CONJUGATE REINFORCEMENT AS A METHOD OF STUDYING TELEVISION VIEWING BEHAVIOUR

© Alice Yung-Kit Chin HO

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ABSTRACT

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Alice Yung-Kit Chin HO

This study evaluated attention to, and learning from, a TV program with the subject matter of "Chinese Calligraphy and Painting", using the conjugate analysis technique. A viewer's continuous, moment-to-moment response to the program was automatically recorded on a cumulative recorder. The cumulative record provided an objective and accurate measure of a subject's attention to particular segments of the program.

Subjects were 20 English-speaking and 20 Chinese-speaking students. Comparison was made of individual cumulative records on attention to different segments of the program, recall/recognition scores to questions about different segments of the program, as well as attitude towards the program.

By examining individual cumulative records, results showed that all subjects have much higher attention to rapidly changing visual images (film insert) in segments of the TV program than to segments with static pictures (slides and graphics). Subjects also showed higher attention to segments with sequence of static pictures than to a fixed shot of the narrator. Questions from the recall/recognition posttest were differentiated according to their information source: video-only, audio and video, and audio-only; their relations to attention were analysed. Results demonstrated that the probability of recalling/recognizing specific knowledge is directly related to viewing/not viewing a specific program segment, particularly for video-only information for English subjects. (The conditional probability of correct response to test items given that the corresponding TV segment was/was not watched is 0.46 and 0 respectively for English subjects and 0.81 and 0.67 for Chinese subjects). Results also suggest that high attending behaviour produced favourable attitudes towards the TV program.

Table of Contents

		Page No.
1.	THE PROBLEM	
	Introduction	9
	Context of Problem	10
	Scope of the Study	12
	Statement of the Problem	14
	Importance of the Study	15
2.	REVIEW OF RELATED RESEARCH	
	Educational Television Research	17
	Attention Studies	20
	Conjugate Analysis	24
3.	RESEARCH DESIGN AND METHOD	
	Hypothesis	27
	Rationale for Hypothesis	28
	Definitions	31
	Operationally Defined Hypothesis	34
	The Sample	35
	Selection of Subject Matter	36
	Outline of Content & Form of Presentation	36
	Production of Media Presentation	37
	Conjugate Analysis Technique and Apparatus	37
	Recall Questionnaire	38
	Attitude Questionnaire	39
	Experimental Design	40
	Variables	40
	Tryout of Apparatus and Procedures	43
4.	RESULTS	
	Attending Behaviour	46
	Recall/Recognition	62
	Attitudes	94

Table of Contents (Cont'd)

	Page No.
5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS	106
Suggestions for Future Research	112
References	115
Appendices	
Appendix 1	123
Appendix 2	124
Appendix 3	126
Appendix 4	148
Appendix 5	169
Appendix 6	177
Appendix 7	180
Appendix 8	187

List of Tables

		Page No.
Table 1	Results of Data on Item Analysis (Recall/Recognition Questionnaire) for English-speaking subjects	65
Table 2	Results of Data on Item Analysis (Recall/Recognition Questionnaire) for Chinese-speaking subjects	68
Table 3	Kuder-Richardson Reliability Test	70
Table 4	Point Beserial Correlation Coefficient Between Attention[a] and Right/Wrong[b] Responses to a Test Item (Recall/Recognition)	72
Table 5	Response Pattern of Recall/Recognition Questionnaire for English-speaking Subjects	74
Table 6	Response Pattern of Recall/Recognition Questionnaire for Chinese-speaking Subjects	76
Table 7	Response of Subjects to Posttest Items (Selected by Item Analysis) as a Function of Viewing, or Not Viewing the relation TV Segment	81
Table 8	Chi Square (x^2) for Response of Subjects to Posttest Items (Selected by Item Analysis) as a Function of Viewing, or Not Viewing the Related TV Segment	84
Table 9	Response Pattern of Recall/Recognition Questionnaire Corresponding to the Audio Channel of the TV Program (English-speaking subjects)	87
Table 10	Response Pattern of Recall/Recognition Questionnaire Corresponding to the Audio Channel of the TV Program (Chinese-speaking subjects)	88
Table 11	Response Pattern of Recall/Recognition Questionnaire Corresponding to Audio-Visual Channel of the TV Program (English-speaking Subjects)	89
Table 12	Response Pattern of Recall/Recognition Questionnaire Corresponding to the Audio-Visual Channel of the TV Program (Chinese-speaking subjects)	91

List of Tables (Cont'd)

		Page No.
Table 13	Response Pattern of Recall/Recognition Questionnaire Corresponding to the Visual Channel of the TV Program (English-speaking subjects)	92
Table 14	Response Pattern of Recall/Recognition Questionnaire Corresponding to the Visual Channel of the TV Program (Chinese-speaking subjects)	93
Table 15	Mean Attitude Scores of Likert Scale and Semantic Differential Questionnaire for Groups of Subjects with Different Viewing Behaviour (English-speaking subjects)	98
Table 16	Mean Attitude Scores of Likert Scale and Semantic Differential Questionnaire for Groups of Subjects with Different Viewing Behaviour (Chinese-speaking subjects)	99

List of Figures

		Page No.
Figure 1	Cumulative record of subject A4 (always viewing) --Chinese subject	48
Figure 2	Cumulative record of subject B6 (almost always viewing)--Chinese subject	50
Figure 3	Cumulative record of subject C1 (mostly viewing) --Chinese subject	51
Figure 4	Cumulative record of subject D1 (moderate viewing) --Chinee subject	53
Figure 5	Cumulative record of subject E1 (little viewing) --Chinese subject	55
Figure 6	Cumulative record of subject A5 (always viewing) --English subject	57
Figure 7	Cumulative record of subject B4 (nearly always viewing)--English subject	58
Figure 8	Cumulative record of subject C3 (mostly viewing) --English subject	59
Figure 9	Cumulative record of subject D2 (moderate viewing) --English subject	61
Figure 10	Cumulative record of subject E (infrequently viewing) --English subject	63
Figure 11	Plot of probability of correct response to posttest of knowledge as a function of whether or not the segment containing the concept was viewed (English subjects)	82
Figure 12	Plot of probability of correct response to posttest of knowledge as a function of whether or not the segment containing the concept was viewed (Chinese subjects)	83

List of Figures (Cont'd)

		Page No.
Figure 13	Plot of probability of correct response to recall/ recognition item given that the corresponding TV segment was or was not watched, arranged by information source (English subjects)	95
Figure 14	Plot of probability of correct response to recall/ recognition item given that the corresponding TV segment was or was not watched, arranged by information source (Chinese subjects)	96
Figure 15	Plot of mean attitude score (From Likert Scale) as a function of percentage of time spent viewing the TV program	100
Figure 16	Plot of mean semantic differential rating on "Performer" as a function of percentage of time spent viewing the TV program	102
Figure 17	Plot of mean semantic differential rating on "Program Quality" as a function of percentage of time viewing the TV program	103
Figure 18	Plot of semantic differential rating on "Subject Matter" as a function of percentage of time spent viewing the TV program.	105

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THE PROBLEM

Introduction

The problem of selecting a medium or media of instruction is a special challenge to those of us who are practitioners of educational technology. As Holden stated, a central question is, "How to design and deliver instructional materials which will enhance the integration of study, work and living?" (Holden, 1975, p. 287).

There is no one medium--radio, slide-tape, TV, CAI or whatever--which has overall characteristics that makes it the best every time. Many factors need to be considered. Holden (1975) makes a distinction between software variables (degree of control, kind of learned capability, cost, flexibility, population adaptability and compatibility, portability, life and maintenance cost) that need to be considered in the selection of an instructional medium. But these distinctions occur within media, too.

When looking at the effectiveness of various media, researchers gradually have come to the conclusion that the decision-maker should look within the media rather than just make a simple comparison between media, that is, "how the media are used rather than what media are used" (Schramm, 1973). However as long ago as 1960, Hoban suggested that the study of production variables was important both theoretically and practically. More recently, Levie and Dickie (1973) stated that:

A more productive conceptualization of research related to media

> selection is one that specifies the relevant variables in terms of the attributes of media rather than in terms of the media themselves, media attributes are properties of stimulus materials which are manifest in the physical parameters of media. The attributes of a medium, then, are the capabilities of that medium to show objects in motion, objects in colour, objects in three dimension; to provide printed words, spoken words, simultaneous visual and auditory stimuli. (p. 860)

Finally Mitchell (1979) argues for, and describes, a procedure which may be used by educational technologists to evaluate their selected design strategies at the micro-analytical level of program segments. This procedure--conjugate analysis technique--was used in this study.

Context of Problem

Investigators of television, like Shepard (1967); Zettl (1968); Anderson (1972); Chu & Schramm (1967); and Coldevin (1976) have all outlined areas of actual or potential television production variable research. Coldevin (1975) defines a production variable as "a definitive process, method, or technique of television production" (p.289). Coldevin (1976) puts most variables into three broad categories: (1) presentation/technical variables (2) content/subject matter organization and (3) performer characteristics. However, very little experimentation has been done on the measurement and effect of "attention" to instruction by television despite the number of theorists who suggest attention is a necessary component of both cognitive and affective learning (e.g. Mostofsky, 1968; Gagne, 1970; and Anderson, 1970

Any media like slide-tapes, motion pictures or television, if it is to be effective as a vehicle of learning, must first induce looking and listening. Similarly, "if one version of a program induces more attention than other, then it should be more effective" (Mitchell, 1978). Zeigler (1970) considers that the attention factors are responsible for inducing viewers to watch the messages in the first place, before they ever had a chance to "believe", or "remember", or "become interested" in accepting them as whole messages. The only effective programs are those that are seen and heard by viewers/learners.

How can individual elements of a program be isolated for research? How can the producer of an E.T.V. program insure that his production will induce looking and listening? Many producers have attempted to predict viewing and listening by administering objective tests of program content or measuring recall by interviewing subjects. These methods, however, do not tell the producer anything about his subject's immediate moment-to-moment reaction to the program. Similarly, the procedures outlined by Coldevin (1975; 1976) involve only the relation of post-viewing responses to the content of various segments but they are not direct moment-to-moment responses to various program segments. Moreover they mask individual differences by group statistics.

Lindsley (1962) has demonstrated that attending behaviour (i.e. attention) can be measured behaviourally. His method is based on the operant conditioning methods developed in the past 30 years by B.F. Skinner (1959). These methods have been widely applied in the pharmaceutical industry to predict the effects of drugs and in advertising

research to predict the effectiveness of commercials in gaining consumer interest (Lindsley, 1962; Winters & Wallace, 1963). This technique requires the subject to work in order to view or hear the stimulus material. The measure is continuous, immediate, objective and more sensitive to moment-to-moment changes in viewing behaviour than are most post-viewing tests and interviews. The concept underlying the technique is based on the principle of conjugate reinforcement, that is, where a "subject's rate of responding controls directly and immediately the intensity of a continuously available reinforcing stimulus" (Nathan & Wallace, 1965, p. 14).

According to Lindsley (1962), pretests based on experimental psychological methods are more objective than reports of raw past experience. Using a representative sample of the target viewer population, a pretest can compare two media bearing the same message, or two different messages in the same medium, or compare a black and white versus coloured version of the same program. If the response is continuously recorded, it can be used to examine what production variables contribute to a program's effectiveness and also to correct parts of the program in order to induce sustained perceptual response.

Scope of the Study

The present study is focused within the framework where visual information is considered as important as the audio information, the specific topic chosen was "Chinese Calligraphy and Painting." The concern is to evaluate the response and the attitude towards the medium -

television and its production variables--by studying the viewing behaviour of subjects using conjugate analysis apparatus based on that designed by Lindsley (1962).

Both slide-tape and television involve two channel presentation of information--audio and visual. According to Sive (1969) media may be classified in terms of their components--audio, visual, motion, colour, graphic, photographic. Television belongs to the audio-motion still-visual type, and slide-tape belongs to the audio-projected still-visual.

As Sive suggests, media use depends on the size of the target group, on the nature of instructional objective (cognitive, affective, psychomotor), learner characteristics and intended purpose (instruction, evaluation). Then there are environmental considerations: budgets, space, facilities and equipment, funds, manpower and others. Television is certainly a more dynamic media than slides since it can utilize various components of slides, films and graphics for the production of a program. It does, however, require higher cost and more manpower.

The present study does not intend to determine if TV is a better media than slides or vice versa, not only because the presentation utilizes a great proportion of slides in the TV program, but also such a question is misguided. Rather, the study intends to study the production attributes that will elicit attention of the viewers. Do moving or changing images induce more attention than still images? Is attention related to more information recall? Does the specific subject matter attract people's attention regardless of whether there are changing or

still images? Does eye contact with the narrator on the TV screen induce more attention? Does higher attention induce more favourable attitudes towards a TV program's content?

Beach (1960) reports no significant differences in information gain between groups that viewed television news programs employing either motion picture or still. Identical results were noted by Hazard (1962-63) in terms of both information gain and generated interest levels. Chu & Schramm's (1967) surmisal states that "moving pictures do not add significantly more to learning than still visuals do, unless the continuity of action is an essential part of the learning task" (p. 95). If it is so, it may be that a slide-tape program is equally attractive as TV on a particular subject matter under certain circumstances in terms of cost and manpower constraints.

Statement of the Problem

The purpose of this study is to evaluate what differences, of any, exist in the attention-getting characteristics of segments of the TV production bearing the message of "Chinese Calligraphy and Painting".

The first problem under review is whether particular presentation techniques (changing/still images, narrator on camera/no narrator on camera) are more effective at eliciting attending behaviour.

The second problem is to investigate whether attending behaviour affects an individual's recall/recognition of information.

The third problem is to investigate whether high attention indicates a favourable attitude towards the particular program under study.

Importance of the Study

Empirical testing and revision of audio-visual materials (e.g. most studies of Educational Television) have relied upon post-viewing scores on tests of recognition or recall. Further they relied on aggregate data from many viewers. But how can individual differences in attention to, or interest in, the instructional communication be explained? Mitchell (1978) states that "if the viewer does not observe information pertinent to post-viewing test items then this could explain why his score is lower than it otherwise might have been. Also composite scores on a posttest do not imply shared knowledge about identical segments of the program" (p. 1-2). An individual may elect to pay attention to and therefore recall different portions of a program.

Lindsley's conjugate analysis technique provides an investigation of an individual's moment-to-moment responses to a particular stimulus (TV program) and enables the researcher to study the various cues that make up the segments of a program. The conjugate analysis technique may provide a way to carry out empirical revision both cheaply and effectively. It also enables us to investigate continuous fluctuations in viewing behaviour and to relate attention to both the content and the production techniques used in the program segments. It may even be possible to revise an audio-visual program as programmed instruction is revised--segment by segment.

It is hoped that by utilizing the conjugate analysis technique in evaluating a TV program we will contribute to the area of production variable investigation. Also, it is hoped that this research will serve as an impetus to future researchers of the possibility of using this objective technique in pretesting or evaluating audio-visual production.

Owing to the experimental nature of this study, the researcher searched thoroughly for related research but found there was little experimental evidence dealing with viewers' attention to a TV program. The chapter which follows is a synthesis of evidence from studies in the areas of educational television, psychology, mass communication and advertising which deal most closely with this study.

Chapter 2

Review of Related Research

Educational Television Research

Traditionally, a plethora of studies of educational television have involved either a comparison of television vs some other media or an analysis of various production variables. Several reviews of research done by people like Stickell (1964), Chu & Schramm (1968), Saettler (1968), and Schramm (1972) have concluded that in most cases television was seen to be as good as other methods of instruction. When looking at the effectiveness of various media, the decision maker should look within the media: "In fact the conclusion of many researchers is that the chief variance in instructional media effect is within rather than between media" (Schramm, 1972 p. 44).

In the area of production variables, Hoban (1960), Shepard (1967), Zettl (1968), Anderson (1972) and Schramm (1973) were among the people who suggested categories that range from lighting and graphic devices, through camera factors and on to pacing and presenter characteristics. Coldevin (1976) identified three general categories of production variables: (1) presentation/technical; (2) content/subject matter organization and (3) performer characteristics. Within these three classes, twelve sub-classifications were delineated.

In the case of relative effects of motion pictures and still pictures, it can be argued that because the motion pictures produce

a higher fidelity of presentation than still pictures, the former may bring about more learning and attention. Leboutet, Lefranc and Nozet (1949) and Lasser (1955) found motion pictures resulted in more learning than stills. However, in the experiment by Beach (1960), no difference in learning was found between the group that viewed a television news program in motion pictures and the group that saw an identical news program except still pictures were shown. What these experiments suggest is that moving visual images do not add significantly more to learning than still visual images do, unless the continuity of action is an essential part of the learning task. On the other hand, if the two are equally effective, then we should probably use more still pictures in case the cost of production has to be cut down. For instance, if we introduce educational television to a developing country, cost may be a problem. However, Coldevin (1976) suggested that "affective reactions to the differential aesthetic qualities elicited by the two formats may represent a more intriguing research challenge" (p. 90).

Of all the categories, the area of presenter characteristics seems to have garnered the least empirical investigation. Coldevin (1976) examined some effects associated with presenter stereotyping. Three video tapes were produced featuring three types of presenters, operationalized as "young straight, young hip and mature straight." No differences were detected for both samplings on communicativeness ratings between the three presenters, a finding which correlated strongly with non-significant differences in levels of information recall. However, this study used gross data collection and analysis that may mask possible differences There are virtually no studies done on viewer's attention to presenter

on camera vs no presenter (cf. Shears, 1978).

"Which medium?" is, indeed, a difficult and complicated question. The selection of a medium depends on many factors. The questions worth asking are no longer whether students learn from a particular medium, but rather (1) Does the situation call for it? (2) How, in the given situation, can it be used effectively? The question of whether the situation calls for educational television, slides or radio is one that has to be answered in terms of needs, availabilities and alternatives. Economics and technical capabilities are part of the considerations. For instance, radio or slide-tape is cheaper than television, and can contribute to learning too, if a concurrent moving-picture is not required. However we still need to know how a particular media program promotes attention so that learning may occur.

Nevertheless, as said before, both program content and production techniques might control attention. As Mitchell (1978) pointed out, if an educational TV program is to teach, it must induce looking and listening. Schlater (1970) suggests, "if instructional television is to make its impact, its producers must be willing to utilize some of the production techniques of commercial broadcasters" (p. 214) in order to compete for the attention of the audience. Which techniques are best? Conjugate analysis may hold an answer in comparing attention to two or more programmes and the various production techniques in each program. Before an overview of conjugate analysis technique, it is necessary first to take a look at the concept of attention and related studies of retention and attitudes.

Attention Studies

The term "attention" has been given a variety of meanings in the psychological literature. Lewis (1973), from his review of research, outlined several theories, attention as: a perceptual state; an orientation reaction; a mediating response; and as evidenced by stimulus control. The problem in agreeing on the meaning of the term "attention" is because specific and observable kinds of behaviour, such as listening to or looking at a particular subject, do not necessarily reflect the operation of an attentional process. A certain awareness or concentration must also be present and be directed to the topic at hand. The problem is aptly summed up by Fowler & Siegel:

> Because the looking behaviour that is actually manifested cannot guarantee the mental process that is presume to operate, attentional processes would seem to be assessable only by means of introspective analysis..... However, although attentional processes are subject only to indirect assessment, the awareness and involvement of the individual in paying attention can be ensured by requiring him to actively investigate the stimulus object in question. To the extent that an individual is actively investigating a stimulus situation, attention must of necessity be present and be directed to that situation. Hence, by considering those factors and operations that affect investigatory behaviour, one may glean information on attentional processes per se (Fowler & Siegel, 1971, p. 390).

That is to say, attentional-investigatory responses have a common characteristic: they are directed to particular objects or stimulus

conditions within the organism's environment (internal or external).

Whatever the definition, most learning theorists assume attention or indicate its importance for learning. Many suggest that learning cannot occur without attention. For example, Solley & Murphy (1969) indicate that attention must occur before perception. In a study attempting to examine the relationship between camera shots (viz. loose, medium and close-up shots) Williams (1968) found that a loose shot tended to decrease interest level. Although interest may arise independently from the viewers previous favourable experiences to the material being presented, attention has been suggested by Krathwohl (1966) to be one of the first steps in the affective learning hierarchy. Travers stated that "attention can be considered to be a necessary.... condition for the efficient intake of information" (1970, p. 123).

Relating these statements to the medium of television, one must conclude that if an educational program or segment within that program is to teach, it has to first induce looking and listening behaviour. Marks expressed related sentiments suggesting, "sometimes greater viewer attention to a TV presentation will contribute to greater interest in the TV presentation (1974, p. 19). Berlyne (1951) presented cards containing different visual patterns at differing rates of presentation to subjects. He discovered that a recently changed stimulus was more often responded to by a viewer than one which has remained unchanged and had been responded to for some time. Additionally, he found "the effect was particularly strong and persistent if the changed stimulus continues to undergo changes" (p. 277). The overall conclusion was that movement

in the form of changes in visual images affects attention. In regard to educational television and slide-tape, it can be supposed that viewer attention would be apt to decrease in long duration static still pictures, e.g., in slides than changing TV shots.

In the field of advertising and communication, many researchers use the terms attention and interest more or less interchangeably. They speak of attention-interest levels and use various methods to measure them. The method of measurement is either subjective or objective. Subjective methods like telephone or face-to-face interviews are used where subjects are asked to recall their reactions to various commercials or segments of a program. Self-administered rating scales of an individual's perceived interest are also used. However, these measures suffer from potential interviewer or interviewee bias. For example, an interviewee may give the answers that he thinks the interviewer wants to hear. Also, the interviewer may unconsciously affect the responses of the subjects. In the case of self-administered rating scales, forgetting and problems of recall can make the results highly questionable. The other objective measures include use of sophisticated apparatus to study Galvanic Skin Response (GSR) or pupillary dilation and eyeball focusing (Hess & Polt, 1960; Zeigler, 1970; Miller, 1969) for testing attention factor in televised communication. Weaknesses in these measures are that subtle changes in light, drugs and emotional or physical peculiarities can bias the conclusions.

In the educational sphere, other measurements are used for "attending behaviour". Mielke (1970) in his study on the effectiveness

of the interview versus lecture in a television lesson took sequenced photographs of the viewers as they watched the TV screen. Then, he compared the amount of actual viewing each presentation elicited. Unfortunately, Mielke did not take into account a situation where the viewer may be looking at the TV screen but is not seeing what is being shown -- that is, "zombie" viewing. In other words, the subject is in fact not paying attention. Rust & Watkins (1975) improved on this technique by using a videotape to monitor children's behaviour as they watched two screens. One screen showed the TV program while the other screen has a series of slides flashed on it continuously. The intention of the slide projection screen was to draw the subject's attention from the TV screen when they could have gone into a "zombie" state. This distractor method is used to evaluate Sesame Street and other children's TV programs.

This latter approach still had several drawbacks of its own. Videotaping the viewing behaviour was only part of a more complex procedure which involved time-consuming interviews and questionnaires. The conjugate analysis measure mentioned previously tends to minimize many of the biases and sources of imprecision found in the methodologies just described, and allows an objective, effecient, continuous and precise recording of a subject's response.

Conjugate Analysis

Conjugate analysis of viewing behaviour is a technique which seems to satisfy the intuitive meaning of attention given by Wolf, Newman & Winters (1969) i.e., that attention is (1) some form of sustained relation between the viewer and the stimulus, or (2) a heightened intensity or increased arousal from some absolute or relative base level. Applied in the context of television, it shows how rewarding a TV segment is to a viewer by measuring how hard he will "work" to see it. This is done without interviews, recall or pausing. Lindsley (1962) stated: "if the response is continuously recorded, it can be used to correct parts of the copy (i.e. program) in order to induce sustained perceptual response" (p. 2). This experiment endeavours to relate this perceptual response to two potentially concurrent events--information recall and attitude towards a television program's content.

The conjugate analysis method which was suggested by Lindsley has grown out of the operant conditioning methods developed by B.F. Skinner (1959). In the Pavlovian experiment, a reinforcer is paired with a stimulus, whereas in operant behaviour, it is contingent upon a response. In operant conditioning we "strengthen" an operant in the sense of making a response more probable or, in actual fact, more frequent. A response which involves little effort can be emitted by the subject faster than he can make decisions. Often such a response is chosen to be the "operant". It is defined by its consequences which may be "rewards" or "punishments". If pushing a button produces a candy bar, then it is called the candy response. If it illuminates a television receiver

screen, it is called the "television-viewing" response (Lindsley, 1962). In conjugate reinforcement, unlike standard operant conditioning, the viewer controls the stimulus intensity of a continuously available stimulus. He does so by pressing a microswitch held in his hand.

Conjugate reinforcement is an operant method of measuring behaviour. An operant is a response emitted by the subject which involves little effort. Operant research methods are sensitive to very slight and subtle behavioural changes which occur in fractions of a second. The rationale is that by selecting a simple response, "physiological fatigue is ruled out of the experimental data and behaviour can be analyzed in very fine units" (Lindsley, 1962, p. 3). One response often used in human behavioural analysis, as in this study also, is the pressing of a small switch which defines the TV viewing response (because it produces-- mediated by a specially designed micro-processor system--an increase in video brightness). The rate of the response is recorded continuously on a moving paper graph at 60 centimeters per hour, i.e. one cm. per minute. Each response is indicated on the passing record by an upward movement of the recording pen. Thus, the slope of the resulting graph indicates the rate of responding. This permits immediate visual analysis of behaviour in units shorter than the time it takes to make most gross responses from this original record.

In addition, the conjugate reinforcement measure also relates to other theories of attention presented previously. Lewis (1973) stated that this measure is a mediating response since it directly affects the probability that the stimulus will be presented. It also fulfills the

requirements of the orientation response which increases a subject's contact with the stimulus. Lewis also noted that the measure satisfies the cognitive view of attention since it provides an outside index of the value of the stimulus to the subject, and may therefore provide an experimenter with some idea of the subjects's cognitive state. In this study, "attention" is usefully illustrated as a state of arousal. Subject responses in the laboratory are an overt indication of the degree of arousal. Also, the relation between attention and recall and attitudes are to be investigated. The rationale is that there must be attention (arousal) before learning.

> Mitchell (1978) summarised the conjugate analysis method as follows: The viewer sits before a TV receiver which has been modified so that the brightness of the screen is controlled by his viewing behaviour. Each press of a micro-switch held in his hand produces a momentary increase in brightness; this defines a viewing response. Lack of responding produces a blank screen within a second or so (depending on original brightness). A steady state of responding maintains regular brightness. A cumulative record is made of this viewing response (p. 1).

It is this procedure which will be used to investigate three hypotheses about attention to an educational television program.

Chapter 3

RESEARCH DESIGN AND METHOD

Hypotheses

The purpose of this study was to test the following Theoretical Hypotheses:

TH_1: Attention to or interest in TV program is greater with rapidly changing visual images, including presence of a narrator on camera, in segments of an educational television program than in segments with a less rapidly changing sequence of static pictures (slides or graphics).

TH_2: Segments of an educational television program identified as eliciting high attending behaviour will produce more correct recall/ recognition of information from the program when compared to segments of an educational television program identified as eliciting low attending behaviour.

TH_3: Higher attending behaviour in TV will produce favourable attitudes towards an educational television program when compared to lower attending behaviour in a TV program.

Rationale for Hypotheses

Logical support for Theoretical Hypothesis ¶ can be drawn from a few studies. Berlyne (1951) observed that the power of changing or moving objects to attract attention had long been noted in psychological primers and exploited in practical life. Such words as "change" or "novelty" are often employed loosely to cover a wide range of factors which need to be carefully distinguished. A stimulus may be "new" or "unusual" in relation to an individual's total life-history and such a stimulus is likely to attract attention. Berlyne argued that a completely new stimulus of this sort arouses a drive-stimulus producing response. Also, a stimulus may be "new" in relation to what has immediately preceded it. Berlyne's findings showed that a recently changed stimulus was more often responded to by the viewer than one which has remained unchanged. Further he found that "the effect was particularly strong and persistent if the changed stimulus continues to undergo changes" (Berlyne, 1951, p. 277). Our conclusion is that movement in the form of changes in visual images affects attention positively and therefore should increase attention to an ETV program.

In the advertising research field, Rust & Watkine (1975) have concluded that "message monologues consistently turn kids off" and that this holds for both high-school students and adults. They recommend that "for attracting and holding children's attention moving pictures are much better than still pictures and picture of any kind are better than words" (p. 23). This observation, though general (insofar as it refers to moving pictures as a medium rather than stimulus change per se)

lends support to the hypothesis.

Similarly, Lumsdaine, Sulzer, & Kopstein (in Anderson, 1969) investigated the effects of animated cues (arrows) on learning from instructional film and found them to be very effective "in the way they stress and clarify specific informational content, and in the way they direct attention to key aspects of a complex visual scene by precise timing of visual indicators keyed to the narration" (p. 100). This suggests that attention-directing stimuli should in fact draw attention to the information source.

The purpose of Theoretical Hypothesis 1 is to ask the question: "Do changing images induce greater viewing behaviour than fixed images?" It will be tested by using the conjugately programmed analysis technique for measuring attention towards an educational television program which consists of film inserts, slides and graphics. "Do still pictures attract as much attention as moving pictures in the TV program for this study?" Knowing the viewing response towards the different program segments the researcher may be able to identify inadequate segments and improve the program on the specific topic of interest by changing the production techniques.

Theoretical Hypotheses 2 and 3 are intended to demonstrate that there is a relation both between attention and learning and between attention and attitudes. As mentioned before, most learning theorists assume attention or merely indicate its importance for learning. Typical is Travers' (1970) assertion that "attention can be considered to be a

necessary....condition for the efficient intake of information" (p. 123). "Does increased learning result from increased interest in or attention towards a TV program?" The relation between "interest" in a program and the retention of information resulting from exposure to the program is always a concern of producers of an educational TV program.

Despite this, little empirical research exists. Grass & Wallace (1969), in their research on the satiation effects of TV commercials, hypothesized that when a commercial is shown repeatedly to a viewer, the viewer's attention first increases to some maximum level after which it declines to some equilibrium level (i.e. attitude towards the products presented in the commercials rises then declines). But this attention was not linked to learning. However, Becker (1964) investigated the relation between attention, retention and attitude change by measuring GSR responses of subjects. Becker cautions one to distinguish between the failure of learning because of lack of attention from that in which it failed despite the presence of attention. That is to say, attention is a necessary but may not be a sufficient condition for learning. A person may fail to learn from a program unit because his attention is not held to the program and he is attending to something else or he may fail to learn because of the inadequacy of the program unit to which he is actually attending. (For instance there may be insufficient redundancy.)

The present study was intended to test the relation of attention and recall. It is hypothesized that recall is positively related to attention. If higher attention does not lead to correct recall, additional information, repetition or redundancy of messages may be

needed. It is also hypothesized that high attention will induce favourable attitude scores towards the program. Of relevance is Mark's (1974) study of pacing rates which concluded that "rapid" and "moderate" versions of a TV presentation showed a greater effect ($p. < .05$) as compared with the "orignially" paced version in changing viewer's attitudes.

Definitions

1. Attention/Interest

   A sustained relationship between the person and the stimulus material (TV presentation) which will be operationally defined as a high or continuous viewing response rate recorded by the conjugate analysis apparatus. (See "Attending Behaviour")

2. Changing Images

   Refers to the use of zooms, cuts, fade in/out on narrator in a TV program, the change from slides to graphics, the change from narrator on camera to slides or graphics, or the change from narrator on camera from narrator on camera to film sequences. Rapidly changing images refers to film sequences (presumed to be continuous motion) in segments of a TV production.

3. Fixed Images

   Refers to static/fixed images in segments of a TV program in which slides are shown for a period of time.

