organism and the environment (social and acoustic). Different aspects of stuttering have been investigated by many different researchers. Studies, both psychological and physiological, have been carried out in the search for the cause of stuttering and have led to explanations of stuttering that Van Riper has summarized under seven headings (68):

1. **Educational.** Stuttering is a bad habit originating in the natural hesitations and repetitions of children's speech and perpetuated by penalty and fear (49, 55, 62).

2. **Psychoanalytical.** Stuttering is a result of a fixation at the oral and anal stages of sexual development (21, 24).
3. **Neurological.** Stuttering occurs because the paired musculatures used in speech do not receive properly timed impulses from the central nervous system (20, 50, 65).

4. **Neurotic.** Stuttering is a symptom of a basic personality problem (16, 19, 30).

5. **Imagery.** Stuttering is caused by a lack of visual images, thought by some, to be essential for speech (64).

6. **Inhibitory.** Stuttering arises when the conditioned response of speech is inhibited by some traumatic experience (17).

7. **Semantogenic.** Stuttering is caused by incorrect diagnosis of normal childhood breaks in speech rhythms as stuttering (37).

At the present time, stuttering is usually thought of as a symptom of various interacting conditions (56).

Recent studies by Black (15) and Lee (43, 44) have shown that when the delicate relationship of the air- and bone-conducted side-tone is altered, "a stuttering-like speech pattern" is produced by normal speakers. Man's nervous system may be likened to the "carrier-telephony" system as outlined by Weiner (72). This system is capable of carrying several messages at a time. As a person talks he is hearing his own speech at two
different times or, in other words, there is a *phase difference* in his own speech reception. Phase differences are caused by sound waves (of the same sound event) arriving at a point at two different times. In this case, a person hears his voice by bone conduction approximately 0.0003 second (63) after the sound originates at the vocal folds and by air conduction 0.001 second (33) after the sound originates at the vocal folds. Stevens and Davis (60) found that with a phase difference of the order of 0.0001 second a pure tone does not appear to be double, one sound at each ear. However, with a phase difference of 0.0002 second, the sound does appear double, one sound at each ear. In this regard, Rosenzweig and Rosenblith (54) have shown that when two acoustic clicks are delivered to the auditory system of cats, in close succession (intervals of 0.0002 to 0.0005 second), the response to the second click varies with: (A) the time interval between the clicks, and (B) the intensities of the clicks. The recovery cycles may be 0.0001 second or even longer and there may be several "sub- or supernormality" phases. Should this difference in side-tone conduction time be found to be important, then it may follow that in learning to talk, the child's organism learns to adapt to this side-tone difference: this fact that we hear ourselves speak at different times. This
difference in side-tone conduction time is caused by: (A) the length of the air-conduction pathway being almost twice as long as the bone-conduction pathway, and (B) the rate of propagation of sound being slower in air than in bone, tissues, muscles, etc. Stromsta (62) found the length of the bone-conduction pathway (measured from the thyroid notch to the tragus) to be approximately one-half that of the air-conduction pathway (measured from the thyroid notch to the upper lip to the tragus) and the average length, in adults, from the vocal cords to the cochlea to be 13.6 centimeters. In addition, he found that the average time for a sound to react the cochlea from the vocal folds by bone-conduction is 0.0003 second. Since the average distance from the vocal folds to the cochlea by bone-conduction is 13.6 centimeters (63) in adults, it may be assumed that sound travels from the vocal folds through the bone, tissue, and cartilages of the head to the cochlea at the approximate rate of 454 meters per second. Because the speed of sound in dry air at zero degrees centigrade is 331 meters per second (33), a speaker may hear the sounds that originate at the vocal folds three times as quickly by bone-conduction as by air-conduction. With the neural integration necessary for the production of speech, it may be that the "unnatural" difference in reception time (at the
cochlea) of the air- and bone-conducted side-tone, caused by a delay of the air-conducted side-tone, is responsible for the "stuttering speech pattern" observed by Lee (44) and the "retarding of speech," noted by Black (15).

The normal speaker may be conditioned to expect to hear a speech pattern that has a certain difference (in time) between the air- and bone-conducted side-tone. When the difference in the time of the air- and bone-conducted side-tone is changed (side-tone delayed or accelerated) or in other words the feedback signal pattern changed, the output (speech pattern) is changed. The act of speaking may be likened to the action of a servomechanism. A servomechanism is a mechanism that reacts to its own output in such a way as to maintain equilibrium (71). In speaking, a person tends to maintain a "normal" experience at the ear as noted by Black (10). This is in accordance with the properties of a machine as outlined by Weiner (72):

For any machine, subject to a varied external environment, in order to act effectively it is necessary that information concerning the results of its own action be furnished to it as part of the information on which it must continue to act.

An example of this phenomenon is given by Weiner (72) in his explanation of the "human" action involved in picking up a cigar. In order to pick up a cigar one does not will to move any specific muscles. What one does is to:
Turn into action a certain feedback mechanism; namely, a reflex in which the amount by which I have yet failed to pick up the cigar is turned into a new and increased order to the lagging muscles, whichever they may be. In this way, a fairly uniform voluntary command will enable the same task to be performed from widely varying initial positions, and irrespective of the decrease of contraction due to the fatigue of the muscles.

In the instance of the delayed or accelerated side-tone, the information received by the machine (speaker), is divided (in time) and thus presents a new and confusing pattern. The speech of man is possibly controlled by his heard speech and by his expected speech. The latter is a product of memory. When the actual and expected speech are dissimilar (in this instance in time) confusion occurs and on-going speech may disintegrate. Recently the author carried out an investigation of the effects on a stutterer of the acceleration of the air-conducted side-tone. This acceleration was accomplished with the use of a throat microphone (Sonotone, 0-1, bone-conduction receiver) connected through a hearing aid amplifier to one ear. The other ear was partially occluded by the use of an ear warden. When the stutterer talked under these conditions it was observed (by a group of trained speech clinicians) that there was an apparent increase in the precision, clearness, and rapidity of articulation. This was accompanied by a greater range of pitch change, and a decrease in the severity of his stuttering. This
decrease in the severity of stuttering may have been the result of: (A) increased sound pressure level of the side-tone, (B) the "distracting" influence of the talking situation, or (C) a combination of all these factors. When the author practiced talking with the side-tone delay times produced by the Audio Signal Delaying Unit (47), a "stuttering speech pattern" was produced but without the usual kinesthetic sensations that attend normal stuttering (for the author).

These and related studies led to the formulation of a study designed to determine the effects of oral practice in the presence of several conditions of side-tone upon the rate and the sound pressure level of the speech of a group of stutterers who had varying amounts of speech therapy.

THE PROBLEM

The problem under investigation in this study was that of determining the effects of oral practice in the presence of three side-tone delays upon the duration and sound pressure level of the speech of a group of stutterers. The subjects practiced reading aloud with a side-tone delay of 0.001090 second which approximates one of the normal side-tone delays. Similarly they had practice under a side-tone delay of 0.000356 second
which approximates the minimum propagation time of sound from the vocal folds of the cochlea through the bones, tissues, cartilages, etc. of the head (63). In addition, they had oral practice in the presence of a side-tone delay which was approximately half way (in delay time) between the other two delay times of side-tone (0.000678 second).

THE HYPOTHESES.

In order to answer the questions raised in the above discussion, six general hypotheses were formulated for test. The general hypotheses may be stated together with the conditions under which they were tested, as follows:

1. There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).

2. There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).
3. There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).

4. There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).

5. There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).

6. There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).
DEFINITIONS OF TERMS

Technical Terms

Acoustic environment. This refers to the audible sound pressure at the ear of the speaker or listener.

Decibel. A decibel is a ratio with the standard reference level for acoustical measurements of 0.0002 dynes per square centimeter at 1000 cycles. In terms of sound pressure level a decibel is equal to:

$$20 \log_{10} \frac{P_1}{P_2}$$

where $P_1$ and $P_2$ represent the two sound pressure levels being compared.

Henry. A unit of inductance and is equal to the inductance in which a current, changing its rate of flow one ampere per second, induces an electromotive force of one volt.

Lissajous figure. When a point or spot on the oscilloscope undergoes two simple harmonic motions, which at any one instant of time are at right angles to each other, the resultant movement of this point or spot traces out a curve which is called a Lissajous figure. Such patterns are important because they are useful in measurements of relative phase and frequency relations between two A-C signals. If the phase, frequency or amplitude of either or both signals is changed the resulting Lissajous figure will change (52).
**Microfarad.** One millionth of a farad. A farad is equal to the capacity with which a potential difference of one volt between plates results in a change of one coulomb of electricity or in a changing current of one ampere flowing into the capacity per second.

**Non-Technical**

**Experimental Session A.** This refers to the practice period in which each subject read practice material for twenty minutes with a side-tone delay of 0.001090 second and was tested at the beginning, the middle, and the end of the period using five- and fifty-syllable test material under three conditions of side-tone delay (0.001090 second, 0.000678 second, and 0.000356 second).

**Experimental Session B.** The same as Experimental Session A except that the subjects read aloud, during the practice period, with a side-tone delay of 0.000678 second.

**Experimental Session C.** The same as Experimental Session A except that the subjects read aloud, during the practice period, with a side-tone delay of 0.000356 second.

**External Pathway (air conduction).** This is the pathway of sound from the vocal folds to the upper lip and then to the external ear and hence to the cochlea.
Internal Pathway (bone conducted). This is the pathway of sound from the vocal folds through the bone, tissues, cartilages, etc. to the cochlea.

Side-Tone. This refers to the auditory experience of hearing oneself talk or sing.

Test Condition A. The subject's speech is recorded while he reads five- and fifty-syllable test material with his side-tone delayed 0.001090 second.

Test Condition B. The subject's speech is recorded while he reads five-and fifty-syllable test material with his side-tone delayed 0.000678 second.

Test Condition C. The subject's speech is recorded while he reads five- and fifty-syllable test material with his side-tone delayed 0.000356 second.

ORGANIZATION OF THE DISSERTATION

This dissertation reports a study that was made to determine the effect of oral practice in the presence of different conditions of side-tone upon the rate and sound pressure level of the speech of a group of stutterers.

The dissertation is divided into five chapters with references, appendices, and an autobiography added. Chapter I treats of the phenomena of stuttering, the effects of acoustical environment upon a person's speech,
a statement of the hypothesis, definitions of terms and an outline of the organization of the dissertation. Chapter II is devoted to a discussion of related studies. Chapter III describes the calibration of the apparatus for determining delay times and controlling sound pressure level, the equipment, subjects, procedure, and the materials used for testing and practice. Chapter IV presents the results of the study and a discussion of them. Chapter V consists of conclusions and recommendations indicated by the results of this study. Appendix A contains practice material number one (X). Appendix B contains practice material number two (Y). Practice material number three (Z) is contained in Appendix C. Appendix D contains the five-syllable test material, while Appendix E contains the fifty-syllable test material. The development of a method for determining the delay times is contained in Appendix F. Appendix G contains the visual and oral instructions to the subjects. The results of the analyses of the fifty-syllable test material are summarized in Appendix H. The five-syllable test material were basic to the study. The fifty-syllable test material were administered for purposes of corroboration. The longer phrases were different from the five-syllable ones in that reading time included interruptions caused by breathing. Since the results of the two types
of tests were alike, the results of the fifty-syllable tests will not be discussed in the text. Appendix I contains the tables of analyses of variance (double classification) in which the basic measures that accompanied the fifty-syllable tests were pooled for the three subjects of a group, duration and sound pressure level, under each of three test conditions and at each of three times of testing during Experimental Sessions A, B, and C. An autobiography concludes the dissertation.
CHAPTER II

REVIEW OF THE LITERATURE

The studies reviewed in this chapter frequently refer to one of the physical aspects of speech, intensity. Sound intensity (1) is the average rate of sound energy in a specified direction transmitted through a unit area normal to this direction at the point considered. The base unit is the erg per second per square centimeter, but may be watts per square centimeter. Similarly, the intensity level (in decibels) of a sound is ten times the logarithm to the base ten of the ratio of the intensity of this sound to the reference intensity. However, since the present study employed a pressure re-acting microphone and power level meter, sound pressure level is more appropriate than intensity. The sound pressure level (in decibels) of a sound is twenty times the logarithm to the base ten of the ratio of the pressure of this sound to the reference pressure (1).

Studies that are particularly relevant, to the one described herein, are summarized here and treat: (A) the effect upon speech of the acoustic environment that precedes the moment of speech; (B) the effect upon speech of the acoustic environment that accompanies the
moment of speech; (C) the effect of side-tone upon speech; and (D) modifications that have been induced in stuttered speech.

Studies that treat the effect on a person's speech of the acoustic environment that precedes the moment of speech. There have been few investigations of the effect on a person's speech of the acoustic environment that precedes the moment of speech. However, in a study by Black (8) it was found that speakers tended to imitate the degree of articulation that they heard. Speakers were also found to copy the direction of the final inflection of a heard phrase when they repeated short messages (7). It has also been pointed out by Black (10) that speakers tend to reply in keeping with the sound pressure level of the perceived message. The stimulus voice also determines, in part, the rate of speaking as shown by a study by Lightfoot (45).

Studies that treat the effect upon speech of the acoustic environment that accompanies the moment of speech. In a study of the effects upon speech of the acoustic environment that accompanies the moment of speech, Black (11) found that people tended to speak more intensely in the presence of signals of increasing sound pressure. An extension of this latter study was made by Atkinson (2), in which subjects were exposed to
a controlled acoustic environment that encompassed the range of their listening-speaking experience. He found that the differential effect of speaking in pure-tone environments that ranged from loudness levels 10 to 100 (64) was four decibels in sound pressure level and four cycles per second in frequency. A further extension of the study done by Black (11) was made by Hyman (36) in which the effects of talking in controlled pure-tone environments on the rate and sound pressure level of normal and cerebral palsied children were investigated. He found that the children with spasticity, with and without speech defects, did not systematically increase their sound pressure level in repeating phrases when stimulated with increases in sound pressure level. In addition, it was found that the spastics were not "fixed" in their rate of speaking but were as variable or responsive to different oral stimuli as the normal children. The children with athetosis, however, had noticeable slower rates of speaking than the normal children when they repeated phrases.

Studies that treat the effect upon speech of the acoustic environment which precedes and accompanies the moment of speech. Several studies have been made that dealt with the effect upon speech of the acoustic environment which preceded and accompanied the moment of speech.
Among them is the survey by Harmes and Malone (32) in which the investigators found that out of a sample of forty-two cases of stuttering in oral schools for the deaf, only eight had usable hearing. Of these eight, four had acquired speech and stuttered before the onset of deafness. They suggest that, "Deaf children do not stutter because they do not receive sound impressions." Sternberg (60) in a similar study found results which indicated that with children who stuttered no hearing loss was present. She also reports that there was no significant difference in mean per cent of words stuttered upon when subjects (stutterers) read in normal conditions and with a ninety-five decibel masking noise introduced into the subject's ear. Changes in reading rate, articulation and voice quality were also noticed. Some of the stutterers increased their reading rate, but this was accompanied by an increase in sound substitutions and omissions in articulation. Others decreased their reading rate and their articulation became slurred with little lip movement. All subjects showed a decrease in control of articulation and voice. The author observes that these results indicate that auditory cues are more important than kinesthetic cues in relation to a stutterer's reaction to his own speech. In another study, Plummer (51) found that a person's ability to
discriminate fricatives, plosives, and affricatives was impaired when he had a hearing loss. In another study on hearing loss and its effect on speech, Carrell (22) found that people with sound substitutions had inferior hearing (as measured with pure tones) relative to people with normal speech. Kerridge (41) also found that children with partial deafness had defective speech. Gaines (28) in a study on cleft palate speech found that the hearing loss of the children may have been partly responsible for their speech abnormality. In analyzing the speech of deaf children, Hudgins and Numbers (35), found that twenty-one per cent of all consonants and twelve per cent of all vowels were malarticulated and that the frequency of errors of articulation and rhythm increased with an increase in hearing loss. Voelker and Voelker (70) found that deaf children had little more than half the maximum pitch range of normal children. The speech of the deaf was found by Hudgins (34) to be, "Slow and laboured, characterized by excessive expenditure of air to contain prolonged vowels with accompanying distortion and to be excessively nasal."

Studies that treat the effect of side-tone upon speech. In studying one aspect of the effect of side-tone upon speech, Black (12) found that his subjects
spoke faster in small rooms than in large ones, and slower in large live rooms than in large dead rooms. The sound pressure level also increased more in large rooms and was greater in dead than in reverberant rooms.

Since normal speech production is determined in part by the feedback or acoustic stimuli, any impairment or change in this feedback may result in an impairment of speech production. This impairment (of feedback) may result in: (A) stoppage of speech production, or (B) repetition of initiating impulse over and over (perhaps stuttering blocks) until the speech mechanism reacts to the feedback signal. In choral reading there is no impairment of the feedback signal. This perhaps explains why stutterers usually have fluent speech when they read with a group. This may be a more adequate explanation of this phenomenon than that of the rhythmic character of the choral speech pattern being responsible for the more fluent speech (3).

In a contemporary study by Robinson (53) on the effect of reading rate of stutterers of some changes in the relationship between the sound level of the external side-tone and that of speech it is reported that: (A) stutterers react to an increase in side-tone level by markedly reducing their rate of oral reading, and (B) an increase in the speech level does not appear to effect
the reading rate. The results of non-stutterers are reversed, especially for those people who had extensive speech training. The responses of people who had no speech training may have been more like those of the stutterers.

Recently, several studies have been made investigating the effect of delayed side-tone on the rate and sound pressure level of speech. These studies indicate the importance of side-tone in the production of speech (15, 44). In one of these studies Black (15) observed that:

The general effect of delaying the side-tone is a retarding of speech. The subjective experience is variously described. With short delays descriptions emphasize 'a stretching out feeling.' Longer delays may produce near traumatic effects that include the blocking of speech, facial contortions, the prolongation and slurring of sounds, and repetitions of sound and syllables.

Black also found that as the delay time of the side-tone was increased the rate of speaking (of the subjects) became slower accompanied by an increase in their sound pressure level. Somewhat similar results were noted by Lee (44). He found that a delay of the side-tone, "Will cause the person to stutter, slow down while raising his voice in pitch and volume, or stop completely." It is interesting to note that he concludes by saying that, "The first chance disturbance will set it off and this
for most subjects occurs invariably within the first half-dozen words spoken." Van Riper has noted the same phenomenon in his studies on stuttering (68).

Stuttering is thought, by some authorities, to be the result of the non-synchronization of nerve impulses to the paired musculature of the speech organs (66). This non-synchronization is thought, by some (4, 23, 25), to be a result of an organic defect. Others believe this condition to be a result of emotional pressure on the individual (31, 58). However, it may be that the stimulus that precipitates the breakdown in synchronization in the speech muscles is an unexpected pattern of side-tone. One such unexpected pattern may be a delay or acceleration of the side-tone. Black (15) and Lee (43, 44) have shown that speech that is not unlike "stuttered" speech is evoked when the person's side-tone is delayed. Thus the impairment may be in the sensory rather than the motor processes. It has been shown that speech reproduction depends, in part, upon the oral stimulation or feedback. Then, if the system does not receive satisfaction at every instant—adequate feedback stimuli—the mechanism, "Halts, repeats, or repeats corrected. Repetition of sentences and words is volitional for emphasis increased clarity or correction of gross errors (44)." Thus when the feedback of the side-
tone is delayed the person slows down his speech, raises it in sound pressure level, halts or repeats syllables and continuant sounds. This speech pattern resembles, in many ways, stuttered speech.

Studies that treat modifications induced in stuttering. The importance of oral stimulation to a speaker, and in particular the stutterer, has been pointed out by Bloodstein (18). He notes that the modifications have been induced in stuttered speech when: (A) there is little responsibility for communication, (B) there are speech pattern changes, and (C) there is intense or unusual stimulation, (D) there is an absence of unfavorable listener reactions, (E) there is reduced motivation to make a favorable impression, and (F) there are excessive bodily movements or activities. It has also been observed by this investigator that the acceleration of the side-tone causes a change in the speech pattern of a stutterer. This aspect of the modification of stuttered speech has been discussed in Chapter I. However, no studies have been carried out to determine the influence that a delay or acceleration of the side-tone may have on the precipitation and perpetuation of the various speech disorders.

In a preliminary study, this investigator found no significant differences in the rate of reading and sound
pressure level of the speech of normal speakers when they were tested under three conditions of delayed side-tone reading five- and fifty-syllable phrases. The test material used in this study was similar to that used in the previous investigation. The side-tone time delays were of the order of 0.001 second, 0.0003, and 0.00045 second. The subjects did not practice talking under the different side-tone delay times and the test material may not have been of sufficient length to provide, by itself, an accurate measuring instrument. The experiment was useful however in that it indicated instrumentation and controls that were essential for further work.

The review of the major studies dealing with the effect of the acoustic environment upon speech shows that no experimental effort has been directed toward determining the effect of oral practice of reading in the presence of delayed or accelerated side-tone upon the speech of individuals who have normal or abnormal speech.

The study reported here attempts to determine the effect upon the rate and sound pressure level of the speech of stutterers who had oral practice in the presence of three side-tone delay times.
CHAPTER III

APPARATUS AND METHODOLOGY

CALIBRATION OF APPARATUS FOR DETERMINING DELAY TIMES AND CONTROLLING SOUND PRESSURE LEVEL

The delay times that were used in this study were measured by the apparatus that is diagrammed in Figure 1. An oscillator was adjusted until the relative phase input and output voltages (as determined by the Lissajous figure (52) on the oscilloscope) was an integral multiple of \( \pi \) radians. This determination was made for the three delay times used in this study (see Tables I, II, III). In these instances the input and output voltages were kept constant. The time delays introduced between the input and output voltages were computed by the formula:

\[
\tau = \frac{1}{4\pi}
\]

where \( \Delta f \) is equal to the frequency difference required to cause a 360 degree relative phase change. The above formula applies exactly only when the time delay is independent of frequency. If the time delay is dependent on frequency, the time delay \( \tau \) may be found by the formula:

\[
\tau = \frac{1}{2\pi} \int_{\text{upper}}^{\text{lower}} \frac{d\phi}{df} - \int_{\text{upper}}^{\text{lower}} \frac{d\tau}{df}
\]

where \( \phi \) is in radians and \( F \) is in cycles per second.
A. Oscillator
B. Attenuator
C. Throat Microphones
D. Transformer
E. Amplifier
F. Delay Lines
G. Switching Box
H. Attenuator
I. Earphones
J. Oscilloscope
K. Voltmeter

FIGURE 1

DIAGRAM OF THE APPARATUS FOR DETERMINING DELAY TIMES
AND CONTROLLING SOUND PRESSURE LEVEL
TABLE I

DETERMINE CALIBRATION: TEST CONDITION A. TONE CONTROLS "NORMAL". PHASE ANGLES ARE MEASURED FROM THE SECONDARY OF THE INPUT TRANSFORMER TO HEADSET.*

<table>
<thead>
<tr>
<th>ϕ</th>
<th>f</th>
<th>Δf₁₈₀°</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>110</td>
<td>410</td>
</tr>
<tr>
<td>360</td>
<td>520</td>
<td>490</td>
</tr>
<tr>
<td>540</td>
<td>990</td>
<td>490</td>
</tr>
<tr>
<td>720</td>
<td>1460</td>
<td>460</td>
</tr>
<tr>
<td>900</td>
<td>1920</td>
<td>480</td>
</tr>
<tr>
<td>1080</td>
<td>2400</td>
<td>440</td>
</tr>
<tr>
<td>1260</td>
<td>2860</td>
<td>460</td>
</tr>
<tr>
<td>1440</td>
<td>3320</td>
<td>450</td>
</tr>
<tr>
<td>1620</td>
<td>3770</td>
<td></td>
</tr>
</tbody>
</table>

\[
4 (Δf) \text{ is equal to } 3770 \text{ minus } 110 \text{ cycles per second}
\]

\[
\text{is equal to } 3660 \text{ cycles per second}
\]

Therefore \(Δf\) is equal to 915 cycles per second

Since \(t\) is equal to \(\frac{1}{Δf}\) is equal to \(\frac{1}{915}\) second

Therefore \(t\) is equal to 0.001090 second

* Voltage at the primary was so low that it could not be measured on the oscilloscope; therefore, it was measured from the secondary.
TABLE II

DELAY TIME CALIBRATION: TEST CONDITION B. TONE CONTROLS "NORMAL". PHASE ANGLES ARE MEASURED FROM THE SECONDARY OF THE INPUT TRANSFORMER TO HEADSET.*

<table>
<thead>
<tr>
<th>$\phi$</th>
<th>$f$</th>
<th>$\Delta f_{180^\circ}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>146</td>
<td>689</td>
</tr>
<tr>
<td>360</td>
<td>835</td>
<td>655</td>
</tr>
<tr>
<td>540</td>
<td>1590</td>
<td>760</td>
</tr>
<tr>
<td>720</td>
<td>2350</td>
<td>740</td>
</tr>
<tr>
<td>900</td>
<td>3090</td>
<td>710</td>
</tr>
<tr>
<td>1080</td>
<td>3800</td>
<td>600</td>
</tr>
<tr>
<td>1360</td>
<td>4400</td>
<td></td>
</tr>
</tbody>
</table>

$2 (\Delta f)$ is equal to 3090 minus 146 cycles per second
is equal to 2944 cycles per second
Therefore $\Delta f$ is equal to 1472 cycles per second
Since $t$ is equal to $\frac{1}{\Delta f}$ is equal to $\frac{1}{1472}$ second
Therefore $t$ is equal to 0.000678 second

* See Table I for explanation.
TABLE III

DELAY TIME CALIBRATION: TEST CONDITION C. TONE CONTROLS "NORMAL". PHASE ANGLES ARE MEASURED FROM THE SECONDARY OF THE INPUT TRANSFORMER TO HEADSET.*

<table>
<thead>
<tr>
<th>( \phi )</th>
<th>( f )</th>
<th>( \Delta f_{180^\circ} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>208</td>
<td>1332</td>
</tr>
<tr>
<td>360</td>
<td>1540</td>
<td>1470</td>
</tr>
<tr>
<td>540</td>
<td>3010</td>
<td>1290</td>
</tr>
<tr>
<td>720</td>
<td>4300</td>
<td>1050</td>
</tr>
<tr>
<td>900</td>
<td>5450</td>
<td>950</td>
</tr>
<tr>
<td>1080</td>
<td>6400</td>
<td></td>
</tr>
</tbody>
</table>

\( \Delta f_{2\pi} \) is equal to 3010 minus 208 cycles per second is equal to 2802 cycles per second

Since \( t \) is equal to \( \Delta f_{2\pi} \)

Therefore \( t \) is equal to \( \frac{1}{2802} \) second

is equal to 0.000356 second

* See Table I for explanation.
The development of a method for determining the delay times is given in Appendix F.

As shown in Tables I, II, and III, the delay times of the side-tone used in this study were calculated to be 1090, 678, and 356 milliseconds. In later discussions, Test Condition A will refer to a side-tone delay time of 0.001090 second, Test Condition B will refer to a side-tone delay time of 0.000678 seconds and Test Condition C will refer to a side-tone delay time of 0.000356 second. The side-tone delay time of 0.001090 second approximates the normal side-tone delay for air-conducted side-tone in a free field and is the longest delay time used in this study. The shortest side-tone delay time used in this study was 0.000356 second and approximates the minimum propagation time of sound from the vocal folds to the cochlea by bone conduction as found by Stromsta (62). Thus when the subjects spoke under this condition, the delay times of the air conducted and bone conducted side-tone were approximately equal. The third side-tone delay time utilized was that of 0.000678 second which was approximately halfway (in time delay) between the maximum and minimum delay times used in this study.

A two-decibel change in sound pressure level over a frequency range of 100-7000 cycles per second in the
delay lines was corrected by an attenuator in the circuit at the output side of the delay lines (see Figure 1). The control was manually operated by the investigator. In order to insure that the sound pressure level gain was the same at the earphones for the three delay times of the side-tone, the circuit was tested with three types of stimuli (1000 cycle pure tone; white noise; and recorded speech), using a voltmeter inserted at the output side of the second attenuator (see Figure 1). The attenuator was then set so that when manually operated by the investigator the gain was the same at the earphones for each of the three side-tone delay times. This gain was kept constant throughout the entire experiment.

EQUIPMENT

This study required equipment to: (A) control conditions of side-tone delay, (B) control the sound pressure level at the earphones for the three side-tone delay times, and (C) record the duration and sound pressure level of the speech of the subjects as they read the test material (see Figure 2).

To fulfill the above requirements, the following equipment was used:

1. Artificial delay lines. The delay lines consisted of two bays of twenty-four 'T' sections (see
A. Throat Microphones
B. Transformer
C. Amplifier
D. Delay Lines
E. Switching Box
F. Attenuator
G. Earphones
H. Microphone
I. Recorder-Reproducer

FIGURE 2

DIAGRAM OF APPARATUS USED DURING THE PRACTICE AND TESTING SESSIONS
Figure 3. Each bay had an equivalent delay time of 0.000430 second or 788 miles of open telephone wire. Each "T" section had a capacity of 0.064 microfarads and an induction of 0.0292 henrys.*

* The delay lines provided the delay times used in this study and were made available through Mr. James Early, Instructor, Department of Electrical Engineering, The Ohio State University.

2. **Attenuator** (variable resistance type, Hewlett-Packard, Model 350 A). The artificial delay lines had a change in sound pressure level of two decibels from minimum delay over a frequency range of 100-7000 cycles per second. This attenuation was compensated for by the use of the attenuator.

3. **Switching box.** The three side-tone delay times were selected manually by the investigator for each test condition, and for the oral practice sessions.

4. **Throat microphones** (Sonotone 0-1 bone conduction receivers). Four of these receivers were used as throat microphones by the subjects and the investigator.