4. Educational Television Program

Refers specifically to the program produced by the investigator on the topic of "Chinese Calligraphy and Painting". This presentation is approximately 21 minutes in length. The program is segmented into 34 sections according to content for the purpose of analysis.

5. Attending Behaviour

This is an overt indication of the person's attention level in the present study. It is measured by recording the rate of response to the stimulus (TV program) as controlled and measured by the conjugate analysis apparatus. The response rate is recorded automatically by a cumulative recorder on a paper with a moving pen, and in addition the number of responses per segment is recorded by the recording counter on the conjugate analysis apparatus.

6. Conjugate Analysis Apparatus

(Conjugately Programmed Response Apparatus)

Refers to the micro-processor equipment which relates the response (pressing a small hand-held switch) to the stimulus (brightness of the video portion of a TV program). The apparatus also maintains an automatic record of the subject's attending behaviour in the form of numerical rate of responses on an automatic counter as well as graphical record on a paper. (This specially designed apparatus is located in the Educational Technology laboratory.)

7. Recall/Recognition

Refers to correct recall or recognition of cognitive information pre-

sented in the TV program as measured by a mix of multiple-choice and fill-in-the-blanks questionnaire given immediately after the viewing of the TV program.

8. Attitude Scores

There are two types of measures:

(1) The viewer's score on a post-interest questionnaire constructed and validated by Julian Marks (1974) to measure viewers' attention, enjoyment and overall evaluation of the TV presentation viewed.

(2) The viewer's reaction to the subject matter, narrator, and production quality of the TV program. It is measured by a semantic differential rating scale developed by MacLean, Grane, Kiel (1960).

9. Experimental Environment

Refers to the lab carrel in Educational Technology Laboratory where a subject's attending behaviour, while viewing a TV program, is measured. It consisted of a chair in front of a colour TV receiver plus a hand-held switch. (This is described later.)

Operationally Defined Hypotheses

The three general hypotheses stated previously are operationally defined as follows:

OH_1: A viewer's attending behaviour (as measured by a conjugately programmed response apparatus in an experimental environment) towards segments of the TV program which contains: (i) changes from slides to graphics to film sequences; or (ii) film sequences with cuts, zooms, fade in/out and/or (iii) presence of narrator on camera; is higher compared to those segments with fixed static pictures on camera.

OH_2: Segments of an educational television program identified as eliciting high attending behaviour will produce a correct recall/recognition of cognitive information from the program when compared to those segments of the educational television program identified as eliciting low attending behaviour. Recall/recognition is measured by a mix of multiple-choice, fill-in-the-blanks questionnaire given as a posttest after the TV program is shown.

OH_3: Higher attending behaviour (defined as occuring when a subject watches 80% of the TV program) to the video portion of a TV program will produce more favourable attitudes towards an educational television program. Attitudes are measured by a Likert type (5-point) attitude scale and a semantic differential (7point) attitude scale given as a posttest immediately after the recall questionnaire.

The Sample

The population from which the sample was drawn for this study consisted of English-speaking graduate students at Concordia University in the Educational Technology program, and undergraduate Chinese students at Concordia University. The subjects, both male and female, were chosen because of their availability. They were volunteers.

As the presentation was on the specific topic of "Chinese Calligraphy and Painting", the researcher intended to control the difference in language background which might affect the attractiveness of the program to the subjects. The subjects were divided into 2 groups of 20 subjects in each group, i.e., Chinese vs, non-Chinese speakers. The TV program was presented to both groups of subjects, the English-speaking subjects and the Chinese-speaking subjects.

As the program was intended to be representative of a general educational program shown on TV (or more appropriately for presentation in a course or a museum concerning the particular Chinese art), it could be used with any adults.

Selection of Subject Matter

The subject of the TV program is "Chinese Calligraphy and Painting". The content was taken from Chiang Yee's (1973) classic introduction to Chinese Calligraphy. The first part of the book was selected and simplified for the script used in the TV presentation for the present study. Chiang explored the aesthetics and the techniques of this art. The book was a superb appreciation of the beauty of the strokes and in the patterns of structure of Chinese Calligraphy -- an inspiration to amateurs as well as professionals interested in the decorative arts (which was also the objective of the TV production in this study).

Outline of Content and Form of Presentation

The TV production was approximately twenty-one minutes in length. The program used a narrator on camera with slides, film sequences and life objects. The complete script appears in Appendix 5 while Appendix 1 provides the length of each of the 34 segments and Appendix 2 details the production techniques used in each.

The outline of content is as follows:

(1) Origin of Chinese characters

(2) Types of Chinese characters

(3) Styles of Chinese Calligraphy

(4) The dependence of Chinese Painting on calligraphic training and techniques.

Production of Media Presentation

All the slides, graphics and super-8 film inserts used in the television production were produced by the researcher. The actual TV production was done in the studio facilities at Concordia University with current students of the Educational Technology program acting as the production crew.

The production consisted of super-8 motion pictures and a great proportion of slides and graphics using the techniques of mixing from one slide to another slide, or cutting from slides to graphics. So, strictly speaking, there was "movement" even in these fixed pictures, unlike an ordinary slide-tape program with a blank screen between two slides.

Conjugate Analysis Technique and Apparatus

The conjugately programmed operant behaviour apparatus was placed in separate room away from the subject, in order to prevent the subject from becoming distracted by unwanted variables which might disturb his viewing behaviour. A response, pressing a button held in the hand, was used as the operant which operationally defined attention. In the lab, the subject was seated in front of the television, and was given a small switch which he was asked to hold. When pressed by the viewer, the switch produced a brief (less than 0.5 second) slight increase in the brightness of the television image. As in Lindsley's (1962) arrangement, the response definer converted each press of the switch to

an electrical impulse which operated the conjugate reinforcer. Thus, high rates of pressing (above 60 per minute) kept the picture brightly illuminated, intermediate rates of response kept the picture at dimmer levels, and during no pressing the picture was dark.

The subject's response rate was recorded by a pen on a paper graph that moved on a roller drum at 60 cm/hour. The rate of response was indicated by the upward slope of the line while stoppage (i.e. non-viewing) could be identified as horizontal portions in the response line. The apparatus and procedures used in this study are those described by Mitchell (1979) and those of Lindsley's research (1962). A numerical cumulative response for each segment of the program was also recorded in order to provide information for statistical purpose. These records provided a direct measure of the subject's moment-to-moment desire to "work" for the video portion of the TV program. Because the button-pressing "produced" the visual image, they were records of his attending or looking responses.

There was no pre-test for the programs produced because of the originality of the script, which was based on a well documented content by Chiang Yee (1973). Test reliability and item reliability generally conducted during the pre-test was carried out using the results from the two groups of subjects.

Recall Questionnaire

There were 34 sections in the TV program. (See Appendix 1 and 2.)

From each of these sections, a corresponding question(s), measuring recall or recognition of a particular unit was constructed, therefore content validity was guaranteed (Tuckman, 1972). The questionnaire was administered immediately after the viewing of the TV program. The subjects were not informed that they would have to answer questions after viewing the program before the experiment began. The test was given a multiple choice/fill-in-the-blanks format for both recall and recognition of information from the program.

No reliability studies or pre-test were done on the test prior to use since on the one hand English-speaking subjects would not have any knowledge of Chinese, and on the other hand, a pre-test probably would have an effect on Chinese-speaking subjects prior to their viewing behaviour. On the posttest results, items were tested for index of difficulty, index of discriminability and reliability coefficient (Kuder-Richardson formula 21).

Attitude Questionnaire

The attitude measure consisted of two questionnaires. One was a 20-item five point Likert-type scale (strongly agree - strongly disagree) constructed and validated by Julian Marks' study (1974). (An alpha coefficient of .97 with all individual items having a correlation of $.91 > r > .72$) The other questionnaire was a semantic differential scale used by MacLean, Crane, Kiel (1960) measuring subject's reaction to the subject matter, narrator and production quality of the program.

Experimental Design

			X	
R	A	O1	O2	O3
	B	O1	O2	O3

R- Randomization of samples

A- English-speaking students

B- Chinese-speaking students

X- TV presentation

O1- Measure of Attending Behaviour

O2- Scores on a cognitive questionnaire which correspond to the 34 segments in the TV program

O3- Scores on attitude scale

The different groups of subjects were randomly assigned to the TV presentation with equal number of males and females with posttest only design.

Variables

Independent: (1) Television program with segments of fixed images, films, and narrator on camera.

(2) History of subjects - no knowledge of Chinese language vs. familiarity with Chinese language.

Dependent: (1) Attending behaviour (measured by conjugate analysis apparatus).

(2) Cognitive recall/recognition of factual information as measured by a multiple choice and fill-in-the-blanks questionnaire.

(3) Attitude scores as measured by a rating scale instrument (both the Likert Scale and the Semantic Differential).

Control: (1) Sex of the subjects.

(2) The total time span of the presentations.

(3) The same content and narration was used.

(4) The same physical experimental environment.

(5) The same conditions for completing the posttest - similar instructions given, no time limit.

Statistical Procedures and Analysis

Attending Behaviour

1. Attending behaviour (viewing response rate) for each individual subject was analysed in detail both in each segment of the TV program as well as the total pattern of attending behaviour in the program. Subjects who behaved similarly were then grouped together. The precentage of viewing time in the program was also noted.
2. A comparison was made of the viewing responses between the English-speaking subjects and the Chinese subjects to find out if there were any differences between the two groups of subjects.

Recall

1. An item analysis and a reliability test were performed on the

questionnaire for both groups of subjects.

2. Means of correct responses on the questionnaire for both groups of subjects were recorded and a comparison was made between the two groups of subjects.
3. The number of correct responses on each item in the questionnaire was also recorded for both groups of subjects.
4. Individual cumulative records (graphs) were examined to determine if the post-viewing response was correct or wrong corresponding to the presence or absence of attending behaviour for specific program segments.
5. A point-biserial correlation coefficient was calculated on each item to test the relation between attention and correct/wrong response.
6. The relation between correct/wrong response (knowledge), attention, and the sources of information from the TV program (i.e., audio, video, audio/video) was also analysed.

Attitude Measures

Likert Scale:

1. As the subjects were sub-divided for analysis into groups according to their percentages of viewing responses in the program, the means for each of these sub-groups on the interest questionnaire were calculated.
2. Then a graph was plotted for the means of these groups as a function of the percentage of time spent viewing the TV program.

Semantic Differential:

1. Similarly, the mean scores on each of the three concepts:

subject matter, performer and production quality in the semantic differential questionnaire were calculated.

2. Then a graph was plotted for the mean scores of each concept as a function of the percentage of time viewing the TV program.

Tryout of Apparatus and Procedures

A tryout pilot experiment were held prior to the actual experiment in order to ensure that the laboratory apparatus would be totally ready for the actual experiment. Four subjects were used, two English-speaking and two Chinese-speaking. The tryout experiment was conducted 2 days before the actual experiment in early March, 1980.

Based on the observations of the researcher, the apparatus itself was altered so that the rate of rotation of the stepping motor on the conjugate reinforcement apparatus was adjusted between 30cm/minute to 60cm/minute according to each person's optimal level of viewing responses. This was done because different persons tend to have different preferred rates of pressing the switch. Therefore, the amount of attending behaviour required to maintain a bright TV picture was increased or decreased by the experimenter (during a baseline program) for each subject in order to bring the required attending behaviour closer to the average person's optimal level.

The Experimental Procedure

A baseline program of about seven minutes was viewed before the

actual 21 minutes experimental program so that the researcher could adjust the apparatus with the subject's viewing responses to bring out the required response rate for optimal attending behaviour in the first 5 minutes.

Viewers sat in a room in which there was a chair facing a television set on top of a table. The TV set used was a Sony 14 inch colour unit. Earphones connected to the TV were used on every subject to cut down on possible extraneous noise. Subjects controlled the brightness of the TV screen by using a push-button switch that was held in the hand. Two subjects could view the program at the same time with separate TV monitors and switches.

The researcher had a separate room where all the conjugate analysis apparatus were located. A 14 inch colour TV monitor was used by the researcher to follow the progress of the program. The researcher sat close to the response recorder so that she could monitor the attending behaviour and mark all changes in shots and any other interesting points on the moving graph.

Prior to the experiment, written instructions were read to him (her) by the researcher. The instructions explained what he (she) was to do. Appendix 6 contains a copy of these instructions. The video tape was then started and the subject's attending behaviour response rate requirement was adjusted during the baseline program. All viewing behaviour was recorded on the cumulative recorder, and on the response counter after each segment.

After the program had finished, the subjects were given instructions to complete the recall/recognition questionnaire and the interest questionnaires. (The subjects were not informed prior to viewing that they had to answer these questionnaires after the experiment.) After the tests were completed and the subjects thanked for their help, the next two subjects were brought into the viewing room and the procedures were repeated.

Chapter 4

Results

Attending Behaviour

Two types of data on attention were collected in this study: (1) numerical data (recorded by the automatic recording counter); and (2) graphical (recorded by the automatic recording apparatus with highlights marked by the experimenter).

The numerical recording was done after each of the 34 segments in the TV program. The experimenter pressed a reset button after each segment of the program, then the automatic recording counter printed out the total number of viewing responses during that particular segment and reset to zero for the next segment. These numerical data were considered as a side reference for the analysis of results.

The primary emphasis was on the graphical cumulative records for subjects in the lab environment. The major reason was that the researcher was intent on trying to investigate moment-to-moment fluctuations in attention and to relate attention to both the content and the production techniques used in each segment of the TV program. Statistical analysis of mean pressing rate for each program segment would only obscure many details in changes in viewing behaviour throughout the TV program. Therefore, gross analysis of subjects' attending behaviour was not appropriate in this study.

Twenty-three subjects in each group, English-speaking and Chinese-speaking, were sampled for the experimental treatment (Total number: 46). As no measures of scholastic ability were available, the only measure of equivalence of groups was the number of males and females in each group. Six subjects were discarded for the final analysis of attending behaviour because of breakdown of apparatus during the course of the experiment (e.g., the stepping motor that controls the brightness of the picture was not working; the push-button was not working, etc.). So, for the final analysis of viewing responses, there were 20 subjects in each group, 9 male subjects and 11 female subjects, which made up a total of 40 subjects. Each subjects's graphic cumulative record was studied to examine the changes in viewing responses. With reference to the length of each segment (in seconds) in the TV program (see Appendix 1) and the graphic cumulative record, the total percentage of the time viewing the program was analyzed for each subject. This analysis of viewing responses led to clusters of five groups for both Chinese-speaking subjects and English-speaking subjects.

The Chinese-Speaking Subjects (N=20)

The cumulative records of all Chinese-speaking subjects appear in Appendix 3.

A. Twenty-five percent (5 subjects) of the subjects continuously viewed the program from the beginning to the end. They were always viewing. After the test, these subjects told the researcher that they kept watching because they liked to view the program. The subject matter of "Chinese Calligraphy and Painting" was reinforcing and interesting to them. A typical cumulative record (Subject A4) appears in Figure 1.

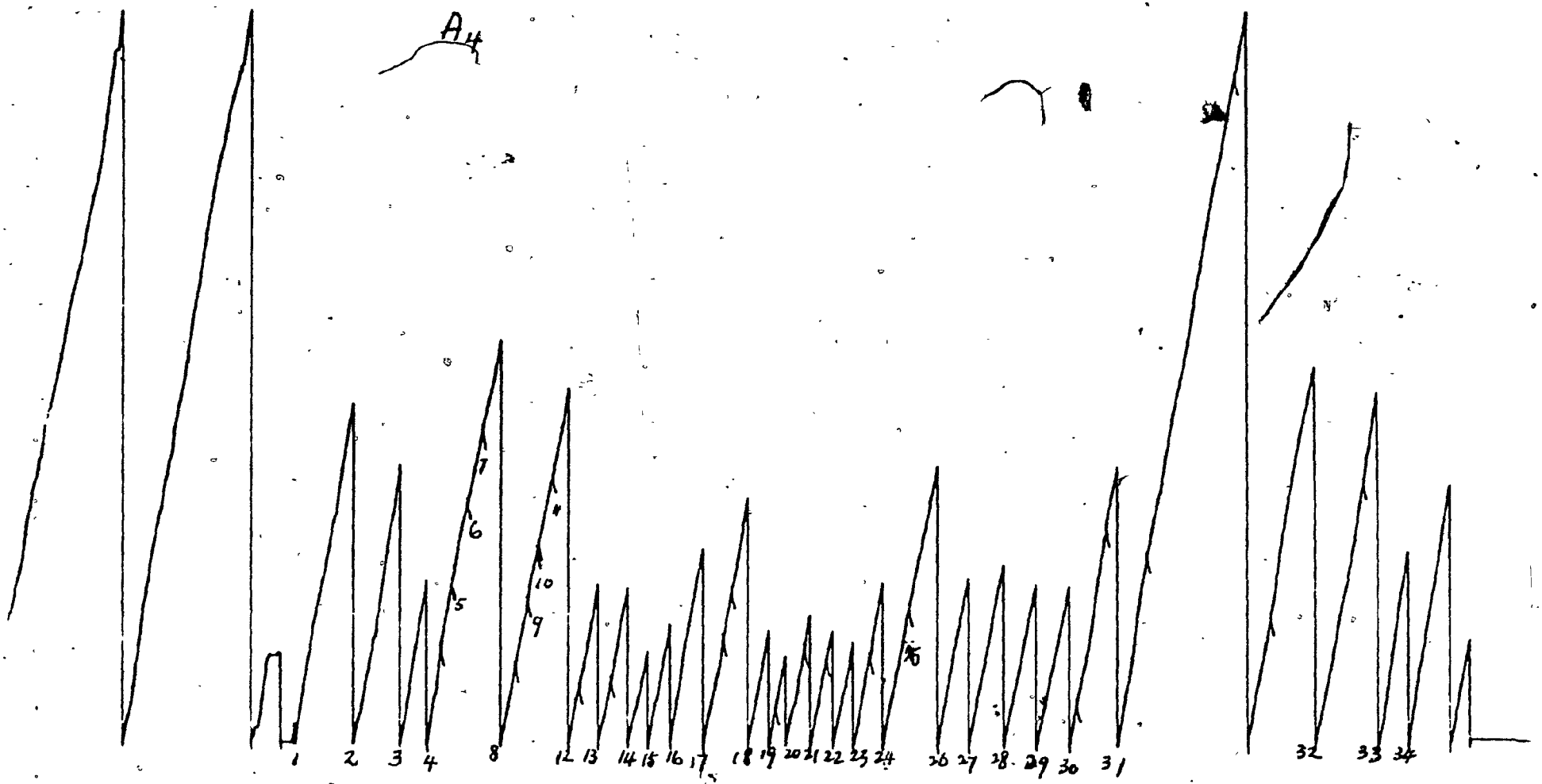

Figure 1. Cumulative Record of Subject A4 (always viewing)--Chinese subject.

B. Thirty-five percent (7 subjects) of the subjects viewed the program most of the time, with some non-viewing responses in some segments of the program--approximately about 2%-4% of the time not viewing throughout the TV program. A typical cumulative record appears in Figure 2.

In general,

(1) This group of subjects tended not to watch sometimes for 2-5 seconds when the narrator was on camera in the beginning of each segment, they watched again when "audio cues" indicated something would be shown on the screen, e.g. of typical cues would be "the character...", "let us now take a look at...".

(2) They watched always when there were slide and graphic sequences of pictures and characters, except in some instances when one slide (during a sequence of slides shown) was on for more than 6 seconds during segments 26-29, showing different styles of Chinese Calligraphy.

(3) For end of Segment 23 and Segment 31 (3.56 minutes) where there were film sequence demonstrations of "grinding ink on stone" and "Chinese painting", all these subjects watched nearly consistently (98% of the time viewing) during that section of the TV program.

C. Twenty percent (4 subjects) of the subjects viewed the program for 89-92% of the time, with about 8-11% of the time not viewing. A typical cumulative record appears in Figure 3.

The viewing responses of this group of subjects resembled that of Group

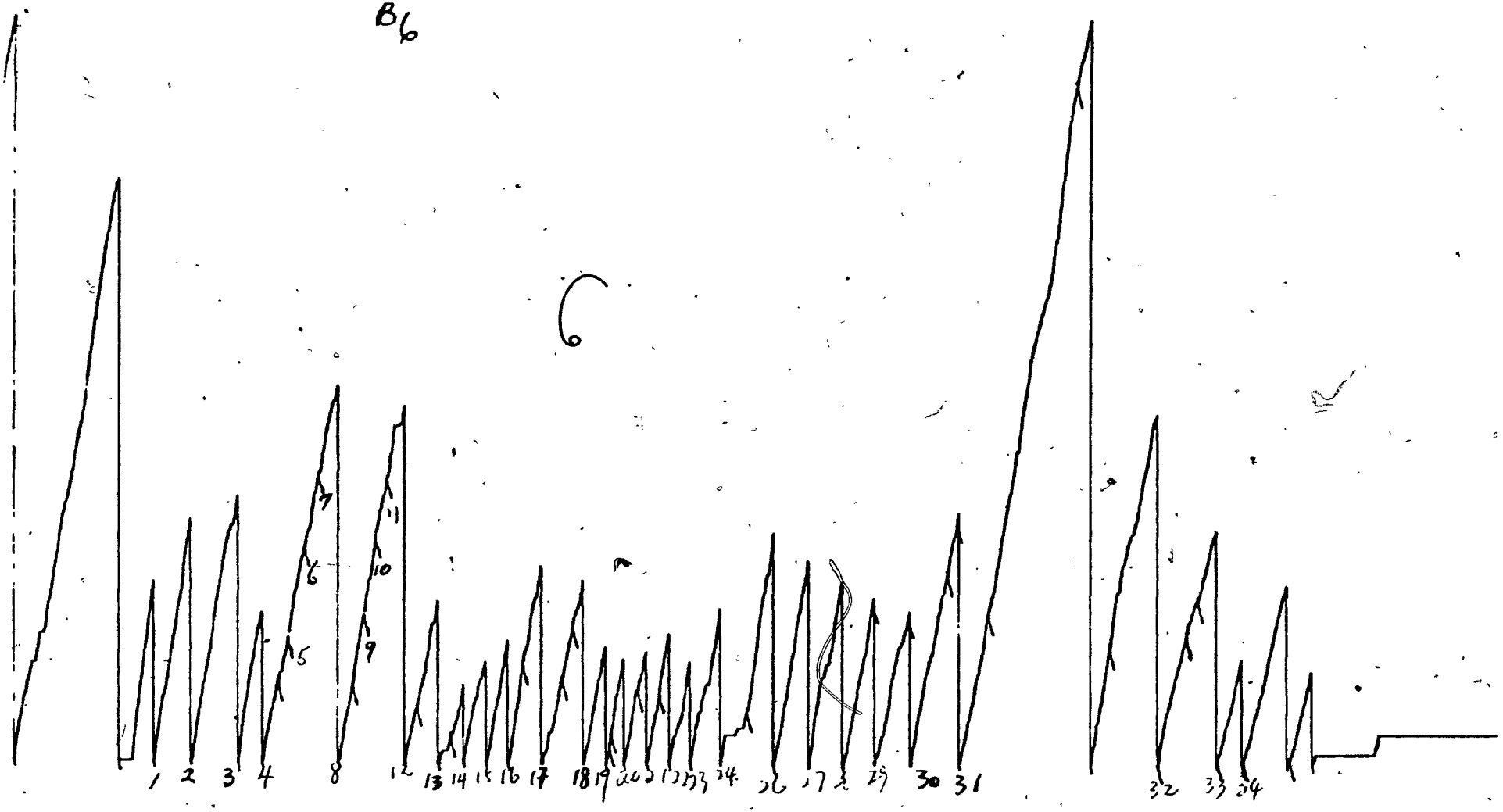

Figure 2. Cumulative record of subject B6 (almost always viewing)--Chinese subject.

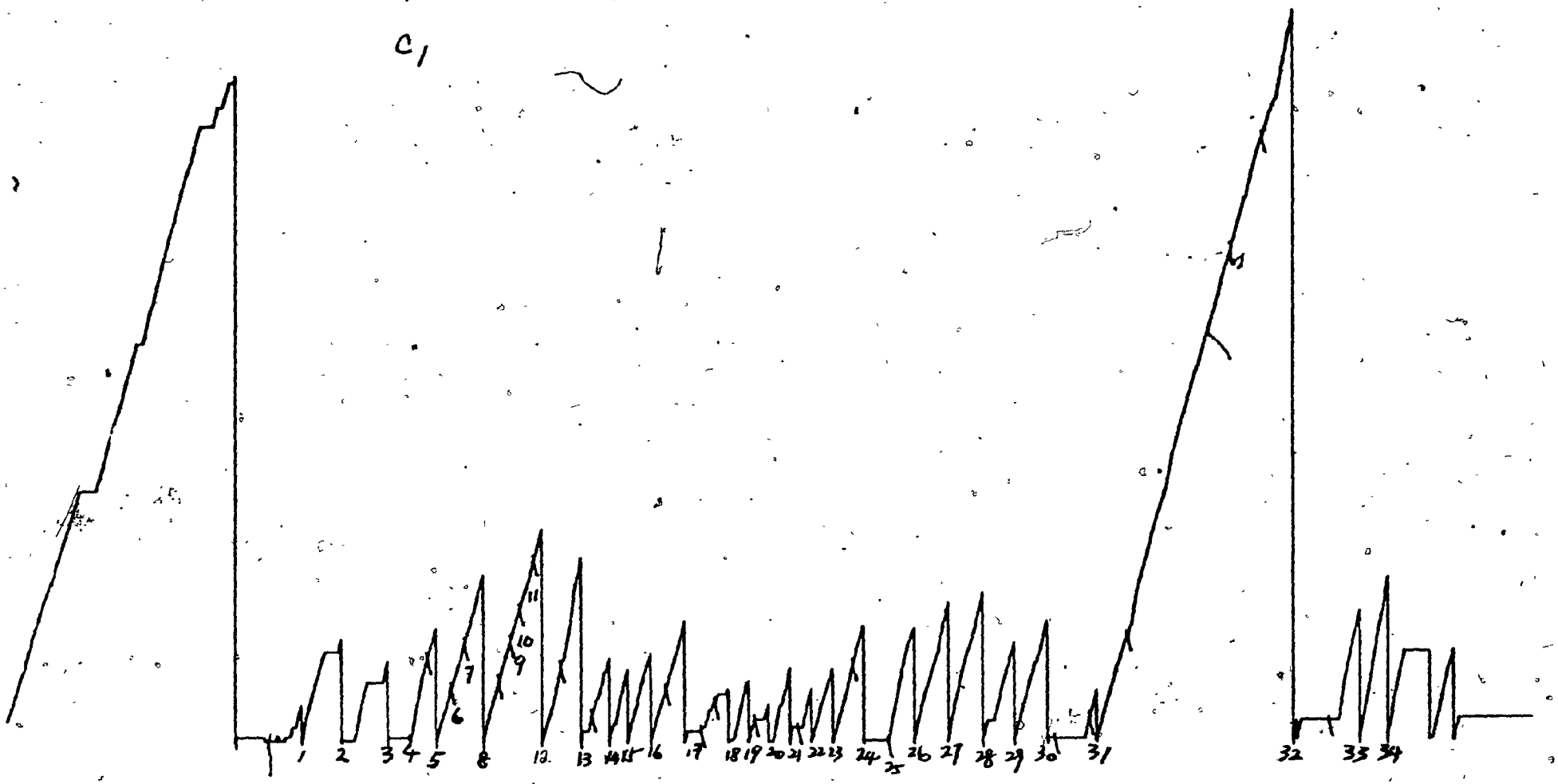

Figure 3. Cumulative record of subject C1 (mostly viewing)--Chinese subject.

B mentioned above except that

(1) Compared to Group B, they were not viewing most of the time (50%) when the narrator was on camera; OR they have slower rates of responding during the time narrator was on camera alone. In this way, the TV screen was kept at an intermediate level of brightness only.

(2) Some subjects have a slower rate of responding, and sometimes were not viewing when there were sequences of slides shown for over 30 seconds during segments 26-29.

(3) One subject did not view at all during segment 20 and 21 with narrator-to-slides in each segment, talking about "variation of strokes in each character" and "paper used for writing".

D. Ten percent (2 subjects) of the subjects viewed the program for about 60% of the time, with about 40% of the time not viewing. A typical cumulative record appears in Figure 4.

(1) These subjects did not watch whenever the presenter alone was on camera, except at the beginning of the program (Segment 1 and 2).

(2) They watched only when Chinese characters and styles of writing were presented. (Segment 5-17, 25-29). They did not watch Segment 18 to first half of Segment 23, where the content was about techniques of writing, paper used, and brush strokes of characters. Probably they could understand these segments well by listening to

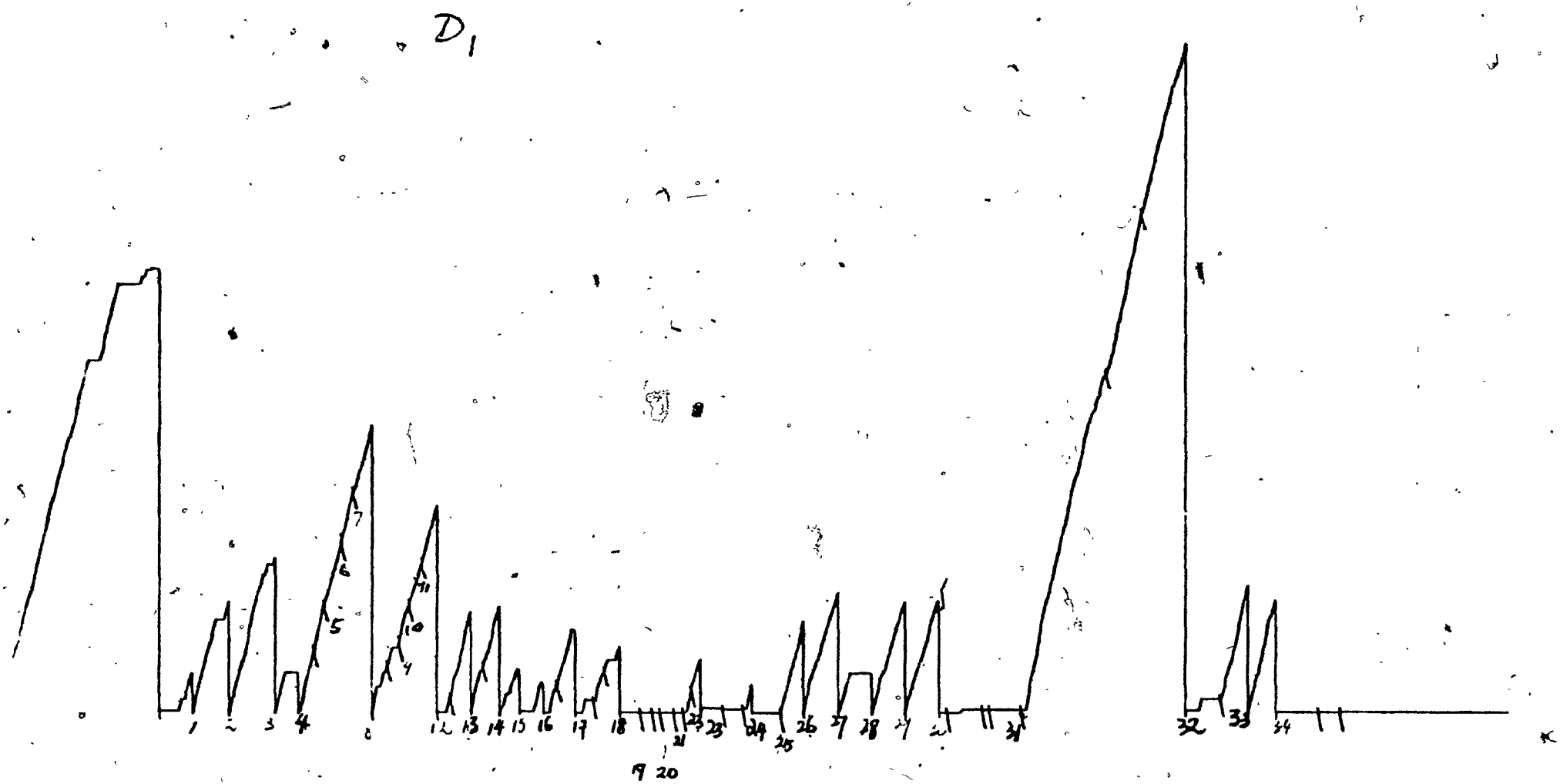

Figure 4: Cumulative record of subject D1 (moderate viewing)--Chinese subject.

the audio channel only.

(3) They watched fairly consistently (92-95%) throughout the film sequences, and the last portion of Segment 23 and Segment 31 where the demonstrations of "grinding ink stick on stone with water" and "Chinese painting" were presented.

(4) After Segment 31, they did not view the program.

E. Ten percent (2 subjects) of the subjects viewed the program only about 20-30 percent of the time. A typical cumulative record appears in Figure 5.

(1) One subject did not view the program consistently even during the presentation of characters and styles of writing. One subject was not viewing from Segment 2-9 and from Segment 18-29.

(2) They were viewing always only at Segment 31 when the film sequence was shown with demonstrations of "Chinese painting".

These subjects told the researcher that they did not like to watch because:

(1) They felt that they knew the subject matter very well already. They knew the characters even just by listening to the audio channel of the TV program.

(2) There was nothing new or interesting to show on the program, except

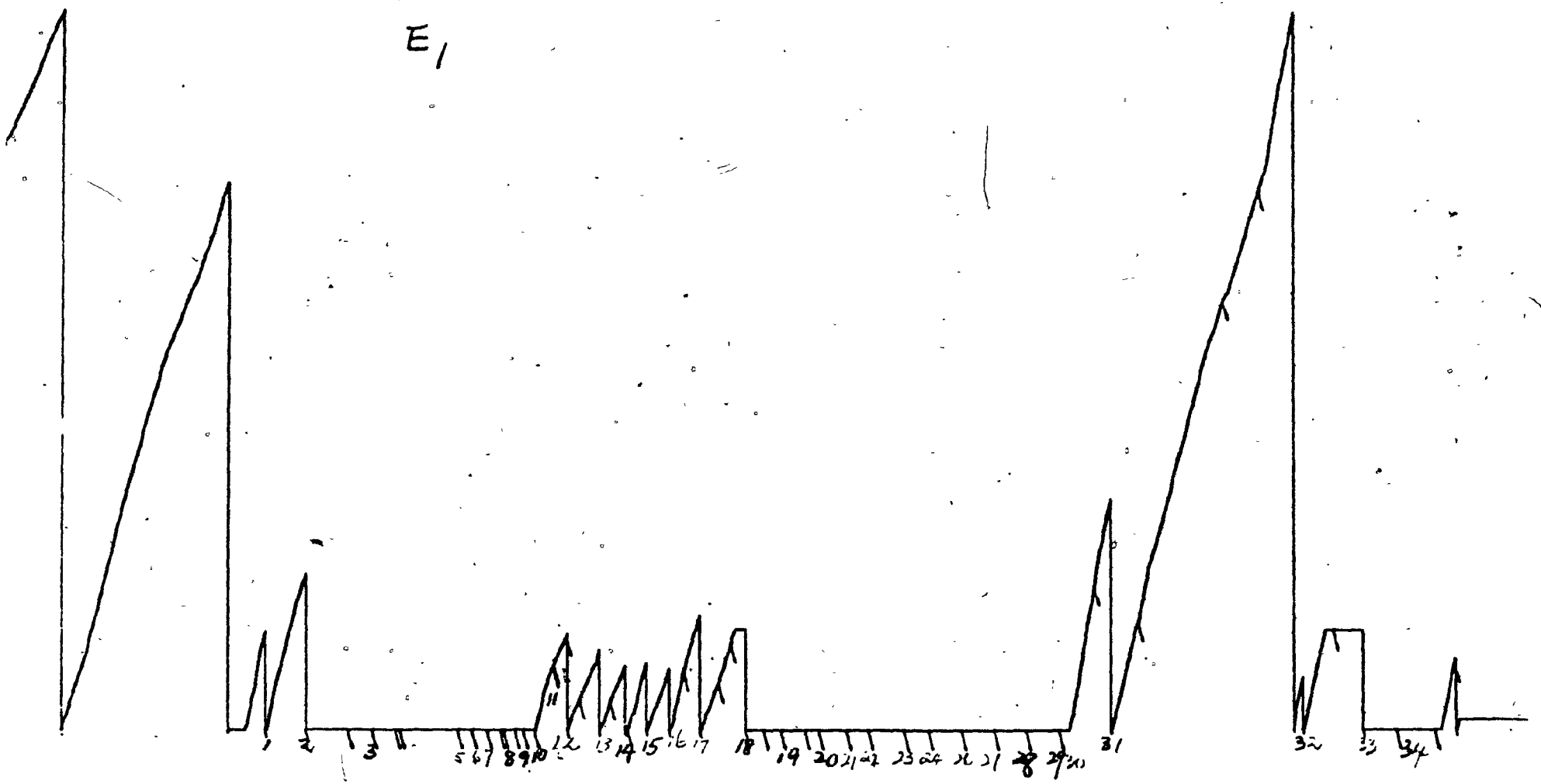

Figure 5. Cumulative record of subject E1 (little viewing)--Chinese subject.

the part where the painter was demonstrating a Chinese painting of bamboo shoots.

The English-Speaking Subjects (N=20)

The cumulative records of attending behaviour of all English-speaking subjects appear in Appendix 4.

A. Twenty-five percent (5 subjects) of the subjects viewed the program from the beginning to the end. They were always viewing. They told the researcher that the program was "interesting". A typical cumulative record appears in Figure 6.

B. Twenty percent (4 subjects) of the subjects viewed the program 98% of the time, with non-viewing responses about 2% of the time. They were almost always viewing. A typical cumulative record appears in Figure 7.

The typical non-viewing responses were found at Segment 12, 18, 23, 30, 32, 33 where the presenter alone was on camera; and Segment 26-29 where sequences of slides were presented showing different styles of Chinese Calligraphy. The subjects tend to stop viewing for one or two seconds during these parts of the program.

C. Thirty percent (6 subjects) of the subjects viewed the program 89-92% of the time, with non-viewing responses for about 8-11% of the time. A typical cumulative record appears in Figure 8.

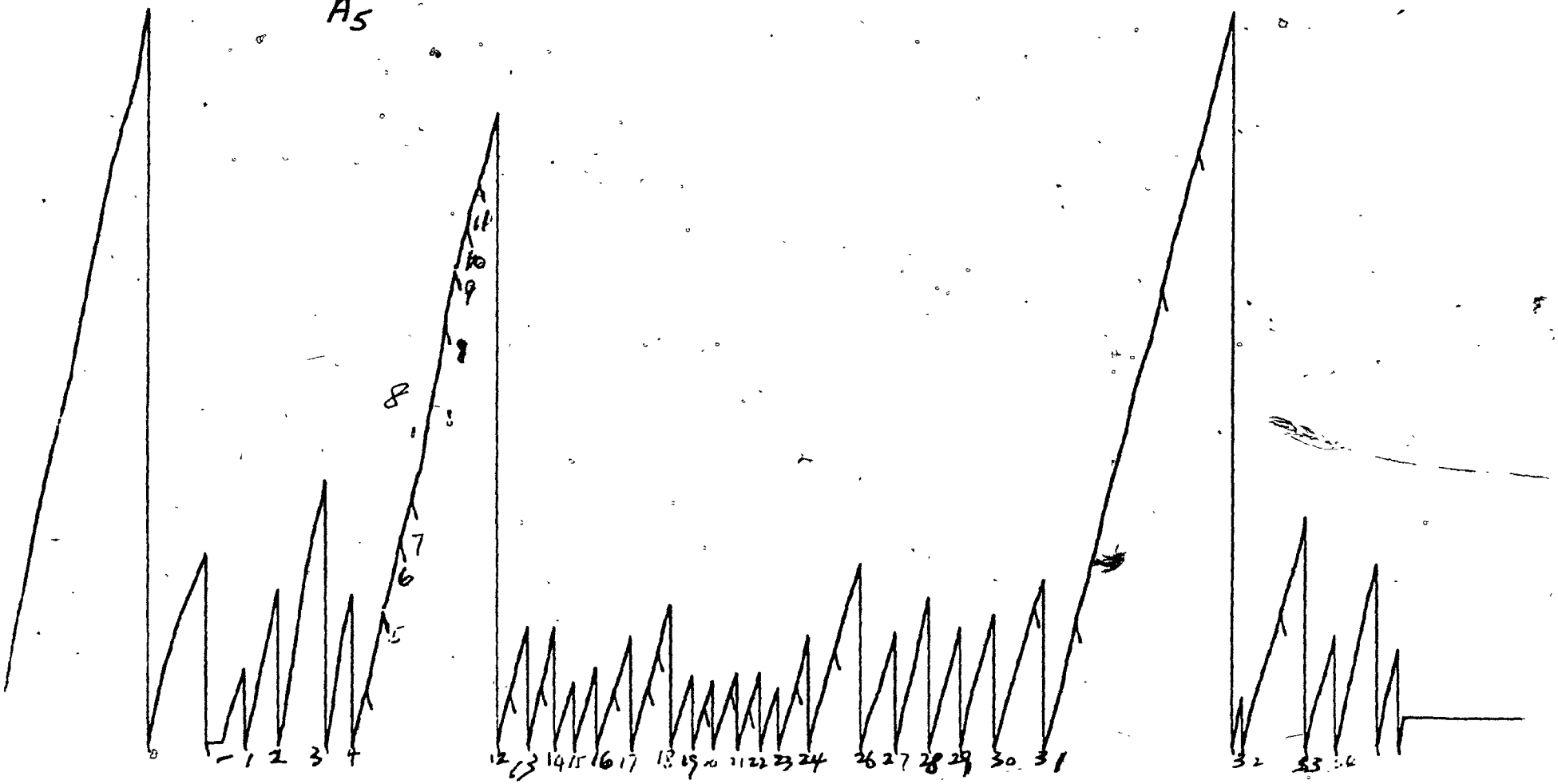

Figure 6. Cumulative record of subject A5 (always viewing)--English subject.

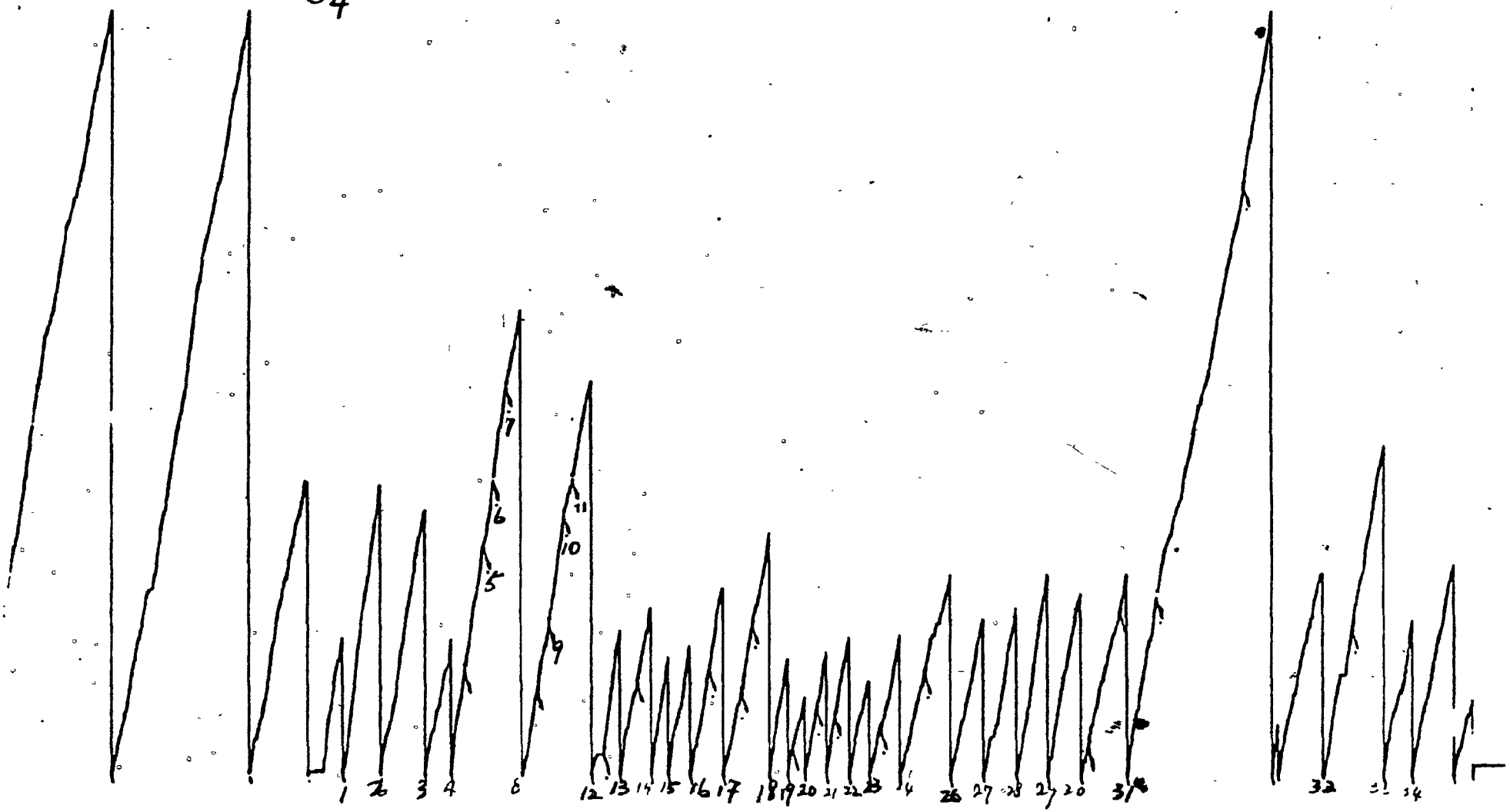

Figure 7. Cumulative record of subject B4 (nearly always viewing)--English subject.

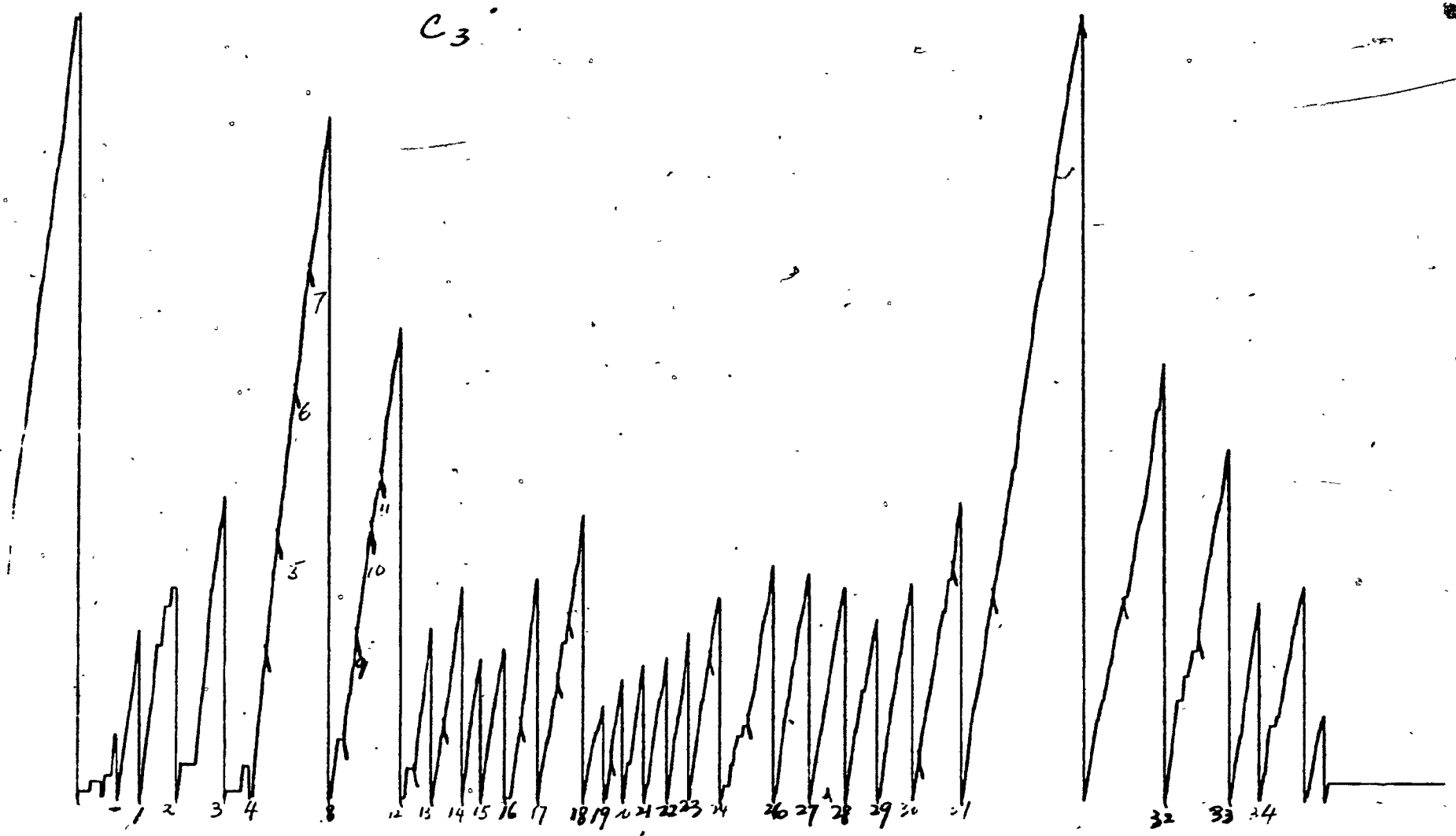

Figure 8. Cumulative record of subject C3 (mostly viewing)--English subject.

In general,

(1) This group of subjects was not viewing sometimes when the narrator alone was on camera, (Segment 12, 13, 16, 17, 18, 21, 24, 30) they watched again when audio cues indicated something would be shown on the TV screen. e.g., "For instance, the word..."; "let's now turn a look at...".

(2) They were not viewing sometimes during the sequences of slides shown from Segment 25-29. The non-viewing responses were usually at the last 3-5 seconds in each Segment.

(3) For Segment 23 and 31 where there were film sequences demonstrating "grinding ink on stone" and "Chinese Painting", subjects always watched consistently during these sections of the TV program.

D. Twenty percent (4 subjects) viewed the program for about 60% of the time, with about 40% of the time not viewing. A typical cumulative record appears in Figure 9.

(1) These subjects were not viewing for more than 5 seconds whenever the narrator alone was on camera except during the beginning and at the end of the TV program.

(2) They were not viewing for a longer time than that of Group C subjects between Segment 25-29 where there were sequences of slides showing "different styles of Chinese Calligraphy".

(3) These subjects were sometimes not viewing even during the film sequence in Segment 31.

E. Five percent (1 subject) of the subjects watched the program for about 30% of the time. He was not viewing at all between Segment

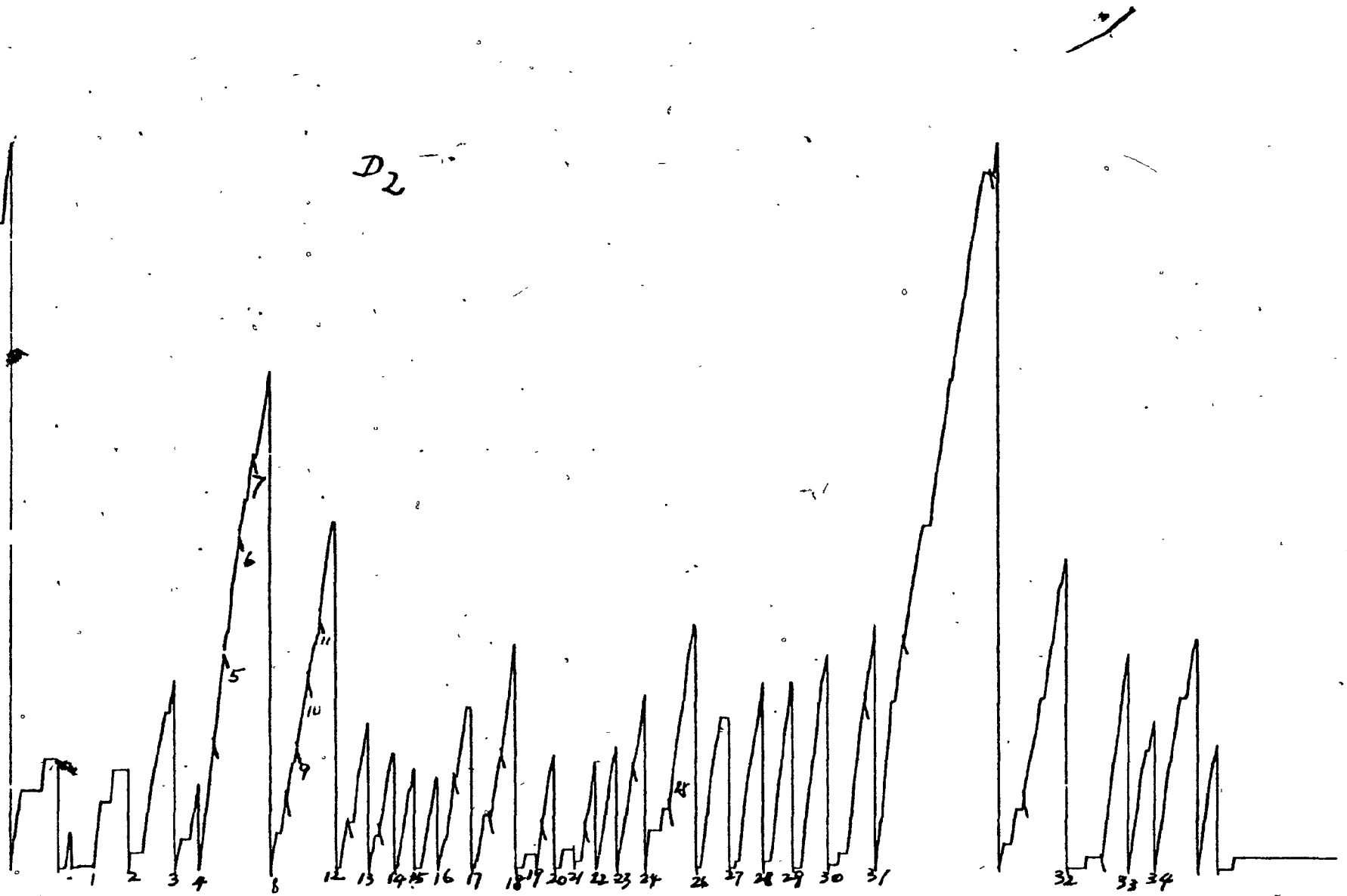

Figure 9. Cumulative record of subject D2 (moderate viewing)--English subject.

12-20. He commented that he was bored by the "characters" on the screen. He was also not viewing most of the time between Segment 27-29 where there were slide sequences showing "styles of Chinese Calligraphy". However, he viewed fairly consistently (98%) during the film sequences in Segment 23 and Segment 31. This cumulative record appears in Figure 10.

Overall Results of Attending Behaviour

By examining the individual cumulative record of subjects it was found that:

(1) Segments of a TV program with rapidly changing visual images elicit higher attending behaviour than segments of a TV program with less rapidly changing sequence of slides.

(2) Segments of a TV program with sequences of slides elicit higher attending behaviour than segments of a TV program with narrator alone on camera with fixed shots.

Recall Recognition

Item Analysis

An item analysis was performed on the questionnaire in order to determine if the test items were valid and discriminating between the English-speaking subjects and the Chinese-speaking subjects. Based on the total scores, the subjects in each group (consisting of 20 subjects each) were divided into high-third scorers, middle-third scorers, and low-third scorers. The number of high-third and low-third scorers who

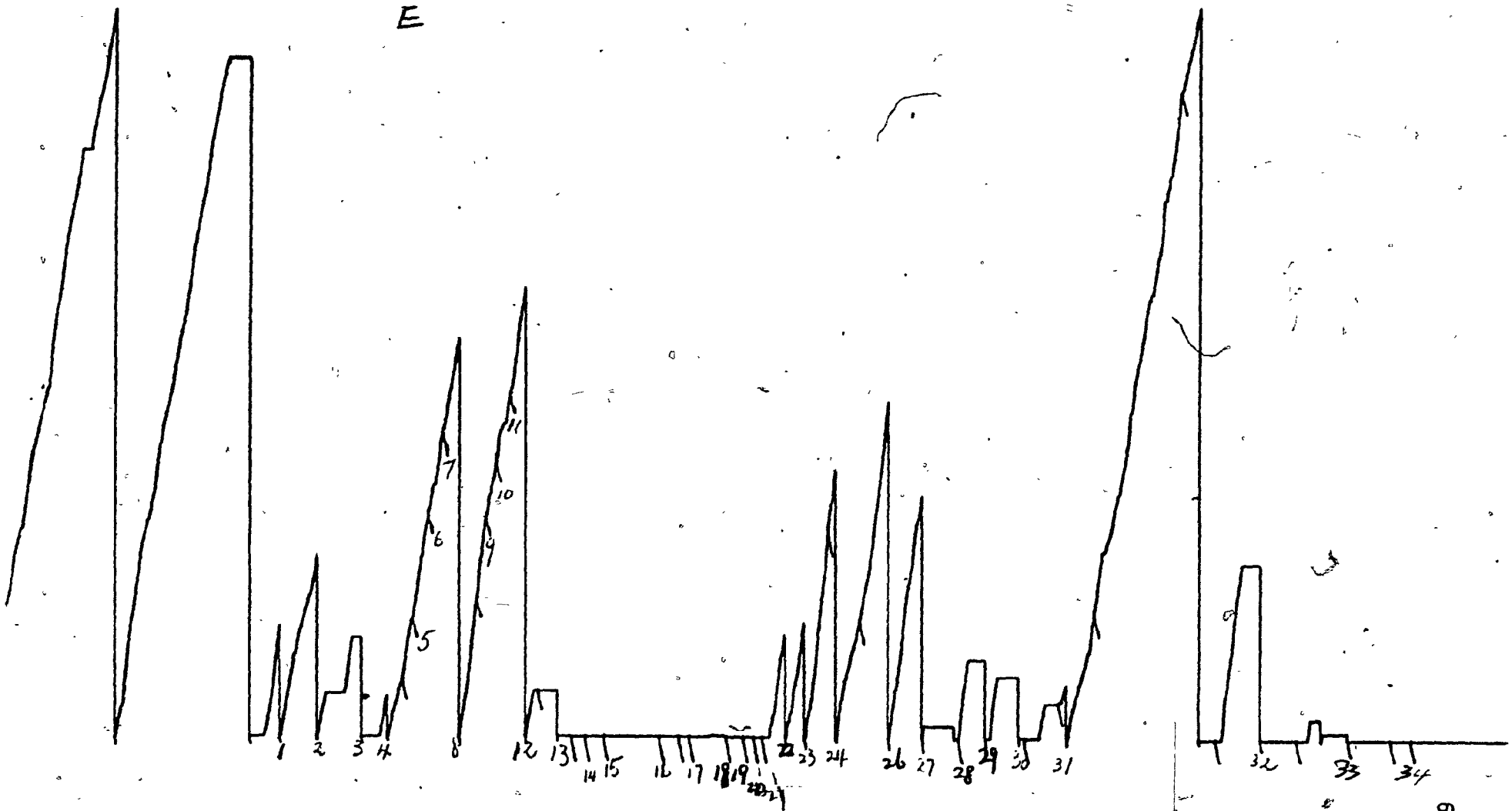

Figure 10. Cumulative record of subject E (infrequently viewing)--English subject.

pass each item were then identified. Using this information, and the formula (see Table 1) for measuring an item's discriminability and difficulty, an item analysis was performed on each group of subjects.

Discriminability refers to the "extent to which a test item is responded to correctly by those students possessing more of the quality being measured and incorrectly by those students possessing less of this quality." Such items served the purpose of separating more knowledgeable subjects from less knowledgeable ones. Difficulty refers to the "extent to which a test item can be responded to correctly by any student." It differs from discriminability in that it does not include any differentiation between students (Tuckman 1972, p. 154-155).

Based on each item that was tested (36 items), a data table was then established. (Refer to Table 1). For the English-speaking group, the results of the item analysis showed that only ten of the thirty-six items tested have satisfactory discriminating power in that two-thirds (.67) are in the high-third group (i.e., the index of discriminability for these items is above .67). These are items 5, 6, 10, 15, 17, 18, 21, 22, 27 and 29. For their level of difficulty, twelve items (items 2, 8, 10, 11, 14, 15, 18, 19, 21, 29, 31, 32) are too difficult (maybe they were not paying attention) since more than 2/3 (.67) got them wrong (i.e., the index of difficulty for these items is above .67). Thirteen items in the test are too easy since fewer than 1/3 (.33) got them wrong (i.e., the index of difficulty for these items is below .33). Taking both considerations into account, items 4, 5, 17, 22 and 27 would survive the test since they have both satisfactory discriminability (above .67) and

Table 1

Results of Data on Item Analysis (Recall/Recognition Questionnaire) for English-speaking subjects

Item	No. of high 1/3 who pass	No. of low 1/3 who pass	Index of Difficulty	Index of Discriminability
1	7	6	0.07	0.53
2	1	2	0.78	0.33
3	7	6	0.07	0.53
*4	5	0	0.64	1.00
*5	7	2	0.35	0.77
6	6	4	0.28	0.60
7	7	5	0.14	0.58
8	1	1	0.85	0.50
9	4	3	0.50	0.57
10	1	0	0.92	1.00
11	1	1	0.85	0.50
12	7	4	0.21	0.63
13	6	4	0.28	0.60
14	0	0	1.00	0.00
15	4	0	0.71	1.00
16	3	3	0.57	0,50
*17	5	0	0.64	1.00
18	3	1	0.71	0.75
19	0	0	1.00	0.00
20	3	4	0.50	0.42
21	2	0	0.85	1.00
*22	7	1	0.42	0.87
23	3	2	0.64	0.60
24	7	5	0.14	0.58
25	4	4	0.42	0.50
26	6	6	0.14	0.50
*27	5	0	0.64	1.00
28	6	4	0.28	0.60
29	2	0	0.85	1.00
30	5	5	0.28	0.50
31	2	2	0.71	0.50
32	0	3	0.78	0.00
33	3	2	0.64	0.60
34	7	5	0.14	0.58
35	7	7	0.00	0.50
36	6	6	0.14	0.50

Note. Items with reasonable difficulty: between .33 and .67
satisfactory discriminability: above .67

* Test items that have both satisfactory discriminability and reasonable difficulty

....cont'd

Table 1 (cont'd)

Index of Difficulty =

$$\frac{\text{Number who fail an item}}{\text{Total number in both group (high 1/3 \& low 1/3 group)}}$$

Index of Discriminability =

$$\frac{\text{Number of high 1/3 who pass an item}}{\text{Total no. in both groups who pass the item}}$$

reasonable difficulty (between .33 and .67). (See Table 1)

For the Chinese-speaking group, the results of the item analysis showed that only 9 of the 36 items tested have satisfactory discriminating power in that 2/3 (.67) are in the high-third group. These are items 8, 20, 22, 23, 25, 27, 29, 33 and 36. For their level of difficulty, six items (items 2, 8, 10, 14, 19, 20) are too difficult since more than 2/3 (.67) got them wrong. Twenty-two items in the test are too easy since fewer than 1/3 (.33) got them wrong. Therefore, items 22, 23, 25, 27, and 29 would survive the test since they have both satisfactory discriminability (above .67) and reasonable difficulty (between .33 and .67). (See Table 2)

Comparing the results of item analysis of the two groups of subjects, it was found that for the Chinese-speaking group, 61% (22 items) of the test items (36 items) was too easy (index of difficulty below .33) whereas only 36% (13 items) of the test items was too easy for the English-speaking subjects. Also, only 16% (6 items) of the test items was too difficult (index of difficulty above .67) for the Chinese-speaking subjects, whereas 33% (13 items) of the test items was too difficult for the English-speaking subjects. The results of this study showed that it may be much easier for the Chinese-speaking subjects than the English-speaking subjects to comprehend the contents of the TV program as well as to answer the questionnaire as they already possess knowledge of Chinese language.