5. **Amplifier** (Thordarson Model T-31M 10 A). The amplifier was set so that the sound pressure level at the earphones was "natural" or "reasonable". This setting was maintained throughout the entire experiment. Thus the speech-to-noise ratio was the same for the whole experiment.
$Z_{\text{in}} = Z_{\text{out}}$

$L = 0.0292$ henrys

$C = 0.064$ microfarads

**FIGURE 3**

DIAGRAM OF ARTIFICIAL DELAY LINE "T" SECTION
6. **Earphones** (Permoflux PDR 3 and ear cushions NAF 48490-1). Two of these were worn by each subject and the investigator throughout each experimental session.

7. **Microphone** (Turner 999). This microphone was placed and fixed in the middle of the table at which the subjects sat during each experimental session.

8. **Recorder-reproducer** (Hart, Model VRF-R). This piece of apparatus was used to record the speech of the subjects as they read the different types of test material under the three different test conditions. It was operated manually by the investigator.

9. **Power level meter** (Sound Apparatus Co., 50 db potentiometer, 50 mm. per second). The graphic tracings given by the power level meter were used to determine the duration and sound pressure measurements for the different test positions for the different experimental sessions.

10. **Oscilloscope** (Dumont 208-B). This was used in determining the delay times used in this study.

11. **Voltmeter** (Vacuum tube, Instrument Electronics). The voltmeter was used to test output sound pressure levels at the earphones for the three delay times.
SUBJECTS
The subjects were male adult stutterers who had some speech therapy. The subjects were arbitrarily assigned to six groups, three in each group. A subject remained with the same group throughout the three experimental sessions.

PROCEDURE
Each group of three subjects came to the testing and practice room on three different days. An effort was made to have each group come to the testing and training room at the same time each day and with the same interval of time (days) between experimental sessions. Each day the testing and practice session lasted approximately two hours. In each session each subject was successively: (A) tested with five- and fifty-syllable test material under three conditions of side tone; (B) had an experience of talking for ten minutes with a certain delay of their side-tone as the first half of the practice material was read; (C) was retested as at the beginning of the session with similar test material; (D) had an experience of reading the second half of the practice material (for that day); (E) was retested as at the beginning of the session with similar material. This procedure was followed for all
three days (experimental sessions) for all groups (see Table IV).

When the subjects came into the testing and practice room they were assigned to positions at the table. Each subject's position was systematically varied for the remaining two days. After the subjects were seated at the table the throat microphones and earphones were adjusted on each subject by the investigator. Then, when all the apparatus was correctly placed, the circuit was closed (manually operated by the investigator) and each subject was asked to count aloud from one to ten. In this way the subjects were made aware of the experience that lay ahead of them and it furnished, in addition, a further check on the performance of the apparatus.

Immediately after the circuit was tested, the subjects were asked to read the instructions printed on the first page of each of the practice materials. Following this, they were given oral instructions by the investigator (see Appendix G). The testing and practice session started after all questions had been answered and the investigator was satisfied that each subject knew what was expected of him.
Table IV

Order of Presentation of Test Conditions; Practice Conditions; Test Materials; Practice Materials.

<table>
<thead>
<tr>
<th>Group Subjects</th>
<th>Practice</th>
<th>Test Position</th>
<th>Practice</th>
<th>Test Position</th>
<th>Practice</th>
<th>Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Medial</td>
<td>Final</td>
<td>Initial</td>
<td>Medial</td>
<td>Final</td>
</tr>
<tr>
<td>1</td>
<td>A.Y.</td>
<td>1.41.51</td>
<td>6.4.54</td>
<td>A.7.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A.Y.</td>
<td>2.3.54</td>
<td>6.5.57</td>
<td>B.6.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>A.Y.</td>
<td>3.5.57</td>
<td>6.6.51</td>
<td>0.9.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A.Y.</td>
<td>4.1.52</td>
<td>4.4.55</td>
<td>4.7.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A.Y.</td>
<td>5.3.58</td>
<td>5.5.58</td>
<td>8.8.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>A.Y.</td>
<td>6.3.58</td>
<td>6.6.52</td>
<td>4.9.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A.Y.</td>
<td>7.1.53</td>
<td>4.4.56</td>
<td>6.7.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A.Y.</td>
<td>8.3.56</td>
<td>8.5.59</td>
<td>8.8.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>A.Y.</td>
<td>9.3.59</td>
<td>6.6.53</td>
<td>0.9.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>B.Y.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>B.Y.</td>
<td>(same as Group 1)</td>
<td></td>
<td>(same as Group 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>B.Y.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>B.Y.</td>
<td>(same as Group 2)</td>
<td></td>
<td></td>
<td>A.Y.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>C.Y.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>C.Y.</td>
<td>(same as Group 3)</td>
<td></td>
<td></td>
<td>A.Y.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>A.Y.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>A.Y.</td>
<td>(same as Group 1)</td>
<td></td>
<td></td>
<td>C.Y.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>A.Y.</td>
<td>(same as Group 2)</td>
<td></td>
<td></td>
<td>A.Y.</td>
<td></td>
</tr>
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Test and Practice Conditions

<table>
<thead>
<tr>
<th>Side-tone delay time</th>
<th>Code</th>
<th>Practice Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.001090 Second</td>
<td>A</td>
<td>Number One</td>
</tr>
<tr>
<td>0.000678 Second</td>
<td>B</td>
<td>Number Two</td>
</tr>
<tr>
<td>0.000356 Second</td>
<td>D</td>
<td>Number Three</td>
</tr>
</tbody>
</table>

Five-Syllable Test Material

<table>
<thead>
<tr>
<th>Order of phrases</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,3.</td>
<td>1</td>
</tr>
<tr>
<td>2,3,1.</td>
<td>2</td>
</tr>
<tr>
<td>3,1,2.</td>
<td>3</td>
</tr>
<tr>
<td>4,5,6.</td>
<td>4</td>
</tr>
<tr>
<td>5,6,4.</td>
<td>5</td>
</tr>
<tr>
<td>6,4,5.</td>
<td>6</td>
</tr>
<tr>
<td>7,8,9.</td>
<td>7</td>
</tr>
<tr>
<td>8,9,7.</td>
<td>8</td>
</tr>
<tr>
<td>9,7,8.</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order of phrases</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,11,12</td>
<td>10</td>
</tr>
<tr>
<td>11,12,10</td>
<td>11</td>
</tr>
<tr>
<td>12,10,11</td>
<td>12</td>
</tr>
<tr>
<td>13,19,15</td>
<td>13</td>
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<tr>
<td>14,15,16</td>
<td>14</td>
</tr>
<tr>
<td>15,14,15</td>
<td>15</td>
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<tr>
<td>16,17,18</td>
<td>16</td>
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<tr>
<td>17,18,16</td>
<td>17</td>
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<td>18,16,17</td>
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<tr>
<td>19,20,21,22</td>
<td>19</td>
</tr>
<tr>
<td>20,21,19,23</td>
<td>20</td>
</tr>
<tr>
<td>21,19,20,23</td>
<td>21</td>
</tr>
<tr>
<td>22,23,24,25</td>
<td>22</td>
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<td>26</td>
</tr>
<tr>
<td>27,25,26,27</td>
<td>27</td>
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</table>

Fifty-Syllable Test Material

<table>
<thead>
<tr>
<th>Order of phrases</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>51,52,53.</td>
<td>51</td>
</tr>
<tr>
<td>52,53,51.</td>
<td>52</td>
</tr>
<tr>
<td>53,51,52.</td>
<td>53</td>
</tr>
<tr>
<td>54,55,56.</td>
<td>54</td>
</tr>
<tr>
<td>55,56,55.</td>
<td>55</td>
</tr>
<tr>
<td>56,54,55.</td>
<td>56</td>
</tr>
<tr>
<td>57,58,59.</td>
<td>57</td>
</tr>
<tr>
<td>58,59,57.</td>
<td>58</td>
</tr>
<tr>
<td>59,57,58.</td>
<td>59</td>
</tr>
</tbody>
</table>
MATERIALS FOR TESTING AND PRACTICE

Each day (or experimental session) each group read different practice materials (see Appendices A, B, and C). However the different practice materials contained approximately similar types and amounts of reading. The order of the different types of reading passages was varied randomly among the three practice materials. A section of each material was devoted to radio plays and speeches that had been broadcasted over Radio Station WOSU, The Ohio State University.* News reports

* This material was used by permission of Mr. Newton Rochte, Assistant Supervisor, Radio Station WOSU, The Ohio State University.

and sports announcements were included in each practice material;**

** This material was used with the permission of Dr. W. Fotheringham and Mr. R. Mall, Department of Speech, The Ohio State University.

also panel discussions on world affairs (47). In each of the practice materials two pages of incomplete sentences (questions) were included, making it possible for the subjects to give some spontaneous speech during the practice session. Each subject read aloud for approximately twenty minutes each day with a single time delay
of side-tone. The test conditions, practice conditions, test materials, and practice materials were systematically varied from day to day for each group.

During an experimental session, a subject read aloud forty-five five-syllable phrases and nine fifty-syllable phrases in addition to the practice material. Fifteen five-syllable phrases were read at the beginning of the experimental session with three conditions of side-tone delay (five phrases under each side-tone delay condition). Similarly fifteen five-syllable phrases were read under three conditions of side-tone delay (five phrases for each side-tone conditions) at the middle and the end of each experimental session. The five-syllable test material (69) is included in Appendix D; the fifty-syllable material (12) in Appendix E.

MEASURING PROCEDURE

The speech of the subjects was recorded as they read the two types of test material at the beginning, middle, and end of each experimental session. The speech was recorded on a Hart recorder-reproducer (see Figure 2). Immediately following the experimental session, the power level meter was coupled to the Hart recorder-reproducer and graphic tracings were obtained of the speech of the subjects as they read the test material. In recording
the test material, the gain on the recorder was kept constant for all groups (on all days), thus insuring a constant signal-to-noise ratio throughout the entire experiment. In obtaining the graphic tracings, the power level meter was adjusted for the first subject and then kept constant for all of the remaining subjects.

The measurements used in this study were those of duration (seconds)* and relative sound pressure level (bels).**

* Horizontal displacement measures in centimeters on the graphic tracings from a power level meter were converted to seconds. This was possible because the speed of the tape was known (50 millemeters per second).

** Vertical displacement measures in centimeters on the graphic tracings from a power level meter were converted to bels. This was done by using a 50 decibel potentiometer in conjunction with the power level meter (one centimeter equal to one bel).

The test material had been previously equated for duration and sound pressure level (12, 68). The duration measurements for the five five-syllable phrases were averaged, the mean becoming a basic score in the analyses; for a fifty-syllable item one over-all measurement of duration was made. In obtaining the sound pressure level, the peak displacements (three highest) of the five five-syllable phrases were averaged and this mean used as a basic measure in the analyses. For the
fifty-syllable test phrases the fifteen highest peak measurements were averaged to provide a basic measure in the analyses.
CHAPTER IV

RESULTS AND DISCUSSION

Measurements were made of duration and sound pressure level with which five- and fifty-syllable test material were spoken by eighteen adult male stutterers. The measurements of duration and sound pressure level were obtained from the graphic tracings of a power level meter. From the beginning of first experimental session to the end of the final (third) experimental session each subject earned 108 scores, fifty-four scores related to duration and fifty-four scores related to sound pressure level. The fifty-four scores for both duration and sound pressure level were subdivided into twenty-seven scores for five-syllable test material and twenty-seven scores for the fifty-syllable test material. Of a set of twenty-seven scores, nine were earned by a subject at each session with respect to his rate of reading, and nine with respect to his sound pressure level. These pairs of scores corresponded to three tests (side-tone delays: (A) 0.001090 second, (B) 0.000678 second, (C) 0.000356 second) all of which were given at the beginning, the middle, and again at the end of each experimental session.
The scores for similar tests were arranged in matrices. Columns represented test position; sub-columns test condition; and rows experimental subjects. Then the variance attributable to the principal sources, test condition and test position, was determined and tested for statistical significance.

Triple-classification analyses of variance were employed to test the significance of the variables, test condition, test position, and subjects, and the first- and second-order interactions for the main analyses: (A) among the measurements of duration obtained under three conditions of side-tone delay at the beginning, the middle, and the end of Experimental Sessions A, B, and C; and (B) among the measurements of sound pressure level obtained under three conditions of side-tone delay obtained at the onset, the middle, and the end of Experimental Sessions A, B, and C. Inasmuch as two of the first-order interactions in the triple-classification analysis of variance were statistically significant subordinate analyses, double-classification analyses of variance were also made. These can be divided into six categories: (A) among measurements of duration obtained at the onset, the middle, and the end of Experimental Sessions A, B, and C; (B) among measurements of sound pressure level obtained at the beginning, the middle and
the end of Experimental Sessions A, B, and C; (C) among measurements of duration of three test conditions obtained at three test positions; (D) among measurements of sound pressure level of three test conditions obtained at three test positions; (E) among measurements of duration obtained at the three test positions using three test conditions and the resultant scores (for the three subjects of a group) pooled; and (F) among measurements of sound pressure level obtained at three test positions using three test conditions and the resultant scores (for the three subjects of a group) pooled.

The variability among the measurements of duration and sound pressure level can be attributed to (A) subjects, eighteen adult male stutterers, in six groups of three individuals each; (B) experimental sessions, subjects had oral reading practice for twenty minutes during each of three experimental sessions with side-tone delays of 0.001090 second, 0.000678 second, and 0.000356 second; (D) test condition, subjects tested under side-tone delays of 0.001090 second, 0.000678 second, and 0.000356 second, each given at the onset, the middle, and the end of Experimental Sessions A, B, and C.
Experimental Session A.

Duration. The first hypothesis under test was, "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)." A triple-classification analysis of variance was performed in which the principal sources of variance were test condition (three side-tone delays), test position (the onset, the middle, and at the end of the experimental session), subjects (eighteen adult male stutterers). This analysis was basic to all of the analyses of the data gathered from Experimental Session A. In this analysis the measurements of the main variables, test condition and test position, were treated (see Table V).

The variance attributable to test condition was non-significant (F, 0.07, d.f., 2 and 68). This would have been the case also had the triple interaction variance been used as the denominator instead of the highly significant subjects x test condition interaction variance. Similarly, the variance attributable to test position was non-significant (F, 1.18, d.f., 2 and 68), and would have been so had either the triple interaction
TABLE V

Summary of analysis of variance (triple classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>12,814</td>
<td>6,107</td>
<td>0.71</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>23,259</td>
<td>11,630</td>
<td>1.18</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>3,053,330</td>
<td>179,608</td>
<td>19.42</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>10,187</td>
<td>2,531</td>
<td>0.61</td>
<td>n.s.</td>
</tr>
<tr>
<td>SXC</td>
<td>34</td>
<td>294,062</td>
<td>8,649</td>
<td>2.09</td>
<td>0.01</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>334,973</td>
<td>9,852</td>
<td>2.38</td>
<td>0.01</td>
</tr>
<tr>
<td>PXCS</td>
<td>68</td>
<td>281,721</td>
<td>4,143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>4,009,686</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
variance or test position x subjects interaction variance been used as error.

The results indicate that when the speakers had practice reading aloud in the presence of a side-tone delay of 0.001090 second there was no significant change in the reading rates of the subjects from initial test to final test.

Subordinate analyses (see Table VI), double-classification analyses of variance, indicated no significant differences in the rate of the speakers measured at the onset, middle, and end of the experimental session, using Test Condition A (see Column 3, Table VI), Test Condition B (see Column 4, Table VI), Test Condition C (see Column 5, Table VI).

Figure 4 shows, graphically, that the mean duration scores (see Table VII) were numerically highest at the middle of the experimental session, but there were no significant differences in duration (see Table VI) from test to test.

Other double-classification analyses of variance were used to evaluate the measurements of duration using three test conditions obtained at the onset, middle, and end of Experimental Session A. There were no significant differences in duration among the three test conditions at the onset of the session (see Column 8, Table VI), at
### TABLE VI

Summary of two sets of analyses of variance (double classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Variance</td>
<td>Degrees of Freedom</td>
<td>Variance, Test Condition A</td>
<td>Variance, Test Condition B</td>
<td>Variance, Test Condition C</td>
</tr>
<tr>
<td>Test Position</td>
<td>2</td>
<td>10,372</td>
<td>3,213</td>
<td>3,078</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>87,517*</td>
<td>54,384*</td>
<td>56,005*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>9,732</td>
<td>2,607</td>
<td>5,415</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
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<tbody>
<tr>
<td>Source of Variance</td>
<td>Degrees of Freedom</td>
<td>Variance, Initial Test Position</td>
<td>Variance, Medial Test Position</td>
<td>Variance, Final Test Position</td>
</tr>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>5,598</td>
<td>5,361</td>
<td>168</td>
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<tr>
<td>Subjects</td>
<td>17</td>
<td>79,760*</td>
<td>71,605*</td>
<td>47,899*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>5,445</td>
<td>7,759</td>
<td>3,304</td>
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</tbody>
</table>

* Significant (F) at 1% level of Confidence
TABLE VII

Mean measurements of duration (seconds) obtained with three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Test Conditions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
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</thead>
<tbody>
<tr>
<td>Pooled</td>
<td>1.34</td>
<td>1.39</td>
<td>1.35</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.37</td>
<td>1.42</td>
<td>1.35</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.30</td>
<td>1.35</td>
<td>1.36</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.35</td>
<td>1.39</td>
<td>1.33</td>
</tr>
</tbody>
</table>
the middle (see Column 9, Table VI), and at the end (see Column 10, Table VI) of the experimental session.

When the mean measurements of duration are compared (see Figure 4) it is seen that the means for Test Conditions A and C were numerically greater than Test Condition B at the onset and middle of the experimental session. At the end of the experimental session the mean for Test Condition B was numerically greater than those of Test Conditions A and C (see Table VII).

The measurements of duration were next analyzed with the measurements for each test condition pooled for each group of three subjects. However, there were no significant differences in rate of reading when the scores of the three test conditions were compared at each of three test positions (see Table XLI, Appendix I).

Because of the results of the above analyses, Hypothesis One cannot be rejected, "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

**Sound Pressure Level.** The second Hypothesis under test was, "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with
a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second). A triple-classification analysis of variance was performed in which the principal sources of variance were test condition (side-tone delay time), test position (time of testing), subjects (eighteen male adult stutterers). In this analysis the measurements of the main variables, test condition and test position, were treated (see Table VIII). The variance attributable to test condition was non-significant (F, 0.17, d.f., 2 and 68). The variance attributable to the other principal variable, test position, was significant (F, 4.51, d.f., 2 and 68).

Figure 4 shows an upward trend in mean measurements of sound pressure level from the beginning of the experimental session to the end. It is interesting to note, at this time, that while the mean sound pressure level increased the rate of reading did not change (see Table IX).

Subordinate analyses, double-classification analyses of variance, showed that there was not a significant difference in sound pressure level as measured with Test Condition A from initial to final test after the subjects practiced reading aloud with a side-tone delay of 0.001090
TABLE VIII

Summary of analysis of variance (triple classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>80</td>
<td>40</td>
<td>0.17</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>13,579</td>
<td>6,788</td>
<td>4.51</td>
<td>0.05</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>105,306</td>
<td>6,194</td>
<td>4.11</td>
<td>0.05</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>638</td>
<td>160</td>
<td>0.67</td>
<td>n.s.</td>
</tr>
<tr>
<td>SXC</td>
<td>34</td>
<td>7,891</td>
<td>232</td>
<td>0.97</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>51,202</td>
<td>1,506</td>
<td>6.29</td>
<td>0.01</td>
</tr>
<tr>
<td>PXCXS</td>
<td>68</td>
<td>16,269</td>
<td>239</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>194,964</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TABLE IX**

Mean measurements of relative sound pressure level (bels) obtained with three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.66</td>
<td>1.83</td>
<td>1.87</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.68</td>
<td>1.86</td>
<td>1.84</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.63</td>
<td>1.80</td>
<td>1.89</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.66</td>
<td>1.83</td>
<td>1.88</td>
</tr>
</tbody>
</table>
second (see Column 3, Table X). When Test Condition B was used, there was a highly significant difference in sound pressure level from the onset to the end of the experimental session (see Column 4, Table X), and similar results are observed when Test Condition C was used (see Column 5, Table X).

Further analyses (see Columns 8, 9, 10, Table X) indicate that when the measurements of sound pressure level were compared at each time of testing there was no difference among the results obtained from the three test conditions. Similarly when the measurements were pooled for the three subjects of each group, and the resultant score used as a basic measure in analyses of variance, there was no significant difference in sound pressure level among the three test conditions at each time of testing (see Table XLII, Appendix I).

As can be seen in Figure 4 however, there was a numerical increase in mean sound pressure level from the onset to the end of the session using each of the three test conditions. This increase was, however, not significant (see Table X). In other words, the stutterers did not significantly change their sound pressure level after practicing with a side-tone delay of 0.001090 second.

As a result of the above analyses, Hypothesis Two cannot be rejected, "There is no difference in sound
TABLE X

Summary of two sets of analyses of variance (double classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>1,667</td>
<td>2,930</td>
<td>2,481</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>2,019*</td>
<td>2,274*</td>
<td>2,362*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>641</td>
<td>443</td>
<td>608</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>168</td>
<td>158</td>
<td>98</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>4,764*</td>
<td>2,653*</td>
<td>1,785*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>385</td>
<td>231</td>
<td>92</td>
</tr>
</tbody>
</table>

* Significant (F) at 1% level of Confidence
pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second)." However, Hypothesis Two can be rejected when: B. tested with a side-tone delay of 0.000678 second; and C. tested with a side-tone delay of 0.000356 second.

It might be expected that as the sound pressure level changed the rate of speaking would change. Black (15) found that, using side-tone delay times, that as the intensity (sound pressure level) increased the rate of speaking became slower. In this case, however, the statistical evidence does not suggest such a relationship.

It has been found that when the subjects practiced with a side-tone delay of 0.001090 second reading aloud five-syllable test material that their sound pressure level increased. These results are in keeping with those obtained using the fifty-syllable test material (see Appendix H). From the experimental evidence, shown above, it might be expected that more intelligible speech could be had since sound pressure level or intensity is an important component of intelligibility, with no decrease in the rate of speaking, if the subjects practiced talking with a side-tone delay of 0.001090 second.

Experimental Session B.

**Duration.** The third hypothesis under test was,
"There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)." In analyzing the data from Experimental Session B, a triple-classification analysis of variance was first used in which the measurements of the principal variables, test condition and test position, were treated. The variance attributable to test condition was non-significant (F, 2.83, d.f., 2 and 68). The variance attributable to test position was also non-significant (F, 1.80, d.f., 2 and 68). As was found in analyzing the data of Experimental Session A there was a highly significant difference in rate of speaking among the eighteen subjects during Experimental Session B (see Table XI).

Subordinate analyses, double-classification analyses of variance (see Table XII), indicated that there were no significant differences in duration from the onset of the experimental session to the end in any of the three test conditions. When the duration was measured under the three test conditions at the onset of the experimental session and the results were compared there were no significant differences (see Column 8,
TABLE XI

Summary of analysis of variance (triple classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th></th>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test Condition (C)</td>
<td>2</td>
<td>46,458</td>
<td>23,229</td>
<td>2.83</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>Test Position (P)</td>
<td>2</td>
<td>29,643</td>
<td>14,822</td>
<td>1.80</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>Subjects (S)</td>
<td>17</td>
<td>4,180,515</td>
<td>245,913</td>
<td>29.92</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>PXC</td>
<td>4</td>
<td>32,008</td>
<td>8,001</td>
<td>0.97</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>SXC</td>
<td>34</td>
<td>398,911</td>
<td>11,733</td>
<td>1.43</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>PXS</td>
<td>34</td>
<td>500,099</td>
<td>14,709</td>
<td>1.79</td>
<td>n.s.</td>
</tr>
<tr>
<td></td>
<td>PXCS</td>
<td>68</td>
<td>558,903</td>
<td>8,219</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>161</td>
<td>5,746,738</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE XII

Summary of two sets of analyses of variance (double classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>2,260</td>
<td>24,781</td>
<td>3,785</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>103,210*</td>
<td>121,055*</td>
<td>45,308*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>10,403</td>
<td>18,505</td>
<td>10,068</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>2,881</td>
<td>18,328**</td>
<td>14,577</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>71,981*</td>
<td>79,461*</td>
<td>123,600*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>3,390</td>
<td>5,339</td>
<td>21,480</td>
</tr>
</tbody>
</table>

* Significant (F) at 1% level of Confidence
** Significant (F) at 5% level of Confidence

Table XII). However, when the three test conditions were measured at the middle of the session, there was a significant difference in duration from condition to condition (see Column 9, Table XII). The differences in duration were non-significant among the three test conditions when they were measured at the end of Experimental Session B (see Column 10, Table XII).

When the measurements for a condition were pooled (for the three subjects of a group) and the summation score used as a basic measure in a double-classification analysis of variance, it was found that there was no significant difference in duration among the three test conditions when they were measured at the initial test position (see Column 3, Table XLV, Appendix I). When the measurements from the three test conditions were compared at the middle of the experimental session it was found that there was a significant difference in duration among them (see Column 4, Table XLV, Appendix I). However, at the end of the experimental session it was found that there was not a significant difference in duration among the measurements of the three test conditions (see Column 5, Table XLV, Appendix I).

Figure 5 indicates that there was a numerical increase, using Test Condition A, in the duration of the stutterers from the beginning to the end of Experimental
Session B. There was a similar increase in duration from the initial test to the final test with Test Condition B. However, with Test Condition C the duration was numerically less at the onset and the end of the experimental session than at the middle (see Table XIII). As a result of the above analyses, Hypothesis Three cannot be rejected, "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).

Sound Pressure Level. A triple-classification analysis of variance was next performed with the principal sources of variance being test condition and test position. The variance attributable to test condition was non-significant (F, 1.38, d.f., 2 and 68). Similarly the variance attributable to test position, the other principal variable, was non-significant (F, 0.87, d.f., 2 and 34). This would have been true even if the triple interaction variance had been used as the denominator in determining the F-ratio instead of the highly significant test position x subject interaction variance (see Table XIV).

The results of the analysis indicate that when the
TABLE XIII

Mean measurements of duration (sounds) obtained with three test conditions and at each of three times of testing during Experimental Session B.

Test Positions

<table>
<thead>
<tr>
<th>Test Conditions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled</td>
<td>1.34</td>
<td>1.36</td>
<td>1.41</td>
</tr>
<tr>
<td>Condition A</td>
<td>1.37</td>
<td>1.41</td>
<td>1.41</td>
</tr>
<tr>
<td>Condition B</td>
<td>1.33</td>
<td>1.38</td>
<td>1.47</td>
</tr>
<tr>
<td>Condition C</td>
<td>1.33</td>
<td>1.29</td>
<td>1.34</td>
</tr>
</tbody>
</table>
TABLE XIV

Summary of analysis of variance (triple classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>1,154</td>
<td>577</td>
<td>1.38</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>1,747</td>
<td>874</td>
<td>0.88</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>249,886</td>
<td>14,699</td>
<td>14.60</td>
<td>0.01</td>
</tr>
<tr>
<td>PXc</td>
<td>4</td>
<td>430</td>
<td>108</td>
<td>0.26</td>
<td>n.s.</td>
</tr>
<tr>
<td>SXc</td>
<td>34</td>
<td>5,051</td>
<td>149</td>
<td>0.36</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXs</td>
<td>34</td>
<td>34,838</td>
<td>1,007</td>
<td>2.40</td>
<td>0.01</td>
</tr>
<tr>
<td>PXcxs</td>
<td>68</td>
<td>23,493</td>
<td>419</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>320,999</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
group of stutterers had oral practice in the presence of a side-tone delay of 0.000678 second there was no significant change in the sound pressure level from the beginning to the end of the experimental session. Further analyses, double-classification analyses of variance, indicated that when the measurements obtained from the three test conditions were compared at the three test positions there was not a significant difference in sound pressure level from initial to final test of Experimental Session B (see Table XV).

Similar non-significant results were obtained when the three test conditions were measured and compared at the initial test position (see Column 8, Table XV), at the medial test position (see Column 9, Table XV), and at the final test position (see Column 10, Table XV). When the scores of the three subjects in each group were pooled and the pooled scores used as basic measures in analyses of variance, it was found that there was no significant difference in sound pressure level among the three test conditions at each of the three test positions (see Table XLVI, Appendix I).

The above analyses indicate that Hypothesis Four cannot be rejected: "There is no difference in sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A.
TABLE XV

Summary of two sets of analyses of variance (double classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>564</td>
<td>356</td>
<td>168</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>5,232*</td>
<td>5,107*</td>
<td>4,658*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>494</td>
<td>747</td>
<td>575</td>
</tr>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>204</td>
<td>265</td>
<td>323</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>4,420*</td>
<td>6,043*</td>
<td>8,956*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>177</td>
<td>165</td>
<td>266</td>
</tr>
</tbody>
</table>

* Significant (F) at 1% level of Confidence
tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second).

Figure 5 shows that plots of the mean measurements of duration and sound pressure level follow no single pattern (the measurements of the three test conditions) among the three test positions. Mean measurements of duration as measured by Test Conditions A and B increase numerically from initial to final tests while the mean measurements of Test Condition C do not. The mean measurements for the sound pressure level follow the same pattern as the measurements for duration (see Table XVI).

Experimental Session C.

Duration. The fifth hypothesis under test was, "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)." A triple-classification analysis of variance was performed in which the measurements of the main variables, test condition and test position, were treated. In this analysis the variance attributable to test condition was non-significant
TABLE XVI

Mean measurements of relative sound pressure level (bel) obtained with three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.90</td>
<td>1.86</td>
<td>1.82</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.91</td>
<td>1.82</td>
<td>1.81</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.86</td>
<td>1.86</td>
<td>1.78</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.93</td>
<td>1.90</td>
<td>1.87</td>
</tr>
</tbody>
</table>
(F, 0.88, d.f., 2 and 68), as was that of test position
(F, 0.13, d.f., 2 and 68). The secondary interactions
were also non-significant (see Table XVII). The analysis
showed no significant difference in rate of speaking when
stutterers have oral practice under a side-tone delay of
0.000356 second, from initial to final tests of the
experimental session.