Table 2

Results of Data on Item Analysis (Recall/Recognition Questionnaire) for Chinese-speaking subjects

Item	No. of high 1/3 who pass	No. of low 1/3 who pass	Index of Difficulty	Index of Discriminability
1	6	6	0.14	0.50
2	1	1	0.85	0.50
3	7	6	0.07	0.53
4	4	4	0.42	0.50
5	7	6	0.07	0.53
6	7	7	0.00	0.50
7	7	6	0.07	0.53
8	1	0	0.92	1.00
9	4	5	0.35	0.44
10	0	1	0.92	0.00
11	7	6	0.07	0.53
12	7	4	0.21	0.63
13	1	5	0.21	0.54
14	0	0	1.00	0.00
15	7	4	0.21	0.63
16	7	6	0.07	0.53
17	7	6	0.07	0.53
18	7	6	0.07	0.53
19	0	0	1.00	0.00
20	3	0	0.78	1.00
21	6	5	0.21	0.54
*22	6	2	0.42	0.75
*23	4	1	0.64	0.80
24	7	4	0.21	0.63
*25	6	2	0.42	0.75
26	7	7	0.00	0.50
*27	6	2	0.42	0.75
28	7	6	0.07	0.53
*29	5	1	0.57	0.83
30	7	4	0.21	0.63
31	5	3	0.42	0.62
32	6	6	0.14	0.50
33	7	3	0.28	0.70
34	6	4	0.28	0.60
35	7	4	0.21	0.63
36	7	3	0.28	0.70

Note. Items with reasonable difficulty: between .33 & .67
satisfactory discriminability: above .67

* Test items that have both satisfactory discriminability and reasonable difficulty

Test Reliability

Test reliability means that a test is consistent from one measurement to another. A certain amount of variation in test performance can be expected from one time to another, from one sample of items to another, and from one part of the test to another.

One of the simplest means of estimating the reliability of test scores from a single administration of a test is by using Kuder-Richardson Formula 21. The formula required three types of information: (1) the number of items in the test, (2) the mean, and (3) the standard deviation (cf. Gronlund, 1968). A simplified version of the formula that was used is as follows:

Reliability Coefficient (KR 21)

$$1 = \frac{M\,(K-M)}{Ks^2}$$

Where K = the number of items in the test

M = the mean of the test scores

s = the standard deviation of the test scores

The result of the reliability test showed that a reliability of .62 was arrived for the Chinese-speaking group, and .39 was concluded for the English-speaking group. (Refer to Table 3)

Table 3

Kuder-Richardson Reliability Test

English-speaking Subjects

K= 36 (The no. of items in the recall/recognition questionnaire)

M= 17.95 (The mean of the test scores)

s^2= 14.70 (The variance of the test scores)

$$1 - \frac{17.95\ (36-17.95)}{36 \times 14.7}$$

$$1 - \frac{17.95 \times 18.05}{36 \times 14.7} = \frac{323.9975}{529.2}$$

$$1 - 0.61$$

$$= \underline{0.39} \quad \text{(Reliability Coefficient)}$$

Chinese-Speaking Subjects

K= 36

M= 24.15

s^2= 20.5

$$1 - \frac{24.15\ (36-24.15)}{36 \times 20.5}$$

$$1 - \frac{24.15 \times 11.85}{36 \times 20.5} = \frac{286.1775}{738}$$

$$1 - 0.38$$

$$= \underline{0.62} \quad \text{(Reliability Coefficient)}$$

Analysis of Knowledge as a Function of Attention to the Relevant TV Segment

Point Biserial Coefficient of Correlation

When one of the two variables in a correlation problem is a genuine dichotomy, the appropriate type of coefficient to use is the point-biserial correlation. In this study, the response to a test item was treated as a dichotomous variable which was scored as either right or wrong. A "score" of +1 was given to each person with a correct answer and a "score" of zero to each person with a wrong answer. (See Tables 5 and 6) As each test item was constructed according to the content of each segment in the TV program, the point-biserial correlation coefficient (See Table 4) was computed to find out the correlation between attention scores for each segment of the TV program and item scores of each test item. (NOTE: Attention scores here refers to the total number of viewing responses in each segment of the TV program as recorded by the automatic numerical printing counter of the conjugate analysis apparatus.)

The point-biserial correlation formula is as follows:

$$rpb = \frac{\overline{Y1} - \overline{Y0}}{Sy}\sqrt{pq}$$

$\overline{Y1}$ = mean of attention scores for those answered right (+1) for the test items

$\overline{Y0}$ = mean of attention scores for those answered wrong (0) for the test

Table 4

Point Biserial Correlation Coefficient Between Attention[a] and Right/Wrong[b] Responses to a Test Item (Recall/Recognition)

Item	English-speaking Subjects	Chinese-speaking Subjects
1	-0.01	-0.14
2	-0.22	0.05
3	0.22	-0.43
4	-0.10*	-0.07
5	0.48*	0.15
6	-0.02	0.00
7	0.07	0.05
8	0.31	0.16
9	0.005	-0.12
10	-0.69	-0.16
11	0.02	-0.18
12	0.04	0.12
13	-0.22	0.25
14	0.00	0.00
15	0.20	-0.19
16	0.23	0.32
17	0.40*	0.20
18	0.19	0.18
19	0.00	0.00
20	0.26	0.26
21	0.07	-0.004
22	0.28*	0.37*
23	-0.16	0.04*
24	-0.02	-0.51
25	-0.22	-0.20*
26	0.39	0.00
27	0.09*	-0.001*
28	-0.2	0.18
29	-0.17	0.15*
30	-0.31	0.31
31	0.21	0.05

....cont'd

Table 4 (Cont'd)

Point Biserial Correlation Coefficient Between Attention[a] and Right/Wrong[b] Responses to a Test Item (Recall/Recognition)

Item	English-speaking Subjects	Chinese-speaking Subjects
32	-0.12	-0.27
33	0.007	-0.23
34	0.31	-0.21
35	0.00	0.26
36	-0.07	0.37

Note. 71 instances not watching, 34 answers wrong (47.8 %). 103 instances not watching, 46 answers wrong (44.6 %).

[a] Attention scores refer to the total number of viewing responses in each segment of the TV program (pressing of a micro switch which controls the brightness of the TV screen) as recorded by the automatic numerical counter of the conjugate analysis apparatus.

[b] English-speaking subjects, when not viewing, 47.8 % of answers were wrong.
Chinese-speaking subjects, when not viewing, 44.6 % of answers were wrong.

* Useful items revealed by item analysis

Table 5

Response Pattern of Recall/Recognition Questionnaire for English-speaking Subjects

Items	Subjects																				No. of Correct Responses
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	1	1	1	1	1	1	1	#1	#0	#1	1	#1	#1	1	1	1	1	0	#1	1	18
2	0	0	0	0	0	0	0	1	1	#0	1	0	#1	0	0	0	0	0	#1	0	5
3	1	1	#1	1	1	#1	#1	#1	#0	#1	#1	#1	1	1	1	1	1	1	0	#1	18
*4	1	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	10
*5	0	0	0	1	1	0	1	1	1	0	0	1	1	1	1	1	1	0	1	1	13
6	1	0	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	16
7	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	18
8	0	0	#0	0	0	1	#0	0	0	#0	0	#0	0	0	0	1	0	0	1	0	3
9	1	0	0	0	1	1	0	#0	#1	1	0	1	1	0	1	1	1	1	1	#0	12
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
11	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	3
12	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	17
13	0	0	1	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	0	0	12
14	0	0	0	0	0	0	#0	0	#0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	0	0	1	0	0	0	1	0	0	#0	1	0	0	1	0	0	1	1	0	8
16	0	1	0	0	0	#0	0	1	1	1	#0	0	0	0	1	1	0	1	1	0	8
*17	1	0	0	1	1	#0	0	0	0	0	#0	0	1	1	1	1	0	0	1	1	9
18	1	1	0	1	0	0	0	1	0	0	#0	1	0	0	0	1	0	1	1	1	9
19	0	0	0	0	0	0	0	#0	0	0	#0	0	0	0	0	0	0	0	0	0	0
20	0	1	1	0	1	0	#1	0	#0	1	#0	0	0	0	0	1	1	0	1	0	8

...cont'd

Table 5 (Cont'd)

Response Pattern of Recall/Recognition Questionnaire for English-speaking Subjects

Items	Subjects																				No. of correct Responses
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
21	0	0	0	0	0	0	0	0	0	0	#0	1	0	0	1	1	0	0	0	0	3
*22	1	0	0	1	1	1	#0	1	0	0	#0	0	#0	1	1	1	1	1	0	#0	10
23	0	0	0	0	0	0	1	1	0	#0	#1	0	0	0	1	0	1	0	0	1	7
24	1	1	1	1	1	#1	0	#1	1	#0	#1	0	#1	1	1	1	1	1	#1	#0	16
25	1	0	0	1	0	1	#1	0	1	#1	0	1	1	1	1	0	1	0	1	1	13
26	0	1	1	1	1	1	#0	1	1	1	1	1	1	1	1	1	1	1	1	1	18
*27	0	0	0	1	1	0	#0	0	0	0	0	1	0	0	1	1	1	1	0	1	8
28	1	1	0	1	1	1	#1	#1	#1	0	0	1	#1	1	1	0	1	1	#1	1	16
29	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
30	1	0	1	0	1	1	0	1	1	1	1	0	0	1	1	1	0	0	0	1	12
31	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	5
32	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	4
33	0	1	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	1	6
34	1	1	1	1	1	1	1	1	0	1	#0	1	#1	1	1	1	1	1	0	#1	17
35	1	1	1	1	1	1	1	1	1	1	#1	1	1	1	1	1	1	1	1	1	20
36	0	1	1	1	1	#1	1	#0	#0	#1	1	#1	#0	1	1	1	1	0	0	#1	14
Total Correct Responses	18	13	15	19	19	17	12	21	14	15	12	18	18	19	24	27	22	18	19	19	Mean: 18.0

1 = correct ans. 0 = wrong ans. # = not viewing

*Items accepted after item analysis

Table 6

Response Pattern of Recall/Recognition Questionnaire for Chinese-speaking Subjects

Items	Subjects																				No. of Correct Responses
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	1	#1	0	1	1	#1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	18
2	0	#0	0	0	0	0	1	0	0	0	1	0	0	#0	#0	0	1	#0	0	0	3
3	1	1	1	1	1	#1	1	1	1	1	1	1	0	1	1	0	1	#1	1	1	18
4	0	1	0	1	0	1	1	1	1	1	1	1	1	#1	1	1	1	#0	0	0	14
5	1	1	1	1	0	1	1	1	1	1	0	1	1	0	#1	1	1	1	1	1	17
6	1	1	1	1	1	1	1	1	1	1	1	1	1	#1	1	1	1	1	1	1	20
7	1	1	1	1	1	1	1	0	1	1	1	1	1	#1	#1	1	1	1	1	1	19
8	1	#0	0	0	0	0	0	0	0	0	0	#0	0	#0	0	0	0	#0	0	0	1
9	1	1	0	1	0	1	1	1	0	1	1	1	1	#1	#1	1	1	#0	0	1	15
10	0	0	0	0	#0	0	#0	1	0	0	0	1	0	#0	#0	0	0	#0	0	0	2
11	1	1	1	1	1	1	1	0	1	1	1	1	1	#1	1	1	1	1	1	1	19
12	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	17
13	1	1	1	1	0	1	1	1	1	1	1	1	1	0	#1	1	0	1	#0	1	16
14	0	0	0	0	0	0	0	0	0	0	0	#0	0	0	0	0	0	#0	0	0	0
15	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	#1	0	1	16
16	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	#1	0	1	16
17	1	1	1	1	1	1	1	1	1	1	1	#0	1	1	1	1	1	1	0	1	18
18	1	1	1	1	1	1	1	1	1	1	1	#0	1	1	1	1	1	1	0	1	18
19	0	0	0	0	#0	0	#0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	0	1	1	0	0	#0	0	0	0	1	#0	0	0	0	0	0	0	0	0	4

....cont'd

Table 6 (Cont'd)

Response Pattern of Recall/Recognition Questionnaire for Chinese-speaking Subjects

Items	Subjects																				No. of Correct Responses
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
21	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	1	0	0	15
*22	1	1	1	0	0	#0	0	1	1	1	1	1	1	#1	#1	1	1	#0	0	1	14
*23	0	#0	1	1	0	#0	#0	1	1	1	1	1	0	#1	#0	0	1	#0	0	0	9
24	1	1	1	1	0	1	#1	0	1	1	0	#0	0	#1	#1	1	1	#1	0	1	14
*25	1	0	1	1	0	#0	1	0	1	1	0	1	1	1	#0	1	1	0	0	1	12
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20
*27	1	1	1	0	0	0	#0	1	1	0	0	0	1	#1	1	0	1	1	1	0	11
28	1	1	1	1	0	#1	1	#1	1	1	1	#1	1	#1	#1	1	1	1	#1	1	19
*29	0	1	1	1	1	0	0	0	0	0	0	1	1	#0	#1	0	1	1	0	0	9
30	1	1	1	1	0	0	0	1	1	1	1	1	1	#0	#1	1	1	#1	1	1	16
31	0	1	1	1	1	0	0	1	0	0	1	1	1	#1	1	1	1	1	0	0	13
32	0	1	1	1	1	1	1	1	1	1	1	1	1	#1	1	1	1	1	1	0	18
33	1	1	1	1	0	0	#0	1	1	1	0	1	1	#1	1	1	1	1	1	0	15
34	1	1	1	0	0	#1	#1	0	1	1	1	1	1	1	#1	1	1	1	1	0	16
35	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1	#1	0	1	16
36	1	1	1	1	1	0	1	0	1	1	1	1	1	#1	#0	0	1	#1	0	1	15
Total Correct Responses	27	28	28	29	14	19	24	22	26	25	26	26	26	25	25	24	30	26	13	20	Mean: 24.1

1 = correct answer 0 = wrong answer # = not viewing

*Items accepted after item analysis

items

S_y = standard deviation of attention scores for each test item

p = proportion of subjects answered right for a test item

q = proportion of subjects answered wrong for a test item

Th point biserial correlation (rpb) statistics can "always be interpreted as a measure of the degree to which the continuous variable differentiates or discriminates, between the two categories of the dichotomous variable" (Ferguson, 1976, p. 416). The maximum value of rpb never reaches +1; the minimum value never reaches -1. The higher the value of rpb approaches +1 or -1, the higher the degree of positive/negative correlation.

The results of the correlation analysis between attention scores and the right/wrong responses to all 36 test items are shown in Table 4. For the English-speaking group, only two test items have a rpb above .33 (item 5 and 26). One test item (item 10) has a negative rpb of -0.69. For the Chinese-speaking group, two test items (item 22 and 26) have a negative rpb above .33, and two test items (item 3 and 24) have a negative rpb of -0.43 and -0.51. All the other items had a very low rpb between attention scores and response to the test items. So, the results of point biserial correlation of coefficient of all test items did not indicate a great proportion of TV program segments identified as eliciting high attending behaviour will produce a correct recall/recognition of cognitive information from the program when compared to those segments identified as eliciting low attending behaviour.

This is not surprising however because the Item Analysis revealed few useful items. When we examine those items for each group the situation improves only slightly (items used are identified in Table 4 by *).

English Subjects. Only five items were acceptable (see Item Analysis above). Of these, two had moderately high point biserial correlations (of 0.48 and 0.40), a third had a rpb of 0.28 and the remaining two were essentially uncorrelated.

Chinese Subjects. Only five items were acceptable. Of these, only one had a moderately high correlation (of 0.37) and the remainder were essentially uncorrelated.

This analysis of point biserial correlations suggests that several segments of the TV program which elicit high viewing behaviour did produce a correct response on the associated posttest items. However, it should be noted that this analysis was based on mean scores for the group and may obscure details. Analysis of individual response patterns may reveal more details.

Conditional Probability of Correct Response to Items Selected by Item Analysis

Analysis of responses to those items identified earlier as having satisfactory discriminability and reasonable difficulty (see Item Analysis, Table 1 & 2) revealed differences in cumulative probability

of a correct response, given that the related TV segment was, or was not viewed.

For English-speaking subjects (see Table 7), the conditional probability of a correct response, given that the TV segment containing information about the concept tested was viewed, is 0.54. The conditional probability, given that the segment was not viewed, is 0. These conditional probabilities are plotted in Figure 11.

For Chinese-speaking subjects (see Table 7), the conditional probability of a correct response, given that the TV segment containing information about the concept tested was viewed, is 0.60. The conditional probability of a correct response, given that the segment was not viewed, is 0.31. These conditional probabilities are plotted in Fig. 12.

For both groups the conditional probability of a correct response to the accepted items on the Recall/Recognition test is much greater if the subjects were watching than if they were not.

Further more a statistical analysis of Chi square (x^2) test also reveals that this large difference is statistically significant for the English-speaking subjects ($x^2 = 5.53$, $p < 0.025$; refer to Table 8) but not quite statistically significant for the Chinese-speaking groups ($x^2 = 3.3$, $.05 < p < .10$, refer to Table 8).

Even though the number of scored items is low (items selected by Item Analysis), we can conclude that the differences in cumulative

Table 7

Response of Subjects to Post-test Items (Selected by Item Analysis) as a Function of Viewing, or Not Viewing the relation TV Segment

English-speaking Subjects

Items Scored	Viewed		Not Viewed	
	Correct	Wrong	Correct	Wrong
4	10	10	-	-
5	13	7	-	-
17	9	9	0	2
22	10	6	0	4
27	8	11	0	1
Total	50	43	0	7
Percent	54%	46%	0	100%

Chinese-speaking Subjects

Items Scored	Viewed		Not Viewed	
	Correct	Wrong	Correct	Wrong
22	12	4	2	2
23	8	6	1	5
25	12	6	0	2
27	10	8	1	1
29	8	10	1	1
Total	50	34	5	11
Percent	60%	40%	31%	69%

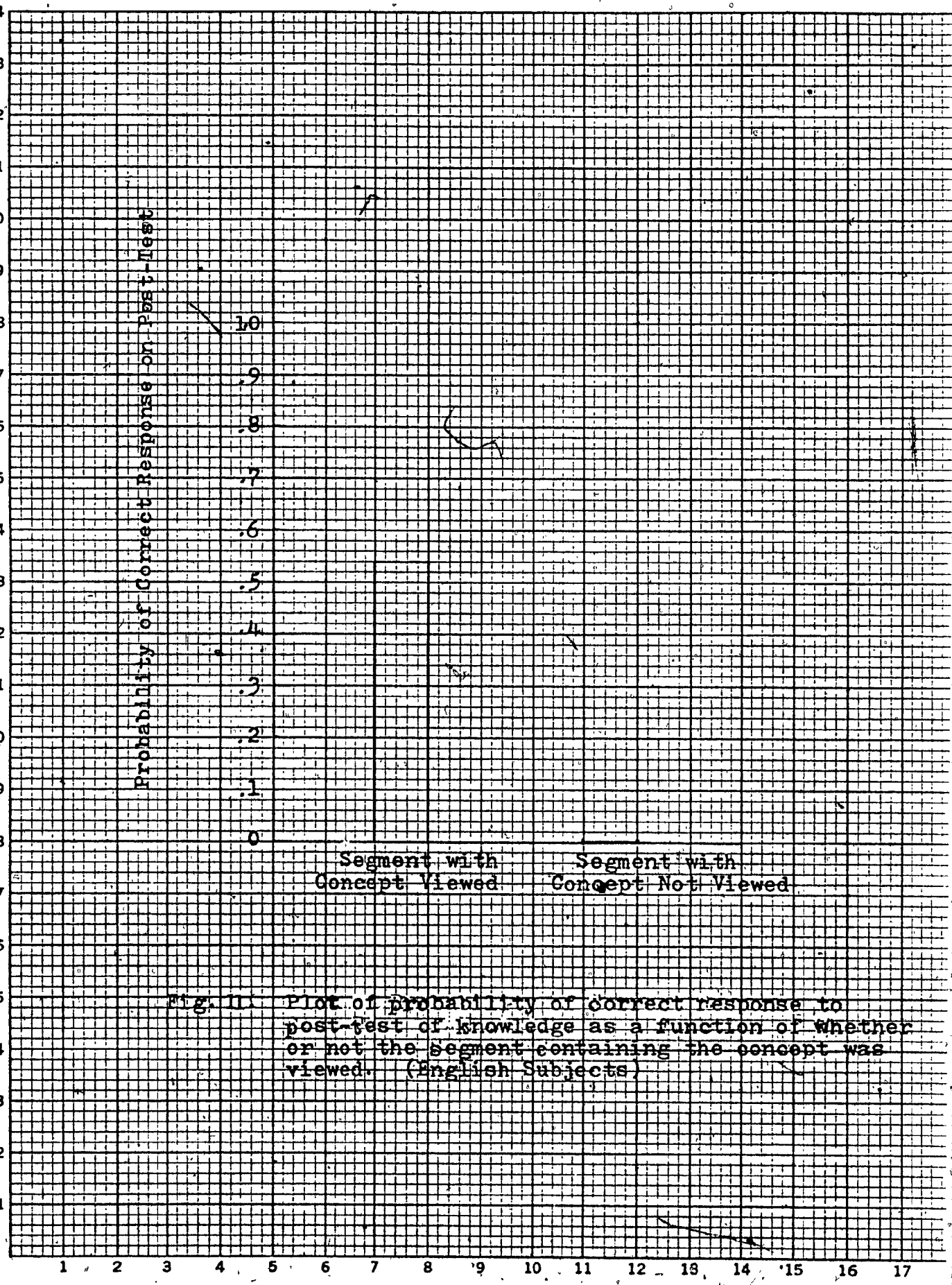

Fig. 11. Plot of probability of correct response to post-test of knowledge as a function of whether or not the segment containing the concept was viewed. (English Subjects)

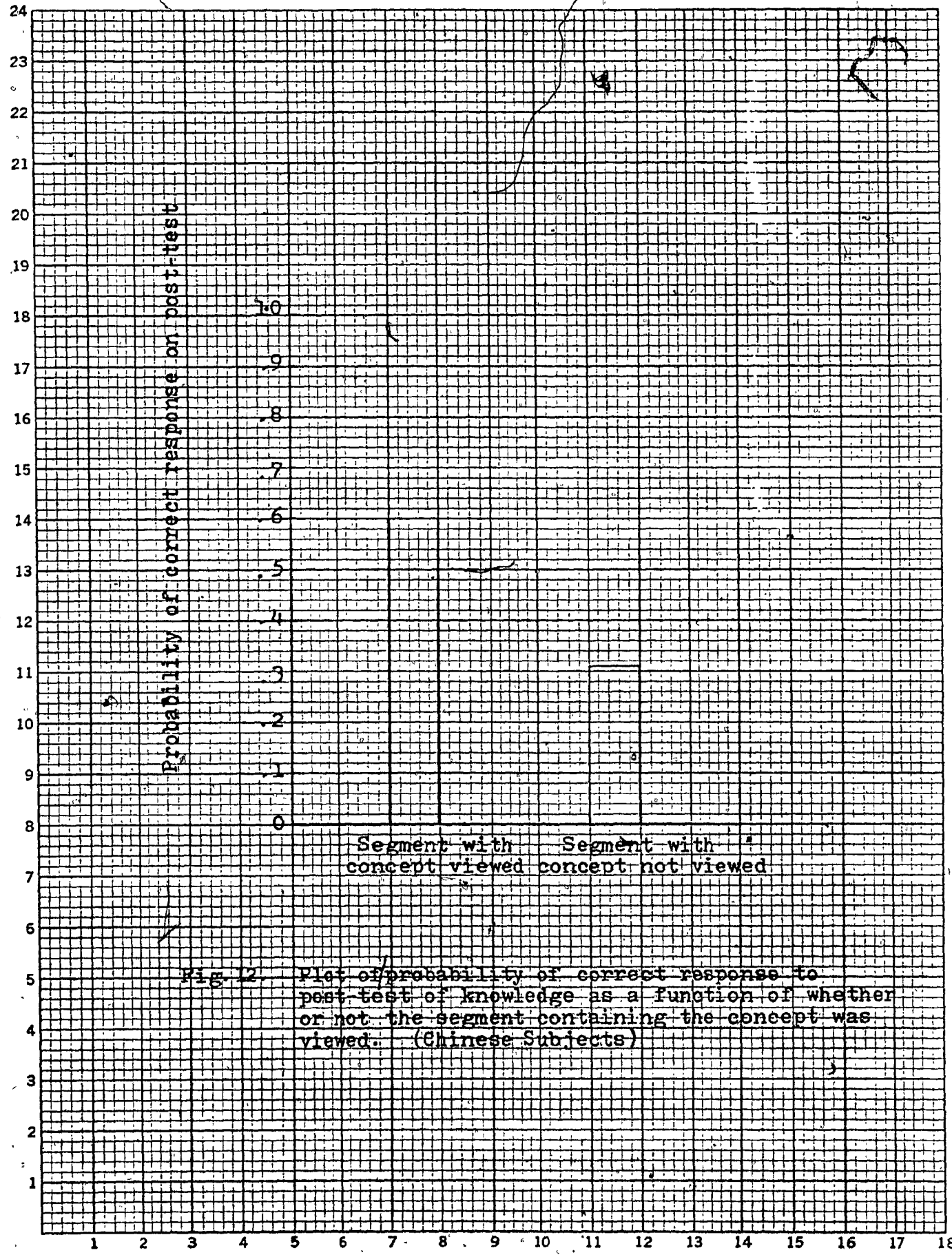

Fig. 12. Plot of probability of correct response to post-test of knowledge as a function of whether or not the segment containing the concept was viewed. (Chinese Subjects)

Squares to the Centimeter

Table 8

Chi Square Test (χ^2) for Response of Subjects to Posttest Items (Selected by Item Analysis) as a Function of Viewing, or Not Viewing the Related TV Segment

English-speaking Subjects

	Correct Responses	Wrong Responses	
Viewing	A = 50	B = 43	A+B = 93
Non-Viewing	C = 0	D = 7	C+D = 7
	A+C = 50	B+D = 50	N = 100

$$\chi^2 = \frac{N\,(AxD) - (BxC) - \frac{N^2}{2}}{(A+B)\,(C+D)\,(A+C)\,(B+D)}$$

$\chi^2 = 5.53^*$

df = 1 $p < .025$

Chinese-speaking Subjects

	Correct Responses	Wrong Responses	
Viewing	A = 50	B = 34	A+B = 84
Non-Viewing	C = 5	D = 11	C+D = 16
	A+C = 55	B+D = 45	N = 100

$\chi^2 = 3.3$

df = 1 $.05 < p < .10$

Note. A χ^2 of 3.84 is needed to attain significance at the 0.05 level for df = 1 ; a χ^2 of 5.02 is significant at the 0.025 level and a χ^2 of 2.71 is significant at the 0.10 level.

probability of a correct/wrong response, given that the related TV segment was, or was not, viewed is large. That is, watching segments of the TV program that produced high viewing behaviour yield higher scores on the recall/recognition posttest compared with not watching. Actually the chi-square (x^2) test reveals that the difference is statistically significant only for the English-speaking subjects but not quite significant for the Chinese-speaking subjects because of prior familiarity with the topic. In effect, by using two experimental groups, we have a replication of the experiment and thus can have more confidence in these findings.

Another possible source of confounding exists, closer analysis of the shooting script for the TV program reveals that about half of the items actually could be answered without having seen the video source of information. Clearly if viewing is not necessary to answer a post-test item point-biserial correlation would be low. What does the response pattern look like when we compare recall/recognition scores for items which can be identified with each of the three information sources: video alone; audio and video combined; and audio alone?

Knowledge as a Function of Information Source

The researcher analyzed both the script and the posttest and divided up the test items into three groups:

(1) test items relating to the audio channel of the TV program,

(2) test items relating to both the aduio and visual channels of the TV program,

(3) test items relating to the visual images of the TV program.

Next, cumulative records of viewing behaviour was analyzed to determine whether the subject was watching the specified segments.

(1) "Audio-related" test items (n = 8)

For the English speaking subjects, out of the total number of 34 non-viewing responses, 67% of the answers were right even when the subjects were not viewing compared with 66% when subjects were watching. (See Table 9) Thus, the conditional probability of a correct response to the audio-related test items for English-speaking subjects, given that the person was watching, is 0.66; given that he was not watching, the conditional probability is 0.67.

For the Chinese-speaking subjects, out of a total of 27 non-viewing responses, 63% of the answers were right even when the subjects were not watching compared with 66% when subjects were watching. (See Table 10) Thus, the conditional probability of a correct response to the audio-related test items for Chinese-speaking viewers, given that the person was watching, is 0.66; given that he was not watching, the conditional probability is 0.63.

(2) "Audio-Visual-related" test items (n = 11)

For the English-speaking subjects, out of a total of 31 non-viewing responses, only 20% were answered correctly when subjects were not viewing compared with 47% when subjects were watching. (See Table 11) Thus, the conditional probability of a correct response to the audio-

Table 9

Response Pattern of Recall/Recognition Questionnaire Corresponding to the Audio Channel of the TV Program (English-speaking Subjects)

Items	Percentage Correct when TV Segment Not-Viewed	Percentage Correct When TV Segment Viewed
1	84%	92%
2	33%	17%
3	89%	90%
9	33%	64%
20	33%	41%
25	100%	61%
28	100%	73%
34	67%	88%
	Not-Viewed, 67% ans. correct	Viewed, 66 ans. correct

Note. Conditional Probability of correct response, given the TV segment was viewed, 0.66, not viewed, 0.67.

Table 10

Response Pattern of Recall/Recognition Questionnaire Corresponding to the Audio Channel of the TV Program (Chinese-speaking Subjects)

Items	Percentage Correct When TV Segment Not-Viewed	Percentage Correct When TV Segment Viewed
1	100%	88%
2	0%	18%
3	100%	80%
9	67%	76%
20	0%	33%
25	33%	64%
28	100%	92%
34	100%	75%
	Not-Viewed, 63% ans. correct	Viewed, 66% ans. correct

Note. Conditional Probability of correct response, given that the TV segment was viewed, 0.66, not-viewed, 0.63.

Table 11

Response Pattern of Recall/Recognition Questionnaire Corresponding to Audio-Visual Channel of the TV Program (English-speaking Subjects)

Items	Percentage Correct When TV Segment Not-Viewed	Percentage Correct When TV Segment Viewed
8	0%	18%
10	-	5%
14	0%	0%
19	0%	0%
22	0%	62%
23	0%	38%
24	71%	84%
26	0%	94%
27	0%	42%
35	100%	100%
36	57%	76%
	Not-Viewed, 21% ans. correct	Viewed, 47% ans. correct

Note. COnditional Probability of Correct Response, given that the TV segment was viewd, 0.47, not -viewed, 0.21.

visual related items for English-speaking viewers, given that the person was watching, is 0.47; given that he was not watching, the conditional probability is 0.21.

For the Chinese-speaking subjects, out of a total of 36 non-viewing responses, only 43% were answered correctly when subjects were not viewing compared with 47% when subjects were watching. (See Table 12) Thus, the conditional probability of a correct response to the audio-visual related test items for Chinese-speaking viewers, given that the person was watching, is 0.47; given that he was not watching, the conditional probability is 0.43.

(3) "Visual-related" test items (n=17)

For the English-speaking subjects, out of a total of 7 non-viewing responses, none of the answers were correct when the subjects were not watching these segments compared with 54% when subjects were watching. (See Table 13) Thus, the conditional probability of a correct response to the visual-related test items for English-speaking viewers, given that the person was watching, is 0.46; given that he was not watching, the conditional probability is 0.

For the Chinese-speaking subjects, out of a total of 22 non-viewing responses, 63% were answered correctly even though the subjects were not watching compared to 81% when the appropriate segment was watched. (See Table 14) Thus, the conditional probability of a correct response to the visual-related test items for Chinese-speaking viewers, given that the person was watching, is 0.81; given that he was not watching, the condi-

Table 12

Response Pattern of Recall/Recognition Questionnaire Corresponding to Audio-Visual Channel of the TV Program (Chinese-speaking Subjects)

Items	Percentage Correct When TV Segment Not-Viewed	Percentage Correct When TV Segment Viewed
8	0%	6%
10	0%	13%
14	0%	0%
19	0%	0%
22	50%	75%
23	17%	57%
24	80%	60%
26	67%	88%
27	100%	68%
35	100%	78%
36	67%	76%
	Not-Viewed, 43% ans. correct	Viewed, 47% ans. correct

Note. Conditional Probability of correct response, given that the TV Segment was viewed, 0.47, not-viewed. 0.43

Table 13

Response Pattern of Recall/Recognition Questionnaire Corresponding to the Visual Channel of the TV Program (English-speaking Subjects)

Items	Percentage Correct When TV Segments Not-Viewed	Percentage Correct When TV Segments Viewed
4	-	50%
5	-	65%
6	-	80%
7	-	90%
11	-	15%
12	-	85%
13	-	60%
15	0%	42%
16	0%	44%
17	0%	50%
18	0%	47%
21	0%	15%
29	-	10%
30	-	60%
31	-	25%
32	-	20%
33	-	30%
	0%	46%

Note. Conditional Probability of Correct Response, given that the TV segment was Not-Viewed: 0, Viewed: 0.46.

Table 14

Response Pattern of Recall/Recognition Questionnaire Corresponding to the Visual Channel of the TV Program (Chinese-speaking Subjects)

Items	Percentage Correct When TV Segments Not-Viewed	Percentage Correct When TV Segments Viewed
4	50%	72%
5	50%	80%
6	100%	100%
7	100%	94%
11	100%	94%
12	-	85%
13	50%	80%
15	100%	77%
16	100%	78%
17	0%	94%
18	0%	94%
21	-	75%
29	50%	44%
30	67%	82%
31	100%	63%
32	100%	89%
33	50%	77%
	67%	81%

Note. Conditional Probability of Correct Response, given that the TV segment was Not-Viewed: 0.67, Viewed: 0.81

tional probability was 0.67.

The probability of a correct response to recall/recognition test items, given that the corresponding segment of the TV program was/or was not watched is plotted against the source of information (audio, audio-visual, visual) for English-speaking subjects (See Fig. 13) and Chinese-speaking subjects (See Fig. 14). It is noted that the two language groups perform identically when audio information was presented and similarly with audio-visual information but differ greatly when only visual images were presented and tested. In all cases where the information was presented in visual form, the probability of answering the posttest item correctly is greater when people were watching the TV segment. This difference is very great for English-speaking viewers with video only.

Attending Behaviour and Attitudes Towards the TV Program

Method of Analysis

The attitude measure consisted of two questionnaires. The general interest in the TV program was measured by the Likert scale. The other questionnaire was a semantic differential scale which measured subjects' reaction to the subject matter, narrator and production quality of the TV program.

Both the English-speaking subjects and the Chinese-speaking subjects were sub-divided into five groups according to their percentage of viewing

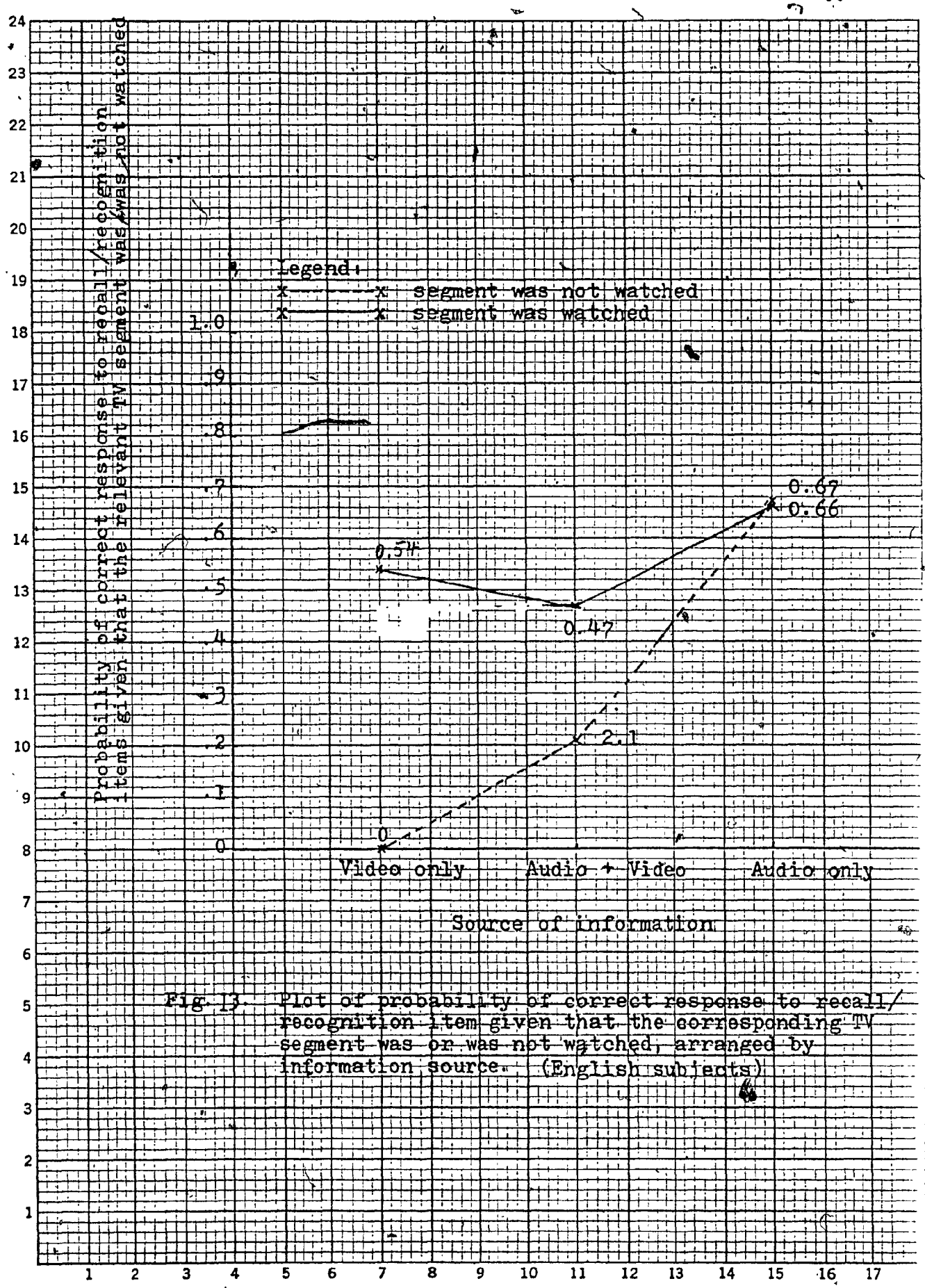

Fig. 13. Plot of probability of correct response to recall/recognition item given that the corresponding TV segment was or was not watched, arranged by information source. (English subjects)

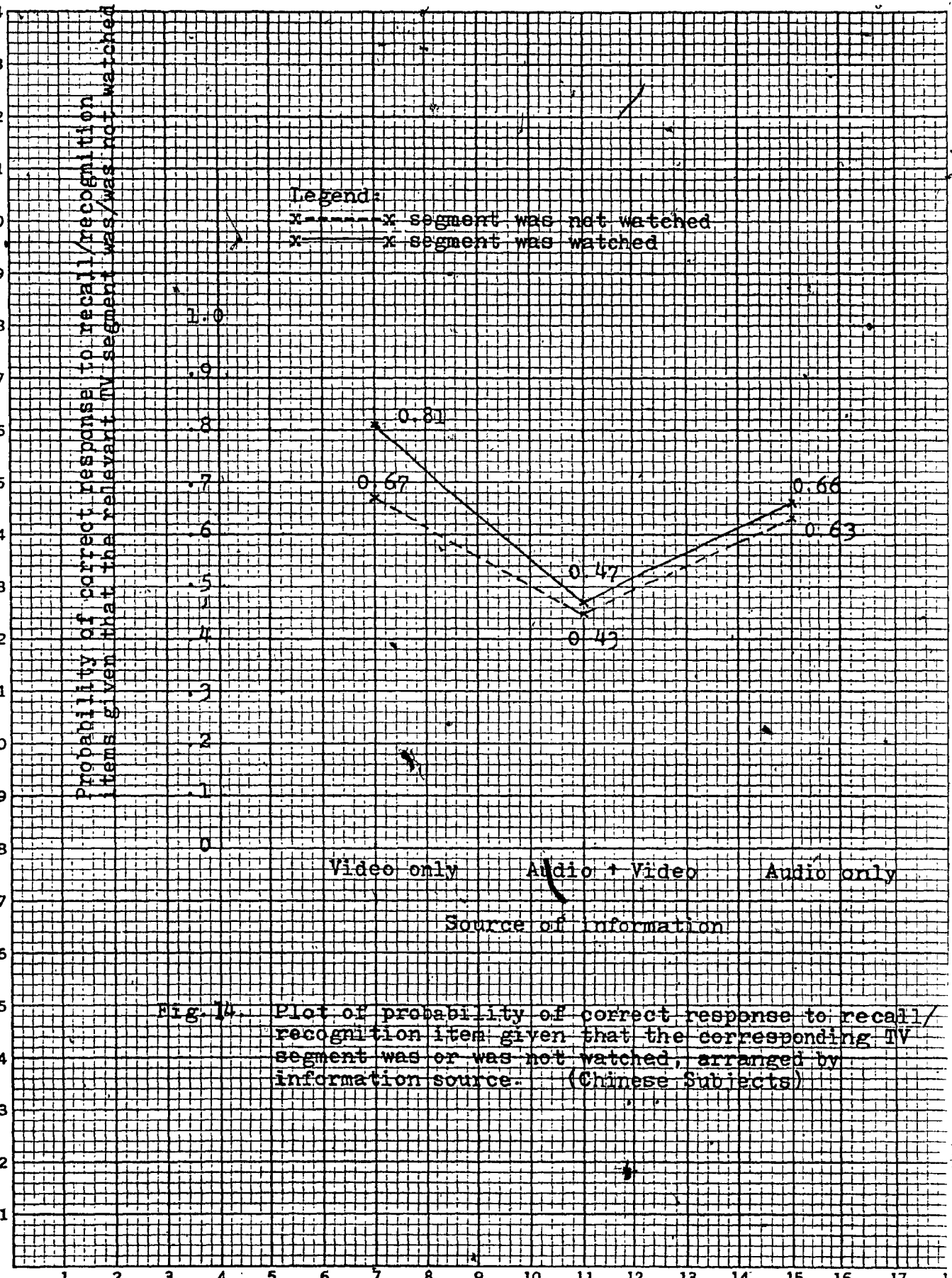

Fig. 14. Plot of probability of correct response to recall/recognition item given that the corresponding TV segment was or was not watched, arranged by information source. (Chinese Subjects)

5 Squares to the Centimeter

behaviour (derived from the graphical cumulative records).

The mean scores of each group of subjects on the interest questionnaire (Likert scale) were calculated. Then a graph was plotted for the mean scores of the two groups as a function of percentage of time viewing the TV program (Refer to Tables 15 and 16; Fig. 15).

Similarly, the mean scores on three concepts (performer, subject matter and production quality) in the semantic differential questionnaire for each group of subjects were calculated and graphs were plotted for the three concepts (Refer to Tables 15 and 16; Figures 16, 17 and 18).

General Interest

For both the English-speaking subjects and Chinese-speaking subjects, a similar pattern of mean scores on the general interest was found, as shown in Fig. 15. The scores tended to decrease as the time spent viewing the TV program decreased. Generally, subjects who spent more time viewing the TV program did have higher interest in the program than those who spent less time viewing the program. Chinese-speaking subjects have higher interest mean scores than the English-speaking subjects.

Attitude Toward the Performer

From the graph of Fig. 16, it seems that the English-speaking subjects tend to have a higher rating toward the performer than the

Table 15

Mean Attitude Scores of Likert Scale and Semantic Differential Questionnaire for Groups of Subjects with Different Viewing Behaviour

(English-speaking Subjects)

	Classification of Subjects by Groups				
Measure	A always viewing n=5	B viewing 98% of the time n=4	C viewing 89-92% of the time n=6	D viewing 60% of the time n=4	E viewing 30% of the time n=1
	Likert Scale				
General Interest	3.4	3.0	3.2	2.8	1.9
	Semantic Differential				
Performer	5.6	4.3	4.7	4.9	3.1
Program Quality	5.3	4.1	4.1	4.2	2.9
Subject Matter	5.8	4.8	5.1	5.0	2.9

Table 16

Mean Attitude Scores of Likert Scale and Semantic Differential Questionnaire for Groups of Subjects with Different Viewing Behaviour (Chinese-speaking Subjects)

	Classification of Subjects by Groups				
Measure	A always viewing n=5	B viewing 98% of the time n=7	C viewing 89-92% of the time n=4	D viewing 60% of the time n=2	E viewing 20-30% of the time n=2
	Likert Scale				
General Interest	4.0	3.5	3.5	3.0	2.3
	Semantic Differential				
Performer	5.1	5.0	4.2	4.6	4.5
Program Quality	5.6	5.2	3.9	4.3	3.5
Subject Matter	6.1	5.6	5.3	5.3	4.6

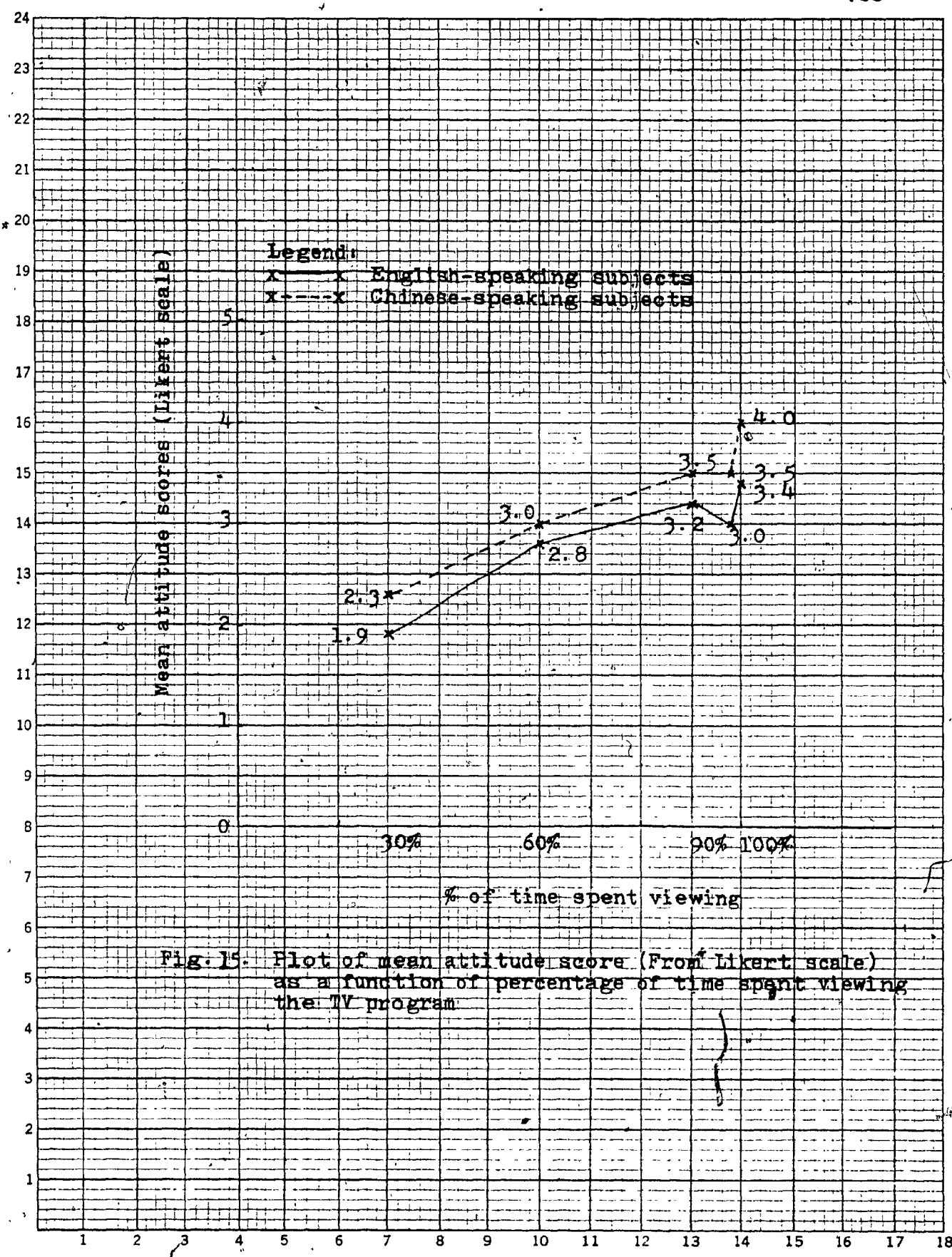

Fig. 15. Plot of mean attitude score (From Likert scale) as a function of percentage of time spent viewing the TV program

Chines-speaking subjects except for the infrequently viewing group (viewing 30% of the time). In general, the means scores for the different groups indicated a favourable rating toward the performer, with an average rating around 4.5.

Attitude toward Program Quality

For the English-speaking subjects, all groups who viewed the program more than 60% of the time rated the program quality more positively than those who watched it less than 30% of the time. The pattern of the mean scores was that the ratings decreased as the viewing time decreased.

For the Chinese-speaking subjects, groups who viewed the program more than 96% of the time rated its quality higher than those who viewed it less than 30% of the time. However, a high-viewing group (Group C which was attended about 89% of the time) also rated the program quality much less than the continuously viewing group and less than Group D subjects who viewed about 60% of the time. It might be that they liked the program content so they viewed it (see Fig. 17).

Attitude toward the Subject Matter

For the English-speaking subjects, all groups who watched the program more than 60% of the time rated its content more highly than those viewing it less than 30% of the time. The Chinese-speaking subjects have similar results on the ratings toward the subject matter.

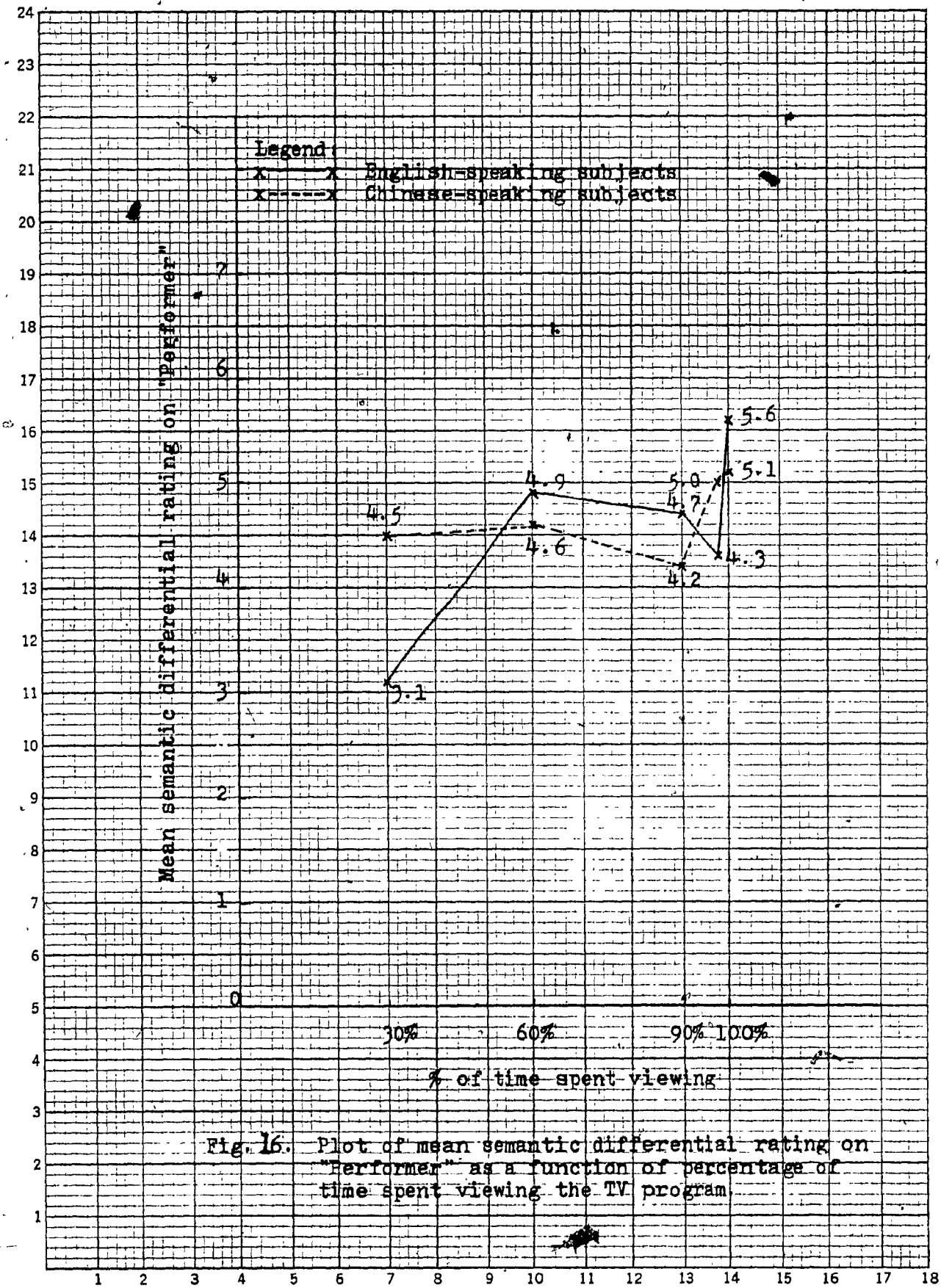

Fig. 16. Plot of mean semantic differential rating on "Performer" as a function of percentage of time spent viewing the TV program.

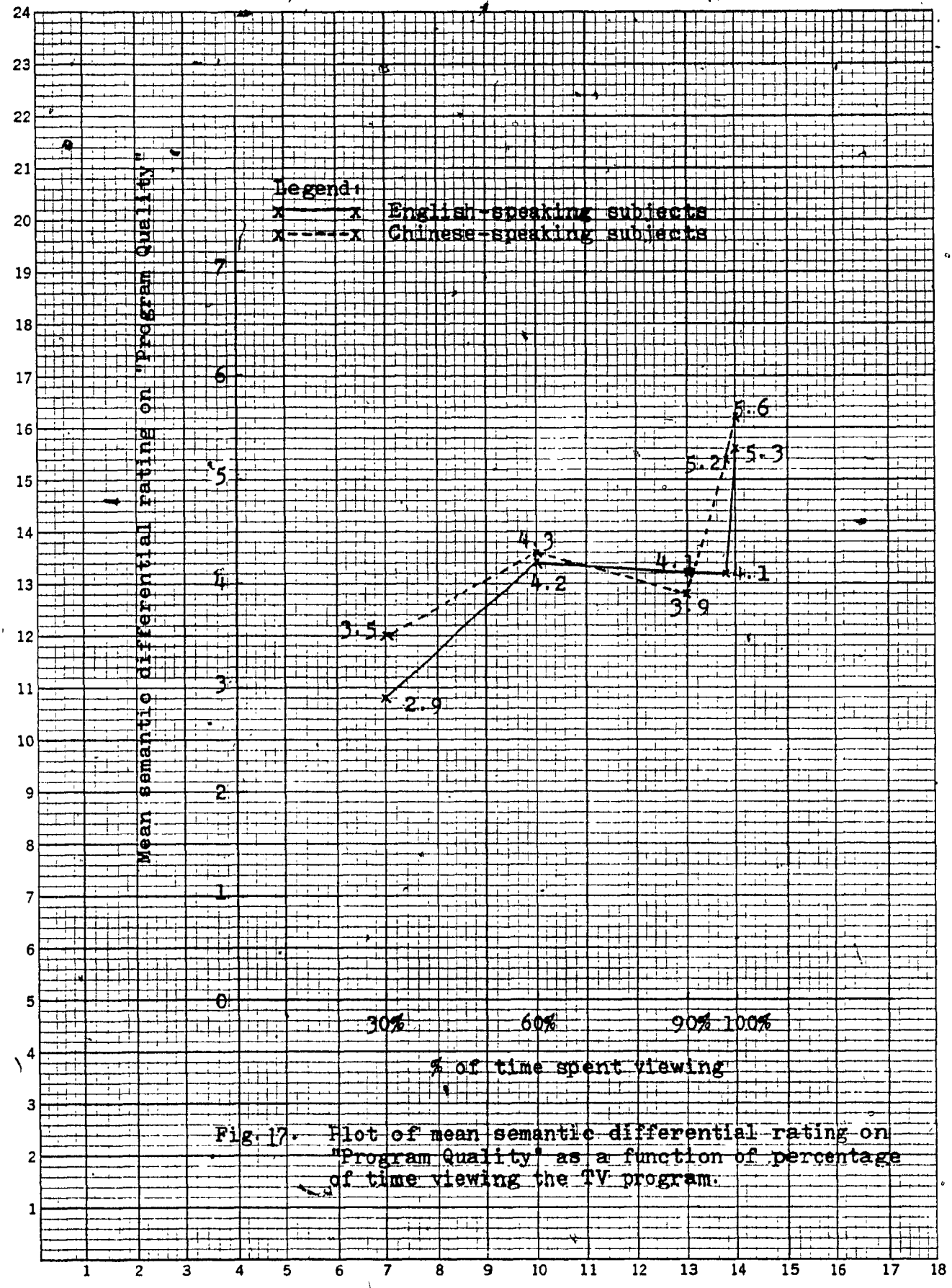

Fig. 17. Plot of mean semantic differential rating on "Program Quality" as a function of percentage of time viewing the TV program.

5 Squares to the Centimeter

The curves of the English-speaking groups and the Chinese-speaking groups of Fig. 18 are generally very similar. Those who spent more time viewing the program rated the subject matter more favourably. The Chinese groups seemed to rate the subject matter more favourably than the English groups..

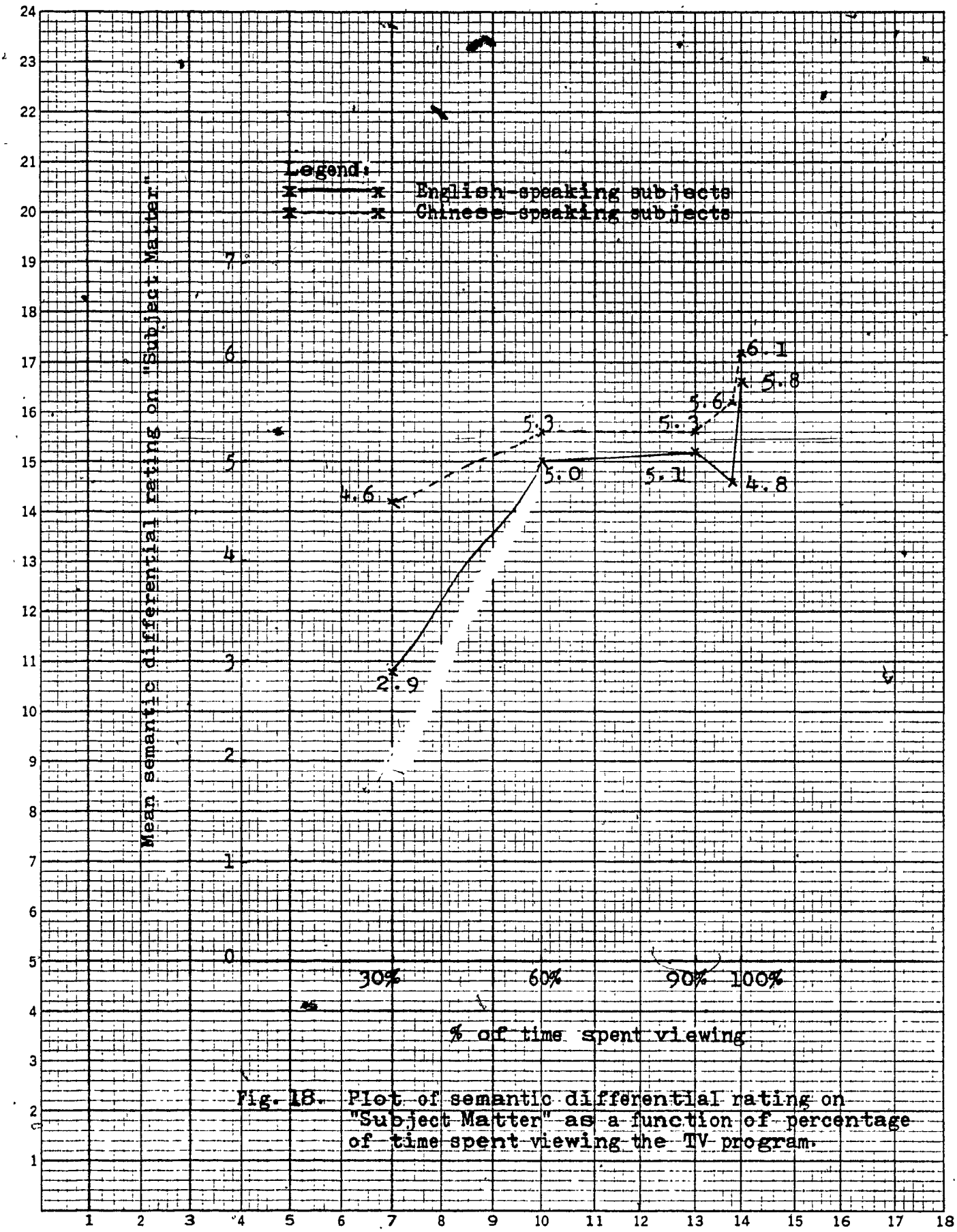

Fig. 18. Plot of semantic differential rating on "Subject Matter" as a function of percentage of time spent viewing the TV program.

Chapter 5

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Hypothesis 1

In hypothesis 1, it was predicted that: a viewer's attending behaviour (as measured by a conjugately programmed response apparatus in an experimental environment) towards segments of a TV program which contains: (1) changes from slides to graphics to film sequences and/or (2) film sequences with cuts, zooms, fade in/out, and presence of narrator on camera; would be higher compared to those segments with fixed static pictures on camera.