When the three test conditions were compared
separately at the three test positions there was a
significant change in duration from test to test only
with Test Condition B (see Column 4, Table XVIII). Non­
significant differences in duration were found among the
three test conditions when they were compared at each of
the three test positions (see Columns 8, 9, 10, Table
XVIII). Similar non-significant results were obtained
with the pooled measurements, for three subjects, as
basic measures in an analysis of variance (see Table
XLIX, Appendix I).

Figure 6 shows graphically that the mean measure­
ments of duration for Test Conditions A and B decreased,
numerically, from initial to final tests (see Table XIX).
The mean measurements of duration for Test Condition C
increased numerically from initial to medial test posi­
tions and decreased from medial to final tests. However,
these differences in duration were not significant.
TABLE XVII

Summary of analysis of variance (triple classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>20,451</td>
<td>10,226</td>
<td>0.88</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>2,964</td>
<td>1,482</td>
<td>0.13</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>5,684,336</td>
<td>334,373</td>
<td>23.66</td>
<td>0.01</td>
</tr>
<tr>
<td>PX</td>
<td>4</td>
<td>35,158</td>
<td>8,790</td>
<td>0.75</td>
<td>n.s.</td>
</tr>
<tr>
<td>CXS</td>
<td>34</td>
<td>41,111</td>
<td>1,209</td>
<td>0.10</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>356,290</td>
<td>10,479</td>
<td>0.90</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXCS</td>
<td>68</td>
<td>793,301</td>
<td>11,666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>6,933,611</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary of two sets of analyses of variance (double classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>5,289</td>
<td>89,913*</td>
<td>6,539</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>112,086*</td>
<td>152,032*</td>
<td>82,333*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>10,633</td>
<td>9,677</td>
<td>7,780</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>18,164</td>
<td>1,409</td>
<td>\ 8,278</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>145,047*</td>
<td>94,795*</td>
<td>115,604*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>16,250</td>
<td>2,976</td>
<td>4,154</td>
</tr>
</tbody>
</table>

* Significant (F) at 1% level of Confidence
TABLE XIX

Mean measurements of duration (seconds) obtained with three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.39</td>
<td>1.37</td>
<td>1.37</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.42</td>
<td>1.37</td>
<td>1.36</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.43</td>
<td>1.36</td>
<td>1.42</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.32</td>
<td>1.39</td>
<td>1.34</td>
</tr>
</tbody>
</table>
However, the differences in duration as tested with Test Condition B were significant (see Column 4, Table XVIII).

Because of the results of the above analyses, Hypothesis Five cannot, using Test Conditions A and C, be rejected. "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; C. tested with a side-tone delay of 0.000356 second)." However, using a side-tone delay of 0.000678 second the hypothesis can be rejected with confidence.

**Sound Pressure Level.** The sixth hypothesis under test was, "There is no difference in sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)." As with the previous analyses, the first analysis made was a triple-classification analysis of variance. The principal variables were test condition and test position.

The variance attributable to test condition was non-significant (F, 0.06, d.f., 2 and 68); that attributable to test position was also non-significant (F, 2.01, d.f., 2 and 34). However, the latter would have been
significant had the triple interaction variance been used instead of the highly significant test position x subjects interaction variance, as the denominator for determining the F-ratio (see Table XX).

Further analyses (see Columns 3, 4, 5, Table XXI) show that when each of the three test conditions was compared at the three test positions, there was no significant difference in sound pressure level involved. This is surprising in that when Test Condition B was used in measuring duration there was a highly significant difference in duration (rate of speaking) from initial to final tests. A corresponding change in sound pressure level might have been expected. However, when the stutterers talked with a side-tone delay of 0.000356 second this was not the case.

When the three test conditions were compared at the initial test position, it was found that there was no significant difference in sound pressure level among them (see Column 8, Table XXI). When the three test conditions were measured and compared at the medial and final positions similar non-significant results were observed (see Columns 9 and 10, Table XXI).

When pooled measurements of sound pressure level (for the three subjects of a group) under the three test conditions were compared at each of the three test
TABLE XX

Summary of analysis of variance (triple classification): basic measures, relative sound pressure level (bel) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>27</td>
<td>14</td>
<td>0.0609</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>3,735</td>
<td>1,868</td>
<td>2.0086</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>215,750</td>
<td>12,691</td>
<td>12.2240</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>1,165</td>
<td>291</td>
<td>2.0638</td>
<td>n.s.</td>
</tr>
<tr>
<td>SXc</td>
<td>34</td>
<td>7,820</td>
<td>230</td>
<td>1.6312</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXs</td>
<td>34</td>
<td>31,630</td>
<td>930</td>
<td>6.5957</td>
<td>0.01</td>
</tr>
<tr>
<td>PXcXs</td>
<td>68</td>
<td>9,596</td>
<td>141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>269,723</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE XXI

Summary of two sets of analyses of variance (double classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>616</td>
<td>1,360</td>
<td>858</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>5,122*</td>
<td>4,110*</td>
<td>3,979*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>383</td>
<td>461</td>
<td>346</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>304</td>
<td>202</td>
<td>202</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>5,409*</td>
<td>4,279*</td>
<td>4,840*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>294</td>
<td>107</td>
<td>117</td>
</tr>
</tbody>
</table>

* Significant (F) at 1% level of Confidence
positions it is indicated by the analyses that there were no significant differences in sound pressure level among them (see Table LI, Appendix I).

Because of the results indicated above, Hypothesis Six cannot be rejected, "There is no difference in sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second, (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

Figure 6 indicates that there were numerical increases in sound pressure level from beginning to end of Experimental Session C when the mean measurements of each of the three test conditions were compared. These numerical increases were not significant (see Table XXII).

In summary, when stutterers have an experience of talking for twenty minutes with a side-tone delay of 0.001090 second there was a significant increase in sound pressure level from initial to final tests when tested with Test Conditions B and C. At the same time there was no significant change in duration. When the stutterers had an experience of talking for twenty minutes with a side-tone delay of 0.000678 second there was no significant change in either duration or sound pressure level. However, when the stutterers had an experience of talking
**TABLE XXII**

Mean measurements of relative sound pressure level (bels) obtained with three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.73</td>
<td>1.79</td>
<td>1.85</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.78</td>
<td>1.76</td>
<td>1.81</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.70</td>
<td>1.81</td>
<td>1.88</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.72</td>
<td>1.80</td>
<td>1.86</td>
</tr>
</tbody>
</table>
with a side-tone delay of 0.000356 second there was a significant decrease in duration from initial to final tests as measured by Test Condition B, with no significant change in sound pressure level. Similar results were observed when fifty-syllable test material was used to measure duration and sound pressure level (see Appendix H).

*Although the tests of the hypotheses did not require comparisons of the scores on the initial test from day to day, the reader may be interested in such comparisons. When the measurements of duration were compared among the first tests of the three days, it was found that the variance attributable to test condition was non-significant (F, 1.45, d.f., 2 and 34). Similarly, the variance due to day was non-significant (F, 1.34, d.f., 2 and 34). Similar non-significant results were obtained when the corresponding sound pressure level data was analyzed. It was found that the variance attributable to test condition was non-significant (F, 2.34, d.f., 2 and 34); attributable to day non-significant (F, 0.14, d.f., 2 and 34).
CHAPTER V

Conclusions and Recommendations

The statistical analyses that were summarized in the preceding chapter treated the effect of oral practice in the presence of three side-tone delays upon duration and sound pressure level of a group of stutterers as tested with five-syllable reading material in three conditions of side-tone delay. Six hypotheses were tested relative to any effect oral practice in the presence of three side-tone delays might have on duration and sound pressure levels of the speech of stutterers.

Two sections of Hypothesis Two and one section of Hypothesis Five were rejected as a result of the statistical analysis of the subjects' responses.

1. Hypothesis Two: "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

2. Hypothesis Five: "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (B. tested with a side-tone delay of 0.000678 second)."

The following hypotheses were not rejected:
1. Hypothesis One: "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

2. Hypothesis Two: "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second)."

3. Hypothesis Three: "There is no difference in the rate of speaking of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

4. Hypothesis Four: "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000678 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

5. Hypothesis Five: "There is no difference in the rate of speaking of stutterers who have practiced
reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; C. tested with a side-tone delay of 0.000356 second)."

6. Hypothesis Six: "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.000356 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

Similar results were obtained with fifty-syllable test material except that these tests permitted the rejection of all sections of Hypothesis Two, "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second) (see Appendix H)."

The non-significance of a majority of the results may be due to: (A) the side-tone delay times used, (B) the length of time of oral practice, (C) the differing amounts of speech therapy undergone by the subjects previous to this experiment, (D) the type of material used for testing changes in duration and sound pressure level, (E) the conditions (side-tone delays) under which the subjects were tested.
Significant differences in sound pressure levels were obtained only when the stutterers had oral practice with a side-tone delay time of 0.001090, the maximum delay time used in this study, and the one which most closely approximates one of the "normal" side-tone delay times. A significant difference in rate of speaking (duration) was found only when the stutterers had oral practice with a side-tone delay of 0.000356 second and tested with a side-tone delay time of 0.000678 second. This side-tone delay time (0.000356 second, used for the oral practice session) was the minimum delay time used in this study and closely approximates the minimum time of sound propagation from vocal cords to cochlea via bone conduction as found by Stromsta (63).

It is interesting to note that changes in sound pressure levels occurred when the stutterers had oral practice in a side-tone condition which approximates "normal speaking experience" and that changes in duration occurred when the propagation times of the air-conducted and bone-conducted side-tones were approximately equal.

The subjects in this study varied significantly in duration and sound pressure levels from the beginning to the end of an experimental session. It was observed that during the entire experiment three of the subjects (one in each of groups 1, 3, 4) evidenced stuttering spasms of
mild severity, the rest of the subjects had few stuttering spasms. Two of the subjects showed (judgment by the investigator) greater severity in their stuttering spasms after the three experimental sessions were experienced. This may have been caused by: (A) type of reading material used, (B) manner in which material had to be read, (C) amount and type of speech therapy experienced previously by these two subjects.

During this investigation several possibilities for future research became evident. Some of these were:

1. What effect would different sound pressure levels of delayed side-tone have on the duration and sound pressure level of speech.

2. Would duration and sound pressure level of normal speakers be influenced in the same way as the stutterers, if given the same conditions of oral practice as in this study.

3. What effect would periods of oral practice with other side-tone delay times (longer delay times) have on the duration and sound pressure levels of the speech of stutterers and normal speaking individuals.

4. What effect would greater or less oral practice time with the side-tone delay times used in this study have in determining the duration and sound pressure levels of stutterers and normal speaking individuals.
5. What part would oral practice with spontaneous speech practice, with these side-tone delay times, play in determining duration and sound pressure levels of stutterers and non-stuttering individuals.

6. What effect would the experimental sessions of oral practice, as used in this study, have on the duration and sound pressure levels of the speech of stutterers who had no speech therapy.

7. What effect would oral practice by normal speakers using the same side-tone delay times, as in this study, have on their intelligibility.

The method of experimentation and the materials used in this study have many applications. Some of these are:

1. Evaluation of different types of therapy for stuttering.

2. The practice material used in this study could be used as supplementary material in therapy for stuttering.

3. To study effects of long and short periods of practice with different delay times of side-tone and different types of equipment upon the duration and sound pressure level of the speech of speech defectives and normal speakers.
4. To study effects of long or short periods of practice with different delay times of the side-tone and different types of equipment upon the intelligibility of speech defectives and normal speakers.
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19. Frederick W. Brown, "Personality Integration as the Essential Factor in the Permanent Cure of Stuttering," Mental Hygiene, XVII (1933), 266-277.


REFERENCES (Continued)


REFERENCES (Continued)


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REFERENCES (Continued)


REFERENCES (Continued)


APPENDIX A

PRACTICE MATERIAL NUMBER ONE (X)
Please note pages 100-206 are not original copy with some disappearing print. Filmed as received from The Ohio State University.

UNIVERSITY MICROFILMS
A... Westinghouse has named the smallest, most compact of its new line of radios, the little jewel. For into a superbly styled case of jewel-like plastic, Westinghouse engineering has built a radio set that has all the brilliance...the jewel-like quality of tone, that you'd expect only in larger console radios. Like all the now Westinghouse radios now in production, it embodies many war-born improvements pioneered by Westinghouse and exclusive in the now Westinghouse line of radios; In the amazing Little Jewel, clever new cabinet construction plus an extra-large compensated speaker give you big-set performance and tone...a console radio in capsule form. It's portable, of course! You can carry it from room to room. There's even a clever disappearing handle to make carrying still easier. Even if you have a larger console model for the living room, you'll want one of these superb new Westinghouse Little Jewels for an extra set—for the kitchen, bed room, play room, or the children. Wait for the new Westinghouse radios - at your dealers soon!

*****

C... I'll bet anything that you pride yourself on getting the most for your food dollar! So, when buying package soup, remember—you get so much for so little with Betty Crocker Vegetable Noodle Soup Ingredients. So much soup...and such good soup, too...for so little money! Now, each red-and-yellow package of the Betty Crocker Vegetable Noodle Soup Ingredients makes six big bowls of soup...six generous bowlfuls...more then twice as much soup as you get from the average size can. And there's so little work making vegetable noodle soup at home the Betty Crocker way. Just dump the Betty Crocker Soup Ingredients into boiling water...add fat or meat drippings...then let simmer. Yes, you get so much...for so little; with Betty Crocker Vegetable Noodle Soup Ingredients. So much soup...and such good soup...for so little money and work. Today, tell your grocer, "Make it three for me. Three packages of the Betty Crocker Vegetable Noodle Soup."

E... American diplomats in China are doing a hasty job of packing up for the trip home.

State Department officials in Washington say the 135 American employees in the five Consulates maintained in China have started applying for exit visas—hoping the Chinese Communists won't place any stumbling blocks in their paths toward home. The State Department yesterday ordered all American Consulates in China closed after the Communists seized the American Consulate at Peiping.

Meanwhile, informed diplomatic quarters in Washington say a "Little Marshall Plan" for Southeastern Asia is shaping up as the administration's answer to Communist seizure of China. The Asiatic Plan is now being drafted in the State Department. It differs in detail from the Marshall Recovery Plan in Europe—but it has the same basic aim...to stop Communist expansion by building up the economic strength of free nations in the path of Red advance.
Nations said to be ear-marked for United States support are India, Pakistan, Siam, Indo-China, Burma, and Indonesia. Administration officials believe most of the needed economic aid can be given under President Truman's program of helping underdeveloped areas.

Almost everybody, I guess, feels extra good on bright, sunny, clear fall days. Just sorta feel like struttin' around and beamin' at the world, don't you, when the air is so fresh, the sky so blue? Well, now, I hope you men will be smokin' the pipe tobacco that matches that mood—meanin' Prince Albert, of course. Because in Prince Albert you have sunny, happy, rich flavor to make your bright mood even brighter. You have cool mildness that's really something special in pipe enjoyment, as any Prince Albert smoker will tell you. Yessirree! You know, Prince Albert's rich-flavored, choice tobacco is specially treated to insure against 'tongue bite'—crimp cut to burn slow and even to smoke cool. More pipes smoke Prince Albert than any other tobacco...because it's specially made for smoking pleasure so—if you're not smoking Prince Albert now...join all those other happy smokers...Get P.A. ...The national joy smoke!

From all over comes praise for that grand Sealtest Dessert-of-the-Month...and no wonder; just picture an individual tart shell filled with luscious Sealtest Vanilla ice cream covered with a puree topping of crushed red-ripe juicy strawberries and decorated with a scalloped edge of real whipped cream. Four individual tarts are packed in a carton ready to take home—or you may order individual tarts at fountains and restaurants. Enjoy them often all this month, just ask your Sealtest dealer for Ice Cream Strawberry Tarts—the Sealtest Dessert-of-the-Month. During October, Sealtest is also featuring a thrilling new Ice Cream Flavor-for-the-Month. It's butter crunch ice cream—a creamy-smooth Sealtest Ice Cream with delicious morsels of crisp butter crunch candy blended all through it. Just try that on your palate. The name again—isButter Crunch Ice Cream—the Sealtest Flavor-of-the-Month.

It's more than a local need this year...It's a need from the four corners of the earth... The Community Chest has a tremendous job to do...Give it every possible help; every possible penny you can spare...Give now to your local branch of the Community Chest...It's a vital part of the war effort. Brighten your living room with small changes...Maybe the cigarette boxes would cheer up the table if they were Duco Tied Flame...or maybe just your initials in Duco Silver would do the trick...Paint stripes or waves of curlicues on your lamp shades...Find out what you can do with a paint brush and Duco! Your House of Dreams is worth your most careful planning...Every room should reflect contented living and pride in your home...The Home Decorating Shop can help you secure the right results...If you are planning a House of Dreams, drop in and let us help you.
Mr. McBurney: We welcome to our Reviewing Stand microphone today Mr. Bentley McCloud, President of the First National Bank of Chicago; Mr. Neil Jacoby, professor of finance at the University of Chicago; and Mr. Harry Guthmann, professor of finance at Northwestern University.

Immediately following V-J Day our government stopped all Lend-Lease shipments to our Allies. This action precipitated, almost immediately, requests for loans and financial assistance from the countries which have benefited by these Lend-Lease agreements. The most urgent requests came from England; and much of the debate concerning the wisdom of emergency loans has centered around this British request.

I think we ought to begin this discussion by clarifying our responsibility under Lend-Lease. Mr. Jacoby, do you think we were justified in cutting off all Lend-Lease assistance as soon as Japan surrendered?

Mr. Jacoby: Yes, McBurney, I think we were so justified. Lend-Lease is a weapon of war. It was adopted as such by the Congress, and Mr. Stettinius made it perfectly clear that Lend-Lease was not a loan or a gift but a measure adopted in the interests of the people of the United States to throw their resources into a common pool for the winning of the war; and when the war was over Lend-Lease should cease along with other wartime weapons and some new method of financing international trade should be found.

Mr. McBurney: The British apparently did not take quite that position, did they, Guthmann?

Mr. Guthmann: It seems to me that the reason why the British may have had a technical complaint is that Lend-Lease was ended with the coming of V-J Day whereas practically all of our other legislation of a wartime character is still continuing in force by virtue of the fact that the President has not proclaimed the official end of the war and Congress has taken no such action. Until that time, the British might argue that Lend-Lease should continue in view of the fact that the war is not technically ended.

Mr. McBurney: Then, quite apart from this matter of the technical end of the war, the British might argue that they still have large armies in the field and important financial needs growing out of the war, even though the hostilities are formally over. Isn't that the case, Jacoby?

Mr. Jacoby: Well, it is certainly true that the cessation of Lend-Lease has confronted the British and ourselves with the need of devising some new kind of peacetime arrangement for providing Britain with the food and the goods and services she needs in the very difficult transitional period that she faces. But that was a problem that I think the British could foresee as well as ourselves.
And while a sudden cutoff may have been embarrassing, it has precipitated action that we are now seeing in Washington with the meeting between Lord Halifax and Keynes and Under Secretary Clayton and others.

Mr. McBurney: Which raises the question, I think, precisely what does England want? What is she after? How much money is she asking for, McCloud?

Mr. McCloud: Between five and six billion dollars at the present time.

Mr. McBurney: And do we face similar demands from our other Allies, France, Russia and others?

Mr. McCloud: We don't know what France or Russia desires at the present time. My guess is that they will probably want large amounts, approximately the same figure.

Mr. Jacoby: China also, McCloud.

Mr. McCloud: Yes, and we'll also receive requests from the Scandinavian countries, Belgium and Holland, and some of the other countries. Of course, in the case of Belgium and Holland and France, I think they have a large amount of earmarked gold in this country, and their citizens also have a large amount of American securities which could be borrowed by the government and pledged to their loans with us. To that extent I don't think those loans will be such a problem as the loans to England and China and some of the other countries.

Mr. McBurney: Are we talking here about ten billion in loans, fifteen billion? About what is the over-all figure, Jacoby, or is there any way of getting at that, at all?

Mr. Jacoby: I don't think anyone can do more than guess at this stage, McBurney; but the British are asking up to six billions; the Russians have asked for several billions; China has put in a bid for four or more billion. If we add up these requests, we can easily get up into astronomical figures. But I don't think as a practical matter, we will be in a position to export the goods in the next few years that all of these requests will require.

Mr. Guthmann: Actually, the immediate need will be much less than that. In the case of Britain, probably two billion would meet their immediate need. This larger amount of six billion might extend over a period of six years or more. So our problem is how to care for the immediate emergency. Indeed, we have some institutions which are prepared to care for some of these needs on an international basis.
Mr. McBurney: The main question we have before us is the wisdom of making such loans. How do you men feel about this? A recent Gallup Poll showed that about 60 per cent of the American people oppose making the kind of loan to Britain that we're talking about. Do you share that opposition, McCloud?

C.

Mr. McCloud: With all due respect to the intelligence of the American people, I disagree with the results of the Gallup Poll. I certainly think we have a moral obligation to give every consideration to England's request for a loan. They were our Allies in two world wars. They stood alone in 1940 after the fall of Dunkirk when it looked as if Hitler were going to overrun all of Europe. The people took a terrific bombing of their homes. The British Navy stood between us and the fighting of Germany at that time. I think if England had not given us a breathing spell, or if England had fallen, it would have been very difficult for us to fight Germany and Japan alone. And on that ground I think they have a distinct moral claim on us.

Now look at it from another point of view, as a part of our domestic economy. In normal times, about 10 per cent of our trade represents exports. In the cotton industry alone as high as 50 per cent of the cotton product is exported. England in normal times has been a very large purchaser of these goods. If we do not give consideration to these loans and give them some assistance, we may shut off this purchaser, and if we do, it may result in a declining economy. It may mean that the prices of these goods will decline; it may mean a lower standard of living; it may mean an economic depression that might set in later on.

Mr. McBurney: That's a clear statement of your position. You are putting it both on moral grounds and on the grounds that it will help our own economy. Do you share that view, Guthmann?

B.

Mr. Guthmann: I have the feeling that British leadership and British periodicals have laid too much emphasis on the first argument of McCloud's—the equality of sacrifice.

Mr. McBurney: The moral argument?

B.

Mr. Guthmann: Yes, the moral argument. I feel that in a political situation of this sort the best argument is to appeal to the self-interest of the person you are working on or with, and it seems to me the second argument is the one that should be emphasized in presenting the matter to the American public. In view of the fact that Britain and France have been our Allies and may continue to represent that position in the European picture, I think it is tremendously important in looking forward into the future that we should restore them economically and politically. After all, after the last war we weren't very successful in settling the problem of Germany. It may very well be that after this war we will not be any more successful with either Germany or Japan. In that case, I think we would feel much safer if England and France in Europe,
and China in the Orient were restored in strength. And consequently, it seems to me we have a practical stake in reviving their economies.

Mr. McBurney: I want to know gentlemen, how is this going to affect our own economy here at home. Do you have an opinion on that, Jacoby?

Mr. Jacoby: I'd like to add to what Guthmann has said that we have a long run interest, certainly in world peace. And one of the best ways to assure world peace, not the only way, but certainly one of the roads to peace, is to try to reconstruct the economic systems of England and of the rest of Western Europe to prevent frustration and discontent and a feeling of injustice that will certainly ferment another war. Now, our stake in world peace can be measured in money, in terms of cutting down the amount of funds we're going to have to tax ourselves each year for armaments. And I think to the extent that we take a long range statesmanlike view on loans, it will help other countries get on their own feet, we will be able to cut our own armament bills, and our own tax bill as a result will be less.

Mr. McBurney: Let me ask some questions about the immediate effect on our own economy of making the sort of loans you are talking about. In the first place, won't that have a very definite inflationary effect on our own country? I really ask two questions: First, would it have an inflationary effect; and second, will it necessitate the rationing of goods in this country, or at least accentuate shortages if they are going to spend six billions here in America?

Mr. Jacoby: I'd like to answer that, if I may, McBurney. It seems to me it would have an anti-inflationary effect. What I mean is this: We exported fourteen billion dollars worth of goods during these war years—most of which was Lend-Lease. The chances are those exports would fall to very much lower level unless the foreign countries are placed in a position to receive the goods. And this loan would be a method of keeping that flow moving.

Mr. Guthmann: In view of the shortages that we face I wouldn't regard that as too important in the immediate future. Eventually I feel that the restoration of these European markets can be very important to us. I think though for the short run, we would have to admit that the immediate export of either capital goods or food is likely to have some inflationary tendencies, but I don't think we ought to exaggerate those tendencies. After all, if we loaned as much as five billion to the Allies, we ought to compare that to the amount we have been spending—more than a billion dollars a week—on the war. It seems to me that the real factors that will make for inflation in America are domestic factors. Our handling of our domestic problems will be
far more important in determining whether or not we have inflation than what we do about these loans to our Allies.

A. Mr. Jacoby: I agree with that.

M. Mr. McDurney: But we are putting England in the market to the tune of about six billions to buy the sort of things we want to buy.

C. Mr. McCloud: I think you will find that the English people are not going to use this money to buy refrigerators. They are going to use it to rebuild their industries and get back into shape, to develop import and export trade, and not to use it for socialization. And I think you're going to find they have a lot of common sense over there. They are going to build up their industries and improve the condition of the people. They have a very low standard of living. The wages are down. Everything is very bad over there at the present time, and they haven't any money to buy luxuries.

A. Mr. Jacoby: I think, McCloud, we ought to recognize rather frankly that if the United States is going to make large loans to finance the reconstruction of the devastated areas of the world, including China and the countries of Western Europe as well as England, we may prolong the period of shortages for some kind of commodities, for example, railroad equipment. The transportation systems of Europe and China have been bombed out of existence, virtually. They need a great many rails and so forth. Our railways also need these things. And those items are likely to be short for a longer time if we decide to lend other countries the money to buy them. That is just a condition we ought to face very frankly.

M. Mr. McDurney: And you gentlemen are willing to embrace that condition in recommending that these loans should be made?

G. Mr. Guthmann: Yes, although I feel, McDurney, that when it comes to items of food that I would prefer, as far as possible, that British needs for food be obtained from channels through which they obtained food before the war.

A. Mr. Jacoby: You would rather see the Canadians ration meat?

G. Mr. Guthmann: Yes, for a very good reason of practical politics. It will make it harder for us to achieve this assistance which is necessary. I don't think delaying new railroad equipment will have quite the same effect politically. And after all, the Canadians themselves have gone on a strike over the rationing which has now been put into effect so that they may give some meat to England for the coming winter.
Mr. McBurnoy: In relation to what McCloud said a minute ago, when we are asked to make a loan to England, do you think we should be concerned with England's internal economy—the plans of her Labor government to socialize railroads, mines and land? In other words, are we being asked to underwrite rather expensive British social reforms, or at least potentially expensive, British social reforms?

C. Mr. McCloud: No, I don't think we should be concerned with England's internal policy. I think the matter of socialization of the Bank of England and the mines and British railways is their own business, but I do think that we should be certain that they do not use this money for that purpose. And I'm sure they will not. We can work out that arrangement with them.

A. Mr. Jacoby: And too, I think we should insist that the British not use the proceeds of our loans to pay off their own debts to various other countries that have supplied Britain with good during the war and now have claims on them for around fourteen billion dollars. We would merely be substituting ourselves as creditors for other countries. We should insist that the proceeds of any loan we make should support it, and that the money should be used to rebuild Britain's shattered industries.

M. Mr. McBurnoy: Now we are beginning to discuss the conditions under which these loans should be made, if they are going to be made. And I assume we are still talking about these emergency loans that need to be made within the next year or two, if not immediately. Who is going to make these loans, McCloud?

C. Mr. McCloud: In the mechanical end of it, the only agency set up is the Export-Import Bank. Congress recently approved the increase of the capital of the Export-Import Bank to three and a half billion dollars. This bank at the present time is already making loans to South American countries—long term loans at low rates of interest, at approximately 4% per cent. In most instances they are selling these loans to not 1½ per cent to commercial banks; and, on the other hand, the commercial bank has the right to request the Export-Import Bank to take up the loan on demand any time within 30 days. And that's the reason it makes a spread on the difference between 1½ and 4% per cent.

M. Mr. McBurnoy: Now this Export-Import Bank is a government-owned bank, is it?

C. Mr. McCloud: It is a government loan. To that extent it is government-owned. The only other mechanism that might be set up is this Bretton Woods International Bank, but it will probably take at least another year to get all the countries to agree to that, and it may take longer to set up the Bank. Obviously when that Bank is set up—it will have a capital of around nine billion dollars, of which we will own apparently
one-third. If that Bank is set up, it is obviously the Bank's responsibility to make these loans because the risk is shared by other countries.

The third method that might be used would be for Congress to appropriate certain sums to be loaned under certain instructions, and they could be made by the Treasury Department.

Mr. McDurney: And isn't there really a fourth possibility, that is, loans through private corporations? Or don't you wish to entertain that possibility?

Mr. McCloud: I think we should leave that out for the present.

Mr. McDurney: How do you feel about that, Jacoby?

Mr. Jacoby: I should like to say that as far as this loan to Britain and perhaps other loans to France and China are concerned: it is scarcely possible to think of private American corporations making loans to private individuals or foreign governments. They will necessarily have to be loans of the government of the United States. But, in the longer run, as we look over the years ahead, we should visualize for this country a very important position as an international investor, because we are a rich country. We will have capital goods available for export, and I should like to see as much as possible of that investment occur under the control and with the initiative of private individuals and American corporations.

Mr. McDurney: That's in the longer run?