The findings in this experiment led to the following conclusions:

(1) All subjects, whether the English-speaking group or the Chinese-speaking group, showed much higher attention/interest with rapidly changing visual images (film inserts) in segments of an educational television program than in segments with static pictures (slides and graphics). Although some subjects have very low viewing responses in other segments of the TV program, they have consistent high viewing responses during the parts of the TV program with rapidly changing visual images.

(2) All subjects showed higher interest/attention in segments of the TV program with static visual images (still some "changes": from one slide to another graphic, or sequences of slides) than in segments of

the TV program with a fixed shot of the narrator on camera.

(3) Most subjects tended to start viewing the program whenever there was "new" stimulus (new in relation to what has immediately preceded it). For example, some subjects stopped viewing whenever the narrator alone was on camera, then they viewed the program again whenever there were new elements (relating to the content of the program) like slides, or film inserts shown on the screen. In this case, though subjects were not viewing, they still attended to the audio channel of the program. Whenever there were audio changes from one segment to another, subjects began to view the program again.

(4) Comparing the Chinese-speaking subjects and the English-speaking subjects, it was founded that both groups had a similar and consistent pattern of viewing responses towards the TV program: "Chinese Calligraphy and Painting" in this study. For those subjects who have very low viewing responses (20%-30% of the time viewing), it is interesting to note that Chinese-speaking subjects reported that they "knew" the subject matter very well already. There was nothing new to be watched whereas the English-speaking subjects reported that they were "bored" by the characters on the screen. It was monotonous and not stimulating for them to watch the program.

Hypothesis 2

In hypothesis 2, it was predicted that "segments of an educational television program identified as eliciting high attending behaviour will

produce a correct recall/recognition of cognitive information from the program when compared to those segments of an educational television program identified as eliciting low attending behaviour."

The results of the recall/recognition questionnaire in relation to attending behaviour was conclusive in supporting the hypothesis.

Initially, the results of the point-biserial correlation analysis between attention scores and the right/wrong responses to all 36 test items did not indicate a high correlation between the two. The reason was that the Item Analysis revealed few useful items. For the English subjects, out of five acceptable items, only two had moderately high point biserial correlations (of 0.48 and 0.40). For the Chinese subjects, out of five acceptable items, only one had a moderately high correlation (of 0.37). This analysis of point biserial correlations suggested that several segments of the TV program which elicit high viewing behaviour did produce a correct response on the associated posttest item. However, it should be noted that this analysis was essentially based on mean scores for the group and may obscure details. Is there another explanation?

Analysis of the shooting script of the TV program revealed that about half the items could be answered without having seen the video source of information. Obviously then, if viewing was not necessary to answer a posttest item, the point biserial correlation would be low.

Then, when we compared recall/recognition scores for items which

could be identified with each of the three information sources: video alone, audio and video combined, and audio alone, the results were strongly positive in supporting the hypothesis that segments of educational television program identified as eliciting high attending behaviour will produce a correct recall/recognition of cognitive information from the program when compared to those segments identified as eliciting low attending behaviour.

The probability of a correct response to recall/recognition test items, given that the corresponding TV segment was/or was not watched was plotted against the source of information: audio, audio-visual or visual for both the English-speaking and Chinese-speaking subjects (See Fig. 13 and 14.) The two language groups performed almost identically when audio or audio-visual information was presented, however, they differed greatly when only visual images were presented and tested. It was noted that where the information was presented solely in visual form, the probability of answering the posttest item correctly was much greater when people were watching the TV segment. This difference was especially great for English-speaking viewers (for "Not Watching" conditional probability of correct response is 0; whereas for "Watching" it is 0.46).

In regarding to "visual" test items, for the English-speaking subjects, all non-viewing responses led to incorrect test item response. However, for many other test items (item 11, 21, 29, 31, 32) viewing responses still resulted in wrong responses. By examining the results of item analysis (See Table 1 and 2) it implied that those items were

too difficult for the English-speaking viewers, so that viewing responses did not lead to correct recall/recognition. On the other hand, Chinese subjects have some familiarity with relevant Chinese characters or information, so that they were able to answer correctly the visual tested items even when they were not viewing (for Chinese subjects, "Not "Watching", conditional probability of a correct response was 0.67 compared with 0.80 with "Watching").

In conclusion, whenever the English-speaking subjects were not viewing, they answered the visual-linked items wrong. However, often they were not able to answer them even when they had viewed the certain segment in the program, probably because of the novelty of the subject matter. Redundancy and repetition of particular concepts were needed in certain segments of the TV program: Some of the segments (e.g. segment 29-33 showing different styles of Chinese Calligraphy) needed to be changed in the method of presentation in order that English-speaking subjects would comprehend and "learn" them.

Hypothesis 3

The results of the attitude questionnaire support the hypothesis that high attending behaviour in TV produces favourable attitudes towards an educational TV program.

One interesting point is that most Chinese-speaking subjects had high ratings (favourable attitudes) on the subject matter of the TV program. However, those whose attending behaviour was low would either

have low ratings on the program quality or often, though they were interested in the subject matter, they perceived the subject matter as "useless" to them (one of the attitude items). That is, they liked the subject matter, but were not viewing actively, probably because they "knew" the content of the program already, thus, they considered it as "useless" to them. For the English-speaking subjects, often they liked the subject matter, yet the presentation of the program influenced their viewing behaviour.

In general, the results of the present study supported the hypothesis that rapidly changing visual images do lead to higher attending behaviour than static images. However, though slides were made to be one essential element of the presentation of Chinese characters, subjects did view the slide sequences. It is interesting to note that when some of the slides were more than 6-7 seconds on the screen, subjects tended to stop viewing them in some segments of the TV program. One could perform future research with conjugate reinforcement to test responses to optimal time of duration of different slides on the screen.

The results of this study were conclusive for the relation between attention and recall. Attention has always been rendered as a necessary precedent for learning. However, it might not be a sufficient condition for learning. People may have different cognitive style of learning. Some subjects reported that they might learn more (remember more) if they did not have to press the switch. So pressing the switch might also interfere with one's learning ability. A further research is also needed in this area to differentiate between recall that corresponds

only to the audio channel, visual images or the audio-visual channel of a TV program. One could also perform research with conjugate reinforcement to prove that retention or formal learning is not related to operant rates of response, but rather to listening to the program's content.

Using the conjugate reinforcement apparatus does bring about a fruitful evaluation of a TV program. The present study also confirms a previous finding that the presence of a "talking head" with a fixed shot is visually uninteresting to the audience even though the narrator might provide eye contact. Inspection of cumulative records also reveal frequent cue effects. Non-viewing subjects responded after hearing such phrases as: "now what you see", "let us now turn to", etc. Future research may also improve the sensitivity of the apparatus to ensure that experiment can be done smoothly.

Suggestions for Future Research

1. Present narrator on camera with different shots and angles which may be visually more interesting to the audience and see whether it would lead to more viewing behaviour.

2. Investigate, using conjugate reinforcement, to test responses to optimal time of duration of different slides on the screen.

3. Improve the sensitivity of the dial setting which controls the stepping motor of the conjugate programmed apparatus.

4. Prepare posttest and script simultaneously to maximize number of "visual-only" information sources for this sort of research.

5. Conduct further research which differentiates between recall that corresponds only to the audio channel, visual images or the audio-visual channel of a TV program.

In fact, there can be endless replication of this type of experiment--using the conjugate reinforcement method--in further study of other production variables, such as camera factors, visual only/audio-visual reinforcement or audio only/visual only reinforcement, presenter versus no presenter, or popular presenter (say, a famous star) versus presenter unknown to the target audience, etc.

Accurate selection of media would be facilitated with this technique. For example, if a taped or filmed program produced listening responses only but not looking responses, it clearly would be most efficiently presented over the radio medium, or improvements on the visuals are needed. This method can also be applied in a cybernetic TV production system (if there is one such system being set up in future) where a feedback loop is provided to the educational materials producer who can try out different versions of the program for increasing viewing responses as suggested by Mitchell (1979). This will not only lead to increased viewing responses towards a TV program, but hopefully improving instructional systems and thus enhance learning.

The conjugate reinforcement method may also be applied to test differences in viewing behaviour between different target viewers, for example, normal child versus mentally retarded children. We may find out differences in attention span for different viewer groups which may help us to choose different medium of instruction for different audiences.

A comparison between the conjugate analysis method with other methods, such as filming viewing behaviour, administering recall tests after viewing a TV program, can also be tried out which can help to strength the theoretical basis of this method.

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Appendices

Appendix 1

Length of Each Segment in the TV Production (In Seconds)

Segment	Time	Question Items that Corresponds to Seg.
1.	.38 seconds	1
2.	.49	2
3.	.26	3
4.	.26	4
5.	.17	5
6.	.14	6
7.	.19	7
8.	.32	8, 9, 10
9.	.09	11
10.	.13	12
11.	.17	13
12.	.36	14, 15
13.	.29	16
14.	.24	17
15.	.23	18, 19
16.	.35	20, 21
17.	.48	22
18.	.21	24
19.	.21	23
20.	.22	
21.	.24	25
22.	.23	26
23.	.32	27
24.	.29	28
25.	.29	29
26.	.37	30
27.	.36	31
28.	.34	32
29.	.35	33
30.	.56	34
31.	3.27	35
32.	1.06	
33.	.26	36
34.	.50	

Total time: 20 min. 51 sec. (Including Credits)

Appendix 2

Production Techniques of TV Program: "Chinese Calligraphy and Painting"

Segment

1. Presenter alone with decoration and settings - Long Shot -
2. Presenter alone - zoom in to medium close up
3. Presenter alone - medium close up
4. Slide sequence (3)*
5. Slide and grpahic sequence (2)
6. Slide and graphic sequence (2)
7. Slide and graphic sequence (3)
8. Presenter - medium close up - super credits
9. Slide and grpahic sequence (3)
10. Slide and graphic sequence (2)
11. Slide and graphic sequence (3)
12. Presenter - close up - super credits - mix to slides and graphic (2)
13. Presenter - close up - super credits - mix to slide
14. Slide and graphics (4)
15. Slide, super credits, slides
16. Presenter alone - super credits - mix to slide
17. Presenter alone - super credits - mix to slide
18. Presenter alone - medium close up
19. Slides and graphics (3)
20. Presenter alone - slides and graphics (2)
21. Presenter alone - medium long shot - close up of paper used for writing
22. Brush pen - close up - slide
23. Ink stone - close up - vut to VTR, demonstration of grinding ink stone on stone
24. Presenter alone - close up - music up - slide and graphic sequence
25. Slides and graphics (4) Music
26. Slides and graphics (4) Music

Appendix 2 (cont'd)

27. Slides and graphics (4)*Music
28. Slides and Graphics (4) Music
29. Slides and Graphics (4) Music
30. Presenter alone - close up - slides
31. VTR - Music - Demonstration of Chinese Painting
32. Presenter alone - close up - objects - close up
33. Presenter alone - medium long shot - showing "spring couplet"
34. Presenter - zoom out to medium long shot - end of program

*in parenthesis - total number of slides and graphics in that segment

Appendix 3

Attending Behaviour of Chinese-speaking subjects

(Cumulative Records)