Mr. Jacoby: Yes. For the immediate situation I think we have to look upon the American government as the lender.

Mr. Guthmann: I think we shouldn't minimize the risk that follows these loans. After all, after the last war the United States treasury made heavy advances to our Allies, the chief of which were Britain, France, and Italy. A total of some ten billion dollars of these loans still remains unpaid. And we had loans similarly that private investors made abroad, loans made to Latin American countries. There are still two-thirds of these in default. So, for that reason, I think we ought not to blink at the fact that there is considerable risk here, that if we are going into them, we should go into them with our eyes open and believe that there are indirect benefits such as world cooperation and hope for peace that may grow out of this. Undoubtedly if we handle the matter carefully, we should be able to get tangible, or rather indirect, benefits such as smaller budgets for armaments which will compensate for the risk we are taking.
A.- Mr. Jacoby: Guthmann, I think I agree with you, but I'm not sure. I think we ought clearly to distinguish loans from gifts, or loans from Lend-Lease. Lend-Lease is over. That was a way of winning the war. From now on the credit the United States extends ought to be extended under conditions where we feel reasonably sure of payment. And that means among other things, that the rate of interest ought to at least compensate our government for the rate of interest it has to pay for money, and that we should insist on the expenditure of the foreign loan by the debtor country in a way that will increase its productivity and the debt-paying ability of that country. Just as a banker who lends a business man money in this country insists on looking at that business man's balance sheet and insists that the money borrowed shall be used to increase the stock of goods or the debt-paying power of the business. That is, they ought to be business loans.

B.- Mr. Guthmann: I don't agree with their being ordinary business loans, and I think that is one of the points on which there is the sharpest disagreement at Bretton Woods. It is true we ought to be cautious; we ought to be careful in making these loans, and know what the purposes of the loans are. But never-the less, I think we would be doing less than justice to our American public if we didn't recognize that on the basis of the record there have been these losses. But we ought to feel that there are strong arguments for making them in spite of that fact, and there are other compensations to the taxpayer.

M.- Mr. McDurney: Mr. McCloud?

C.- Mr. McCloud: Speaking of the banking business, there are two classes of loans: the loans to our customers, and the other is what we call pro bono publico.

M.- Mr. McDurney: What was that?

C.- Mr. McCloud: Pro bono publico loans.

M.- Mr. McDurney: Will you tell us about that?

B.- Mr. Guthmann: Were those the loans that broke our banks?

C.- Mr. McCloud: They were the kind that rescued some of the banks from difficulties. For instance, you remember back in 1932--some of our banks both here in Chicago and in other cities were in danger, and the banks in Chicago and elsewhere were called upon to help those banks. Well, in helping them, we were more liberal in our attitude than we were in the regular current commercial loans. We realized there was a great element of risk in making those loans. Nevertheless we felt that it was to our own selfish interest that these banks did not go down. And that, I think applies to credit conditions and credit terms to Great Britain. We should consider very carefully the wisdom
of making liberal loans to them even if there is a prospect of some loss. We might very well have more loss in the long run if England went off the gold standard, and had a lot of other troubles over there.

A. Mr. Jacoby: Furthermore, McCloud, I think we ought to regard Britain as a good risk. Great Britain has had a very long experience in making and selling goods throughout the world. They have merchandising know-how, they have great skill in shipping. And I think that once their industries are back in the modern productive state they are going to produce and sell goods in sufficient quantities to enable them to repay the loan we make. Britain is not a bad risk, although I concur with Guthmann that any loan involves some risk.

B. Mr. Guthmann: Yes, in all fairness we should say that Britain, Sweden and Norway, when they borrowed from private investors, paid back every penny, together with interest, before the end of the decade.

A. Mr. McBurney: You remember, McCloud, your point of a moment or two ago that we ought to move in the direction of carrying these loans through an international bank contemplated by the Bretton Woods Conference. Are you gentlemen in agreement with his recommendations there? How do you feel about it Guthmann?

B. Mr. Guthmann: Yes, I feel that we should purposely make these current loans as small as possible with the idea of inducing the various countries to adopt this scheme, which we have now adopted, as soon as possible. In this way we can end these loans and put them on a cooperative basis.

A. Mr. Jacoby: It seems to me that the Bank of Reconstruction and Development, which was proposed at Bretton Woods, is an excellent institution and one to which all countries ought to subscribe. One of its great merits, as I see it, is the principle of mutual insurance. Every country which is in the Bank shares the risk of any given loan. And another advantage of it is that the Bank shall only make or insure loans that are used for productive projects. We are not going to have a lot of lending hereafter if the Bank goes into effect, to build opera houses on the Amazon River, but loans made to provide factories.

M. Mr. McBurney: I take it you are not in sympathy with opera houses on the Amazon River.

A. Mr. Jacoby: Not at this stage.

B. Mr. McBurney: Well, how to pull this together a bit, what conditions would you impose on these loans? We have suggested some of them, I think, one being that we see to it that this money is put into productive assets.
Mr. Guthmann: Namely, that they should be used for productive purposes. English mines should be run efficiently. English factories ought to be rebuilt. New machinery should be introduced. Railway equipment ought to be bought. The British need the money for ships, in order to take their own place on the seas. And those purposes are purposes which mean productive loans which make it possible for the borrower to pay the loan back.

Mr. McBurney: Well I think this panel is pretty much agreed that it would be wise for this country to extend credit to our Allies. These loans should be made on a business basis with the assurance that the money will be invested in productive assets, as Guthmann has just pointed out. Initial loans must be viewed as emergency credit. As soon as possible it would seem wise to handle such loans through the international bank provided for at Bretton Woods. I think that has been McCloud's point. It is our opinion that an intelligent lending policy can be of real political and economic help to us.

Chopin's music is mostly for piano. Unlike the other great masters, he confined his efforts almost wholly to this single branch of music. His concertos and dances with orchestra are practically piano works with an instrumental accompaniment. His piano trio and 'cello sonata are not among his best works. His songs are sometimes lightly joyous, like "Were I a birdling" but in some instances they are tinged with wild power. Anything connected with his native land moved Chopin to the depths of his heart. An example is found in the song "Poland's Dirge" which is a gloomy threnody of the strongest intensity.

In his piano work as a whole, Chopin introduced the idea of embellishments and refinements, not in their seventeenth-century forms, but as episodes or connecting links in the melodic structure. Little runs, or passages of several grace-notes together, take their place in the design of the piece, and give it an exquisite charm. With Chopin everything must be made poetic and full of feeling. This result is attained in part by the proper use of rubato and pedals, and for the rest by interpreting and expressing the sentiment that glows in the music itself. Chopin has been called with justice "the poet of the piano."

Haydn's style was not that of a Beethoven. The earlier composer did not scale Olympus, nor talk in the accents of gods. His utterances consisted rather of unaffected bits of cheerfulness. Some of his symphonies seem rather artless and naive when judged by modern standards; but they still hold our interest. They have sufficient vigor and virility to prevent their directness from becoming too simple in effect. There is strength as well as optimism in Haydn's music. It has its own beauty, too, though its charms are those of a simpler harmonic
system than that used by the more recent orchestral colorists. For a time it was customary to call him “Papa Haydn”, and sneer at his simplicity; but his works still show the charm of refreshing directness. At the time of their composition, they were of value as pioneer work in the orchestral field. Even Beethoven followed the Haydn models at first. Wilhelm Richard Wagner was born at Leipzig on May 22, 1813. After he became well-known, he omitted the “Wilhelm” permanently. His mother, widowed before his birth, married the actor and artist Ludwig Geyer, the family moving soon to Dresden. Some have thought that Geyer was really Wagner’s father, though the evidence seems against the idea. The little Richard was a spirited, warm-hearted boy, with a taste for reading fairy tales. He showed no musical aptitude at first. Geyer, on hearing him pick out a tune that his sister had played, asked himself, “Has he, perhaps, a talent for music?” But Geyer died before having his question answered. It was not until 1827 that a hearing of Beethoven’s symphonies and Weber’s operas aroused Richard’s love of music. His studies with Theodor Weinlig, at Leipzig, resulted in the composition of sonatas, overtures, and even a symphony in C; but these works were nearly all pedantic and uninspired.

A.— With Haydn the sonata took shape at last. The form was no longer experimental, as in the hands of Galuppi, Paradisi, or Bach’s sons. It had at last crystallized into something definite, which Haydn and Mozart used, and which Beethoven brought to a grand culmination. This form is described in the section on “Musical Form,” in this work; but one may state here that its excellence depended on the two artistic principles of balance and contrast. The three or four movements forming the sonata or symphony or other work in sonata form were in contrasted style, and in so far were an outgrowth of the old suite movements. The sonata allegro form, upon which so many movements or portions of orchestral works are built, shows three main divisions,—themes, development of a new musical structure from the thematic material, and a return of the themes. The first and second of these themes were usually well contrasted, the former being bold, while the latter was often tender and lyrical; and a short closing theme followed them. While the sonata allegro had its recognizable divisions, its chief strength lay in the fact that it did not hamper composers. The great sonata writers, especially Beethoven could create the most powerful and dramatic music while keeping strictly to the prescribed outlines of the form.
The poultry and egg national board is now carrying on an intensive campaign to increase the consumption of eggs. Their argument truthfully says "eggs supply about the best balanced protein commercially available. Eggs provide what might be called standard protein."

They further argue that "each new horizon of nutritional knowledge more clearly reveals the true significance of eggs as supplies of food values that contribute to better control of disease, greater vigor and longer life. With an average per capita consumption of 376 (up 26 per cent from 1935-39) eggs are providing greater percentages of total nutrients to modern day diets than ever before.

For instance, protein of particularly high quality and biological completeness is one of the chief virtues of this universally popular foodstuff. Properly prepared whole eggs, at low levels of intake, may approximate a biological value of 100.

Their educational literature also states eggs rightfully served then, as one of the most wholesome, appetizing, economical and conveniently available sources of this vital nutrient. Too, in addition to proteins of high biological efficiency, eggs are sources of important vitamins such as those of the B-complex, A.D.E.; Pantothenic Acid and Choline as well as iron, phosphorous, calcium and copper.

In infant feeding eggs have an important place. As with other foods, the initial feeding should be small and the amount gradually increased until a whole egg is taken. It must be remembered, however, that the white of the egg is often responsible for allergic manifestations in infants. For this reason, in families where there are other members with an allergy, it is wise not to introduce any egg into the diet of the child until he is 8 or 10 months old. By this time, his intestines will be much better prepared to handle the egg without developing an allergy to it. Whenever egg is started it should be begun by using very small amounts, the size of a pea and increased slowly provided there is no evidence of allergy. When an egg allergy exists we have to substitute milk, cheese and meat for the egg.

Just how our arteries harden step by step is not known but several investigators have emphasized the role that too much cholesterol may play in causing it. Cholesterol, one of the higher alcohols found in butter, lard, suet and other animal fats, in cream, fatty fish, fish roe, oysters, liver, kidneys, brains, sweet breads, goose, duck, sausage, pork, bacon, in
fact all fats and egg yolks. Hardening of the arteries can be produced quite regularly by feeding experimental animals a diet high in this cholesterol. The histories of so many persons who have acquired the disease reveal all of their young life they ate a great deal of eggs, sour cream, butter, ice cream and milk up to three pints a day. As yet, however, there is no clear evidence to show that low-fat, cholesterol poor diets will prevent arteriosclerosis or its complications in man.

B. It is beginning to be clear nevertheless that some individuals cannot handle cholesterol. They seem to be in the same fix toward this higher alcohol as the diabetic patient is toward sugar. If this is true, then it would seem possible that there is a catalyst missing or at least in poor supply — just as there is a deficiency of insulin in the diabetic. So until this catalyst can be located and prepared for injection into these people as a supplement, it seems wise to advise them to go very lightly on the fatty foods. (The cholesterol is very soluble in the fat and that is why it is carried in the fats).

So we say to those persons who have white cysts in the corners of their eyes (cholesterol containing cysts they are) "you better go slow on the fats!"

A-B-C. And because hardening of the arteries tends to run in a family (unison) whether this is due to inheritance or food habits one cannot say but one can say that it would seem smart for them to avoid cholesterol containing foods. The same advice goes for the stocky type with the bull neck physique. They are so prone to develop arteriosclerosis they too would do well to avoid the fatty foods with their attendant cholesterol.

The patient with gallbladder disease also comes into this picture. In recent years scientists have given us physicians a dye which, when the patient takes it, it goes thru the intestinal wall and is taken up by the liver. The liver in turn secretes it into the bile duct and of course a good deal of the dye finds its way in this manner to the gallbladder where much of the water is taken out of the bile and in a proper concentration this dye then becomes opaque to the X-ray. Hence, when everything is working satisfactorily and normally the next morning after this dye has been taken, the gallbladder casts an excellent shadow on the X-ray plate. Sometimes when gall stones of sufficient size are present and they themselves are not opaque to the X-ray they make holes or lighter areas in the gallbladder shadow and so their presence can be detected. After these pictures are taken the patient is sent out to get a meal rich in fats and incidentally in cholesterol. Such a breakfast consists of cream and eggs and it immediately stimulates the gallbladder to contract and thus empty itself of the opaque material. So another X-ray picture taken some
four hours later shows a much smaller or completely empty gall-bladder. Sometimes these pictures will reveal a stone now that all of the dye except that coating the stone has been removed. Less frequently, the stone itself has enough lime in it to be opaque to the x-ray on its own.

B. Now it ought to be pointed out that most gall-stones are rich in cholesterol. This cholesterol along with other minerals are deposited on a nidus or a "seed". This "seed" may be a group of bacteria. We used to think a few years ago that it always was. This was because when typhoid fever was a common disease, its victim frequently developed gall-stones some years later and our bacteriologists found the typhoid germs in the center of the gall-stones. Then we passed into the vitamin era and we learned that when the patient is short in Vitamin A his skin and his mucus membranes become unhealthy and stones may form in both the urinary and biliary bladder as well as the kidneys.

A. The dead cells roll up in little balls like those of skin when the infrequent bather washes his body. The clump of epithelium may well form the center of a stone. So now we do know that those individuals who have a full supply of vitamin A are less likely to develop gall-stones than one who is deficient in this vitamin. This vitamin is in our green and yellow fruits, vegetables, milk, butter and eggs.

So, shall we eat eggs to prevent the formation of stones or shall we refuse to eat eggs because we do not wish to contribute to the formation of the stones with a diet that is overly rich in cholesterol?

C. For some time now, many physicians have been recommending a low fat, low cholesterol diet for the gall-stone patient. Yet there is no evidence that a diet rich in cholesterol will produce gall-stones. There is no correlation between the cholesterol one eats and the cholesterol in the bile. Even though the diet contains no cholesterol the endogenous cholesterol metabolism in the body goes on just the same. A high cholesterol concentration appears in the blood and bile of pregnant women. Whether this explains the frequent association of gall-bladder disease and gall-stone with the bearing of children cannot, however, be stated with certainty.

A.-B.-C. In the presence of a high level of cholesterol in the blood, it seems wise to most physicians to prescribe a diet poor in cholesterol and then decide whether the diet be high or low in fat. Sometimes I would say that in gall-bladder disease food rich in cholesterol such as egg yolks, liver, sweetbreads, oysters, fish roe and lard are not allowed.
If, on the other hand, it seems wise to stimulate the flow of bile and what is often more important, to get a thin bile until the bladder has a chance to rid itself of the thick old bile.

Will you please read the following sentences filling in the blanks with the most appropriate words.

A... The color of snow is ______________.
B... Twenty times three is ______________.
C... My name is ______________.
D... The four seasons of the year are ______________, ______________, ______________, ______________, and ______________.
E... The names of the great lakes are ______________, ______________, ______________, ______________, ______________.
F... The capital of the State of Ohio is ______________.
G... My address is ______________.
H... When I'm at home I like to ______________.
I... There are ______________ men on a basketball team.
J... When I drink I usually drink ______________.
K... The sun comes up in the ______________.
L... My age is ______________.
M... My home is at ______________.
N... Thirty-six divided by three is ______________.
O... The names of the players on a baseball team are ______________.
P... The most important man on a football team is ______________.
Q... Twenty-two minus eight plus ten is ______________.
R... My home is at ______________.
S... The body of water bordering the southern part of the United States is called ______________.
T... Ten states of the United States are ______________.
U... The five players on a basketball team are ______________.
In a baseball game there is a man on first and a man on second. The batter hits a ground ball to the short stop. A triple play could be made by having him throw the ball to the __________ who throws it to the __________ who in turn throws it to the ________________.

The average top speed of low priced cars (Ford, Chevrolet, etc) is ____________.

Cows like to eat ____________.

The capital of France is ____________.

F. D. Roosevelt was president for ____________ years.

Eight times six is ____________.

The declaration of independence was signed in ____________.

The capital of Michigan is ____________.

The manager of the Columbus Red Birds baseball team is ____________.

The author of "Hamlet" was ____________.

The governor of the State of New York is ____________.

The coach of the Ohio State swimming team is ____________.

The main street of Columbus is ____________.

Red is the complement color of ____________.

The mayor of the City of New York at the present time is ____________.

Twenty-three times three minus six plus four is ____________.

Water is made up of ____________ and ____________ it is usually in ____________ form.

Cream forms on the top of ____________.

In a basketball game when a player on one team is fouled he is given ____________.

I am ____________ years old now.

I weigh ____________.
Knowledge in Action! Over the period of a century or more, there's been a tendency on the part of American's to congregate—to jam together into cities which have grown to monstrous stone monuments to futility and confusion. For, while we've built our cities larger and larger, and pushed people closer and closer together—well, strangely enough, we've actually forced them farther and farther apart. In our great city tenement sections, built row upon row and tier upon tier, families sometime live within a few feet of one another—separated only by a wall or a ceiling—and never get acquainted!—never have anything in common, save, perhaps, the roar of the elevated railway which passes their dingy windows. Let's listen:

C... There, there now, honey. Don't cry. Go to sleep.
B... Th' baby's sure restless tonight Edna. Do you think—
C... Not so loud, George, and I think she'll go back to sleep.
B... What's the matter with her?
C... Nothing—except she didn't get her nap today. The trains woke her up once, and then the people downstairs disturbed her.
B... Oh, that bunch of hyenas! I've got a good notion to—
C... Shhh! For heaven's sake, George. Let her go back to sleep, will you? There's nothing you can do about it except be quiet yourself.
B... Okay—okay, but that bunch downstairs makes me sore. I could stand a little peace and quiet for a change. Where's tonight's paper, I--- For crying out loud, they're at it again. Don't they know better than to play their radio at this time of night?
C... They'll wake the baby for sure—and just when I get her to sleep.
B... You, downstairs! Shut up, will you? Turn off that radio!
M... Hey you up there. Pipe down! Lay off that pounding!
B... My kid's trying to sleep! Shut up!
M... Mind your own business!
B... Keep quiet!!!
C... George! George!
I feel like going down and punching him in the nose.

—and I feel exactly like a goldfish in a bowl.

Yes, in our eagerness to build greater cities we've sometimes forgotten an important point: 'that buildings are for people—for their comfort and happiness. In our enthusiasm to increase our massed populations, we've neglected the basic human needs for privacy, space, and quiet. Instead, we've created confusion and resentment. What's the solution to this pathetic problem in human wretchedness? Does university research hold the answer to architecture for people? Well, each week, the University of Denver presents Knowledge in Action, a series of transcribed, dramatic programs showing knowledge at work to solve the problems of everyday living. And, as usual, here's Randolph McDonough of the University of Denver with a report on university research in Architecture—the profession which builds the homes we live in. And he has a thought-provoking story called: The Goldfish.

Architecture—the art of building—is one of the oldest human activities. But it used to be that only the rich could afford the benefits of good architecture. In too many cases our great cities grew unplanned, grew with wave upon wave of uncontrolled real estate speculation. And in the crowded tenement sections of some cities, this growth has piled human beings together layer upon layer with complete disregard for their needs. Take the family we just heard in the argument. They're complete strangers among millions. They've never crossed the barrier of the wall which separated them from their downstairs neighbors—never spoke except in anger. In fact, in the three years Edna and George McGuire had lived upstairs, they'd never seen their neighbors, and had always referred to them as:

Well, it sounds like "Hey You" and his old lady are out for the evening.

Guess so. Haven't even heard little "Hey You". Maybe they took him with them.

Good idea. They should do it more often. Is Jo Anne asleep?

Haven't heard a peep out of her for an hour.

Then what do you say you and I got a good, quiet night's sleep for a change.

It would be wonderful.

Where's my slippers. I want to take off my shoes and glance at the paper before we turn in.
C.
Right beside you where they always are. But don’t poke your nose in that paper or we’ll be up all night.

B.
Okay—okay. Just let me get my shoes off and look at the headlines a minute.

C.
George, can’t you take your shoes off quietly? You’ll wake the baby, or worse yet those people downstairs.

B.
Awww, they’re gone—remember? Boy, my feet are tired.

C.
I’m tired all over. This apartment wears me out.

B.
Oh, I don’t know. It ain’t so bad.

C.
You should stay in it all day! Nothing but four walls, trains every half hour, and those nuisances downstairs. It drives me—

B.
Oh—oh.

M.
Hey you, up there—

C.
It’s “Hey You” again.

M.
—hey you, up there, “One Shoe”! Drop the other one, fathead—so we can get some sleep! Yes, for heaven’s sake—and then be quiet!

C.
Why that’s Mrs. “Hey You”—haven’t heard from her for quite awhile. She must have been visiting.

B.
Yeah, the old battleaxe. All right, down there! Here comes the other one! Now, “Hey You”—anything else I can do to make you happy?

M.
Sure—why don’t you move?

C.
Yeah, “One Shoe” —or why don’t you drop dead!

C & B
Oh, shut up!

A.
The McGuire family and the people downstairs lived for years not ten feet apart—and never knew each other by any other names than “One Shoe” and “Hey You”. That’s funny? No, it’s one of our greatest tragedies—a tragedy that befalls millions of city people. They’re human beings in a constant state of friction and misunderstanding because the builder who constructed their crowded tenements wasn’t really an architect—he failed to understand the human values of quiet and privacy. These are two fundamental necessities that most of us recognize, yet just the other day I was talking to Carl Peiss of the School of Architecture at the University of Denver, and he told me about another requirement that’s often forgotten. It’s a sense
of belonging to the community in which you live—of having buildings for common activities—in short, having something worthwhile to do in the neighborhood. But year after year, as we return to the tenement story of the McGuire's, they never found this sense of belonging:

C... George! George!! Was that you?
B... I'm in here shaving.
C... Did you just close the front door?
B... Of course not! I'm in the bathroom! Well, it must have been the "Hey Yous" going out for the evening.
B... What did you say?
C... Nothing. The people downstairs just went out, I guess.
B... Oh.
C... George.
B... Yeah.
C... George—I wonder what they're really like.
B... Who?
C... The "Hey Yous"—the people downstairs.
B... Who cares?
C... Oh, I don't know. They may be all right—if you'd get to know them.
B... I know them as well as I want to right now.
C... No, I mean—really—we haven't had a fuss with them now for a month—since you dropped the davenport.
B... That suits me.
C... I wonder what they're like—what they do—where they go.
B... I don't.
C... Well, I got tired cooped up around here all day. I wish we had some friends to ask in.
B... Well, holy mackerel, don't pick the "Hey Yous"!
C. I guess that it's just that I'm lonesome for Jo Anne.

B. Well, me too. But we can't have her hero with us. She goes to school now, and this is no place for a kid in school—she's better off with your mother.

C. I know—it's just that eight years in this place is driving me crazy!

B. Sure, but there's nothing we can do about it now, honey.

C. Well, we can plan—and hope. Maybe someday we can have a place out in the country.

B. Well, as long as I work for the mill, I gotta be near my job.

C. A place with grass and trees, and sunshine and flowers—

B. Yeah, that would be nice—like where we used to go week-ends last summer?

C. That would be wonderful!

B. Yeah, well, maybe it'll come true—someday. When I get a raise, an' houses come down. In the meantime, I guess we'll just have to put up with this.

C. I could take it a lot better, I guess, if only—

B. If what??

C. If only there was something to do—someplace to go to get away from it once in a while.

B. Well—there is! We can go over on Third Avenue to the fights tonight. We haven't been out for a long time, Edna! Come on—let's go!

C. I wouldn't like the fights.

B. Well, we can go to a show then. We haven't been out for a long time. Come on, get ready.

C. No. I don't mean that either. George, I'm tired of shows and shopping—I do that all the time—and they make me feel lost. I don't know anybody and—

B. Well—what do you want to do?

C. I don't know! That's just it! There's nothing to do around here—except listen to the elevated, ——and fight with neighbors we've never even seen.

B. What did you say?
I just said there's nothing around here to do that's worthwhile. That's all! It's just like we were all by ourselves!

Good community planning, as well as building homes for people, has been a problem of university research in architecture even as it is the problem of those who live in the crowded sections of our cities. And their research has shown that quiet and privacy—yes, even space and trees and grass aren't enough. People need worthwhile centers of community activity built into their neighborhoods to belong to—churches, schools, libraries, community centers and gathering places. For without those vital buildings planned and operating in a district, even restful quiet and privacy only lead to boredom. And, you may ask: Why do people live in crowded tenements without neighborliness? Why do the McGuire's remain at odds with their unknown neighbors? Well, as we return to our story it's a few years later—but there's still a familiar sound:

Hey you, up there! What are you trying to do? Knock the house down? Why don't you people move? We're trying to get some rest.

Awww, shut up!

George. George! What's going on?

Oh—nothing! Just getting dressed for work and I woke up the crabs downstairs.

What time is it?

Seven ten. My lunch all ready?

Huh? Oh! It's packed and on the table. Oh—what a night. Did you sleep at all?

Are you kidding? Of course I didn't sleep! Who could sleep with all that racket?

What kind of a party were they having downstairs, anyway?

Search me. Why don't you go down and report them to the management again this morning.

What good would that do? They wouldn't do anything about it last night.

Well then—call the cops.

You call them. Ohhh, I feel like I'd been to that party instead of over it all night.
Well, I can't mess with them today. I don't have time. Anyway, what's the use? Turn on our radio when you get up--make more noise than they do. Oh-oh, they beat us to it. Shut up down there!!

C... George, I can't stand any more of this-- Where are you going?

B... To work, of course--I'm late.

C... Can't you make them turn off that radio?

B... What can I do?

C... Well, we can move, can't we? We've given up our girl. We've put up with them for years! What are we--a couple of goldfish??

A... Yes, moving would have been a good idea--but as the years passed it was never quite practical for the McGuire.

B... We've been over this before. Where's we go?

C... Anyplace! But let's get out of here!

B... Quiet down there!

C... George, let's get out in the country.

B... But I gotta be near my job!

C... Shut up down there.

B... What'll we buy a house with, Edna?

C... I don't know, but I can't stand this a day longer. I'm going crazy.

B... What did you say?

C... I said what are we going to do??

A... What are we going to do? Well, thousands--yes, millions like the McGuire are asking that question--even the people who live downstairs. And a logical solution is a quiet, spacious home in the suburbs--a home with privacy fitted into a cooperative community. A number of our university schools of Architecture have recommended, helped plan, and build such model communities--showed our government that substandard dwellings cost us more in actual dollars than properly planned, adequate housing. They've sold the idea of housing for people.

B... Edna! Edna! Got packed. We're going to move!
A.
Yes, the McGuire's moved—left the crowded congestion, the noise, the "Hey You's", and moved to Gardencrest, a suburb similar to many planned, cooperative communities designed by competent architects for the price average folks could afford. They moved out where they could get their feet on the ground and their fingers in the grass. And this might have been the happy ending to the story of the McGuire's and their home build for people—-but it isn't—-quite, because to understand what good architecture means you have to know how the McGuire's got along after they got acquainted with their neighbors in Gardencrest:

B...
Hey, Sam! Why don't you and Mabel come over tonight for some pinochle? One way of really getting acquainted.

M...
Sure. When we got our kid to bed we'll be over.

C...
Oh, George! Almost forgot.

B...
What?

C...
I'm sorry, Sam—we promised to take Jo Anne to a program at the school house tonight.

M...
Say—-we were supposed to go to that too, weren't we, Mabel? Well, why don't we go together?

C...
Who's that? Jimmy?

M...
Sure, our problem child, playing the radio. He turns it up to the top of the dial.

M...
Jimmy! Hey you, in there! Turn it down, I like it quiet.

C...
That sounded familiar.

B...
What did you say?

M...
I said: I like it quiet, don't you?

C...
No—-just before that.

M...
Just: Hey you, in there—why?

C & B
You're not—"Hey You"?
M.-- Why—why yes--- And you're not—"One Shoo"!
B.-- Sure!!
M.-- Shake hands, neighbor!!
A.-- You know, people aren't the goldfish we sometimes take them to be. Take the McGuirés and their new neighbors—they're people—human beings. And when a good architect builds a house, he builds it for people like the McGuirés and Sam and Habel Hanson, so that they can live as neighbors in harmony. And your universities and colleges have a part in this good neighborliness so important to all of us. They're training architects—builders who build for people—for the future—-who again demonstrate in our everyday lives, the power of knowledge in action.
APPENDIX B

PRACTICE MATERIAL NUMBER TWO (Y)
Knowledge in Action! They say: "figures don't lie"---and, I suppose it's true, but even though the numbers may be perfectly honest---plain, ordinary, every-day arithmetic wastes time for most of us and causes a great deal of trouble. Things like figuring out your income tax, keeping your check-stubs straight, or buying the material for a dress cause no end of confusion. Listen.

Fiddlesticks! Oh, fiddlesticks! Let me see----that'll be thirty-eight less two for the hem---multiply by two for the pleats---Mercy me! Such a bother! I'll just say three yards of material, and costing a dollar twenty-nine—that's—uhhh—land sakes, let's see——seven and carry two—why that's—-that's ridiculous! Oh, fiddlesticks!

Now if plain everyday arithmetic is a lot of "fiddlesticks"---as it is for the lady figuring out the dress. If it's as much of a nuisance for you as it is for most folks—well, think for a moment what it's like for the men working on the complicated problems of science—for the astronomers and physicists struggling with the dynamic equations of the solar system in search of more knowledge. They're working on mathematical problem so great, and so laborious that with all the calculating machines and mathematicians at their disposal, no scientist among them, no matter how gifted, could hope to arrive at the final answer within his lifetime. Yet, these are the problems of science, which contribute to human progress and understanding. What is the solution to these mathematical questions which defy the human mind? Does university research have an answer for the brain-twisting problems of science? Each week the university of Denver presents Knowledge in Action, a series of transcribed, dramatic problems showing knowledge at work to answer the questions of scientific research and everyday living. And, as usual, here's Randolph McDonough of the University of Denver to tell you about a "mechanical brain"—a mathematical giant—developed through university research, to solve the toughest arithmetic problems in history—and, incidentally, he has an amusing story for you called: "The Problem Scientists are as busy as you and I, so the desire to save time and prevent errors in working difficult mathematical problems is as old as science itself. As far back as five thousand years ago the Chinese went to work on a gadget to make arithmetic easy:

Numbers to mind, like smoke to chimney, are quickly lost and gone forever. Note please, therefore, cunning mathematical device to aid insignificant mind to remember elusive numbers. Is called abacus, and most humble mathematician presents difficult sum, thus—moves beads on wires, so—-Tou wang la! Chan choh!—Stop! All finish!
A. Yes, the abacus, the same type of counting device still used in the Orient today—and very much like the wire and bead counters children learn to count on was the first attempt on the part of mathematicians to help the mind remember—to solve difficult problems in arithmetic. But the abacus, the first adding machine, well—it wasn't enough. As knowledge increased, the problems became greater. Astronomers saw farther into space, and came up with greater problems to solve. Physicists probed deeper into the atom—and were held back by the size of the problems they discovered. As recently as twenty years ago, scientific progress, you might say, was limited to the speed in which a mathematician—using standard computing machines—could work through the mountains of figures in a difficult problem.

M. Log seven point eight three five four two equals log seven plus log one point one. Well, that's that. Swanson I've just checked out the fifty third sequence. It's OK. How you coming?

B. I'll be through for the night in another hour. I've one more tape to run.

M. You know, there should be an easier way to prove the theory of space charge conduction.

B. How? With a crystal ball?

M. See here, I'm not joking. I've spent four months at this calculator.

B. Yeah, and you got two more to go—if you're lucky and don't get off the track somewhere.

M. You know, I wish I could sit down and finish this thing tonight! I wish it didn't take so long! I wish--

B. You wish you had a magic brain—one which wheels that wouldn't get tired.

M. You know! That's just what we need.

B. What? A brain?

M. No mechanical calculator with wheels—lots of wheels! A giant machine that could handle up to ten—twenty significant figures—a mechanical brain that could do in seconds what it takes us hours.

B. It's been tried before.

M. I know it has, but somewhere there's someone who can build the machine we need.
B. Won’t work—too complicated!

M. but this time—it will work! I know it will!

A. It had been tried before—in England a hundred years before, an investor by the name of Babbage had invented a giant calculator—had it almost perfected, and then—ran out of money. Similar calculators had been experimented with even more recently at the University of Chicago, Columbia, and the University of Pennsylvania. And now, in nineteen thirty-six, a young physicist, at Harvard University by the name of Howard Aiken—who we heard talking as he struggled with an endless problem—revived the idea for a "mechanical brain". Was it impossible?

M. It can be done! It will work! Someone can build the machine we need.

A. Aiken took his idea to International Business Machines Corporation. That was before the war—but even before the research on the first giant mechanical brain was finished the results of Professor Aiken's work was a wartime secret. No one know what the machine would do except its inventors and operators for it was moved to Harvard, dedicated and put to work on ballistics problems for the Navy in secrecy. Which brings us to our story, for to put it in the words of an old-time Cambridge resident who lived near the University.

C. All I know is there's a lot of strange goings-on over in that laboratory. My son Danny's working over there—all night sometimes—but he won't tell me a thing—except what little I can read in the papers about that machine—and I'm just dying of curiosity. Danny? Is that you, son?

B. Yes, Mom.

C. You're late, son. My lands, what do you want to stay out all hours for?—what are they doing with you over there, anyway?

B. Can't tell you, Mom. Big secret. What are you doing up at this hour?

C. Well, my lands—I'm making a dress. No secret about that. See here, son—I know it's none of my business—and I know the government wouldn't like it if you told anybody, but you're not working on anything dangerous with that—that big adding machine at the university, are you?

B. No—don't worry about it, Mom.
I will too, if I want to! My gracious, you'd think I was a spy or something. Here you are--my own son--doing some important work, and you won't tell me a thing about it.

Sorry, Mom.

Well, I've a good notion to talk to Commander Aiken. He'd tell me. I know it's got something to do with the machine he was working on before the war, the papers said so--but what does it do?

 Couldn't tell you if I wanted to--so let's not talk about it. Come on, put up that sewing and go to bed now.

I will---now. I will---just curious, that's all. Let me see--twice around the thumb is once around the wrist, twice around the wrist is once around the neck, twice around the neck--

What in the world are you doing?

Figuring---just figuring. Making Molly Simms a dress and I forgot sometimes just how big she is. Wish you'd tell me what's going on over there!

Well the work of Commander Aiken and his staff on the mechanical brain remained a secret until after the war was over. Then the world's largest calculator was moved to the new Harvard Computation Laboratory and opened for public inspection just last year.

Well, Mom, now I can tell you all about it. Come on in to the observation room and sit down.

My land!---land sakes! Is that it?

That's it---that's the "brain".

What'd you call it, son?

The "brain"---oh, we call the machine "Mark the First"--you see we're building two more--even larger.

My! What does it do?

Arithmetic!

It does?

Yep--it'll add, subtract, multiply, divide, interpolate---handle problems with sines, co-sines, logarithms---

My gracious!
B. It'll turn out answers accurate to twenty three figures—and about a hundred times faster than any ordinary calculator. In fact, no one has ever figured the limit to what the brain will do.

C. My land, and you were working here all this time?

B. Yep, she operated twenty-four hours a day during the war—still running about twenty.

C. Well, I don't understand it exactly, but it sounds very astonishing—-

B. Well, come on in and get a better look at it. It's against the rules but there's only the operator around and he won't mind.

C. And you operated this great big thing all by yourself?

B. Yep, some machine, isn't it?

C. Why! It must be as long as our house.

B. It is—fifty one feet. There's five hundred miles of wire in her—two million connections, and—

C. And where did you work, son? Where did you run it from?

B. Down at the end there—where Swanson's on duty now.

C. What's that?

B. Come on—I'll show you. Hello Jim. How's it going? Fine—two more sequences to go. Jim, this is my son—he's interested in the machinery. Evening, ma'am.

C. How do you do, young man.

B. You see, mom, the operator puts the problem in the machine on those little cards all punched out according to instructions from the mathematician in charge. He keeps feeding them in and the calculator does the rest. It'll do six months calculations in a day. And get the right answers too!

C. Well, how do you know they're right, son?

B. Oh, they're accurate. That's right, ma'am—you see it checks itself.

C. And it never makes a mistake?
My goodness! What's that?

A break down.

Then it did make a mistake.

B-Nope--just a failure in one of the functional counters. I'll go check it. You see, Mom--anytime anything goes wrong, the machine signals just where the trouble is and the operator can repair it.

C-Why, mercy me--then it almost talks?

B--does better than that--it thinks. What was wrong, Jim? Faulty plug-in--she's OK now.

C-And to think it solves any problem, and never makes a mistake! My gracious, what a handy gadget.

A-No, don't get the idea that the computer will figure your income tax--it wasn't designed for that. It handles problems of far greater magnitude than even your federal income tax and handles them accurately--faultlessly. The operator supplies the series of cards or tape with the problem punched out on it which is just like saying to the mechanical brain:

B-Take the number out of counter sixty--deliver to counter fourteen; deliver to counter forty two--start operation!

A-And seconds, or minutes, or hours later--depending on the size of the problem--it delivers the correct answer--checked and absolutely accurate. Interesting? Well, as Danny's Mother said, next evening.

C-It's simply astonishing! That's what it is, son--

B-Oh! Mom! You down here again. Didn't hear you come in.

C-I just had to come down and watch while you were working the machine. Now show me all about it.

B-Well, I did, Mom--I did the other evening when we were down here on Swanson's shift.

C-But I didn't understand it. Now what do you do?

B-Nothing much. Just watch it. You have to check it constantly during a run in case of breakdown--and I have to feed the cards.

C-Those little cards with the holes in them?

B-Yeah, that's the problem--the sequence. It's a run on
B. Thought you were home sewing.
C. I was.
B. ...Still making that dress for Molly?
C. Yes—only I'm having trouble. Anything the matter? I didn't hear the bell ring?
B. No, I just shut her down. I'm all through.
C. My goodness—now what was the answer?
B. It's printed automatically on the typewriters here.
C. All those numbers?
B. ...Yep, you wouldn't understand them. Well, soon as I file these, we'll go home, huh?
C. Why, of course—son—only—
B. Only what?
C. I'm just so interested in seeing the machine work.
B. Why, you've seen it!
C. But I'd like to see it solve a problem I could understand.
B. Oh no!—Oh no! Nothing doing—don't try to get me into trouble around here.
C. Well, now I don't see what harm a little problem would do—you're through with their work aren't you?
B. Well, sure, but—hey! what's eating you, Mom?
C. Nothing! I just—
B. Come on now—I can tell somethings bothering you.
C. Well—I got into trouble—on Molly's dress.
B. Ohhh.
C. I haven't got a pattern and I just can't get the skirt figured out—and I thought—
B. —You thought the calculator would do it for you?
C. Well—yes, I did. I have so much trouble with arithmetic.
B... Well, my gosh, Mom, this is a scientific machine—it cost a half million dollars! You can't use it to count peanuts.

C... It's not peanuts—it's Molly's dress—and she wants it by Saturday. It wouldn't break the thing would it?

B... Well, no---only a problem like yours---it's well, it's so simple.

C... It isn't either! Did you ever try to figure a full pleated skirt out of thirty-six inch plaid, and match the squares— with a hem?

B... Well, no---

C... Well, don't tell me it's simple. Don't you know how to make the machine run?

B... Sure I do, but—Okay! Oh-kay! Just this once, and don't you ever dare tell a soul. What's the problem?

C... Well no, the material is thirty-six inches wide and the skirt has to be cut on the bias.

B... Now we'll let X equal the hem line, as you call it, or the part you can get on a width of the material---

C... ---and don't forget to double it for the pleats.

B... OK—we got that. And X times Y equals pi D, I guess—or the whatchama call it—the "waist line".

C... Now I want to know the hem and the waist and the material I'll need.

B... Yeah—hope I don't catch heck for this. Okay—we got her all down. Let's, run it through the machine. Here's the first card—and here comes the answer. Each section of the skirt has to be twenty-three point six seven—twenty—three and two-thirds at the bottom.

C... Oh—fine! And how much material will it take?

B... Just a minute now. I— Jee-miny christmas!

C... My gracious! What have you done?

B... I don't know. Somethings fouled up. I'll shut her off.

C... My! Did you break it?

B... I guess not.
C... Well--what's the answer?

B... Let's see. Three and a quarter to the tenth power--Holy smokes, it says you'll need four thousand two hundred and twenty-three yards of material!

C... My gracious! At a dollar twenty-nine, I can't afford it.

B... Gee--I must have made a mistake because it says Molly'll have a waistline of a little over four miles!

C... Fiddlesticks! You're joking--Molly isn't that big!

A... Now we don't mean to say that the "mechanical brain" couldn't do a problem in simple arithmetic. But one thing it won't do is compensate for the human errors of operating--it won't solve a problem that's presented incorrectly. And, anyway, we suggest that if you have a dress to make, you stick to the old way:

C... Twice around the thumb is once around the wrist--etc.

A... For the calculator at Harvard was never intended for problems like that--no matter how complicated they seem to you. But the problems of science that the "mechanical brain" is solving every day mean more knowledge for all of us--knowledge to answer the questions of everyday living. And as it clicks out the answers in the laboratory the giant calculator is again demonstrating in our everyday lives, the power of university research--of Knowledge in Action.
Tonight, sports authorities Larry MacPhail, Ted Husing, and John R. Tunis clash over the question, "Should Organized Sports be Abolished for the Duration?... Get both sides on America's Town Meeting, sponsored by The Reader's Digest--7:30 tonight on this station. Men, here's smooth shaving guaranteed. The Marlin Firearms Company asks you to try Marlin Blades. If you don't agree they're equal to the best you've ever used regardless of price, Marlin will cheerfully refund your money. Single or doubleedge, 12 weeks smooth shaving for 25¢. Shave and Save with Marlin Blades.

Let me tell you an incident in the life of Farmer Brown---Farmer Brown decided that there wasn't enough money in milk and eggs, so--he began sitting up nights to figure out something else for his hens and cows to do---He didn't have much luck but he did have a friend---The friend told him about Cargill Feeds---Now, Farmer Brown is again sitting up nights, figuring out the best way to use the extra money his hens and cows are making for him---You, too, will be money ahead if you follow Farmer Brown's example---Switch to Cargill Feeds today.

Look ahead! Get warm, all-wool snow suits for your family NOW during the big lay-away snow-suit sale at Montgomery Ward in Midway---Snow suits for women and children in a big selection of all wool-fabrics---sale-priced just fourteen dollars and ninety-eight cents---Every one has a zip-out sheepskin lining---zipper front closing---some have matched hoods---only because Wards purchased these suits months ago is it possible to offer them at this amazing low sale-price---and as little as a dollar down with small monthly payments will hold the snow suit you select until November 15th---Montgomery Ward in Midway closes at two today.

Something of the scientific spirit gets into the minds and hearts of men and women who make the products of chemical science--the care, the painstaking accuracy, the conviction that what they are doing is worthwhile. Take DuPont cellulose sponges, for instance. People need sponges, and Nature can't make enough of them, so nowadays DuPont chemistry makes them--and the men and women who control the process of turning a chemical syrup into a light, clean, fluffy sponge are justifiably proud of their jobs. The same thing is true of the men and women who make the other DuPont products in the Buffalo area.

In fact it is this spirit which is perhaps the most important ingredient in all of the products of DuPont chemical science. It is the "hidden value" you find in all of the DuPont Company's BETTER THINGS FOR BETTER LIVING--THROUGH CHEMISTRY.
Here is new and even more conclusive evidence that Wildroot Cream-Oil hair tonic is again and again the choice of men who put good grooming first. Recently thousands of people from coast to coast who bought Wildroot Cream-Oil for the first time were asked: "How does Wildroot Cream-Oil compare with the hair tonic previously used?" Better than four out of five who replied said that they preferred Wildroot Cream-Oil. And no wonder, 'Wildroot Cream-Oil grooms your hair neatly and naturally, relieves dryness and removes loose dandruff. What's more, non-alcoholic Wildroot Cream-Oil contains soothing LANOLIN. Wildroot Cream-Oil is available in bottles in the United States and Canada, and in the United States in the handy new tube as well. So easy to use, easy to pack---and grand to keep in the bathroom cabinet. So don't delay! Try it today! Get Wildroot Cream-Oil hair tonic in bottle or tube.

You know what fun you can have with a camera—taking shots of your family, your pals at a party and your pup. Well now you can win a slick new professional type camera as one of the thousand big prizes in the new contest sponsored by the American Broadcasting Company. Is it a honey! It's a famous Univox 60 millimeter candid-type camera with build-in flash-bulb equipment and takes split-second action shots day or night! And it's a snap to win one of these great Univox cameras! Simply write 50 words or less on why you prefer one of the following programs which are broadcast every weekday over ABC—-Terry and the Pirates, Sky King, Jack Armstrong, and Tennessee Jed. Okay? Then let's get started. Everyone who is 16 or younger can enter. Mail your entry to American Broadcasting Company Contest, Post-Office Box 27, New York 8, New York. Remember: ABC Contest, Box 27, New York 8. Write a letter tonight!

There's one thing you can put in a Christmas stocking that hardly makes a bulge—but what a joyous impression it makes on Christmas morning? I mean, of course, a 14-karat gold wrist watch of the Helbros Regency series. Any lady will be thrilled to find a Helbros Regency Watch for ladies. Its 14-karat gold case is almost too exquisite for words. Two sparkling diamonds adorn its beautiful case. And it has a smart gold-filled double strand, snake-chain bracelet.

And any man will be proud to buckle on the delux padded leather strap that holds his new Helbros Regency for men. It, too, has a magnificent 14-karat gold case and a world famous seventeen jewel Helbros watch movement. Look at these watches at your Jewelor's and you will agree that there, indeed, is the ideal Christmas present.
Here is the season's outstanding travel bargain, the Northern coast-to-coast tour of America—See two world's fairs, San Francisco and New York; visit Los Angeles, Washington, D.C., and Niagara Falls; all in two weeks—Round-trip rail fare only ninety dollars—Call your nearest Northern Pacific office today—Go Northern Pacific.

Here's grape jam that's really swell! Fairway Concord Grape Jam—Made from mellow, sun-ripened Concord Grapes, it's delicious on hotbreads, waffles, and toast, and for lunch-box sandwiches, too—Fairway Concord Grape Jam, one of the many top quality, more-for-your-money fine foods obtainable at Fairway Stores everywhere.

Will you please read the following sentences filling in the blanks with the most appropriate words. Do the best you can please.

A. Joe DiMaggio plays for the ------ ------ ------.

B. The capital of the state of Connecticut is ---------.------

C. Ten times eight minus twelve equals ---------.------

B. The governor of Pennsylvania is ---------.

C. Independence, Missouri is the birthplace of ------- ------.

A. The Gettysburg address was made by -------.

C. General Marshall is the present ------ ------ ------.

B. The ninth month of the year is ------.

A. Six plus seven plus nine plus twelve minus seven equals ------ ------.

B. Arthur Godfrey is heard over the -------- network.

A. I am ------ years old.

C. The capital of the state of Utah is ---------.------

A. The call letters of one of the Columbus Radio Stations is -------.

C. The capital of Canada is -----------.

B. The five greatest men in the world are ------ ------ ------ ------

C. Cleveland is situated on the shores of ------.------

A. Harry James is married to -------.------

...
B. The Japanese surrendered on the battleship---------.
A. The Prime Minister of England is --------------.
B. Fifteen of the forty-eight states are ------------------.
C. The New England states are ------- ------- ------- ------- -------.
B. Three members of the Kefauver Crime Investigation Committee were -------.
C. The largest battleship in the U.S. Navy is the --------------.
B. Twenty members of the United Nations are ------------------.
A. The states bordering on the Pacific Ocean are ------- ------- ------- ------- -------.
B. The present attorney General of the United States is --------------.
A. The senior Senator from Ohio is ------- ------- and he is a member of the ------- party.
C. Four of the greatest baseball players today are ------ ------- ------- -------.
B. One of the greatest football players today is ------------------.
A. Albany is the capitol of the State of ------- -------.
B. Three men out of every four -- get more comfortable -- actually smoother shaves the Palmolive Brushless Shave Cream Way. You be the judge! Try the new Palmolive Brushless Way to Shave. Just do this: Wash your face with soap and water. Rinse! Soap your face thoroughly again and apply Palmolive Brushless Shave cream, smoothing it upward into your beard to get the full benefit of Palmolive Brushless Shave Cream's beard-conditioning effect! Then, shave!

That's all, but remember, Palmolive Brushless Shave Cream offers you proof that three men out of every four get more comfortable - actually smoother shaves the Palmolive Brushless Shave Cream Way.
A... The last word on cleaning teeth is your dentist. And over four thousand dentists in a nationwide survey said COLGATE TOOTH POWDER with the two-minute routine gets teeth sparkling and super clean. So to get your teeth super clean—to show their full natural sparkle follow this two minute routine night and morning with Colgate Tooth Powder. Brush the biting edge, the inside and outside surfaces and always stroke your brush away from the gums. Remember dentists say Colgate Tooth Powder with the two-minute routine gets teeth sparkling and super-clean.

C... It's moisturized -- to smoke milder! Smoke this now, modern, Raleigh "903" See for yourself that it is far better than any cigarette ever made before because it's moisturized by the revolutionary "903" process -- the greatest advance in cigarette making in 25 years! You get new mellow taste, new mildness, new freshness. Remember this extremely important fact about the new moisturized Raleigh "903"; Medical Science offers Proof Positive! No other leading cigarette gives you less nicotine, less throat-irritating tars!
Our first speaker is Mr. Zlatko Balokovic, President of the United Committee of South Slavic Americans and president of the American Slavic Congress of Greater New York. You have this Reviewing Stand microphone for exactly three minutes, Mr. Balokovic.

Mr. Balokovic: The question before us is: Is there a democracy in Yugoslavia? On March 27, 1941, the old Yugoslavia of dictatorships, political terror, and corrupt governments died a sudden death. The old government had signed a pact with Nazi Germany. The Yugoslav people would have none of it. They would finally be masters in their own house or they would die.

The invaders installed traitors in great number. Brother was set against brother. The enemies endeavored to make Serbs, Croats and Slovenes so hate each other that Yugoslavia should never rise again. But in this tragic hour there arose out of the people a unique integrating force; a man whose faith, vision and indomitable will changed hatred into love, disharmony into unity, improvisation into purposeful plan—so bringing order out of chaos and turning defeat into victory. This epic figure is worthy to stand beside the Homeric figures, equally great as military leader and statesman—Marshal Tito!
Serbs, Croats, Slovones, Macedonians, Catholics, Greeks, Mohammedans, peasants, teachers, artists, priests, daily swelled the ranks of Tito's Partisans, a voluntary Army serving entirely without pay. They went into battle barehanded wrestling arms and ammunition from the enemy. They marched at night and surprised the enemy by attacking from the rear. Without anesthetic they had arms and legs amputated with butcher knives and hack saws. They lived on roots and grass and whatever the villagers could spare, which was often nothing but they never faltered, and they won.

They drove off the invaders themselves, and in every liberated village town and district, they opened schools and churches, and the people elected local committees to handle local affairs, just like our own town meetings in America. These local committees then sent representatives to regional assemblies, even during the war.

During their epic struggle to drive out the invader and establish the freedom of democratic government, the Yugoslav people sacrificed 1,680,000 lives. That is as though we here had lost 15 million dead. Those who have survived are more than ever determined to build and preserve a strong, free democratic Yugoslavia.

In the first free election with secret ballot ever held in Yugoslavia, and in which women voted for the first time, 89 per cent of the entire electorate actually voted. Of this, 90 per cent voted for the candidates of the National Liberation Movement.

In the new Yugoslavia, true government of the people; by the people, and for the people is an accomplished fact. And I venture to predict that no power on earth will be able to deprive the Yugoslav peoples of the fruits of their victory which has finally enabled them to be the masters of their own destiny.

Mr. McBurney: That is Mr. Balokovic's position, very clearly and eloquently stated. Our second speaker is Mr. Ray Brock, New York Times correspondent in the Balkans from 1940 to 1943, and author of the book, Nor Any Victory. Brock, is there democracy in Yugoslavia?

Mr. Brock: There certainly is not, Mr. McBurney, but I would like to preface my remarks by saying I think Mr. Balokovic's remarks sound like an abstract from Pravda, Izvestia, or a speech by Mr. Vishinsky.

It is interesting that he brings up March 27, 1941, because on that date I was in Belgrade as a correspondent for the New York Times. It is interesting that Mr. Balokovic, who
is a Croat, brings up that date because on that date no Croat
lifted a finger in the coup d'etat led by the Serbs, now led by
Mihailovich, leader of the Serbian resistance in the mountains;
I repeat, it was the Serbs, not the Croats. The Croats who rose
first as the Fascist Ustashi, and then under Tito provide the
background of the movement, which incidentally did not exist
before the 22nd of June, 1941, when Germany attacked Russia
and when it became expedient for the Partisans to spring into
arms. Mihailovich started that resistance; he leads it alone
today.

But to the point, there is no democracy in Yugoslavia today;
You talk of elections—talk of elections in the sense that Hitler
held elections in the Rhineland of the Ruhr; held them in
Austria and Czechoslovakia. There was a single party policed by
machine guns, as they were policed in Latvia, Estonia, and
Lithuania before.

There was no difference between Yugoslavia's Ozn's; the
secret police, and Germany's Gestapo or Russia's Cheka, which
changed to OGPU, and when that became rather noisome in the
nostrils of the world, became the NKVD.

Aside from Switzerland in August, 1940, I spent the year
through the fall, winter and spring in Yugoslavia, and went
through the war, which Mr. Balokovic did not do, and Mr. Huot,
the next speaker, did not do either. From May 1941 to 1943, I
covered the operations of the Yugoslav guerrillas from nearby
Turkey and Near East vantage points. The story behind the
indescribable Anglo-American and Russian 'censorship' is one of the
major tragedies of the Second World War. The world is prone to
forget as indeed Mr. Balokovic, the Croat, conveniently forgets,
that the Yugoslav government, which arose from the Serbian coup
d'etat, in 1941, was in itself a government of revolution. It
overthrew the collaboration government of Cvotkovich-Markovich
when Russia was still a partner in crime with Nazi Germany.

Mr.

Mr. McBurney: You have heard Mr. Brock's position. Now Louis
Huot, author of Guns for Tito, and Lieutenant Colonel in the
American Army who directed secret operations in the Balkans in
1943, and personally visited Tito in October, 1943. Where do you
stand on this question, Huot?

Mr. Huot: My point of view, Mr. McBurney, is very different
from that of Mr. Brock. Perhaps that is at least partially
explained by the difference in our two experiences during the war.
Mr. Brock left Yugoslavia in 1941 before the Partisans were
organized. I made the acquaintance of these amazing people in
1943, when as an officer in the Army, I was placed in command of
the secret operations conducted by the United States throughout
the Balkan countries.
During the first few months of that duty, I was in Cairo, in closest contact with the Yugoslavian representatives in exile, including even King Peter, with whom I dined in intimacy and talked at length. Before that summer was over, it was evident that the King's man, Mihailovich, was drifting into the ways of collaboration, and a new leader, Tito, was supplanting him.

We did our best to bring those two guerrilla leaders together in the weeks that followed. Our agents were at both headquarters, and their radio messages kept us copiously informed of all that was going on. But before the end of the year we were obliged to withdraw our liaison officers from the headquarters of Mihailovich.

In October, 1943, I met the man responsible for the miracle of Partisan resistance—Tito. My orders were to establish a supply route across the Adriatic for this valiant ally. It was in this connection that I proceeded to his headquarters on my first trip through the German lines.

The man I met was no dictator. His colleagues called him "Stari" or "Old Man." My interviews with him personally lasted a total of 15 hours, and I left convinced that he was one who could make a great contribution to democracy's long, uphill conquest of the world.

Although I was not in Yugoslavia for long, I was there long enough to be shot at by the Chetniks; long enough to travel hundreds of miles through enemy-occupied territory and to be received by the people everywhere with flaming enthusiasm long enough to realize that I was in the very crucible of democracy, and that those people, undiscouraged after their awful hardships, would make good their battle cry of "Death to Fascism; liberty to the people."

Mr. McDermott: Thank you, Mr. Huot. Our fourth speaker is Kurt Singer, author of Spies and Traitors of World War II, and closely associated with the underground movement of several nations. May we hear from you, Singer?

Mr. Singer: Military dictatorship is an old story in Yugoslavia. There was no democracy in Yugoslavia before 1939, and there is none today. The prewar Yugoslavia was pro-German; the present one is pro-Communist. Yugoslavia has gone from one extreme to the other, from extreme right to extreme left, but the people have no say about it in either case.
Just the other day I saw a copy of the new primer for children of the new Yugoslavia. This new official textbook is issued not by the Department of Education but by the Yugoslav Army and is an indication of what the so-called democracy in Yugoslavia is like. I quote from the March issue of the magazine, This Month, which carries the full text. "In this textbook the world is divided into four categories: First, Yugoslavs; second, our Russian brothers; third, Huns; and fourth, foreigners." The children are informed that everyone who is not a Slav is a foreigner and should not be trusted. Even those Americans who delivered guns for Tito, as Colonel Haot did, are wicked, capitalist foreigners.

The new primer teaches not peace and international brotherhood and love, but simply Pan-Slavism and war. War is wonderful and every Yugoslav boy and girl ought to join the Partisans and make the war on the right side.

The spirit of Tito is communist militarism, and yet everything that goes on in Yugoslavia is disguised as democracy. Now, in 1946, every former Nazi and every Communist, too, cries out loudly that they just love democracy, but what they are really doing is preparing new dictatorships, like the ones we already have in Yugoslavia, Roumania, Hungary, and Poland.

Tito, who incidentally is a Russian citizen, is no more than a Communist leader who, with outside support, became the master of his country. What Yugoslavia needs is not a bandit dictator, but a democratic, and free, and honest election—and I say honest election!

Mr. McBurney: Now, Singer says that everything that goes on in Yugoslavia is disguised as democracy. Do we have democracy there or do we not?

Mr. Balokovic: Mr. McBurney, before we go on, I must register a most violent protest to calling one of our most valiant allies, a man who has been of tremendous importance during the crucial battle of El Alamein and Stalingrad, who kept 25 Nazi divisions fully occupied in Yugoslavia—to call him a Communist bandit, that is exactly what we have been hearing for years over the radio from Mr. Goebbels.

Mr. Brock: I should like to repeat: Tito is a Communist bandit. It was not Tito alone, nor even he predominantly, who kept the Axis divisions tied up. And that fiction of the 25 divisions, which Tito is alleged to have tied up, is no more true now when it comes from you, Mr. Balokovic, than when it came from Slobodna Yugoslavia.