Group A = always viewing

Group B = viewing 98% of the time

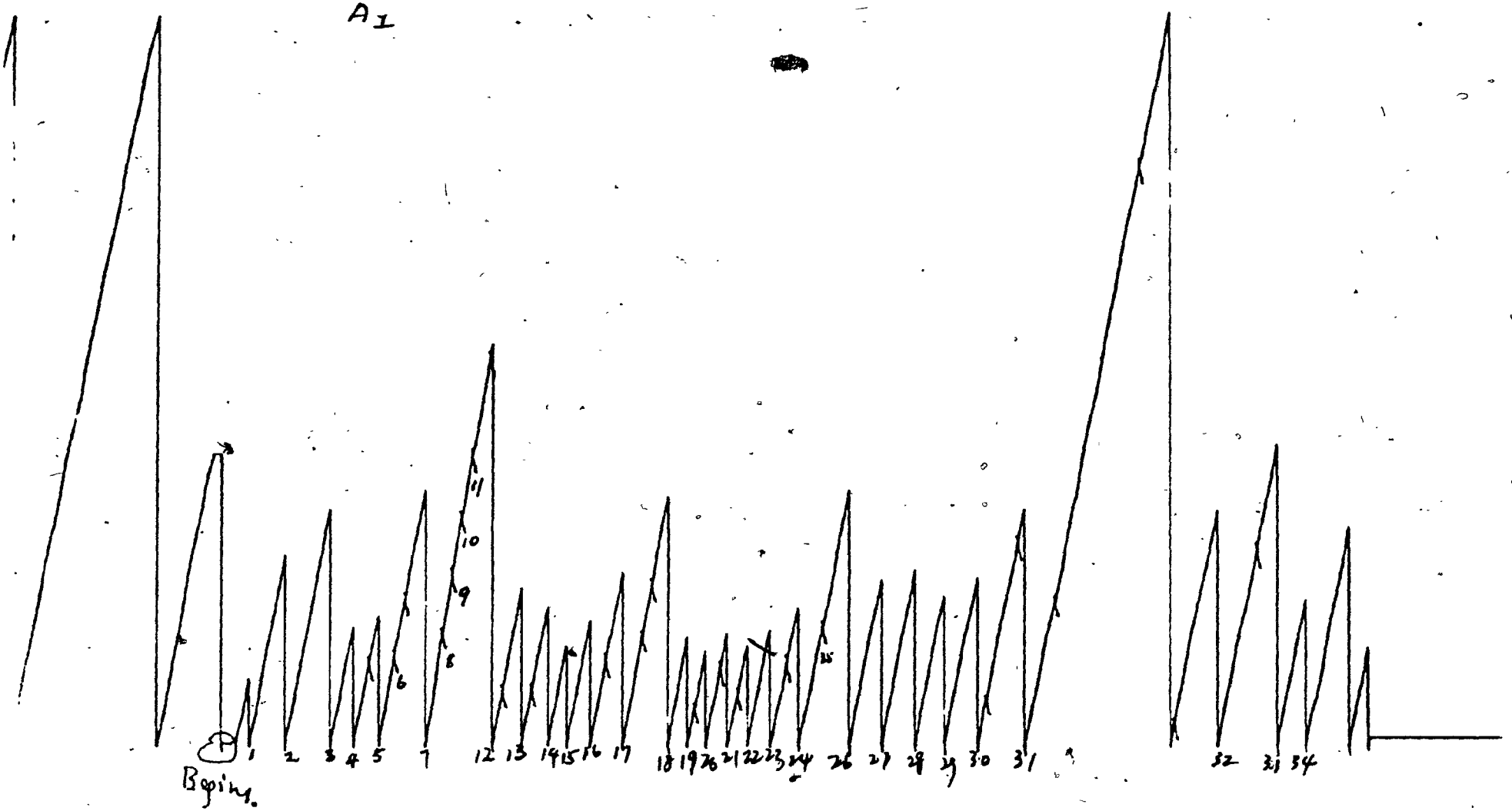
Group C = viewing 89-92% of the time

Group D = viewing 60% of the time

Group E = viewing 30% of the time

Note. - The little hatch (/) on graph = beginning of a new segment

- Reset line = new segment
- numbers at the bottom line or at the hatch (/) = segment no.
- Total number of segments in the TV program = 34
- Other hatches on the graph are indications of audio cues within a segment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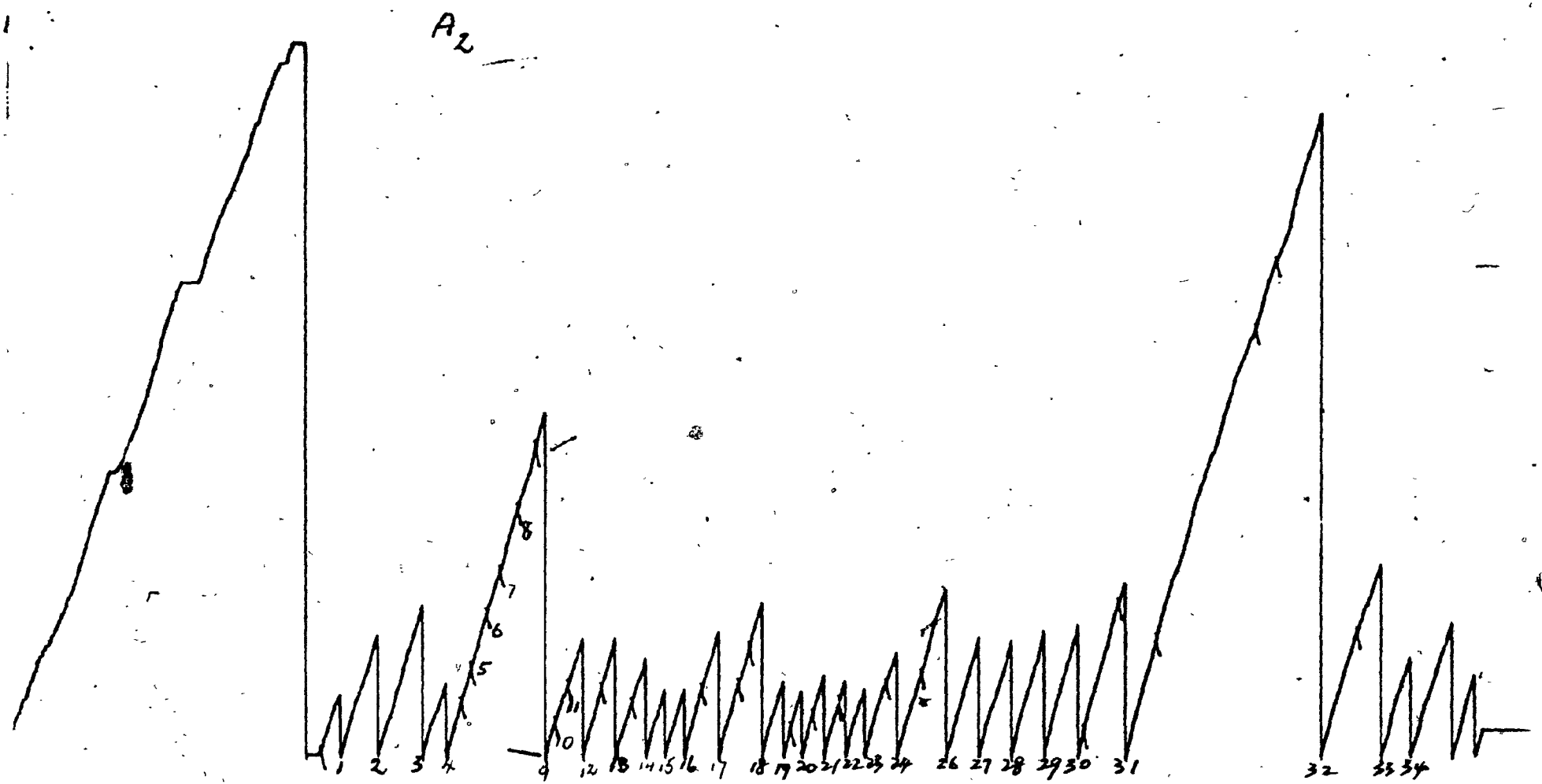
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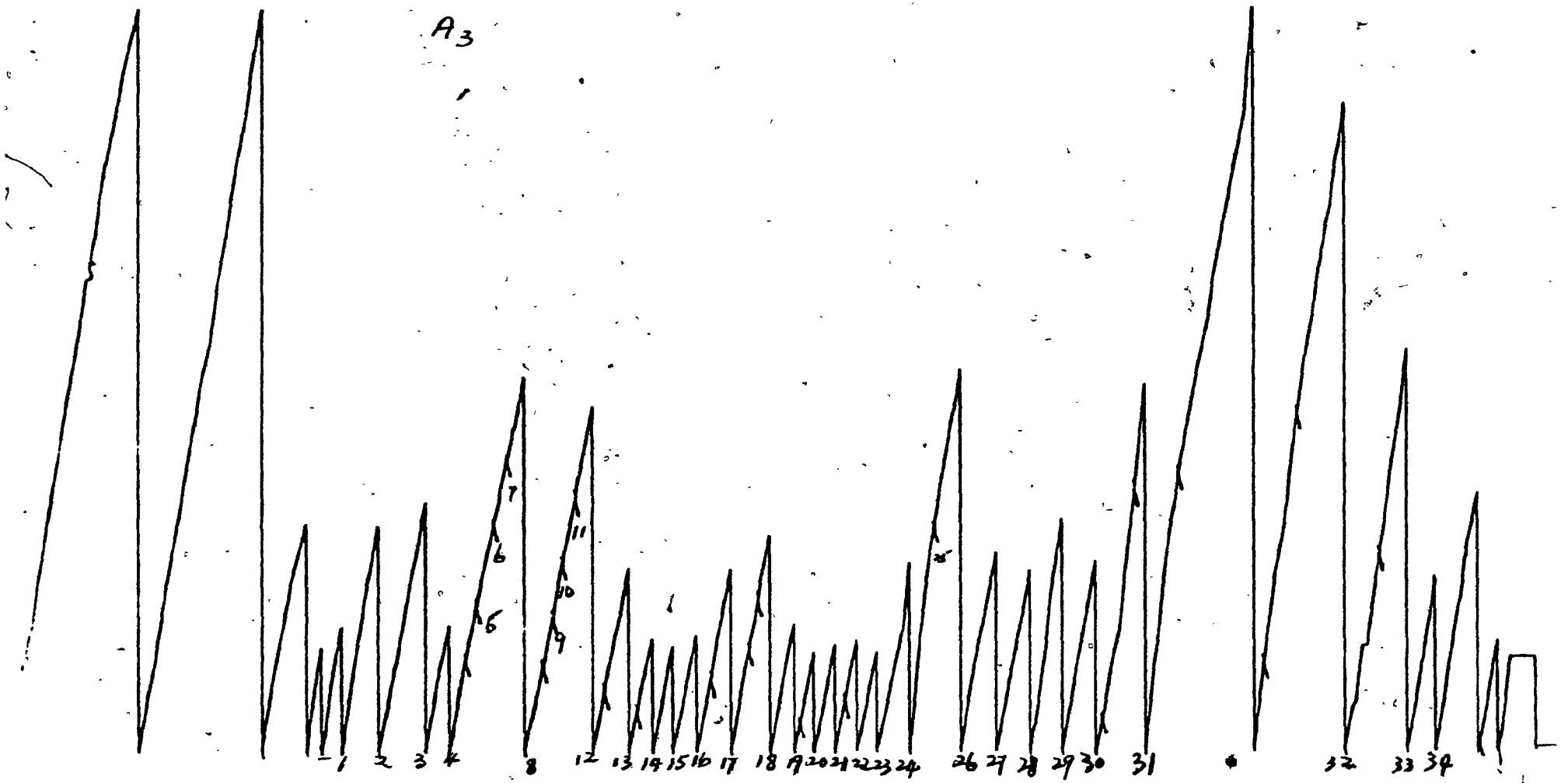
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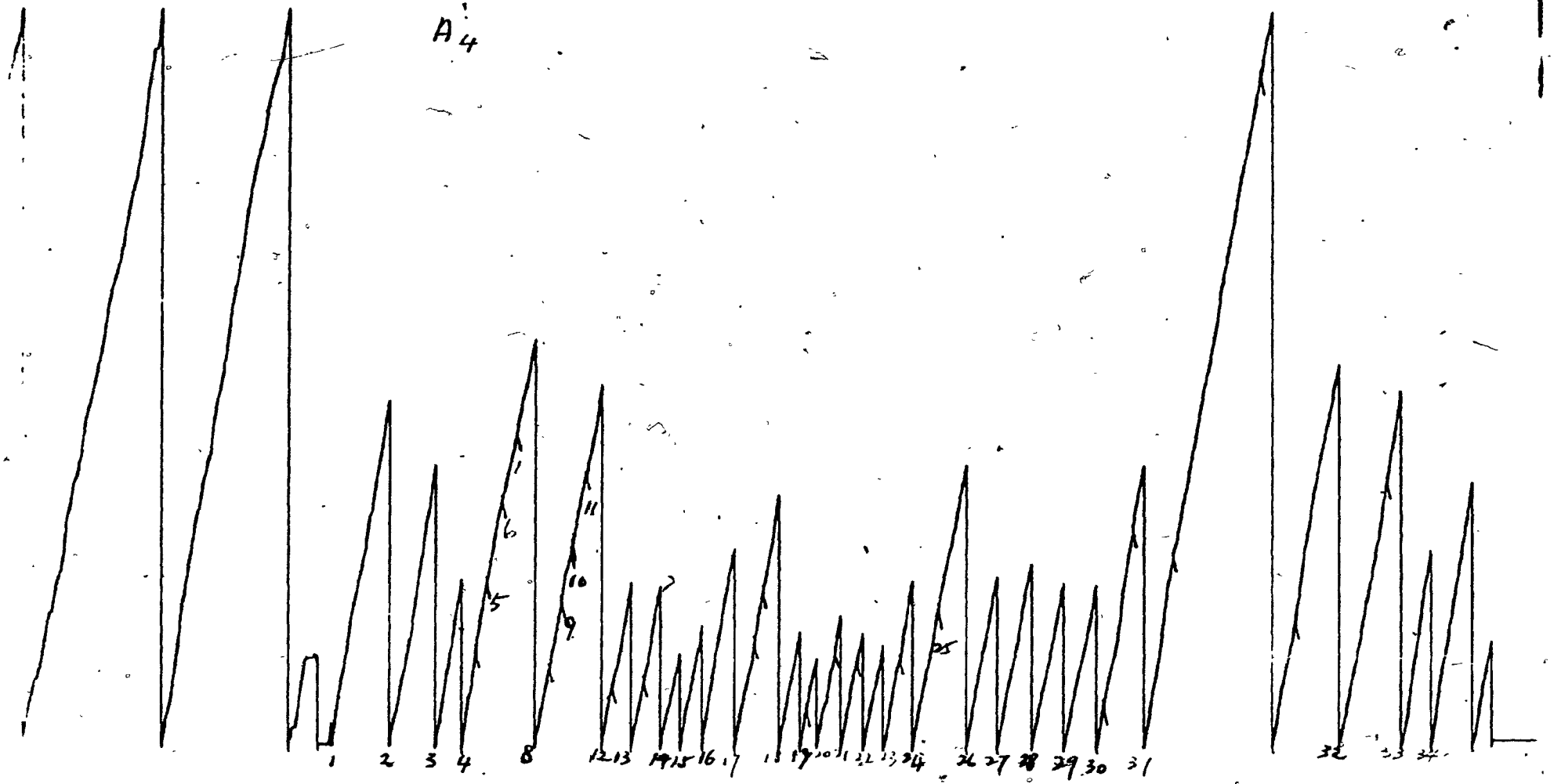
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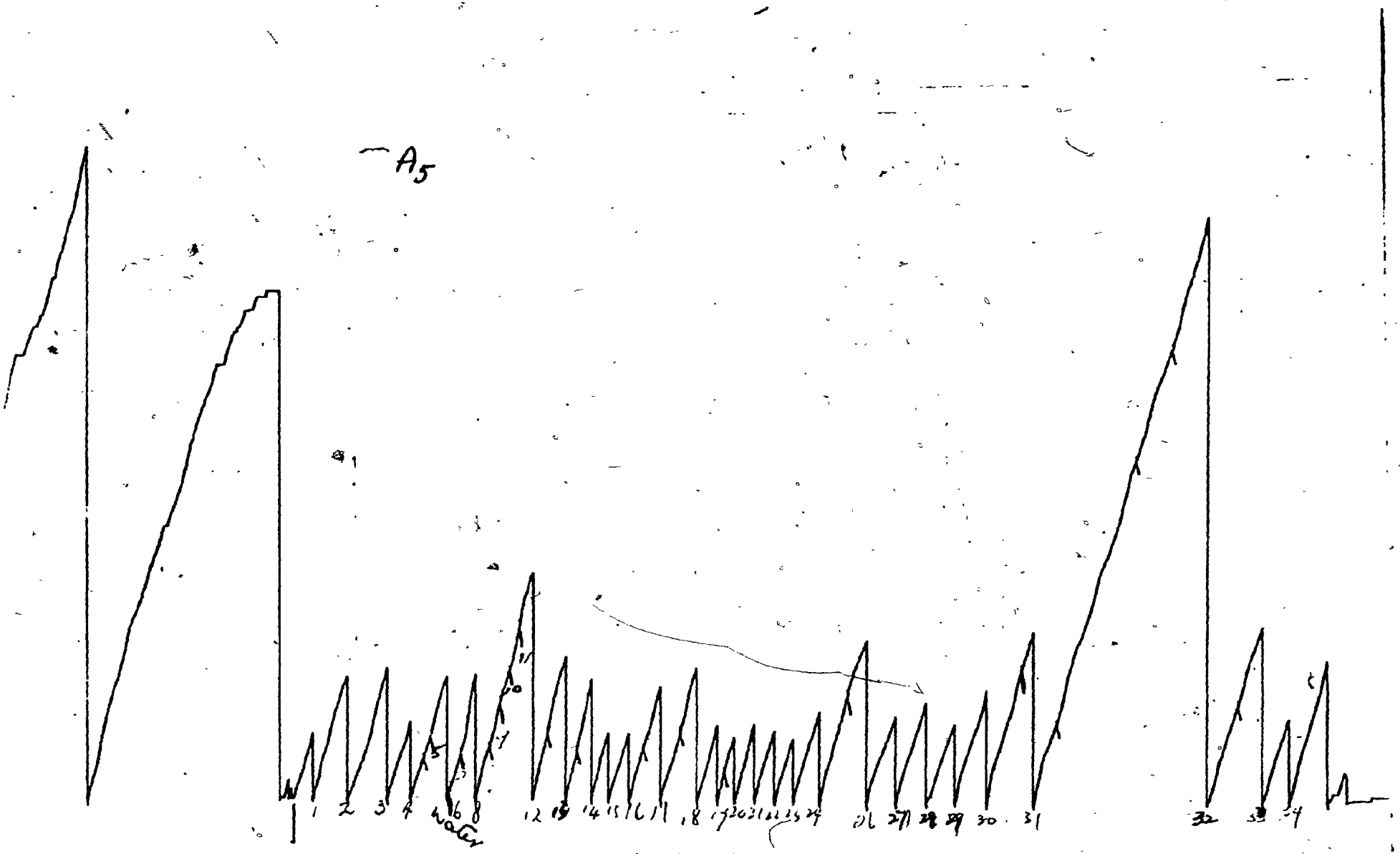
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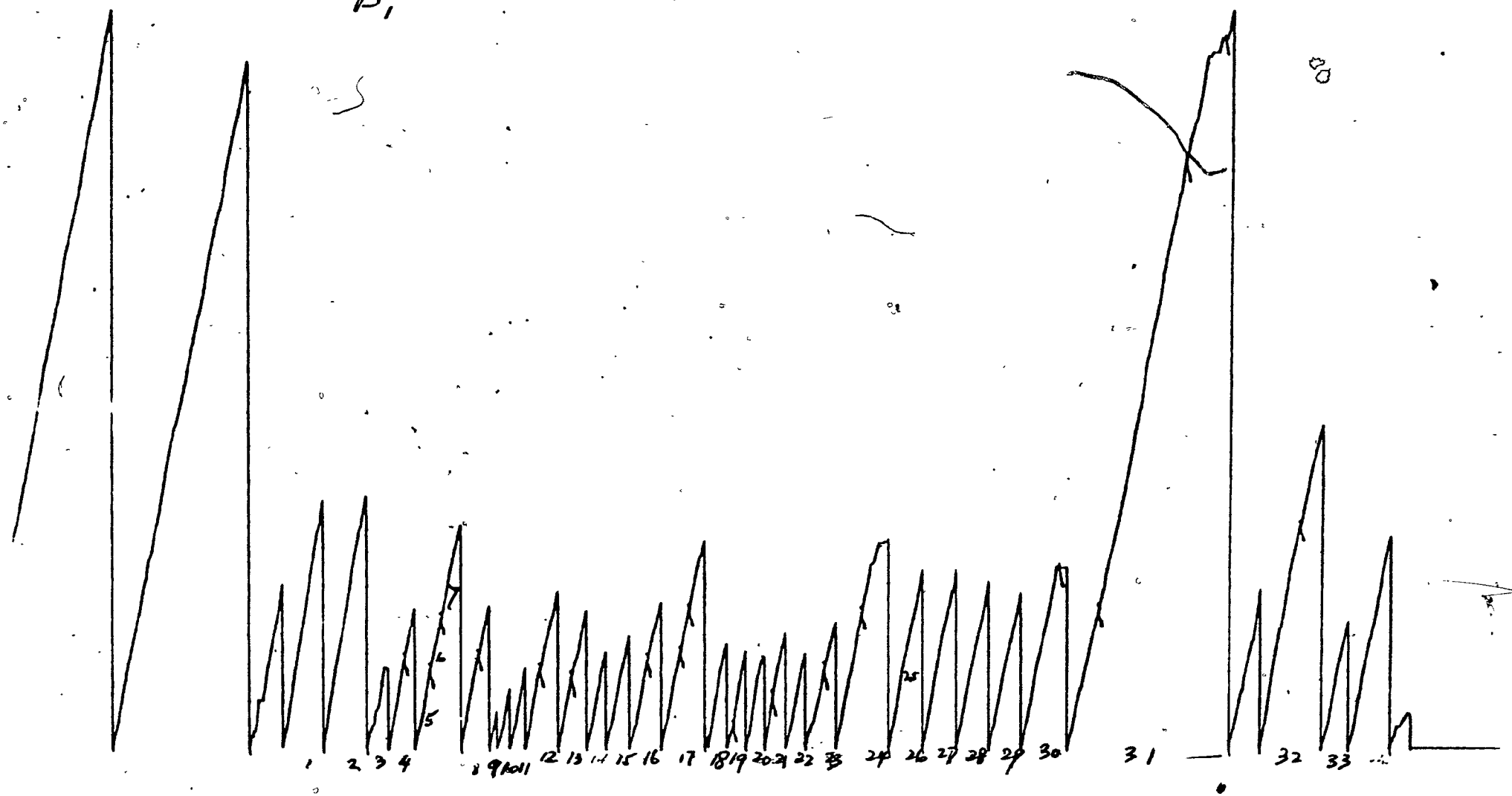
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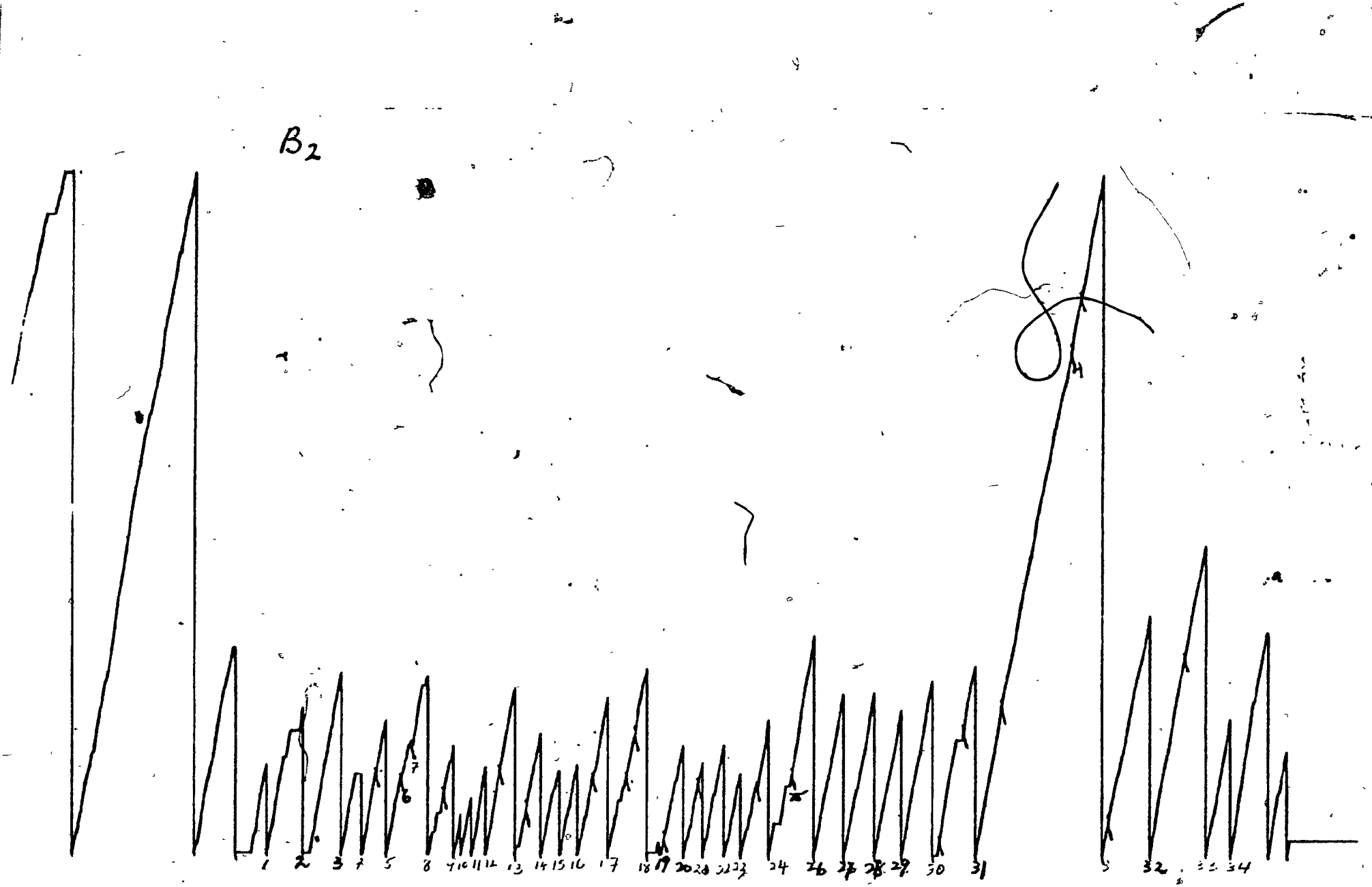
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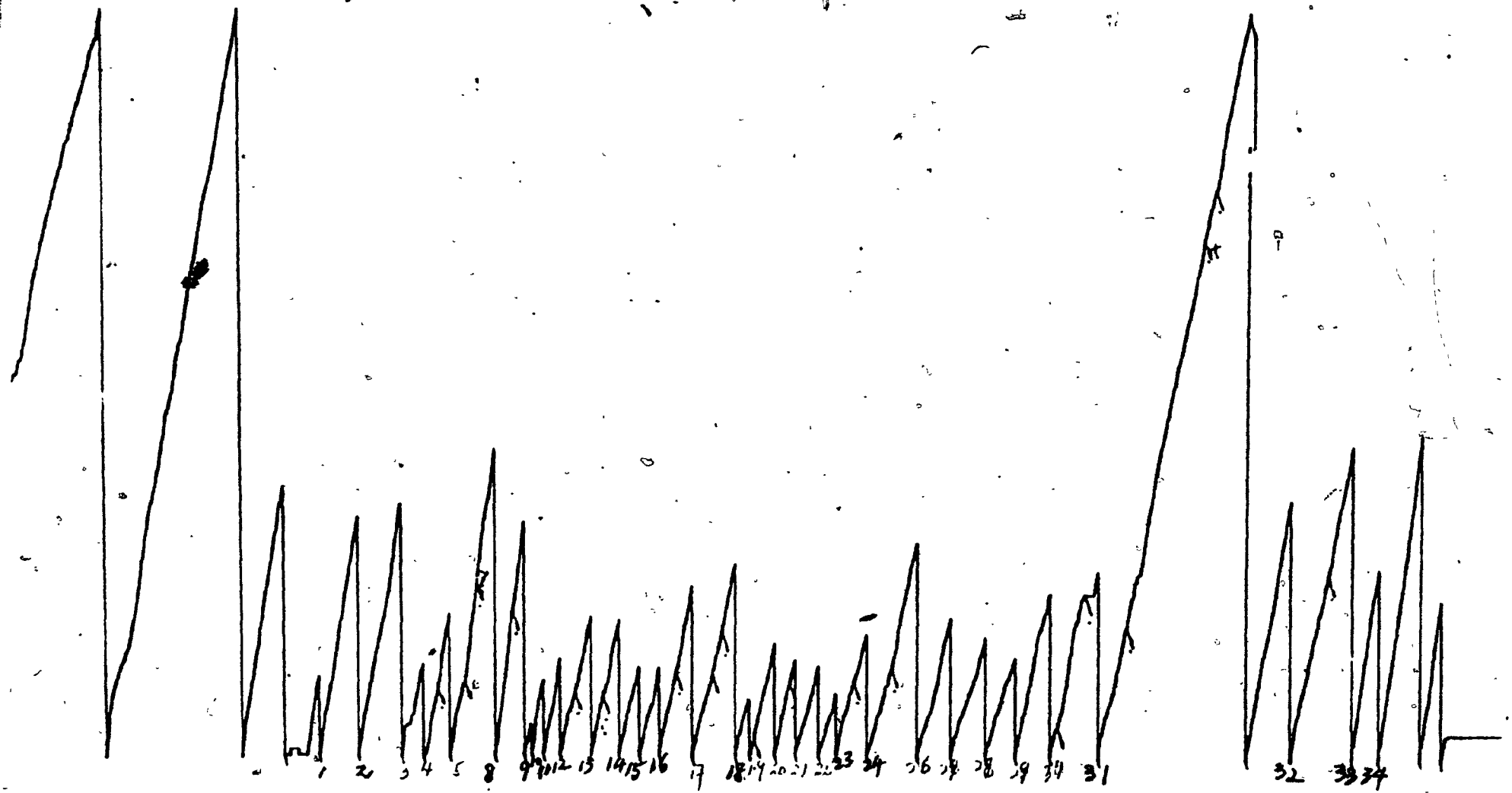
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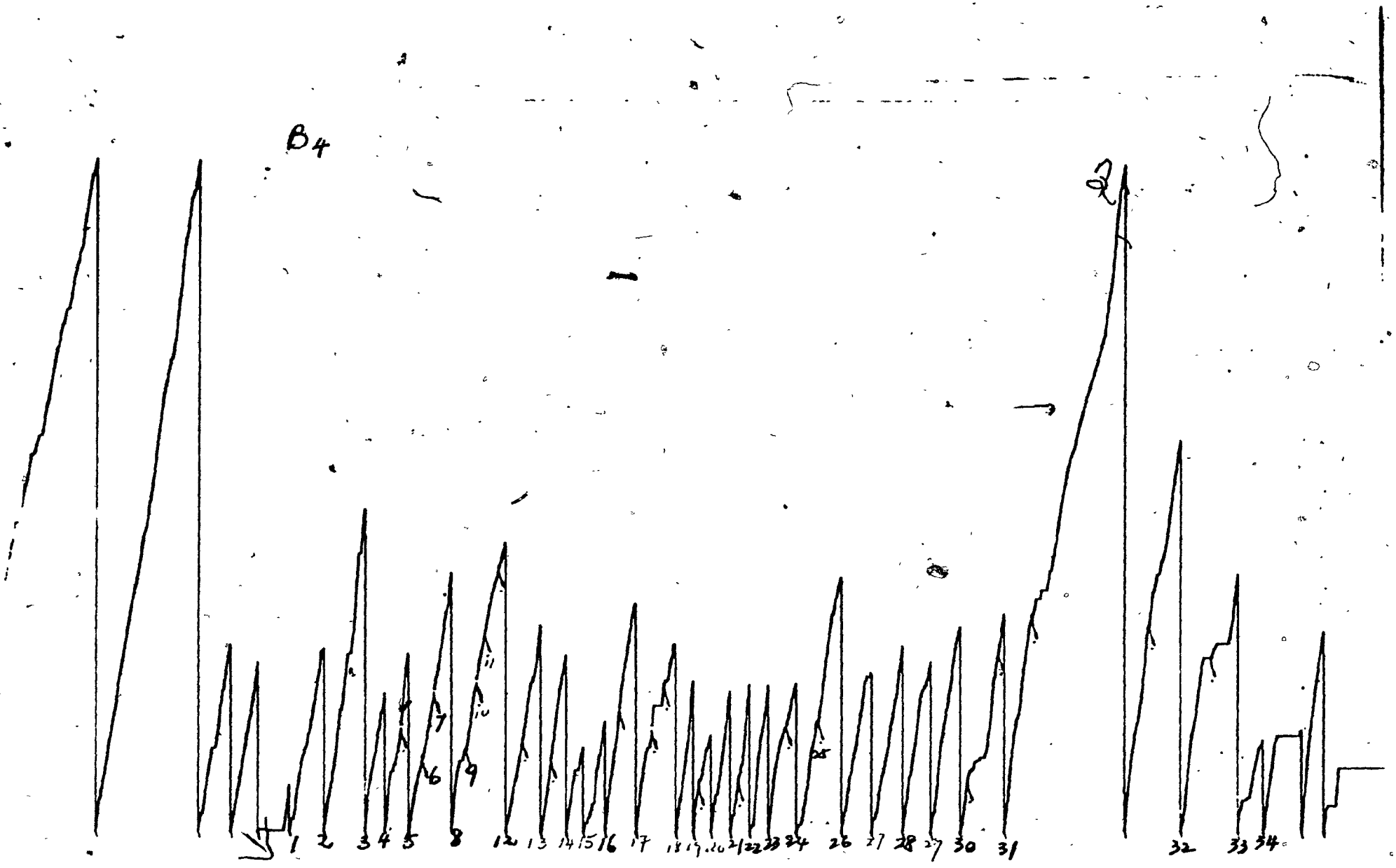
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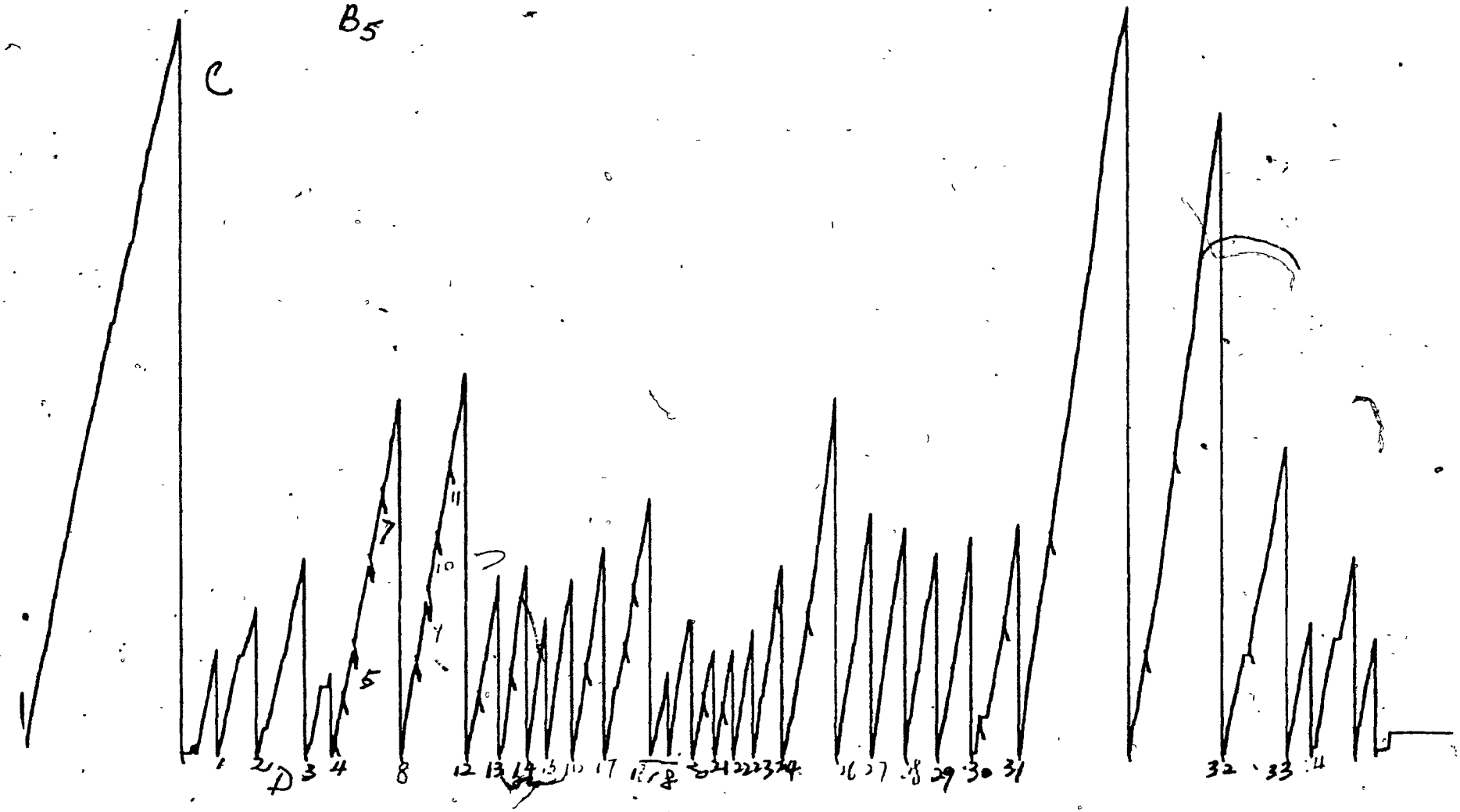
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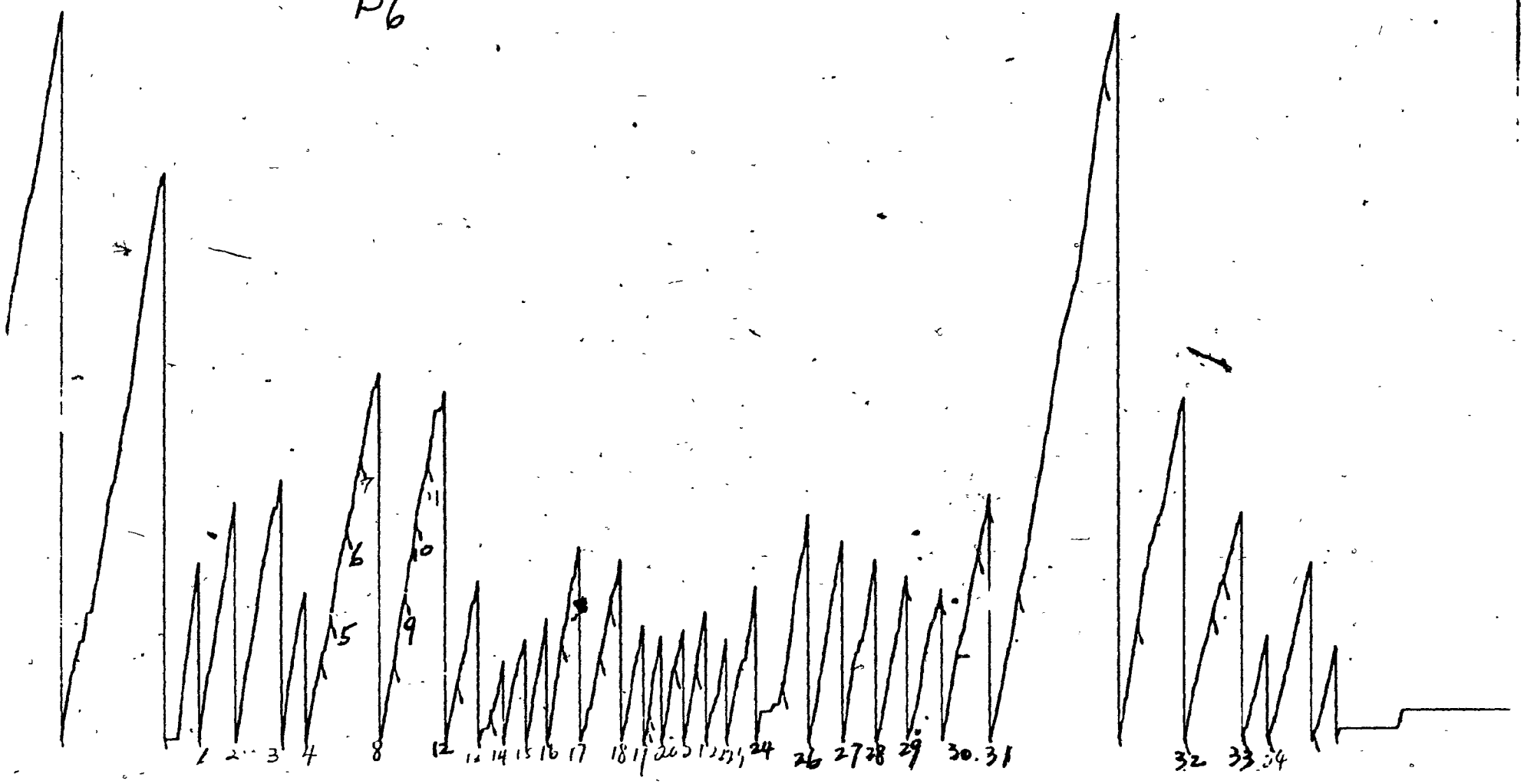
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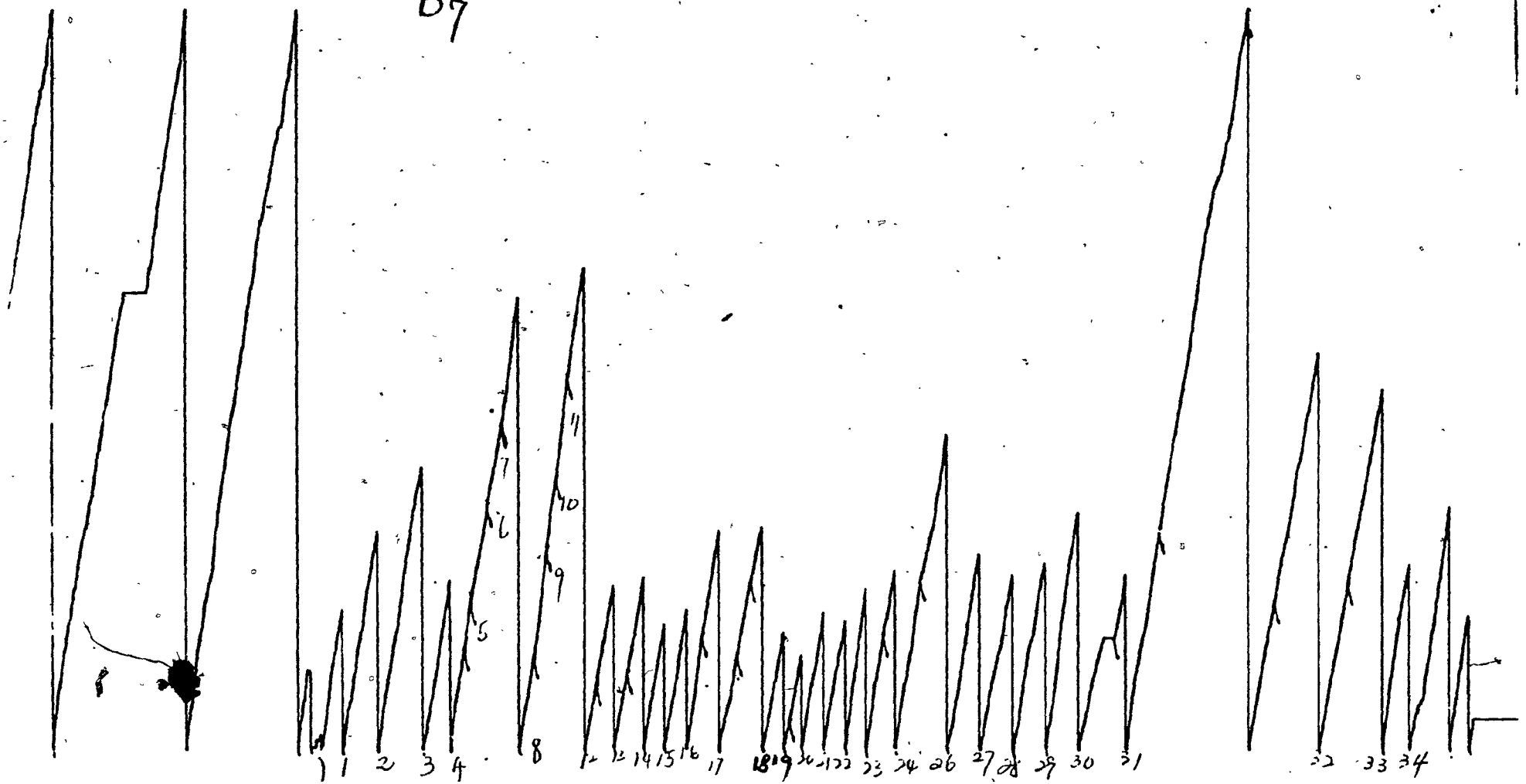
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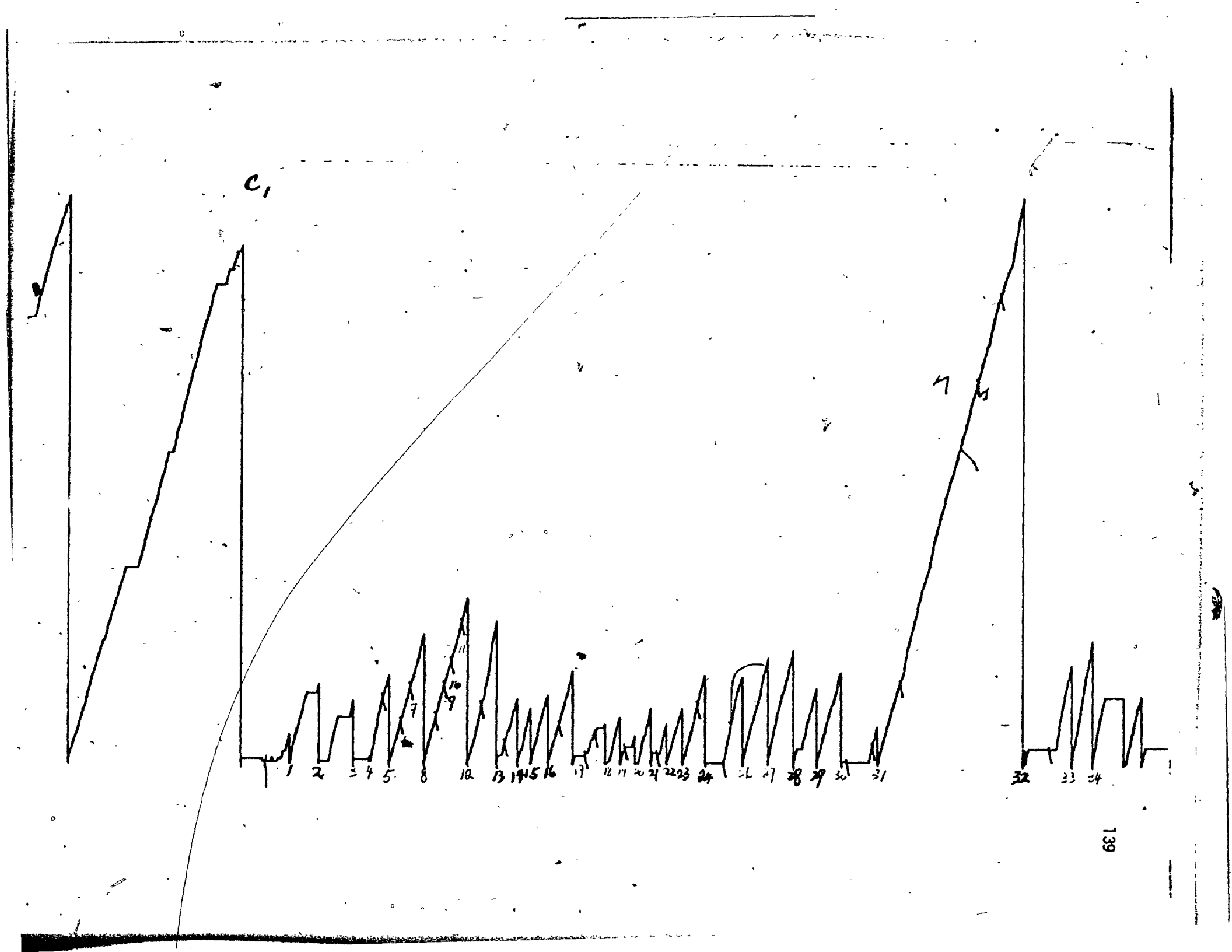
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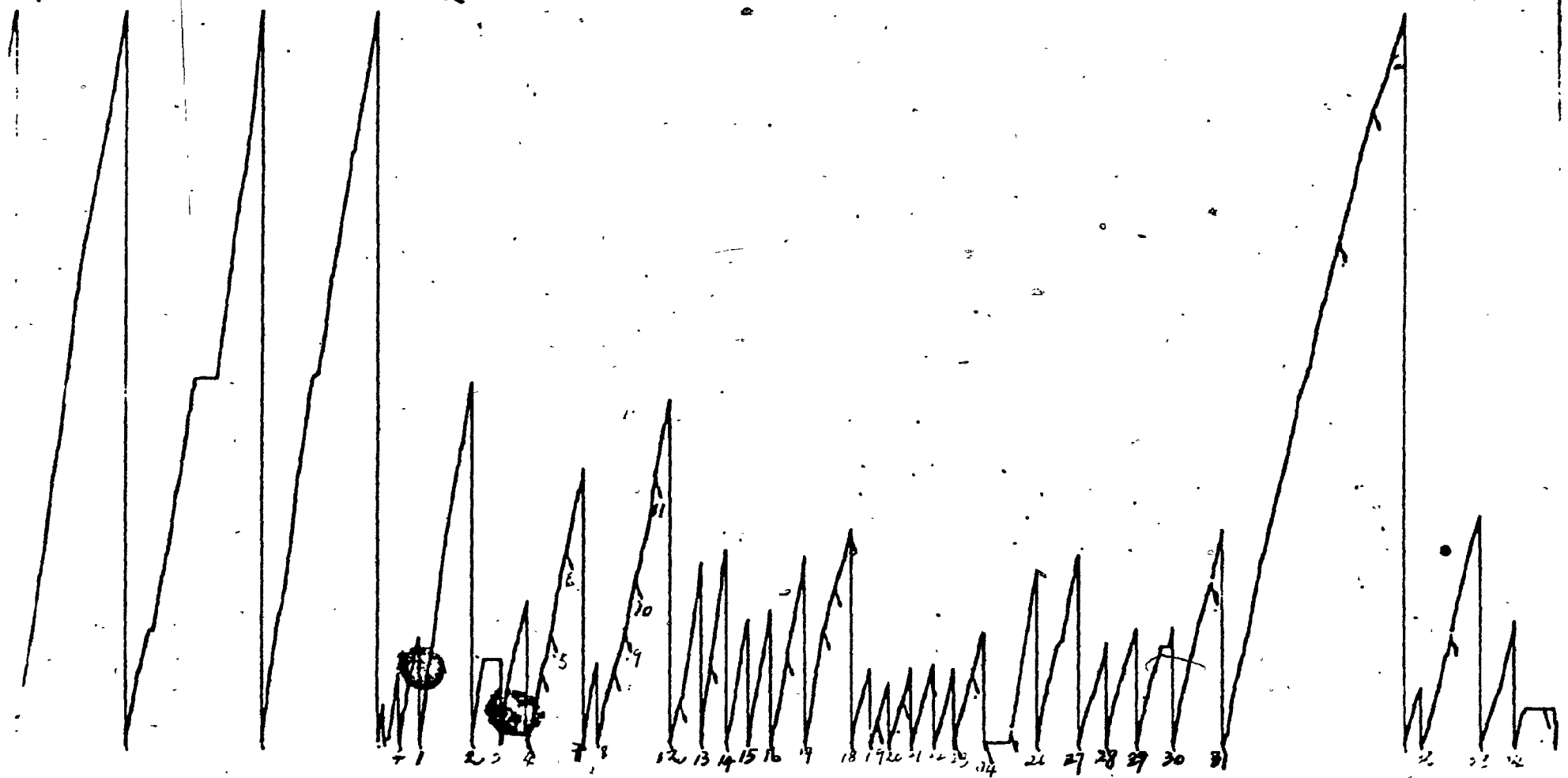
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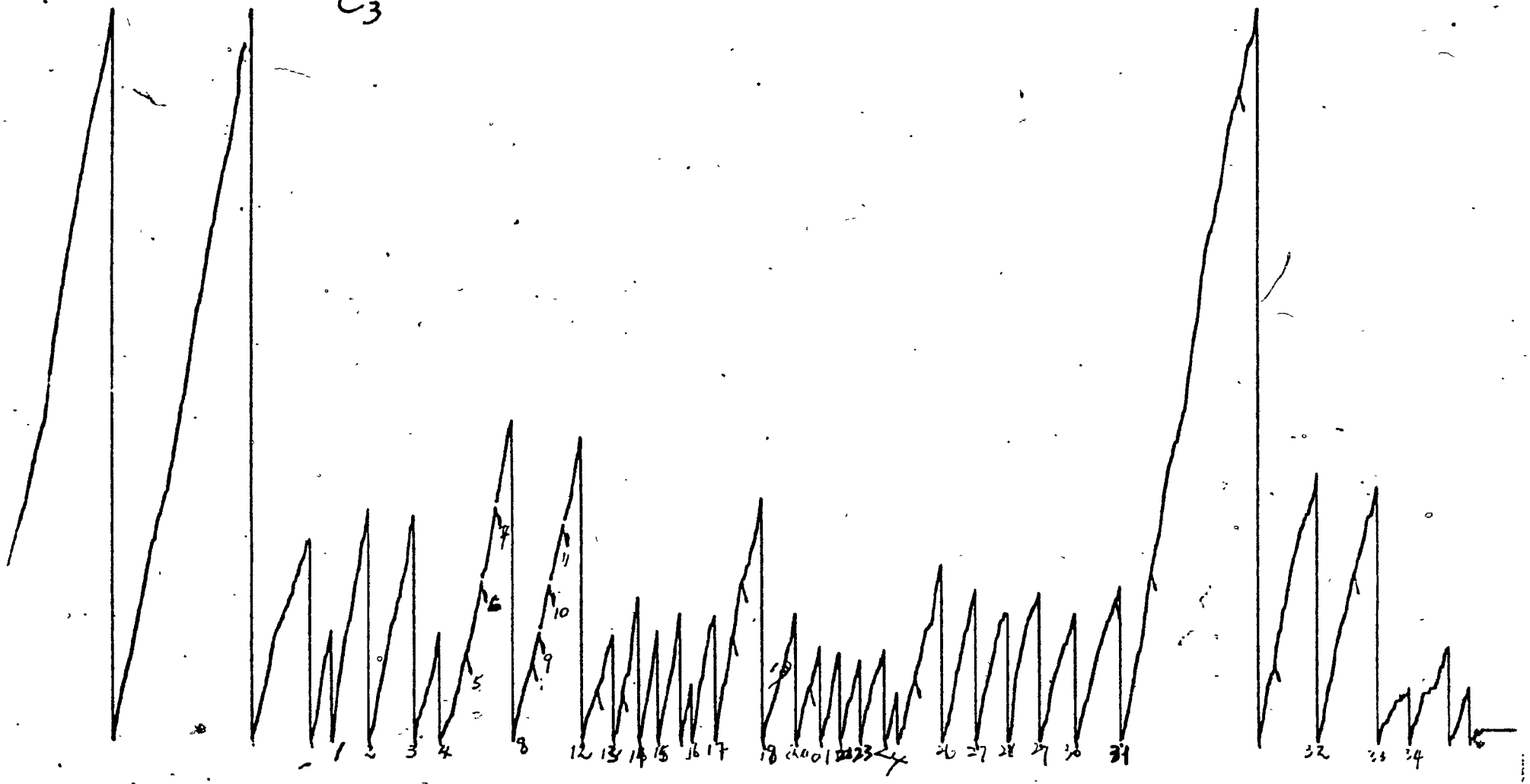
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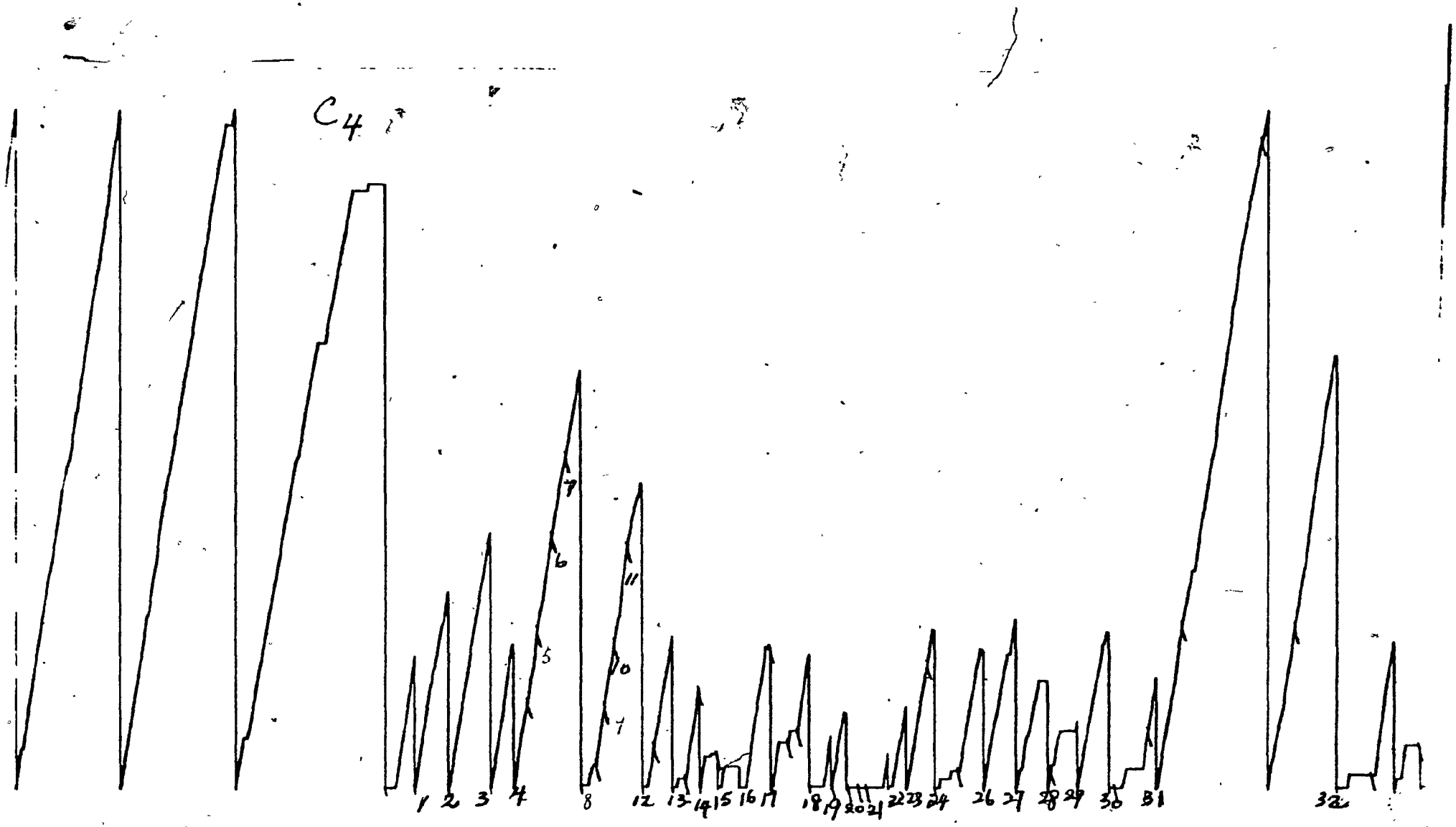
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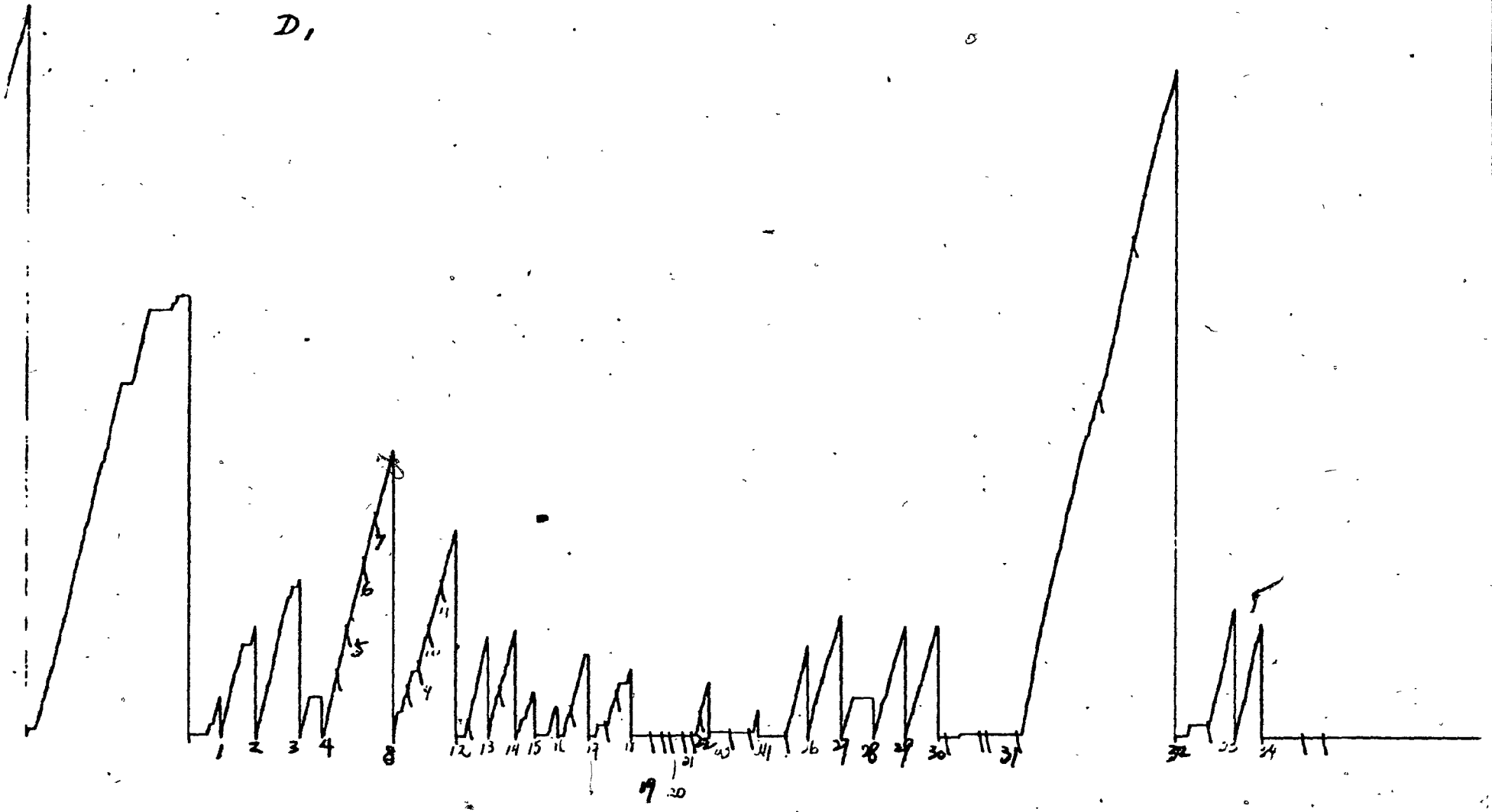