Mr. Ruot: It is true when it comes from me. My business was studying the order of battle, and I have that information. I can no longer cite the names of the divisions, but there was a time when I could. I went to headquarters, through the lines, to get that information for the Allies, and I know it is correct.
Mr. McBurney: My question, gentlemen, is do we have democracy in Yugoslavia? You have been talking about it for ten minutes. What are the elements of democracy: freedom of speech; freedom of press; freedom of assembly? Do these things exist in Yugoslavia today?

Mr. Huot: I would like to make a brief reply there. Certainly one of the essential characteristics of democracy is that its government is voted into office. In that connection I would like to call your attention to a report of nine M.P.s from England who traveled throughout Yugoslavia and witnessed the elections. I would like to read 50 words from their report...

Mr. McBurney: Do.

Mr. Huot: ... to indicate the manner in which the election took place: "We visited a number of polling booths on election day, both in the town and in the country, both in the company of Yugoslav friends and alone, choosing our own itineraries. Our impressions of the elections in the districts we visited confirm the views of the British Embassy, with whom we discussed the matter; namely, that the voting arrangements were mechanically foolproof and knaveproof; and that the proceedings were conducted with scrupulous regard for the provisions of electoral law."

Mr. McBurney: That was the election that brought the Tito regime in?

Mr. Huot: This was the election in which 90 per cent of the votes cast backed the Tito government.

Mr. McBurney: What do you think, Brock, of that election?

Mr. Brock: I would like to point out to you, Mr. McBurney, that it was the same perfidious Albion which made the deal with Russia, which we wagged alone like a tail to a kite in Yugoslavia. In rebuttal to Colonel Huot's eloquent fifty words, I would like to name just a few names of Gentlemen who are responsible correspondents and who have been there enough to spend a total of 70 years in Yugoslavia, combined experience. I mean: Leigh White, of the Chicago Daily News Foreign Service; Sam Brewer, New York Times; Eleanor Packard, United Press; Cy Sulzberger, New York Times; Charles Ranwick Breck, Novi Sad Power Company; Bill Smythe, Automotive Company in Yugoslavia who spent 27 years there.

Mr. Huot: I have read their dispatches...

Mr. Brock: Do I still have the floor, Mr. McBurney?

Mr. McBurney: Go ahead.

Mr. Brock: I would like to name some colleagues of Colonel Huot's: Colonel John F. R. Seitz; Marine Captain Walter Mansfield; Temple H. Fielding, and if you read the Reader's Digest or Harper's for October and November, you are familiar with the views of Major Fielding.
Mr. McBurney: And what are those views?

Mr. Brock: The views are that Tito is a Communist bandit.

Mr. Balokovic: No; no! I read the story and Marshal Tito...

Mr. Singer: Of course he is a "Marshal", but who made him a "Marshal"?

Mr. Balokovic: The people in general and the free elections.

Mr. Singer: Then I am a "Generalissimo"!

Mr. Balokovic: The people's movement in Yugoslavia has come from the bottom up. It has been carried by those people who were willing to die to be free——

Mr. Singer: All the Allied nations did that.

Mr. Balokovic: I am not interrupting Mr. Brock, and I do not expect to be interrupted. These people are joined in a liberation movement. They are not paid for that. Nobody forced them to join the liberation movement; and once they were in the Army, they proceeded immediately to organize themselves. And how democratic the movement was is seen in the fact that within a year of the coming into being of this liberation movement, there was already a parliament, acting for all the freedom-loving and free people of Yugoslavia.

Mr. Brock: Just like the Reichstag acted as a sounding board for Herr Hitler.

Mr. Balokovic: Why bring in the Reichstag all the time?

Mr. Singer: Why not?

Mr. Brock: I am sorry if the comparison is too invidious, but it is quite true.

Mr. Balokovic: We are discussing Yugoslavia.

Mr. Huot: Let's keep to the facts in the record.

Mr. Brock: Let's do.

Mr. McBurney: All right. Let's come to this charge made here several times that the Tito regime is dominated by Soviet Russia, a Communist regime. We have had a lot of talk about Mihailovich and Tito. I think our positions on those men emerge pretty clearly. What about this charge?
Mr. Belokovic: People like the Yugoslav people, who couldn't be dominated by the combined might of the Nazi Fascist Armies, of their Hungarian invaders, of their Bulgarian traitors--those people are never going to be dominated by anybody! They have proved they want to have government of the people, and by the people, and they are having now a government that is a government by consent.

Mr. McBurney. Singer made this charge originally. What do you say to that point?

Mr. Singer: Well, you have a so-called "progressive" government in Yugoslavia. That is a new word for "communistic" anyway. You didn't have free elections. You didn't have free elections. You didn't have primaries. And this is the main thing: You have these local, native Communists who are more vicious Communists than the Russians themselves.

Mr. Brock: Hear! Hear!

Mr. Singer: The Russians have given up Communism, but the grounded forces are still working on it, and the same with Tito.

Mr. Huot: So now the case is that they are now following charitable Russian policy closely enough!

Mr. Brock: It is exactly the point Ronwick Brock brought out, and he has been back a month and a half. He says the old-line Communists in Yugoslavia are sorely distressed because the little jerks operating under Tito have gone way beyond the Communist line and believe law is made only by the rubber truncheon and the machine gun.

Mr. Huot: Mr. McBurney, if you could bear with me a moment, I have another fifty words from the same report on the presence of terror in this country.

Mr. Brock: From the same British report?

Mr. Huot: Yes, the report of the parliament investigation conducted there.

Mr. McBurney: Let's have it.

Mr. Huot: Much is made by the various opposition groups, belonging to all three categories of the opposition that didn't participate in the election, of the issue of intimidation and terror. There seems to be no reasonable doubt that when the country was liberated, there was a wave of violence and vengeance throughout the country, and the paying off of long scores and bitter grudges. But this period appears to have passed and the whole process of purging the country and cleansing
the public life of those actively on the side of the enemy is now under control and is taking place in legal and orderly form."

This is the opinion of an impartial investigation conducted by a number of parliamentary figures from England who represent several different points of view, labor, liberal, and so forth.

A. Mr. Brock: I would like to say in direct reply, again, that this is in absolute contravention of the dispatches of reliable correspondents, such as Leigh White, Sam Brevor, Eleanor Packard, Cy Sulzberger, and many others.

B. Mr. Balokovic: Who says they are reliable, I would like to know.

A. Mr. Brock: You know Sulzberger is reliable! You, yourself and Louis Adamic, your partner in crime on the Yugoslav picture.

C. Mr. Huot: I think we would have to take into consideration all the dispatches of these gentlemen. Many of them are friends of mine from years ago. I know them intimately, like Sulzberger. He has written on both sides of this question. There is good and bad to be found in any country, and a good reporter sends both.

A. Mr. Brock: Exactly.

B. Mr. Balokovic: America's position was the right one. I would like to quote from Cordell Hull: Each nation should be free to decide for itself the forms and details of its governmental organization so long as it conducts its affairs in such a way as not to menace the peace and security of other nations."

And I would like to add to that, a truly democratic government, such as is demanded by the people of Yugoslavia, is not a menace but an assurance of peace to all her neighbors. The unifying ideas that created the national liberation movement of the South Slav people is such an irresistible force that it is drawing within it, even those Italian, Austrian, and Bulgarian elements who are also seeking the establishment of a government by the people and for the people.
Mr. McBurney: Now, two questions with respect to Mr. Hull’s statement. First of all, have the Yugoslavs arrived at this government, this Tito government, through the free means which he speaks of? And is this government . . .

Mr. Hoot: Yes, they have.

Mr. Belokovic: They came by 90 percent ballot.

Mr. Singer: One party and no primaries.

Mr. McBurney: And is this government one that will not disturb world peace?

Mr. Brock: Mr. McBurney, in direct reply to the question, I think that United States policy and British policy that which Mr. Churchill has recanted is now, and has been for the last three years stupid, ignorant, lackadaisical, and extremely harmful to the world peace on the subject of Yugoslavia. As for free elections, I submit to you the evidence I have already given you.

As for the pious and highfalutin words of Mr. Cordell Hull or presently Mr. Jimmie Byrnes, they are so much hogwash on the subject of Yugoslav today, because the Yalta provisions, laid down paragraph by paragraph, have been systematically violated paragraph by paragraph, as the Atlantic Charter has been thrown overboard, and the Four Freedoms jettisoned.

Mr. Hoot: Is there any government on earth, Mr. Brock, of which you do approve and whose policies seem to you to have any kind of good sense to them at all?

Mr. Brock: Yes, there is. Our policies on a number of countries suit no down to the ground, but not on Yugoslavia and not on Eastern Europe generally, I am sorry.

Mr. McBurney: Brock is saying here, in substance, that we have sold Yugoslavia out to the Russians.

Mr. Brock: Yes sir.

Mr. Singer: I would go further and say we have accepted a new bloc in Europe.

Mr. Belokovic: You cannot sell Yugoslavia to anybody because Yugoslav could not be sold. They are people who have shown how indomitable they are in war, and they are showing it today in the peace.
Mr. Brooks: May I agree with you, Mr. Balokovic, for the first time this morning, I agree.

Mr. Balokovic: I am delighted.

Mr. Brock: I should say the Yugoslavs, most specifically the Serbs, cannot be dominated as they have demonstrated for 700 years against the Turks, against the Hungarians, against the Bulgars, against the Austo-Hungarian Armies combined, against the Germans. They will arise again; there is not only latent but actual civil war in Yugoslavia. This will continue unless justice is done; and will plunge us into new wars from Southeastern Europe.

Mr. Balokovic: Mr. McBurney, I would like to say one thing. The greatness of the people of Yugoslavia is best shown in that they fear nothing and nobody. They regard the Russians as friends and they regard America as a friend. I would like the American people to know that Yugoslavia actually has infinitely greater contact with America because you won't find one single village in Yugoslavia that hasn't got somebody in America. Therefore, the contact between Yugoslavian democracy and American democracy is something absolutely living; and I guarantee you that Yugoslavia will never stop until she has a perfect political, economic, and ethnic democracy.

Mr. McBurney: Which raises our final question: What is ahead for Yugoslavia? Political stability, as Balokovic suggests; civil war as Brock suggests, or another breeding ground for another world war, as some of us fear?

Mr. Balokovic: Yugoslavia has already shown a pattern to the world. Europe today has seen in Yugoslavia that you can bring people of the most varying backgrounds and religions together, because in Yugoslavia you see today for the first time Serbs, Croats, Slovenes, Macedonians and Bulgarians who are having absolutely equal rights and equal opportunities.

Mr. McBurney: All right, Brock?

Mr. Brock: I submit that Europe is seeing today in Yugoslavia exemplification of the "police state" as laid down before, first by the Russians, then by the Germans, again by the Russians, Finland, Latvia, Estonia, Lithuania, Poland, Hungary, Yugoslavia, Azerbaijan, and Iran, and soon I am afraid, Turkey.
Mr. Huot: I should like to submit, first, that in a country where more than 8 million out of 14 million people were able to cast a vote, and 90 percent of them voted for the government, that government has a mandate from the people, a people which will hold the government to a reckoning, and that is democracy.

Mr. Singer: You keep talking about the people of Yugoslavia. You have heard all the time here nothing but the people of Yugoslavia. The people of Yugoslavia have not been asked at all! It has been the press under the Kings, under the regents, and now under the Communist party. There will be a civil war ahead in Yugoslavia and in many other European countries, because you just can't rape a country like Yugoslavia through the leading Communists of the country!

Mr. Balokovic: Before we end, any people who have taken such part in framing their constitution as the people of Yugoslavia have done may be certain that their constitution expresses the wishes, the hopes, and the desires of the people.

Mr. McBurney: Gentlemen, I am not going to try to sum up this discussion. You have made your positions sufficiently clear, I am sure.

The important thing that emerges is the sharpness of this conflict. Whether Yugoslavia is democratic or otherwise, we certainly have an explosive concoction in this Balkan test tube. Perhaps the best course for the Allies, if not the most valorous, is to keep our hands off. This may be a conclusion which no one of our speakers would endorse, but I think I am willing to risk it on my own.

This evening I want to talk to you about how to determine whether you are getting enough of the right kind of food. In other words, how do you make a nutritional survey of a community or of a family or for yourself?

The nutrition survey in Newfoundland has demonstrated the possibility of improving the nutritional state on a mass scale through a program of education and the distribution of improved foods. Between 1944 and 1948 significant changes occurred in both the medical signs of bad nutrition and the chemical evidence of the nutritional state as judged by laboratory tests of the blood and urine. So it can now be said that it is possible to improve the nutritional condition of the whole population in a relatively short time.
Some 668 unselected persons were examined to appraise the condition of their nutrition. In 1948 this examination was repeated. In the meantime efforts were made to improve the nutrition of the people of Newfoundland. These efforts consisted of public education in matters of nutrition; distribution in the schools of hot milk drinks; distribution of cod-liver oil; distribution to certain individuals of concentrated orange juice; improvement in the quality of white flour thru "enrichment" with thiamine, riboflavin, niacin, iron and calcium.

The subsequent examination four years later showed that those signs and symptoms of malnutrition which are the result of the lack of those essentials which we again added to the foods of the people were as you would expect less frequently encountered and less severe whereas those signs and symptoms of a bad nutrition which were not the result of the lack of those things which had been replaced were also as you would expect not affected by the four year program or in many instances were even worse.

Recently a study was made of people who live in the low rental areas in New York City. These included 1,567 expectant mothers, 5,369 housewives and 1,189 industrial workers. These were analyzed for the amount of protein, milk, meat and the number of servings of fruit and vegetables high in Vitamin C and high in Vitamin A.

As to the protein these people were getting, it was found that only 20 per cent of the pregnant women were getting what the National Research Council says is needed for such women. Does it occur to you that it is really beginning at the wrong end to be concerned about facilities to care for women with eclampsia and the various complications of pregnancy that are due to a bad diet. The more we lower our standards of living the more of those kind of cases we are going to have unless we can teach our women to get enough protein on a relatively inexpensive diet. The more we tax ourselves for welfare projects and their expensive distribution, the lower our standards of living will become. Only 40 per cent of the housewives, 47 per cent of the women in industry and 83 per cent of the men workers were getting an adequate amount of protein. Note how much better the men did than any of the women.
C...

Milk intake was satisfactory for only about 20 per cent of the expectant mothers, 33 per cent of the homemakers and women in industry and 50 per cent of the men workers in this particular study. This goes to confirm what I have said on these programs so often that if each of us got what we needed in the way of food there would never be any surplus of farm products and we would not be so calm and collected about shipping the fertility of our soils to foreign market. In regards to the cost of milk which was no doubt the main reason why these people did not consume more of it, is the cost of distribution. I saw some figures the other day on the New York City milkman which will explain some of this.

B...

I have always contended that milk should be sold in our grocery stores and handled as any other food product. Such a program certainly would reduce the cost considerably. Today according to these figures the New York City milkman gets around 16.50 a day and is able to deliver milk to 135 families each day. Each family averaged about 2 quarts and 1 pint. It therefore does not take much arithmetic to arrive to the same conclusion that I have often voiced on these programs that milk should not be delivered but should go thru the regular channels of the food trade. It is to be noted that the cost of delivery does not include the automobile and its upkeep nor that of the stations -- much of which would be a common cost if milk were sold exclusively in stores.

A.B.C. A= B= C.

Unison of 88 per cent of all these people who were surveyed in this New York study did have some meat, fish and fowl in their diet.

C...

Fruits and vegetables high in Vitamin C were eaten by 25 per cent of the pregnant women, approximately 40 per cent of the industrial workers and 50 per cent of the homemakers. Fruits high in Carotene or Vitamin A were included in about half of the diets of the industrial workers and 70 per cent of the homemakers and pregnant women.

There have been a good many surveys of school children. So we may ask in the light of their experience what should such mass surveys include? Well, first off there should be a good health history of each individual and children should have their height and weight plotted on the grid devised by Dr. Norman Wotzel of Cleveland so that we can be sure that the physical development is normal for one of its age.
The physical examination should include a search for signs that suggest a bad nutrition; for example, an appearance of chronic fatigue, bad posture, pallor, rough skin, spongy, bleeding gums, a red tongue, crusty eyelids, blinking and other signs of sensitivity to the light and sores at the angles of the mouth.

At the present time few school health departments are prepared to carry out and elaborate laboratory tests for the evaluation of the state of nutrition but for school children it is easy enough to make a test for the iron in their blood and anemia is important in children. In this connection, I always like to tell the story of the kids in the Ozarks who one fall about 10 years ago were subjected to this enemia test by one nurse while another asked them a little later whether their pappy had a garden -- not what kind of a garden or how productive it was -- but just did his folks have a garden.

The result was that there was 75 more anemic kids who did not have the garden at home. One of the most important tests is a record of the diet. Just writing down all foods eaten for a week. Many people think that this is an excellent educational experience as well as helpful fact-finding device. Best of all is the curative tests. Where certain deficiency exists, a corrective nutrient may be given and changes for the better are watched for.

Speaking of the eating habits of school children, another study was recently made of the eating habits of 385 children. The school records of the physical, scholastic and emotional ratings of the children who are getting the "poor" diets as compared with the ratings of the children with the "good" diets showed that the kids on the good diet were slightly better in physical status, dental status, in days absent from school because of illness, in educational ratings and definitely better in social adjustment. Such diet studies always proved to be valuable nutrition tools for both the children and their teachers.

These surveys of communities and groups of people are all very interesting but they only point to the fact that each of us should be making a survey of his own nutritional status.

In doing this we should begin with our food habits. Let me ask you, do you get a quart of milk a day? Do you get a quart of milk a day? Do you get a least two servings of vegetables, and at least one of them raw? And what about fruit -- two servings a day with one of them citrus or tomato?
A. B. C.

Unison

A. B. C.

Most people get one or more servings of meat, fowl, fish, or beans, each day, do you? And one or more slices of dark bread or whole grain cereal at each meal? With some good country butter and an egg a day if you are not the kind of person who is threatened with high blood pressure. How closely do you follow these recommendations?

Now take a good look at yourself in the mirror. As the light shines thru the lobes of your ears can you see that they have red blood in them? Does your face have color in it? Your lips, what about them? Turn your cheeks inside out and see if the mucus membranes are red, now you see you can get a pretty fair idea as to whether you are anemic or not.

C...

If you are lead to believe that you are, then it is time to ask your physician for a blood count to see how badly anemic you really are. Take a good look at your tongue. Does it appear like a tongue should or is it a different color, too rough, or smoothed out?

B...

If that means a vitamin deficiency consult your physician about it at once. Your gums - are they pink and healthy looking or are they spongy and cozing? Do they fit snugly around your teeth or are they receding. If they are not healthy, you better begin to increase the amount of green leafy vegetables and the amount of citrus fruit in your diet. Take a good look at the corners of your mouth, are these cracks and fissures with a dry scaling? This calls for corrections in your diet. Look into it at once. Now look at the skin of your elbows and on the nape of your neck. Do little bumps like goose pimples stand up on these places all of the time making a grater-like skin?

A...

Your eyes - do they have a lustre about them as though you were alive or are they dull and dead? Are the lids dry and crusty, are they sensitive to light?

C...

All this means a bad nutrition and demands that you look into the reason for these things with your physician. What about your posture? And are you overweight? A side glance at yourself will tell you. You do not need to look it up in any table. And if you are over 35 and weigh too much you should get busy and reduce. Remember too much weight comes from too much food. Don't take my word for it, ask your own doctor. Ask your insurance agent. They will tell you that with each increase in the waist line there goes
a shortening of the life line. Medical records tell us that the overweight person is much more susceptible to disease than a person of normal weight. Any surgeon will tell how loathed he is to operate upon a fat patient. By the way, it might cinch this argument and do you a lot of good to visit an old folks home.
APPENDIX C.

PRACTICE MATERIAL NUMBER THREE (Z)
Knowledge in Action: It's as plain as black and white that colors have traditional meanings for all of us. We take it for granted that red and green means Christmas; we associate red, white, and blue with the flag and the Fourth of July—and white is customary for weddings, and black for funerals. And, on the more colorful side—in our cities and this rainbow-colored world we live in each color and combination of hues symbolizes something. For example, to this motorist and his wife, driving downtown on a shopping trip, a red traffic light means stop.

A...Wilbur! Wilbur Wiffle! It says stop—the light's red. Huh—good thing I stopped you. The light's red, you dolt. Don't you see it? Answer me, Wilbur—don't just sit there. Don't you know red means stop?

B...Yes, dear, I know

A...Then why don't you stop when the light turns red?

B...I'm stopped, dear.

A...Very well—after this, pay attention.

B...Yes, dear.

A...The light's going to change in a second, Wilbur! Pay attention to the yellow signal!

B...Yes, dove—yellow means it's going to change—

A...It says "go"! Wilbur! Green means go. Go ahead! For heavens sake, don't be so stupid. The light's green—Go on!

B...Yes, love—yes, pet—I know green means "go". ——and I am going, dear— I am going.

C...Yes, colors are significant to all of us. They're traditional customary symbols in our everyday lives. But are they something more? Does the power of color go deeper than tradition???—is color more basic than custom? Each week the University of Denver presents Knowledge in Action, a series of transcribed, dramatic programs showing knowledge at work to answer the questions in everyday living. And this evening, as usual, here's Randolph McDoough, of the University of Denver with a report on the psychological effect of color on you and me—and an amusing story about the colorful problem of an ordinary fellow called: "The Self-Expression of Wilbur Wiffle!"
Now, I'm not color blind—but I'm not especially "color-conscious" either. I'm like a lot of you, I guess, who live with color all the time and take it for granted. I'd never stopped to think what color really was until recently I heard a physicist's definition. Our physical scientists say that color is light—something you can see and measure.

Color is the visible and measurable part of the spectrum and the color of any object depends upon that part of light it reflects. Any surface which reflects all wave lengths of light, appears white, and that which absorbs light, looks black. In between black and white—depending on the reflecting power of the surface—are the other basic colors of the spectrum—magenta-red, green, and violet-blue. But basically color is light—it's as plain as black and white—you can see it and measure it.

But an artist would contradict a physicist:

Oh, no!—oh, my no. You can't measure color—you really don't see it—you feel color. There's red for vigor and yellow for brilliance—and the basic primary colors are not magenta-red, green and violet-blue. They are plain red, yellow, and blue. And I should know—I mix enough of them.

Now Wilbur Wipple, the mild, little man we heard getting the bawling out over the traffic light, takes color for granted too. He's not what you'd call a colorful man, but as he walks down the street toward the clothing store—just a step behind his wife, Bertha—he's certain of one thing:

But, Lambikins—I want a red necktie to go with my new suit.

Nonsense! I'll pick out your suit—and your necktie.

But why can't I have a red necktie this time? I just love red neckties, dear.

Because they don't suit you, that's why. Wilbur, you've no judgment when it comes to color. Red is gaudy and ostentatious. It's vulgar.

Well, I just thought a red necktie would be nice. I haven't been vulgar for so long—and red is so vigorous.

What did you say?

Nothing my pet—nothing.
A. Well, here we are. Now remember, let me do the talking.

B. Yes, lambie-pie.

A. ---and take my advice about the color of your suit.

B. Of course, tweetiekins.

A. ---and no vulgar, red neckties!

B. Oh, no, turtledove.

C. Are you folks being waited on?

A. No, we're not.

C. What may I show you, please--a shirt for the gentleman perhaps or a necktie?

B. Well, I----

A. We want to look at your men's suits---something for spring.

C. Very well, madam--and sir. Right this way.

A. Wil-bur! Come away from those neckties!

B. Yes, dear--just admiring them, love.

A. Come along!

C. Here we are. Something in a single or double breasted, Sir?

B. Well, I---

A. Double.

C. Plain or swing back?

B. Oh, I think---

A. Plain.

C. And what color did your husband have in mind?

B. Well, now I thought---

A. We thought he's like something in a subdued Victorian gray, or a quiet brown, or a dignified black---didn't we dear?
Yes, Lambie lovekins.

---something plain, subdued and quiet---. Well, would you care for this Oyster Green, double breasted model?

Oh, my no!

---latest color for spring wear.

I should say not---much too startling.

---well, then there's this Parchment Tan--or I know! How about this ultra-conservative model in a Mustard Dun?

----oh, no---please not that---

Wil-bur!

But, dear---mustard makes me frightfully ill.

Ridiculous! I think it'd look very well on you. Hold it up to him.

Yes, madam.

There! Yes, yes, I do---that'll do very well for your complexion, Wilbur.

But, dear, my stomach---

Wilbur!

Ch, all right!

Can you fit him?

Yes, madam---this one's very near his size. Will he try it on now?

No. Later while I do my shopping.

Do you wish to pick out some accessories to go with it now? Shirts, hosiery--neckties??

Dear---could I---?

No! No, not you, sir. Yes, he'll want two shirts---one gray---one white---size 12-31.

Yes, madam---
and one necktie—something in a Puritan Blue.

But, dear—

---or a Rust or Tobacco Brown.

Of course, madam.

But love, couldn't I have just one ---

No, Wilbur! Now while I'm shopping, fit him for the suit. And be sure you pick out his shirts and necktie. He has no sense of color at all.

---but couldn't I have just one red necktie?

Positively not! Now, Wilbur, you stay here till I get back and stay away from those neckties! I'll be gone about an hour and don't you leave.

Oh, pshaw! Oh, fudge! Coooch——fuddle-duddle! I think a man's entitled to a red necktie—and I need a red necktie. Red neckties are warm and vibrant—and bold!

I know whatcha mean, mister. With a wife like that I'm surprised you don't "see red" all the time.

Now let me see something for afternoon and street wear.

Yes, dearie, what would you like? --- what color?

Ohhh, something in a Glacier Blue—or a Frost Gray—something trim and crisp.

Well, I haven't got a thing, honey, in a blue or a gray—but I've got an attractive number in black—very plain, fashionable cut.

Oh, no---black on me looks hideous—so drab. It doesn't match my personality at all—to say nothing of what it does to my figure.

Hummmmm—well, how about this white tea dress?

White!—I should say not! White makes one look like—like a milkwagon—and it's so plain and ghostly.
C...
Well, they say white is concealing, black is revealing—and gray makes you look like you really are. But I haven't a thing in any of them that'll fit you, I guess. What size do you wear, dearie? ——about an eighteen?

A.
No---forty-four.

C.
You don't look it—well, here's a suit in light Chartreuse. It's gay with a touch of serenity.

A.
You know! I believe I like it.

C.
—and I can find you some lotus blue accessories that are crisp, yet modest and feminine.

A.
My, dear!—just looking at it I can almost see the blue gloves—and I believe it would fit my needs exactly!

M.
It's not only psychologically true—it's a medical fact that after looking at Chartreuse—or yellow—Bertha can see blue. To our eyes and our minds blue and yellow are natural complements—they go together. So does red and green. Why does she pick blue and yellow? Well, our university psychologists tell us it amounts to this: deep inside the minds of most of us we're actually starved for some basic need like love or respect, or courage or the power to dominate others. And without this missing, psychological element, we're afraid. We seek to find it in colors which for unknown reason seem to express what we lack. Maybe it's as simple as this: fire is red and fire is hot and vigorous and strong and therefor we associate red with strength. And water is cool and blue and the two go together. Anyway, for strong, basic reasons, we have likes and dislikes, as we shall see as we return to Wilbur Wiffle as he waits for his wife at the clothing store:

B.
——well——I probably shouldn't have said so but gray isn't my choice at all.

C.
Well, for heaven's sake—make up your mind, mister. Do you want me to wrap this gray shirt like your wife said, or not?

B.
Well—Oyster Gray makes me morbid and bilious—but I better take it. Bertha likes gray.

C.
Okay.
They're everlasting monotonous!

What are?

The clothes she picks out. Young man, I hope you'll never know what it's like to wear Desert Brown and Oyster Gray and Puritan Blue. It's like being in jail.

Confidentially, I'd like to know what you see in her -- how you picked her out--

Who?

The warden.

Ohhh--me too. She wore a blue dress once, and looked so calm and peaceful. I guess I just lost my head and proposed. I used to like blue--

Sure--well, what about the necktie--have you made up your mind?

Well, now--I don't know.

--shall I put it back?

Perhaps you'd better.

Okay, mister.

But don't bring the blue one again. Bring one just a little lighter red. Maybe she wouldn't notice.

Look, mister--why don't you stand on your own two feet? stand up to her.

You're joking, of course.

Ohhh--I give up! How about this tie--Ashes of Roses.

I'm afraid it's a little too red--for Bertha.

It's pink.

Well, have you something just a little lighter?--something a little nearer brown or blue--that still has a suggestion of red in it?
C...
Here they are— the last I got— these three. Thistle Pink, Astor Pink, or Sweet Pea. ---but if you get any paler than this you might as well give in and take what she wants.

B...
You're right! ---this time I'm going to stand my ground. By gracious I'll take it. ---and maybe she won't notice anyway.

C...
How's that?

B...
I say, I need that necktie, young man— but wrap it up well— inside the shirt.

C...
Well, you got it mister— and all I can say is— I hope you get by with it.

M...
Well, if Wilbur does get by— and I doubt it very much— what good will a pink necktie do for him? Of course, it's a mildly warm color— and feebly bold. It's close to red in it's psychological effect. But Mustard, and pink and Oyster Gray— not very courageous, would you say? Nothing to get alarmed about. But all the way home, Wilbur kept asking himself:

B...
I wonder if I should have been so bold?

M...
And you wonder whether Wilbur did get by with it— whether this small bit of self-expression went unnoticed? Well, he got home, eventually and reluctantly he had to unwrap the package. And reluctantly but courageously, he had to hold it up and show it to her:

B...
There it is, dear— do— you— like— it?

A...
Wil-bur! Wil-bur Wiffles!

M...
Yes, a physicist can measure color and artist can feel it, and in a way, Wilbur Wiffle could do both. He could measure the after-effects of that pink necktie in the stitches over one eye, and he could feel the lump on his head. And as he looked up at the gray ceiling from his hospital bed you might say he was profoundly and psychologically influenced by color:

B...
I just love the red in my thermometer!! It's so warm, and expressive.
A...

RICHARD HUDNUT EGG CREME SHAMPOO is a modern creme shampoo—a creme shampoo in liquid form—not a creme containing wax or paste. Here's a liquid creme that lathers easily. Here's a shampoo containing egg. Nature's own, chosen shampoo—aid—to coax every dry, unmanageable strand to shining, natural beauty. Is your shampoo enhanced with egg? Is it a modern creme shampoo in liquid form? Is it made by beauty experts? RICHARD HUDNUT EGG CREME SHAMPOO is! It gives you the right answer on all three counts. Tomorrow, at your drug or department store, change to RICHARD HUDNUT EGG CREME SHAMPOO.

B...

There's nothing more uncomfortable than the common cold. If you're suffering from one right now—you know what I mean. Well look—be smart about it—get quick relief from your cold discomfort with Minit Rub—a really modern chest rub. Rub Minit Rub on the throat, chest and back. In a minute Minit Rub's soothing menthol vapors begin to clear that stuffed up feeling in the nose and throat—in a minute Minute Rub helps to bring a feeling of warmth and relief to those tight, sore aching muscles brought on by your cold. And listen—Minit Rub is greaseless and stainless, can't harm clothes or bed linens. So get a tube of Minit Rub and get quick relief from amoying cold misery the modern way, the greaseless, stainless Minit Rub way.

C...

The mushroom is the aristocrat of vegetables—a tender delicacy for a long time prized as a luxury. Until recent years, only a few people were acquainted with its delicate, delightful flavor. Now everybody can enjoy it, in Campbell's Cream of Mushroom Soup—a delicious blend of plump cultivated mushrooms, sweet whipping cream, and a delicate seasoning. The texture of this fine soup is smooth and rich. The taste is delectable. Flatter your guests—and your family, too—with Campbell's Cream of Mushroom Soup—a luxury in everything but price.

D...

The little fellows who entered the stock market a few days ago got their fingers burned today.

During the final hour of trading this afternoon, stocks on the New York Exchange broke sharply—plunging downward from one to five dollars a share. The high-speed tickers dropped 12 minutes behind sales in the most severe jolt on "The Street" since stock began climbing seven months ago.

E...

It started as a routine day, with few signs of what was to come. During the morning hours, there were some small declines—a dollar in the industrial stocks and a half a dollar in the rail issues. But this was not considered unusual.
Then, at 2 P.M., a wave of selling began. In four minutes, so many stocks had changed hands that the tickers were one minute late. The machines got further and further behind as the rush to unload continued. And the final hour of trading was one of the busiest in the past 10 years.

In the sudden shake-down, it was the notice trader who got hurt. Many small operators, heartened by optimistic business predictions at the end of 1949, have done considerable buying. Today, they apparently got frightened, and they dumped their recent purchases in large quantities.

Two Ohio Congressmen had some words today for current battles being waged in Washington.

Representative Earl Wagner of Cincinnati jumped into the battle over Washington streetcar fares.

Wagner wrote the Chairmen of the Public Utilities Commission of the District of Columbia that he objects "with all the vehemence at my command" to a proposal by the Capital Transit Company to raise fares without a public hearing.

The company wants to raise the fare from 13 to 15 cents.

And Representative Frances Bolton of Cleveland suggested that seals of the 48 states should be placed in the London Memorial Chapel for American servicemen.

The seals were recently removed from the Chamber of the House during its renovation.

Mrs. Bolton, who protested strongly against their removal, says that since it has been proposed to dedicate a memorial chapel in Saint Paul's Cathedral in London to United States servicemen it might be a fitting place for the seals.

A one-man rebellion against Russia is the talk of the United Nations this evening.

A member of the Polish delegation to the U.N. has resigned because the Russians are calling the tune in Poland.

He is Alexander Budzinski, and he poured out his complaint in a letter to Secretary of State Acheson. "Freedom has disappeared in Poland," he said, because of Soviet actions. And he also says, "...I tried stubbornly and consistently to save at least some area of independence and initiative
for the Polish delegation." But he says it's hopeless, and so he's quitting, and wants to be protected in the United States.

We frequently grant such requests for asylum, and the State Department says it's thinking it over.

Unison

Hudzinski is not alone. The Secretary of the Czechoslovak Consulate General's office in New York has resigned, too. He's Arnold Fried, and he says, "I find it impossible to serve the present Communist regime of Czechoslovakia." He called it "Anti-Democratic."

And Fried also asked the State Department for asylum in this country.

Thousands of families in river towns of the Midwest and South are sleeping with their suitcases packed tonight. At almost any hour they might get word to grab what valuables they can and run for the hills. It's that bad in at least a score of towns. Laborers, farmers, convicts, schoolboys, soldiers and other volunteers are working around the clock on the levees of the lower Mississippi Valley. Most of them remember a night 13 years ago...The last time the big Mississippi went on a major rampage.

The Ohio, Wabash and smaller Midwestern streams also are continuing to rise by the hour and force hundreds more persons from their homes. Here's the situation in some cities at a glance. Vincennes, Indiana...one of the worst danger zones. Some 200 high school students have joined one-hundred troops in reinforcing a concrete wall against the wild Wabash River---and building a secondary levee behind it. The crest isn't expected until Friday.

Louisville---The Red Cross has set up disaster headquarters for hundreds of families made homeless by Kentucky rivers and streams.

Rosiclare, Illinois---high water from the Ohio drowned out the hospital heating system and patients had to be evacuated.

The progress of growth of any living thing, as it appears to most people, represents merely an increase in size or bulk, taking place in a definite length of time which varies according to the species to which the animal happens to belong. That this process is not solely an increase in mass is evident once you stop to think about it. As you watch a child grow, for instance, you may realize the manifoldness
of the evolvement which changes the proportions of the different parts of the body and causes new elements to appear.

For the student of biology, the growth process is a very complicated business, resulting from a harmonious combination of cellular proliferation and differentiation conductive to organosis in some parts with involution and actual atrophy in others, which together with integrate, in the passing of time, into an organism that matures, reproduces, and finally comes to an end. Is not language wonderful? What I have been trying to say in this high-brow "lingo" is that the growth of the body goes on in a wondrous way, the organ enlarges and takes their place in the body and when their work is done wither away, all in nice balance and control.

In making the body of a human being some two billion units— the cells of your body—arrange themselves into organs and each organ takes up its special tasks, absorption, digestion, transportation, communication, sensation, locomotion. So we can say that normal growth consists of three basic performances, i.e., cell reproduction, but this must be under wraps for if it were not controlled but went on at the rate at which it starts at the time of conception, the body would be twice the size of the world itself in just a short time. So there is differentiation into specialized organs and each of these is kept at a proportionate size.

We have to make a distinction between the size and weight increases which take place after the individual has reached full maturity. In case of size increase new material is incorporated for the growth of the organism; in the latter there is merely an increase or decrease of storage materials to be used for the daily energy requirements.

In the light of this concept, therefore, such changes as may take place in the size of the different organs after maturity cannot be considered as growth. The capacity, however, of the adult person's body to grow, once it has reached its normal adult proportions, is subject to discussion, as we shall see a little later.

It follows, as we have said before, that development pre-supposes that the young body will require essential materials to be worked into the very substance of its tissues, as well as those supplying the necessary energy involved in this building process. This brings me to a consideration of the different factors which contribute to the growth process.
As one of the students of this problem of growth has said, "the egg is already an achievement in the development and evolution; already a chapter in the process of development has been closed while another is yet to begin."

The controversy still goes on as to which is more important—inheritance or environment. The followers of Karl Marx, since they propose to reach Utopia through manipulating their environment, do not recognize the personality of the individual or have any use for the concept of the dignity of a human personality. In fact, it is this basic concept which makes all socialists and communists irrevocably opposed to the Christian philosophy. The Christian concept must be destroyed if the teachings of Karl Marx are to prevail.

But, in spite of the fact that they are killing scientists in Russia for emphasizing inheritance, at the expense of the environmental factors, inheritance is very important. Each cell, in each of us, has already been stamped through heredity with the particular reactivities which will cause it to respond to external stimuli in a particular way. Thus, in studying the development of the kidneys of the opossum it was found that reactivity is a function of age, that is, the organs would form as a result of inheritance and the hormone influences were of secondary importance.

Nevertheless, those chemical factors present in the tissue juices do of course, bathe the cells and also play a decisive role. We have seen that development follows hereditary laws, suffers the influence of humoral as well as environmental factors and undergoes individual variations. But, even more, at any given moment we find the greatest differences in the rate of growth of various organs. Then certain organs like the tonsils and the thymus suffered retrogression and wither away while the sex glands and the adrenal cortex gain as puberty appears.

Unison

Normal growth in uterus and the birth of a normal baby can be assured if the expectant mother does not contract some infectious disease (especially German measles) and has a decent diet from the seven basic foods in reasonably proper balance. In the experimental laboratories, they now produce growth defects such as cleft palates, hare lips, missing shoulder blades and defective arms or legs by withdrawing this or that vitamin or mineral from the diet.
Once the child is born, normal in size and form, then growth is pretty much a matter of nutrition. Any one who is skeptical on this point ought to look about them and note how much larger our young people are today. And there is great difference between them and youngsters in less well nourished peoples. The use of cod liver oil and other vitamins and more attention to the feeding of our children has certainly registered itself in the body build and physical growth of children. In following the growth of children, Dr. Norman Wetzel of Cleveland, Ohio, has invented a chart which is most helpful.

This chart is based upon a statistical study of the 160,000's of measurements of children. The result of this study was the discovery that children grow along seven different channels and one of these channels is the normal one for a particular child and as long as that child grows in, and stays in, his appropriate channel, we do not need to worry about this growth and development. He is doing all right. Dr. Wetzel has labelled their channels as obese, stocky, good, fair, borderline, poor. These terms are descriptive but rather misleading. Misleading because the term "poor" for instance, simply means we are dealing with a child of naturally skinny build.

Whereas obese means we have a naturally fat child. Nevertheless, these channels are of great value for once we get the mark on the chart for his height and weight and then spot him in his channel we have a point from which to work. The child is to be weighed and measured at regular intervals to see if he stays in his own regular channel. No matter what happens then if he is in his channel we need not worry about his growth. But if he moves to another channel, it is evident that something is wrong with his nutrition or that we have not determined his proper channel.
B. The capital city of Mexico is .......... 

A. Two states bordering on the state of Ohio are .... and ..... 

C. If one was on a boat in the Gulf of Mexico the shortest way to get to the Pacific Ocean would be through the ........ 

A. The present governor of the state of Ohio is ....... 

C. The present mayor of the city of Columbus is ------- 

B. Ohio State was beaten by ..... in the last football game of the 1950 season. 

C. A birdie is a team used in describing a game of ........ 

A. The Chinese army on the island of Formosa is Commanded by ...... 

B. "Old soldiers never die, they just fade away" was recently made famous by ........ 

A. The third World War began on ........ 

B. In the army the rank of major is one rank above that of ....... 

C. Black is the opposite of ....... in color. 

A. Ten of the most popular car makes in the United States are .............. 

C. Duff is the Governor of the State of ............... 

B. Nine times seven minus three is .............. 

A. The estimated population of the United States in 1950 was .............. 

C. I was born in .............. 

A. I like to ..............
M...
Knowledge in Action!

A...
Ham an' on two---beef stew. Hurry it up.

M...
Americans are a nation of "eater-outers." From the swanky metropolitan restaurants to the hustle and bustle of "Ptomaine Charley's" lunch wagon around the corner, more Americans eat more meals away from home than any other nation on earth. And what do they want most when they dine out? Cleanliness? Quiet? Superior food? No----the thing most demanded, most praised--most criticized by restaurant patrons--no matter where they eat is:

C...
Service! Service! How about a little service around this joint? Are you going to let me starve to death? I want service.

A...
Okay, mister--sorry. We're just awful busy today. What'll it be?

C...
It's about time--gimme a ham san'wich--well done--on dark bread, no white---

A...
Yes sir.

C...
--an' a pieca pie--apple.

A...
apple pie.

C...
--an' a cuppa coffee. A little cream, no sugar. An' snap it up. I ain't got all day!

A...
Yes sir. Ham san on wheat! Well ----in a hurry!

M...
Sometimes we call it "service with a smile"--or "snappy service"---but no matter what name we give it, the number one requirement of the American restaurant patron is ---service. But exactly what do we mean by the word? Where did good restaurant service come from? Each week the University of Denver presents Knowledge in Action, a series of transcribed, dramatic broadcasts showing knowledge at work to serve the needs of everyday living. And this evening, as usual, here's Randolph McDonough of the University of Denver with a report on the American's favorite "home away from home"----the restaurant--and a story about "service with a smile", called, The Tip:
What's the matter, Dan, what we stoppin' here for?

Beats me, Sam. What's holdin' us up? Where in sam-hill are we anyway?

This here's Prairie Junction, Folks. We stop here half an hour to eat. You'll find a good restaurant just across the tracks. Everybody out for lunch!

All right, everybody—we got sandwiches, pie, and coffee.

Sanwiches!

You got plenty of time now. Just pay th' cashier fifty cents—sit down at th' counter and we'll serve you. You got plenty of time.

'Board! All aboard!

Doggone it, I thought you said we had plenty of time!

Sure! He did.

Sorry, folks—don't miss your train now! Don't miss your train.

'Board!

Come on, Sam. Th' train's pullin' out.

Ooooo! That danged coffee's hot! But I paid for it—

Come on, Sam.

—an' I'm gonna drink it. All right. Dang it all, I'm in a hurry—but not that big a hurry. What kinda service is this anyway? I'll bet they were in cahoots with th' engineer. I'll betcha they planned it that way.

Oh, well—we'll never be back so why kick about the service? Maybe it's a good thing we didn't get to eat that stuff anyway. It'da probably killed us quicker'n a train.

Tickets, please. Tickets.

Give him th' tickets, Dan. You got 'em.

No I ain't neither—you got 'em. Stickin' in your hat band.

Oh.

Clear through to Los Angeles, huh?
Yes siree.

Well, you got a lay over in Hutchinson about midnight tonight. I'll wake you up. So you're headin' for California an' th' real estate boom?

Why, yes---

---matter of fact we are. How'd you know?

Most everybody on the trains anymore aims to get in on real estate.

Well, we sold our farm near Mason City, Iowa---

---and we're headin' West. Plan to speculate some.

Well, I hear things is mighty high. Land people can't even find's sellin' for a thousand dollars a square foot.

Why th' boom's just beginnin'---

---we got a friend out there that told us.

Maybe so---anyway, good luck. If there's anything you need, just holler.

Right now we need some vittles---

---yep, a square meal.

Then I reckon you'll be wantin' dinner when we stop at Florence.

Will it be like them other places we been eatin' at, back across the river?

---fifty cents---in advance?

Nope, you're ridin' Santa Fe now---you'll be eatin' at Harvey Houses from here on out.

Well, so far it's nothin' to eat---

---or in-di-gestion.

From now on, it's the best in the West.

Please take all the time with your dinner you wish--you have plenty of time. Don't hurry. The train will not leave without you. Take your time and enjoy your dinner.
B. — Well, by Jupiter! I'd never have believed it, Dan. A table cloth on the table!
C. — 'an good dishes.
A. — May I take your orders?
B. — Why, yes, Ma'am—
C. — you mean anything on this bill of fare?
A. — Yes sir.
B. — Well, I'll have the works—-sirloin of beef, mashed potatoes, peas, beets,—-apple pie, ice cream—-an' coffee.
C. — same here.
B. — You're sure we got time to eat it—-?
C. — I'd hate to go off an' leave a meal like that.
A. — Yes sir, the train will wait for you. You have plenty of time.
B. — Ahhhhhhh—great food.
C. — Yyyyyyyep — wonderful service.
A. — More coffee, sir?
B. — No thank you, young lady—not me.
C. — Me neither—but tell me girlie—what's your name?
B. — Now don't get gay, Dan.
A. — It's Rose Wilson. Here's your check, gentlemen—-please come again.
C. — We sure will. Doggone it; Can't I ask the girl her name?
B. — Say wait a minute, young lady.
A. — Yes sir.
B. ——there must be a mistake here—-
A. — I beg your pardon sir.
B. — You mean all we ate—for only fifty cents apiece?
A... That's correct sir--wasn't it satisfactory?
C... I should say it was.
A... Was the service slow?
B... Ohhh-no. I didn't know there was anything like it anywhere in the Wild West.
C... ---makes me want to stick around and get acquainted.
B... Hush up now.
C... We're Sam an' Dan Higgins---on our way to California.
A... Are you enjoying the trip?
C... Up to now, no, but---
B... ---he means, Ma'am, that if we can eat like this the rest of the way, it'll be a plumb pleasure.
A... You know I wish I were going along.
C... You do?
B... ---you got the real estate fever?
A... Not exactly---I want to start a restaurant of my own out there.
C... Well, by golly, come on ---
B... Dan, we better be gettin' on our train. We hope you get that restaurant, young lady--an' we want you to take this.
A... But, sir---
C... Go on, now---do as we say.
A... ---but five dollars, sir. It isn't customary!
B... The service was worth it--remember, the customer is always right, ain't he?
C... ---besides we aim to make plenty of money in California.
A... Thank you--both of you. I'll save it for that restaurant of mine.
B... Come on, Dan!
M... 'Board!
C... --we'll be back when we own half of California.
M... 'Board!
E... Hurry up, Dan!
C... --or maybe we'll see you out there.
M... Alla board!
E... You danged fool, we'll miss that train!
C... Anyway, I don't aim to forget this meal—it was just like home.
E... Well, Rose, that was a mighty fine dinner--
C... Better'n the last time.
E... --an I didn't expect you to remember us--
C... --you know I didn't expect to find a pretty girl like you on this job—thought you'd have been married.
A... Not yet.
B... ---still going to start a eatin' place out in California?
A... Still want to. How was California?
B... ---ohhh, can't complain.
C... ---course it depends on which side of the real estate deal you was on.
A... Well, I know there's a lot of disappointed people coming back, and I wondered about you.
B... We did pretty good some of the time, Rose.
C... ---you danged right we did. We made a half of a million dollars.
A... You did!
B... Sure. But then we figgered to make some more.
C... ---ran it up to two million dollars.
A... Two million!!
That's right—but then—
---then what??
---never could figure out quite what happened---
---the soap bubble busted and got in our eyes. Let's see our check's, a dollar. How much you got, Dan?
Seventy-five cents.
---eighty---ninety—a dollar. Not even enough for a tip for Rose.
Oh, but I don't expect--
Wait a minute—here—you take this here, Rose—it's a deed to two acres of dine California real estate---
---if they ever get the water off it so's you can see it.
Now it might be worth something someday Rose, and we're giving it to you.
But, I couldn't---
---you said you wanted to start a restaurant out there someday---
---maybe someday th' tide'll go out an' you can find this property. It's at a place called ---let me see---
Santa Monica----
That's it, ----Santa Monica.
But I couldn't take it. It's yours---
Remember-----!
-----the customer is always right!
People want service today same as in Grandmother's Day---
and they get it. The customer is always right!
Speaker Sam Rayburn went to bat for his boss today... and led the pro-Truman forces to victory in one of the hottest fights the House of Representatives has seen since the war.

But the speaker did not hesitate. With the House floor nearly full—with the galleries jammed, Rayburn laid down his gavel and went to the floor. He spoke out vigorously against the Republican and Dixiecrat combination which wanted to give the Rules Committee life-and-death power over most legislation. Their motion would enable the Rules group controlled by Republicans and Southern Democrats—to bury any measures which it didn't like.

With Rayburn's backing, the move was defeated by a vote of 236 to 183. The present system continues in effect—-Bills may go directly to the House floor if the rules committee fails to act on them in 21 days.

In the main, Republicans supported the measure as a break to the Fair Deal program. But the speaker asked: "Who won the election in 1948 anyway." Now that the coalition has been defeated, the Southern Democrats cannot prevent Civil Rights measures from coming to the House floor. One to set up a permanent Fair Employment Practices Commission is due early next week.

Shortly before the vote, Pres. Truman outlined his forthcoming tax message to House leaders. In general terms, it's understood to call for higher corporation taxes and a cut in some excise levies.

Elsewhere about the capitol —-—House investigators have reported that they found no evidence that Communists have slipped into America through loopholes in the Displaced persons program.

For the first time since war, the United States is on the verge of breaking off relations with another nation. And it looks pretty certain tonight that it will happen.

For Bulgaria -- the country we're at odds with -- isn't likely to give in to the strong note we sent today. The latter demanded that Bulgaria change its mind about asking for the recall of our minister to Sofia. Otherwise, we'll break off with the Bulgars.
... An American note — delivered both to Bulgarian officials in Washington and Sofia — gave the American position in blunt terms. It said this government must take it for granted that the Bulgarians don't want to keep diplomatic relations unless it withdraws its demand for Minister Donald Heath's recall.

... At Lake Success today, the secretary general of the U.N. talked sorrowfully of the state of things in the world organization. Trygve Lie said that the U.N. is at its lowest ebb with the Russian boycott. But Lee hopes that its prestige would be restored.

... And in Formosa, Madame Chiang Kai-Shek has asked this country to send a military mission, but not troops, to help the Nationalist regime in its battle against the Reds.

Dr. Kretschmer: I wish to state at the outset that the people of this country enjoy better health and live longer than the people of any large country in the world. This is the result of the fine quality of medical care rendered by the physicians of this country under our present system of medical service. The American Medical Association is keenly aware of the fact that there are certain areas lacking in adequate medical care and has constantly urged correction of this inadequacy.

The house of delegates of the American Medical Association has just closed its annual session in Chicago. It might be well to tell you of some of the actions taken by them on some of the current problems concerning the health of the people.

Concerning President Truman's health program, the first proposal is to grant federal aid for the building of hospitals and health centers throughout the nation. The board of trustees of the American Medical Association has approved the principles of the Hill-Burton Bill and the House of Delegates has endorsed this action of the Board as being within the program of constructive action toward improving the health of our people.

The second recommendation of President Truman is for an extension of maternal and child services. The Wagner-Murray-Dingell Bill would make this effective by increased grants in aid through the Children's Bureau to the individual states. This constitutes an insidious attempt to turn over to the Federal Government functions that are definitely those of the medical profession. The American Medical Association has always favored proper aid for the extension
of maternal and child health services where the need can be shown.

The third feature of the President's message deals with the development of the National Research Foundation. The committee on post-war medical service, the council on medical education and hospitals, the board of trustees and the house of delegates of the American Medical Association have approved of the principles of the Magnuson Bill, which would place the control of the National Research Foundation under a scientific board of directors rather than under an individual director appointed by the President.

Finally, the fourth proposal of President Truman and the main feature of the Murray-Wagner-Dingell Bill is the creation of compulsory sickness insurance. The house of delegates endorsed the following statement from the Editorial published in the Journal of the American Medical Association on December 1, 1945:

"No one will ever convince the physicians of the United States that the Wagner-Murray-Dingell Bill is not socialized medicine. By this measure the medical profession and the sick whom they treat will be directly under political control. By this measure the great system of private hospitals and community hospitals that have grown up in our country will depend for their continued operation on funds paid to them by a federal agency. By this measure the philanthropic efforts for the care of the sick, which have been the pride of our nation, will be forever deterred. Through this measure competent young men who would enter the medical profession will be forced to seek other fields of action still remaining under our democracy which still permit the exercise of individual initiative and freedom of thought and action. By this measure doctors in America would become clock watchers and slaves of a system. Now, if ever, those who believe in American democracy must make their belief known to their representatives, so that the attempt to enslave medicine as first among the professions, industries and trades to be socialized will meet the ignominious defeat it deserves."

The House of Delegates at their recent meeting have expressed their official disapproval of Section 4 of the Wagner-Murray-Dingell Bill for the following reasons:

1. The Wagner-Murray-Dingell Bill is founded on the false assumption that solution of the medical care problem for the American people is the panacea for all of the troubles of the needy.
2. This is the first step in a plan for general socialization not only of the medical profession but of all professions, industry, business and labor.

3. Positive proof exists from experience in other countries that inferior medical service results from compulsory health insurance.

4. A program such as outlined is enormously expensive. It will result in greatly increased taxes for the entire population of the United States.

5. Voluntary prepayment medical plans now in operation in many parts of the United States and which are rapidly increasing in number will accomplish all the objects of this bill with far less expense to the people and under these plans the public will receive the highest type of medical care.

Since when have our people suddenly become so ill that they need a governmental "shot" in the arm? Since when have our people become so helpless that they cannot look after themselves? This is not borne out by the facts. More than 66,000,000 people carry life insurance. This is the result of education. Education in the field of health and hospital insurance has just begun and can be extended on a voluntary basis, as has life insurance, to every man, woman, and child in this country.

Regimentation of a nation always begins with compulsory sickness insurance. It has inevitably led to totalitarianism and complete collapse. The best example is Germany.

Mr. McBurney: Thank you, Doctor Kretschmer. May we turn now, gentlemen, to a discussion of the issues which these talks have raised. In his address a few days ago, President Truman painted a picture of bad health in America, inadequate medical care in many communities, and the high cost of individual medical care. Dr. Kretschmer has just pointed to the splendid progress which American medicine has made.

Well now, what kind of a conclusion are we to draw? What interpretation do you place on those two conflicting points of view, Lohman?

Mr. Lohman: With all due credit to the splendid progress which American medicine has made, the fact remains that the American people today are not as well off as they might be. On many occasions people suggest that we are the healthiest people in the world. This, of course, is only true in making
comparisons between ourselves and other very large nations. There are countries, at least nine in the world, where the mortality conditions are somewhat more favorable than in other countries. In most of these countries they have some form of collective medicine.

In any event, however, I do not propose to suggest that the measure of our progress is to be made by comparing ourselves with other countries, or by looking at our history. The chief difficulty is that we do not do what we can do. We should measure ourselves in terms of what it is possible for us to accomplish in terms of our own potentialities. There are great differentials in the country in terms of different economic conditions, in terms of different social classes. Rural America for the most part is very inadequately served. These are things that need not be in modern America, things that could be taken care of by an effective organization of our health service.

Mr. McBurney: Do you have an opinion on that, Mr. Pratt?

Mr. Pratt: I have this opinion: We have just passed through four years of war with 60,000 American doctors in the armed forces, and in all likelihood, as in all other areas, there may be some lag in the distribution of medical care in this country. Even under these circumstances in 1944 we had the highest level of health and the lowest death rate in the history of this nation. Surely with these conditions, no one can really complain about the present quality or distribution of medical care.

Mr. Lohman: I think I'd like to complain, if I may. While in 1921, 40 babies died at birth for every 1,000 alive, in one state the rate was 98 and 80 in another. We find similar wide variations in mortality rate; the rate of mothers who died in childbirth was 60 per cent higher in the Southern states than in New England.

I was very much impressed by an account that was made of what took place at a recent meeting of the American Medical Association. It was reported that the situation in rural America was well nigh catastrophic. Moreover this situation is a reflection of long time trends and not the result of the war. Our medical men are not going to rural areas because rural America is not economically able to secure for itself the up-to-date equipment and to support the high cost of medical service.
Mr. Pratt: Mr. Moderator, I think we should get on with another part of this discussion. The American people without any doubt at all—I agree with Mr. Lohman in this—believe that we should not fix our standards by those prevailing anywhere else. We are entitled to the best, better than any other nation can provide. We are in agreement on that point. I think we are in essential agreement on the objective. What is of vital importance in this matter is the means of accomplishing that purpose. That is the thing about which Senator Wagner talked, and, in my opinion, that is what we should talk about now.

Mr. McBurney: All right, let's come directly to that issue. Are we justified in adopting the kind of national health plan which Senator Wagner proposes? There seems to be a little confusion about the exact status of the plan. How does the current bill compare with the earlier Wagner-Murray-Dingell Bill, and how does it relate to President Truman's proposal? Let's justify that proposal.

Mr. Pratt: The present bill, Senate Bill 1606, obviously was introduced into Congress by taking a pencil and scratching out some clauses in Senate Bill 1050 which was introduced on May 24th, and it is identical with these exceptions. It makes no provisions for the construction of hospitals; it makes no provision for loss of wages—disability payments—and what is most important, it makes no provision for a payroll tax program or any method of paying for the plan.

Mr. Lohman: I think it is important to keep in mind that the omission of a consideration of means for paying for these services stems from the fact that Mr. Wagner's earlier proposals were for a long time boxed up in certain committees of the Senate because of the inclusion of methods of payment. These committees are the ones in which measures which have to do with financial measures originate. And the omission of that consideration is designed primarily to give this bill a proper hearing so that the Congress can consider the main issues and so that there can be a discussion in which the public can participate.

Mr. Pratt: In other words, it was a trick to by-pass the cost.

Mr. Lohman: On the contrary, I think to suggest that a few people can keep it bottled up without any consideration at all, simply because it happens to be in the hands of a committee that has certain set political prejudices, is a trick.
Mr. McBurney: Why did President Truman twice point out that these proposals are not socialized medicine?

Mr. Pratt: May I answer that question, Mr. Moderator. President Truman specifies why he did this: He did twice in his message to Congress say that what I am recommending is not socialized medicine. "Then Senator Wagner introduced the bill as Senate Bill 1050 on May 24th he also did the same thing, and he made the statement, "Socialized Medicine—these are devil words." The facts indicate that President Truman said, "Socialized medicine means that all doctors work as employees of government. The American people want no such system." And that is exactly why he also said, "This is not socialized medicine."

The facts in the case are, the term "socialized medicine" is not a defining term at all. It means different things to different people. But the legislation that has been introduced to implement President Truman's statement is worse than any socialized medicine proposal that has ever been in effect in any country anywhere in the world. It provides for an out and out political distribution of medical care throughout the United States to all men, women, and children.

Mr. Lohman: I think I'd like to take some violent exception, if I may, to Mr. Pratt. First, he dismisses the term "socialized medicine", saying it is a loaded term and then proceeds to substitute for it the term "political medicine." This does not contribute to a clarification of a problem.

I agree with him, we ought not to use these terms; we ought to discuss the problem without using the terms such as regimentation, socialized medicine, and so forth, which are designed to cloud the issues and not to throw light on our actual problem.

Compulsory health insurance should be and can be evaluated as such in terms of its merits and limitations, and we should rightly discuss it, not raise these words—these "devil words" as Senator Wagner said, which immediately raise effective barriers to discussion of the issue.

Mr. McBurney: Let's get at some of the specific objections which Mr. Kretschmer has raised to Senator Wagner's proposal. I'm anxious to clarify the areas of agreement here, because I think there are some areas of agreement, and also the areas of disagreement.

Now consider the five points that President Truman made in his report. First of all, Mr. Pratt, do you object to federal aid for the construction of hospitals and related physical equipment?
Mr. Pratt: On the basis of the Hill-Burton Bill the medical profession has given unqualified endorsement to the federal government providing funds for states to make studies of hospital needs and to the determination locally of hospital needs and payment of federal funds to the state. Then, to finance the construction of hospitals there is no disagreement.

Mr. McBurney: Do you object to the expansion of public health facilities?

Mr. Pratt: Yes, under the conditions laid down in the act; but I want to read one little section of the qualifying clause and suggest how this can be revised. You set up a state plan and you set up local agencies under the state plan. One of the provisions of the bill, quoting, "provides such methods of administration including methods relating to the establishment and maintenance of personnel standards on a merit basis...". We would add, "except that (get that--"except that") the Surgeon-General shall exercise no authority with respect to the selection, tenure of office and compensation of any individual employed in accordance with such methods." In other words, you would have a determination, a local determination of need and a local administration with federal subsidy to make sure that there are adequate funds. And under those conditions there are acceptance and agreement.

Mr. McBurney: As I follow Mr. Pratt here, and I'm going to give you a chance in just a minute, Lohman, the Medical Association approves certain things that President Truman proposed under certain conditions: the construction of hospitals and related facilities with federal aid, extension of public health facilities where the need is established, and federal aid for research; but the real objection comes to the compulsory health insurance features.

Mr. Pratt: Absolutely.

Mr. Lohman: May I suggest that some of these things in which we seem to be on the face of it, in agreement, really constitute a serious challenge to any real program that will bring about an effective change. Take, for example, the Hill-Burton Bill, which would approve of the establishment of hospitals, but which at the same time is not accompanied by any provision for the utilization of these facilities. This is to approve in effect nothing, it seems to me. The self-same reason why many sections of America cannot create for themselves adequate health facilities, adequate hospitals, is the reason they cannot attract dentists, doctors, nurses and other related
services. Therefore it is entirely possible we might get hospitals built but with no one to staff them. This was something that actually did happen during the depression when the Public Works Administration built some hospitals to reduce unemployment and some of them were diverted therefore to other purposes. What we must recognize is that the self-same condition which makes it difficult to produce hospitals is the thing that makes it difficult for them to provide any physicians, dentists, and so forth, and we must address these problems together.

Mr. McBurney: Your point is that the Wagner Bill presents an integrated program and to deal with piecemeal is likely to vitiate some of its more important results.

Mr. Lohman: And furthermore, I should like to suggest that, if it is not wrong to utilize government, and if it is envisaged that there be a measure of decentralization, I do not see why the same kind of decentralization cannot exist under a compulsory health program.

Mr. Pratt: Now these are the facts, and I want to get at them. Senator Wagner talked of the Advisory Council, but the Act reads, and I am quoting: "The Surgeon-General is hereby authorized and directed to take all necessary and practical steps to arrange for the availability of these services." Now the Surgeon-General sets up an Advisory Committee of sixteen men. He appoints the Committee. He appoints them. This Advisory Council he appoints, and he is chairman, and what does it do? It advises the Surgeon-General, collects $25 a day when it's on the job, writes reports and appoints other committees. Now, what do those committees do? They advise: Then the Surgeon-General is authorized to put up another committee and this is what it says: "Except with respect to states or local areas for which other arrangements are made the Surgeon-General appoints local area committees to aid in the administration of this title."

Now what are their functions? This is the way the Act reads: "Such committees are hereby authorized to make annual and special reports and recommendations." Thus you have the Surgeon-General directed to work with an Advisory Council that has just an advisory function and with other committees that have the authority under the act to make annual reports.
Mr. Lohman: The inference here is that the Surgeon-General would be set up as some kind of all-powerful dictator. It seems to me that such an allegation does not do credit to the American people in terms of the kind of result we get from our own government, in whom we can have confidence? The idea of setting up some one responsible is thoroughly in accord with the American tradition. We must have some one to whom an accounting can be made, someone who is held responsible. The bill is filled with provisions of policy-making under the Advisory Council, and direct participation by people from the professions. And it seems to me all the way along that Senator Wagner has given evidence of his real concern . . . Just a moment, let me continue . . .

Mr. Pratt: I am sorry. The time is just about up and the moderator is pointing at me. The facts of the case are you cannot have confidence in that part of a government which sets up a dictatorship to provide medical care for all the people in the United States.

Mr. McBurney: Thank you, gentlemen, we shall have to close on this very interesting controversial note. I think your positions have been made sufficiently clear.
APPENDIX D

FIVE-SYLLABLE TEST MATERIAL
Even if you see
you're over the field
we close the throttle
straight along the ground
then we throttle

the same as the one
a clear landing space
for the same reason
in their proper place
how strong the wind is

to keep the plane in
should make your landings
follow the sequence
on the up wind side
when one wing goes down
to a full landing
seemed to be about
make a climbing turn
set the trim tab back
if we were coming

the speed of the plane
until it becomes
for a gliding turn
the nose is brought down
set to break the glide

when we're in the air
the field is roughly
out from the circle
start breaking the glide
apply to that shot
Please read each phrase naturally. Between each phrase count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

release the pressure
that will cause the plane
the throttle is closed
good three-point landing
adjust our distance
closer to the field
hold the control stick
the rate of descent
if you have a great
some cross wind take offs

the degree of bank
in normal gliding
back in level flight
road to fly along
turn so that we'll have
Please read each phrase naturally. Between each phrase count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

you cross the wind line
forward and backward
the tail is higher
before the plane lands
so that we'll know when

land into the field
you'll start the landing
ease of the rudder
if there is little
always check traffic

advance the throttle
the turn is started
a little excess
hold back of neutral
lower the right wing
Please read each phrase naturally. Between each phrase count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

results in a skid
the amount of sky
back pressure is held
sometimes the traffic
we adjust the rate

with the feeling that
complete the landing
start the approach now
always be careful
by flying down wind

the edge of the field
speed is kept constant
so I'll take over
but don't hold the nose
straight and level flight
Please read each phrase naturally. Between each phrase count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

a spin to the right
one-two-three methods
we increase the rate
vary so greatly
back to level flight

increase the throttle
as we get higher
before the plane leaves
we level the wings
we'll try some small field

seem to be skidding
keep the heading straight
as the other planes
clear of other planes
we're flying down wind
as the plane reaches by our rate of turn which we can get back start to break the glide show you what I mean

distance from the field then close the throttle without any turns make contact again and into the wind

push the stick forward you see what you think got close to the ground by a diving turn that is in your path
Please read each phrase naturally. Between each phrase count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

it's a climbing turn
at the proper time
ahead of the plane
never turn your back
that one which may touch
to land on the field
pick up too much speed
try some circle shots
for a normal glide
into the landing

make the second one
pressure on the stick
we'll try some turns now
we start the nose down
on the other hand
Please read each phrase naturally. Between each phrase count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

Adjust the throttle
We pull up the nose
During the take off
We lower the nose
The plane starts to climb

The brakes can be used
If we do not raise
As in the approach
Only then can we
Severe side loading

You have no power
Drop off to one side
What is being done
Alone to the field
About this distance
APPENDIX E

FIFTY-SYLLABLE TEST MATERIAL
If the wind is strong, slip close to the ground with the wings level at the proper time before the plane lands. The glide is broken to start to level. We start the landing until it becomes the plane is landed.

To avoid a tree follow the sequence under thirty feet, when you are over landing straight ahead back into the field. Don't try to turn back in their proper place. If the engine fails don't even look back.

In order to keep in normal gliding to allow the nose the swing toward the road we level the wings to keep the plane from so much excess speed, or the plane will stall. If we do not raise the nose is higher.
For a normal glide during the spiral, speed is kept constant, but don't hold the nose to ease off the back in a normal glide out of a spiral. Keep the bank constant for a gliding turn to be talked over.

Getting the nose down too late in the turn, must be careful not to skid or slip. He can always make approach and landing apply to that shot in such a manner that the student sees. Keep your pressures smooth.

You'll start the landing, even if you see you're over the field. You won't have enough dive down to a field to a full landing. Make the second one land into the field. You see what you think is still on the line.
Please read each passage naturally. Between each paragraph count silently to five. If you make a mistake keep on going.

DO NOT REPEAT

The goal to strive for: to have the student serve as a pattern with the feeling that alone to the field small field work varies for the same reason in such a way that you have the best chance if the engine fails.

Always be careful the degree of back pressures are the same and at the same time off the back pressure as the plane levels. In a normal turn angle of the wings to hold the nose up exert back pressure.

If the bounce is bad, keep raising the nose as you touch the ground far enough ahead during the landing. The plane stops rolling in a normal glide. The plane is rolling, start to break the glide about twenty feet.
APPENDIX F

DEVELOPMENT OF A METHOD FOR DETERMINING THE DELAY TIMES
APPENDIX F

DEVELOPMENT OF A METHOD FOR DETERMINING THE DELAY TIMES*

* Computed by Mr. Nathan B. Marple, Department of Electrical Engineering, Columbia University.

Let

\[ \tau = \text{delay time, seconds} \]
\[ f = \text{frequency of wave} \]
\[ \phi = \text{phase of wave} \]

Then

\[ e = \sin \omega(t + \tau) = \sin (\omega t + \phi) \]

represents wave of angular frequency \( \omega \) delayed time \( \tau \) second.

Then

\[ \phi = \omega \tau = 2\pi f \tau \]

if \( \tau \neq F(f) \) \( \therefore \phi_2 - \phi_1 = 2\pi \tau (f_2 - f_1) \)

Let \( \phi_2 - \phi_1 = 2\pi \)

i.e. a 360 phase change

" \( f_2 - f_1 = \Delta f \)

i.e. frequency change for 360 phase change

Then

\[ 2\pi = 2\pi \tau \Delta f \]

Where \( \tau = \frac{1}{\Delta f} \quad \tau = F(f) \quad \phi = \omega \tau \)

Then

\[ \frac{d\phi}{df} = 2\pi f \frac{d\tau}{df} + 2\pi \tau \]

Therefore

\[ \tau = \frac{1}{2\pi} \frac{d\phi}{df} - f \frac{d\tau}{df} \]

at a given frequency.
APPENDIX G

VISUAL AND ORAL INSTRUCTIONS
TO THE SUBJECTS
VISUAL INSTRUCTIONS TO THE SUBJECTS

M...... In glancing over your script you will notice that the sentences or paragraphs are headed with the letters A, B, C, and M. These letters represent the members of this group. Will you........be A; ..... will be B; and ........will be C. I will be the person represented by M. Read the following passages in a normal tone and rate of speed. If you make a mistake please keep on going DO NOT REPEAT. Between each of the phrases count to 5 silently. This applies to the phrases only. Now will you start Mr........ you are the person represented by A. Then Mr. ....... and then Mr. ...... and so on,
ORAL INSTRUCTIONS TO THE SUBJECTS

Please sit down at the correct places at the table (the investigator indicates the correct seating arrangement). While you read the instructions on the first page of the practice material that is on the table in front of each of you, I will adjust the throat microphones and earphones on each of you (investigator adjusts the apparatus for each subject). Be sure that they are comfortable.

In order to test the communication system and to acquaint you with the setup, will each of you, in turn, count from one to ten beginning with Mr. ______ (each subject counts aloud from one to ten). You have now heard each other and yourselves talk over this setup.

By now you will have read the instructions on the first page of the practice material. Do you have any questions as to what is expected of each of you? It is very important that each of you understands these instructions (investigator answers any questions).

Please count silently to three between each of the phrases on page one and between each of the paragraphs on page two (investigator gives an example of what is expected).

If you wish to ask a question during the training period, please raise your hand. When I give you the
signal, ask the question but not before then. Any questions? (Investigator answers any questions.)
APPENDIX H

RESULTS OF THE FIFTY-SYLLABLE TEST MATERIAL
APPENDIX H

Results of Fifty-Syllable Test Material

The tables and figures contained in this Appendix indicate the results of the analyses of the data gathered from the three experimental sessions with fifty-syllable test material. The statistical analyses of the data reported herein corresponds exactly with the analyses reported on and discussed in Chapter IV.

The results of the analyses of the data gathered with fifty-syllable test material are the same as the results reported for the five-syllable test material except that with all test sections of Hypothesis Two we can reject this hypothesis. This hypothesis is, "There is no difference in the sound pressure level of stutterers who have practiced reading aloud with a side-tone delay of 0.001090 second (A. tested with a side-tone delay of 0.001090 second; B. tested with a side-tone delay of 0.000678 second; C. tested with a side-tone delay of 0.000356 second)."

The tables and figures that are contained in this appendix are in the same order as the tables and figures of corresponding material in Chapter IV (five-syllable test results).
TABLE XXIII

Summary of analysis of variance (triple classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Section A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>95,308</td>
<td>47,654</td>
<td>0.06</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>2,703,586</td>
<td>1,351,793</td>
<td>1.38</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>1,636,962,540</td>
<td>90,997,797</td>
<td>68.59</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>868,228</td>
<td>217,057</td>
<td>0.64</td>
<td>n.s.</td>
</tr>
<tr>
<td>SXC</td>
<td>34</td>
<td>27,073,415</td>
<td>796,277</td>
<td>2.36</td>
<td>0.01</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>33,397,550</td>
<td>932,281</td>
<td>2.91</td>
<td>0.01</td>
</tr>
<tr>
<td>PXCS</td>
<td>68</td>
<td>22,976,346</td>
<td>337,887</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>1,124,976,974</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE XXIV

Summary of two sets of analyses of variance (double classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>172,856</td>
<td>1,125,980</td>
<td>487,225</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>23,054,060*</td>
<td>17,567,813#</td>
<td>21,968,479*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>286,887</td>
<td>548,602</td>
<td>825,793</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>38,247</td>
<td>279,893</td>
<td>163,633</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>19,012,135#</td>
<td>17,067,766#</td>
<td>26,882,465#</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>297,832</td>
<td>389,205</td>
<td>688,268</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
**TABLE XXV**

Mean measurements of duration (seconds) obtained with three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>14.32</td>
<td>13.75</td>
<td>14.26</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>14.40</td>
<td>14.01</td>
<td>14.14</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>14.22</td>
<td>13.52</td>
<td>14.48</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>14.36</td>
<td>13.72</td>
<td>14.17</td>
</tr>
</tbody>
</table>
Summary of analysis of variance (triple classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>831.72</td>
<td>415.86</td>
<td>1.64</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>20,251.46</td>
<td>10,125.73</td>
<td>6.35</td>
<td>0.01</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>108,262.20</td>
<td>6,368.36</td>
<td>3.99</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>149.24</td>
<td>37.31</td>
<td>0.15</td>
<td>n.s.</td>
</tr>
<tr>
<td>SXC</td>
<td>34</td>
<td>6,288.10</td>
<td>184.94</td>
<td>0.73</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>54,205.20</td>
<td>1,594.27</td>
<td>6.29</td>
<td>0.01</td>
</tr>
<tr>
<td>PXCS</td>
<td>68</td>
<td>17,230.28</td>
<td>253.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>207,218.20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE XXVII

Summary of two sets of analyses of variance (double classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>3,925#</td>
<td>3,563**</td>
<td>2,713**</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>2,482*</td>
<td>1,871</td>
<td>2,748*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>559</td>
<td>770</td>
<td>590</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>180</td>
<td>196</td>
<td>167</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>4,902*</td>
<td>2,759*</td>
<td>1,902*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>285</td>
<td>172</td>
<td>238</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence  
** Significant (F) at the 5% level of Confidence
### TABLE XXVIII

Mean measurements of relative sound pressure level (bels) obtained with three test conditions and at each of three times of testing during Experimental Session A.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.66</td>
<td>1.85</td>
<td>1.93</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.63</td>
<td>1.83</td>
<td>1.92</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.69</td>
<td>1.89</td>
<td>1.96</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.66</td>
<td>1.84</td>
<td>1.90</td>
</tr>
</tbody>
</table>
TABLE XXIX

Summary of analysis of variance (triple classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>3,662,220</td>
<td>1,831,110</td>
<td>0.95</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>892,981</td>
<td>446,491</td>
<td>0.23</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>872,556,971</td>
<td>51,332,763</td>
<td>26.73</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>9,927,384</td>
<td>2,481,846</td>
<td>1.29</td>
<td>n.s.</td>
</tr>
<tr>
<td>CXS</td>
<td>34</td>
<td>19,145,476</td>
<td>563,102</td>
<td>0.29</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>66,167,298</td>
<td>1,946,097</td>
<td>1.01</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXCXS</td>
<td>68</td>
<td>130,580,000</td>
<td>1,920,294</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>1,103,032,332</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE XXX

Summary of two sets of analyses of variance (double classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>2,875,799</td>
<td>1,188,275</td>
<td>1,623,891</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>21,404,760*</td>
<td>17,370,499*</td>
<td>13,714,434*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>4,071,061</td>
<td>754,701</td>
<td>943,482</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>1,845,980</td>
<td>725,723</td>
<td>2,938,705</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>11,921,041*</td>
<td>17,873,894*</td>
<td>26,430,218*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>1,245,721</td>
<td>983,869</td>
<td>2,242,517</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
Figure 8
Mean duration and relative sound pressure level as measured under three test conditions and at each of three times of testing during experimental session B (using fifty-syllable test material).
TABLE XXXI

Mean measurements of duration (seconds) obtained with three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>13.41</td>
<td>13.60</td>
<td>14.05</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>13.69</td>
<td>14.09</td>
<td>14.07</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>13.20</td>
<td>13.83</td>
<td>14.68</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>13.33</td>
<td>12.88</td>
<td>13.41</td>
</tr>
</tbody>
</table>
Summary of analysis of variance (triple classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>828</td>
<td>414</td>
<td>0.96</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>1,792</td>
<td>896</td>
<td>0.41</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>278,947</td>
<td>16,409</td>
<td>7.43</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>1,315</td>
<td>329</td>
<td>0.77</td>
<td>n.s.</td>
</tr>
<tr>
<td>CXS</td>
<td>34</td>
<td>14,168</td>
<td>417</td>
<td>0.97</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>75,077</td>
<td>2,208</td>
<td>5.13</td>
<td>0.01</td>
</tr>
<tr>
<td>PXCXS</td>
<td>68</td>
<td>29,251</td>
<td>430</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>401,378</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**TABLE XXXIII**

Summary of two sets of analyses of variance (double classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>329</td>
<td>1,051</td>
<td>101</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>6,118*</td>
<td>5,490*</td>
<td>5,458*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>698</td>
<td>1,854</td>
<td>679</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>236</td>
<td>216</td>
<td>618</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>6,523*</td>
<td>5,541*</td>
<td>7,572*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>220</td>
<td>677</td>
<td>968</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE XXXIV

Mean measurements of relative sound pressure level (bels) obtained with three test conditions and at each of three times of testing during Experimental Session B.

<table>
<thead>
<tr>
<th>Test Conditions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.86</td>
<td>1.89</td>
<td>1.94</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.82</td>
<td>1.87</td>
<td>1.91</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.87</td>
<td>1.88</td>
<td>2.00</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.89</td>
<td>1.93</td>
<td>1.90</td>
</tr>
</tbody>
</table>
### TABLE XXXV

Summary of analysis of variance (triple classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>2,111,968</td>
<td>1,055,984</td>
<td>0.46</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>1,038,913</td>
<td>519,457</td>
<td>0.31</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>1,391,886,169</td>
<td>81,875,657</td>
<td>44.06</td>
<td>0.01</td>
</tr>
<tr>
<td>PXC</td>
<td>4</td>
<td>12,289,764</td>
<td>3,072,441</td>
<td>6.91</td>
<td>0.01</td>
</tr>
<tr>
<td>SXc</td>
<td>34</td>
<td>75,148,872</td>
<td>2,210,261</td>
<td>4.97</td>
<td>0.01</td>
</tr>
<tr>
<td>PXs</td>
<td>34</td>
<td>51,202,227</td>
<td>1,505,948</td>
<td>3.39</td>
<td>0.01</td>
</tr>
<tr>
<td>PXCXS</td>
<td>68</td>
<td>30,221,057</td>
<td>444,427</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>1,563,898,971</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE XXXVI

Summary of two sets of analyses of variance (double classification): basic measures, duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>1,239,678</td>
<td>995,109#</td>
<td>1,621,087</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>17,035,579#</td>
<td>38,168,328#</td>
<td>31,026,933#</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>1,441,068</td>
<td>262,157</td>
<td>2,466,826</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>2,502,582</td>
<td>559,439</td>
<td>1,052,442</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>26,116,915#</td>
<td>22,589,583#</td>
<td>36,186,934#</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>1,523,918</td>
<td>849,849</td>
<td>2,817,924</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
** Significant (F) at the 5% level of Confidence
FIGURE 9
MEAN DURATION AND RELATIVE SOUND PRESSURE LEVEL AS MEASURED UNDER THREE TEST CONDITIONS
AND AT EACH OF THREE TIMES OF TESTING DURING EXPERIMENTAL SESSION C
(USING FETTY-SYLLABIC TEST MATERIAL)
TABLE XXXVII

Mean measurements of duration (seconds) obtained with three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Test Conditions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>14.41</td>
<td>14.06</td>
<td>14.07</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>13.55</td>
<td>14.47</td>
<td>13.57</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>14.80</td>
<td>13.89</td>
<td>14.11</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>14.88</td>
<td>13.82</td>
<td>14.53</td>
</tr>
</tbody>
</table>
TABLE XXXVIII

Summary of analysis of variance (triple classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Variance</th>
<th>F</th>
<th>Level of Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition (C)</td>
<td>2</td>
<td>84</td>
<td>42</td>
<td>0.08</td>
<td>n.s.</td>
</tr>
<tr>
<td>Test Position (P)</td>
<td>2</td>
<td>853</td>
<td>427</td>
<td>0.50</td>
<td>n.s.</td>
</tr>
<tr>
<td>Subjects (S)</td>
<td>17</td>
<td>2,531,192</td>
<td>14,894</td>
<td>16.75</td>
<td>0.01</td>
</tr>
<tr>
<td>PX &amp; SXC</td>
<td>4</td>
<td>2,069</td>
<td>514</td>
<td>3.40</td>
<td>0.05</td>
</tr>
<tr>
<td>PX &amp; SXS</td>
<td>34</td>
<td>8,399</td>
<td>247</td>
<td>1.64</td>
<td>n.s.</td>
</tr>
<tr>
<td>PXS</td>
<td>34</td>
<td>30,238</td>
<td>889</td>
<td>5.89</td>
<td>0.01</td>
</tr>
<tr>
<td>PX &amp; CX &amp; SXS</td>
<td>68</td>
<td>10,243</td>
<td>151</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>161</td>
<td>305,078</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary of two sets of analyses of variance (double classification): basic measures, relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Test Condition A</th>
<th>Variance, Test Condition B</th>
<th>Variance, Test Condition C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Position</td>
<td>2</td>
<td>970</td>
<td>59</td>
<td>432</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>5,620*</td>
<td>5,009*</td>
<td>4,617*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>490</td>
<td>287</td>
<td>388</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>266</td>
<td>422</td>
<td>3,40</td>
</tr>
<tr>
<td>Subjects</td>
<td>17</td>
<td>6,333*</td>
<td>4,399*</td>
<td>5,941*</td>
</tr>
<tr>
<td>Remainder</td>
<td>34</td>
<td>139</td>
<td>138</td>
<td>269</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE XL

Mean measurements of relative sound pressure level (bels) obtained with three test conditions and at each of three times of testing during Experimental Session C.

<table>
<thead>
<tr>
<th>Test Positions</th>
<th>Initial</th>
<th>Medial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Conditions Pooled</td>
<td>1.79</td>
<td>1.82</td>
<td>1.84</td>
</tr>
<tr>
<td>Test Condition A</td>
<td>1.74</td>
<td>1.79</td>
<td>1.89</td>
</tr>
<tr>
<td>Test Condition B</td>
<td>1.83</td>
<td>1.80</td>
<td>1.83</td>
</tr>
<tr>
<td>Test Condition C</td>
<td>1.78</td>
<td>1.88</td>
<td>1.81</td>
</tr>
</tbody>
</table>
APPENDIX I

TABLES, SUMMARY OF ANALYSES OF VARIANCE (DOUBLE CLASSIFICATION); BASIC MEASURES POOLED FOR THE THREE SUBJECTS OF A GROUP FOR EXPERIMENTAL SESSIONS A, B, AND C.
Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session A (using five-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>16,796</td>
<td>16,121</td>
<td>501</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>232,432*</td>
<td>273,516*</td>
<td>129,799*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>16,650</td>
<td>39,783</td>
<td>9,164</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE XLII

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session A (using five-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>323</td>
<td>473</td>
<td>281</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>24,351*</td>
<td>6,691*</td>
<td>7,824*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>1,347</td>
<td>775</td>
<td>386</td>
</tr>
</tbody>
</table>

*Significant (F) at the 1% level of confidence.
**TABLE XLIII**

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session A (using fifty-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>114,735</td>
<td>839,675</td>
<td>490,895</td>
</tr>
<tr>
<td>Panels</td>
<td>5</td>
<td>92,565,942*</td>
<td>73,054,824*</td>
<td>110,240,364*</td>
</tr>
<tr>
<td>Remaider</td>
<td>10</td>
<td>901,310</td>
<td>1,263,811</td>
<td>2,018,361</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session 'A' (using fifty-syllable material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>401</td>
<td>572</td>
<td>500</td>
</tr>
<tr>
<td>Panels</td>
<td>5</td>
<td>21,296*</td>
<td>7,751*</td>
<td>6,288*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>885</td>
<td>460</td>
<td>453</td>
</tr>
</tbody>
</table>

*Significant (F) at the 1% level of Confidence
TABLE XLV

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group) duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session B (using five-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>8,643</td>
<td>54,982**</td>
<td>50,269</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>409,982*</td>
<td>388,890*</td>
<td>483,820</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>12,342</td>
<td>9,040</td>
<td>72,701</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
** Significant (F) at the 1% level of Confidence
Summary of analyses of variance (double classification): basic measures (pooled for the three subjects in a group), relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session B (using five-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>1,180</td>
<td>795</td>
<td>970</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>31,041*</td>
<td>39,733*</td>
<td>34,338*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>462</td>
<td>428</td>
<td>772</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE XLVII

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects in a group), duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session B (using fifty-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>5,537,940</td>
<td>2,177,155</td>
<td>8,816,110</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>67,906,380*</td>
<td>82,662,028*</td>
<td>95,153,364*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>3,887,411</td>
<td>3,450,535</td>
<td>8,588,129</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session B (using fifty-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>708</td>
<td>652</td>
<td>1,463</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>40,956*</td>
<td>34,953*</td>
<td>27,263*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>337</td>
<td>460</td>
<td>3,088</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE XLIX

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects in a group), duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session C (using five-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>54,490</td>
<td>4,228</td>
<td>24,832</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>498,619*</td>
<td>424,164*</td>
<td>447,756*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>66,661</td>
<td>12,656</td>
<td>9,538</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE L

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session C (using five-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>911</td>
<td>271</td>
<td>605</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>26,821*</td>
<td>17,514*</td>
<td>26,977*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>956</td>
<td>231</td>
<td>349</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE LI

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), duration (seconds) under each of three test conditions and at each of three times of testing during Experimental Session C (using fifty-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>7,507,735</td>
<td>1,678,176</td>
<td>3,157,315</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>136,216,334*</td>
<td>107,599,630*</td>
<td>129,235,360*</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>4,437,604</td>
<td>2,176,804</td>
<td>9,019,657</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
TABLE LII

Summary of analyses of variance (double classification): basic measures (pooled for the three subjects of a group), relative sound pressure level (bels) under each of three test conditions and at each of three times of testing during Experimental Session C (using fifty-syllable test material).

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Variance, Initial Test Position</th>
<th>Variance, Medial Test Position</th>
<th>Variance, Final Test Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Condition</td>
<td>2</td>
<td>1,097**</td>
<td>1,264</td>
<td>869</td>
</tr>
<tr>
<td>Subjects</td>
<td>5</td>
<td>36,187#</td>
<td>13,397#</td>
<td>31,144#</td>
</tr>
<tr>
<td>Remainder</td>
<td>10</td>
<td>206</td>
<td>317</td>
<td>894</td>
</tr>
</tbody>
</table>

* Significant (F) at the 1% level of Confidence
** Significant (F) at the 5% level of Confidence
J. Keith Kent Neely, was born in Clarksburg, Ontario, Canada, April 15, 1921. I received my secondary education in the public schools of Clarksburg and Secondary, Ontario, Canada. My undergraduate training was obtained at Western Michigan College of Education, Kalamazoo, Michigan, from which I received the degree Bachelor of Science in 1949. In 1950, I received the degree Master of Arts from The Ohio State University. In the summer of 1950 I received an appointment as Fellow in the Department of Speech, The Ohio State University, where I specialized in Speech Science, particularly in clinical and experimental speech and also in Psychology studying especially in the clinical and experimental areas. I held this position for one year, while completing the residence requirements for the degree Doctor of Philosophy.