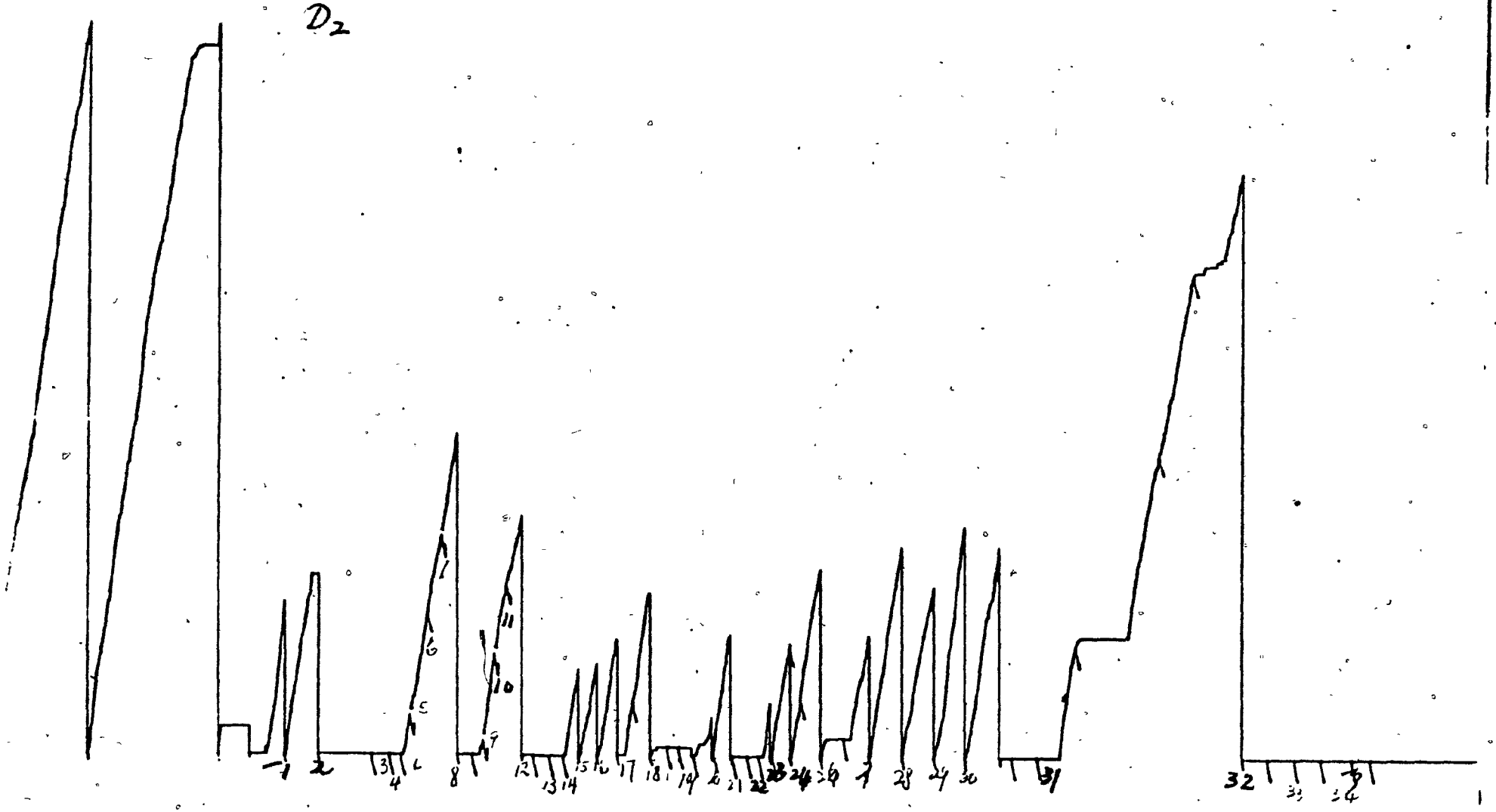
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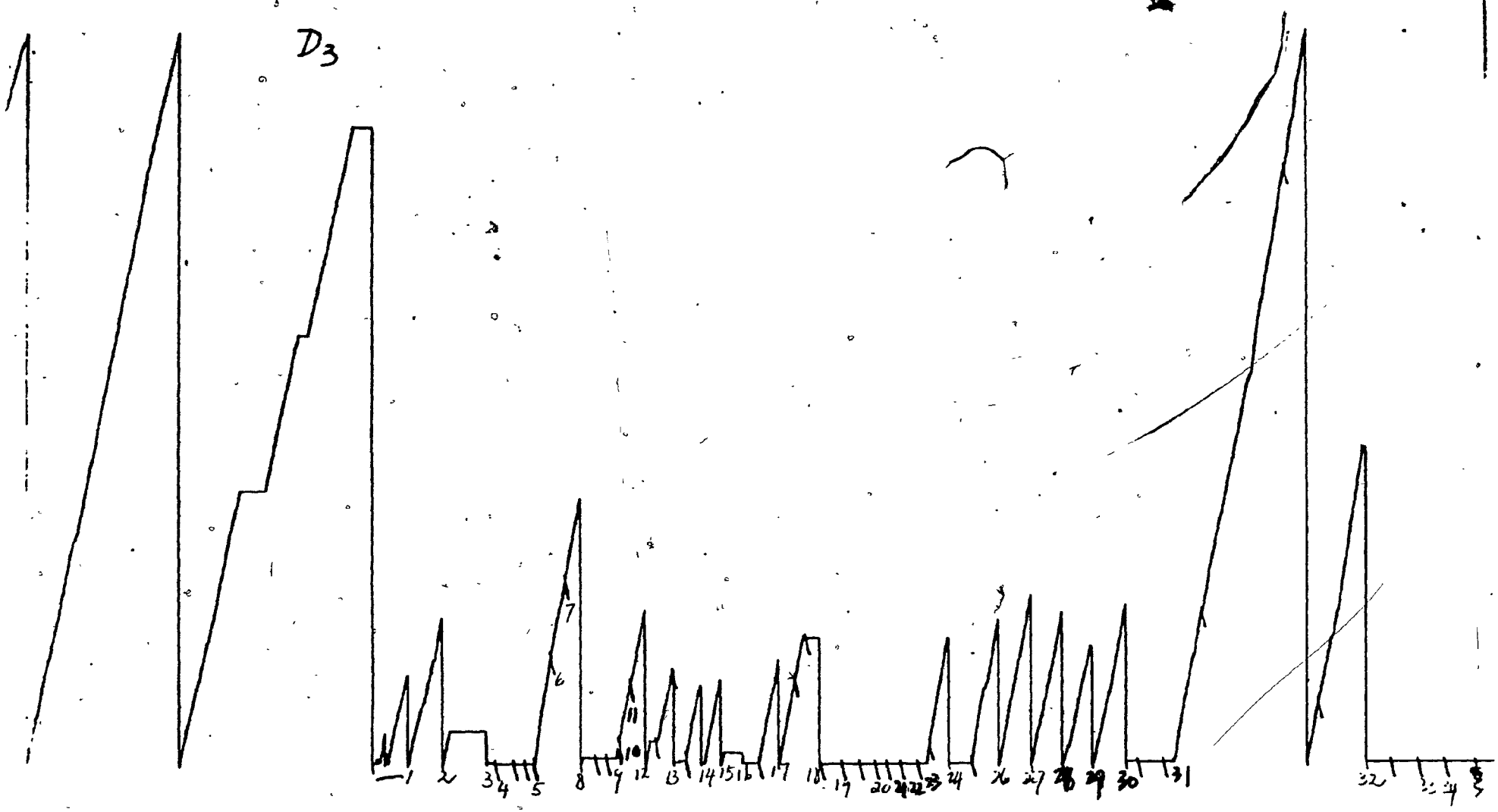
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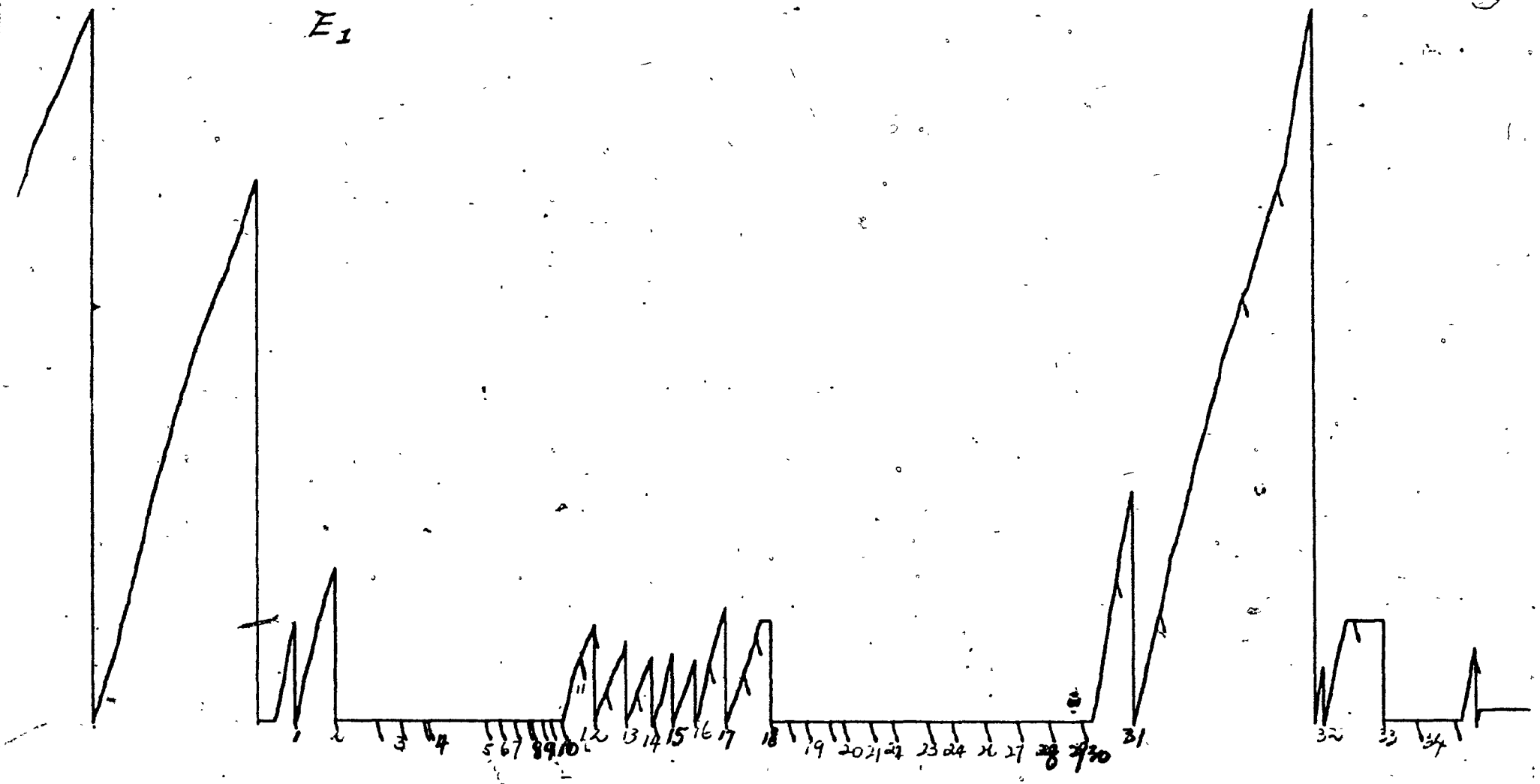
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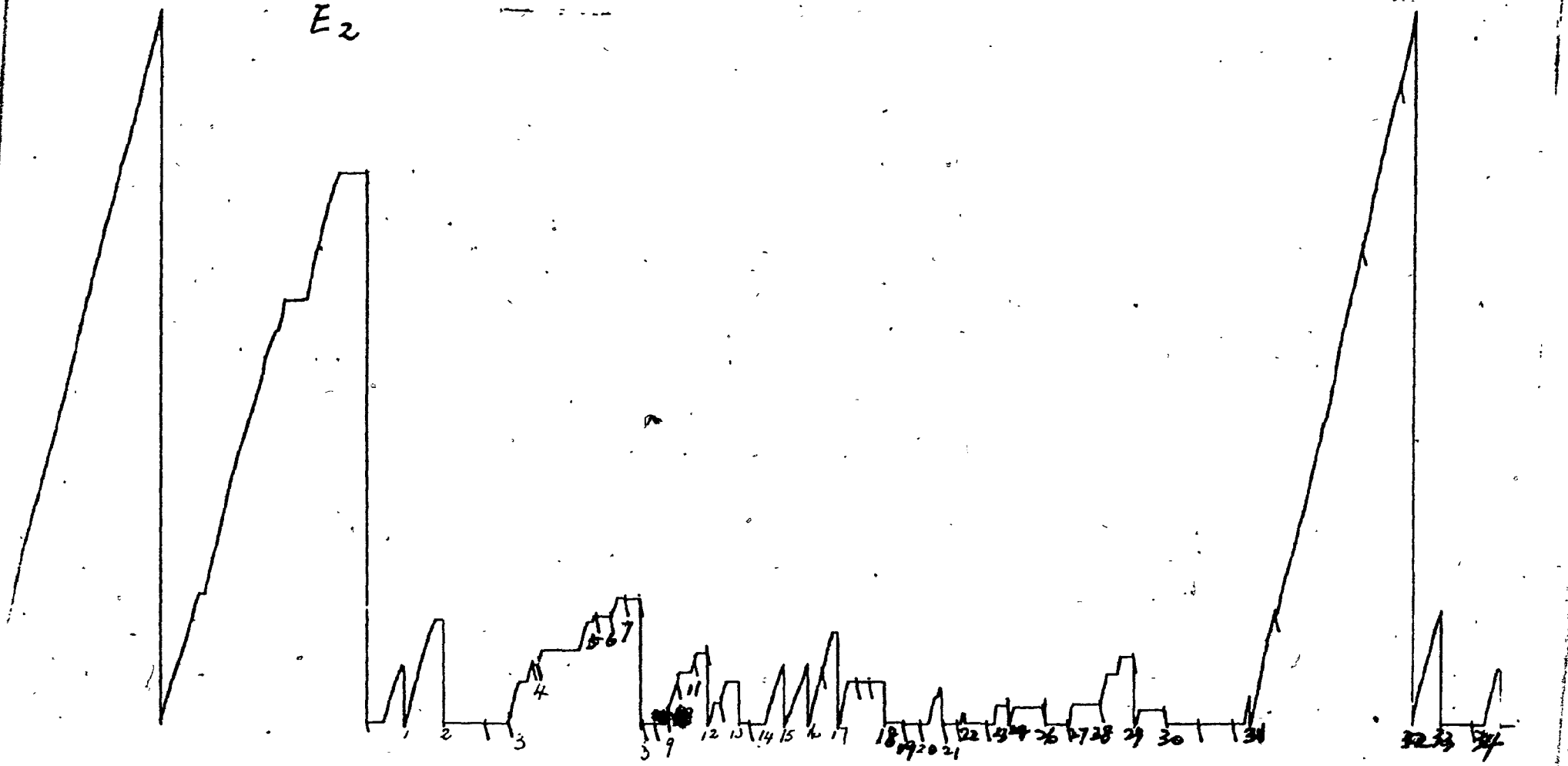
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Appendix 4

Attending Behaviour of English-speaking subjects

(Cumulative Records)

Group A = always viewing

Group B = viewing 98% of the time

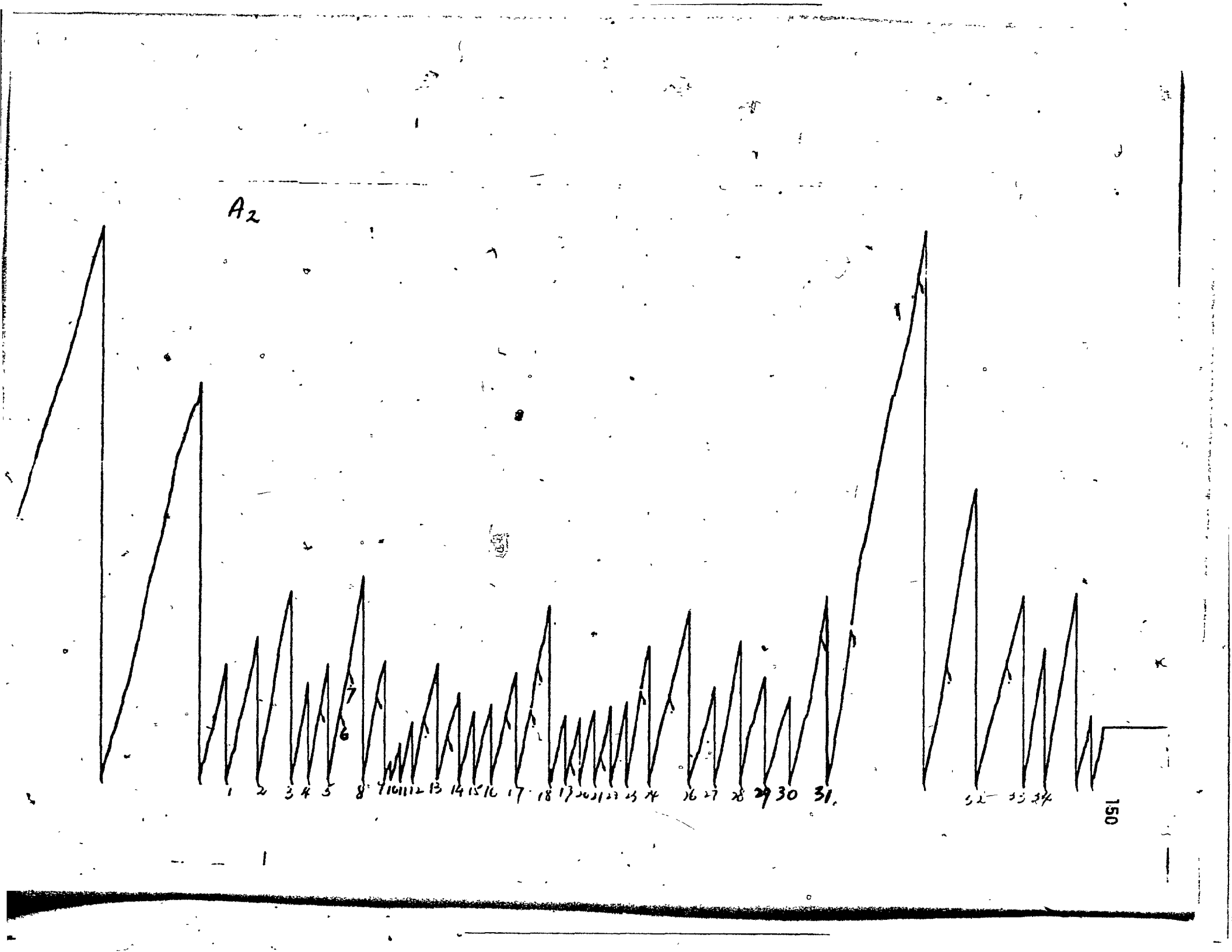
Group C = viewing 89-92% of the time

Group C = viewing 60% of the time

Group C = viewing 30% of the time

Note. - The little hatch (/) on graph = beginning of a new segment

- Reset line = new segment
- numbers at the bottom line or at the hatch (/) = segment no.
- Total number of segments in the TV program = 34
- Other hatches on the graph are indications of audio cues within a segment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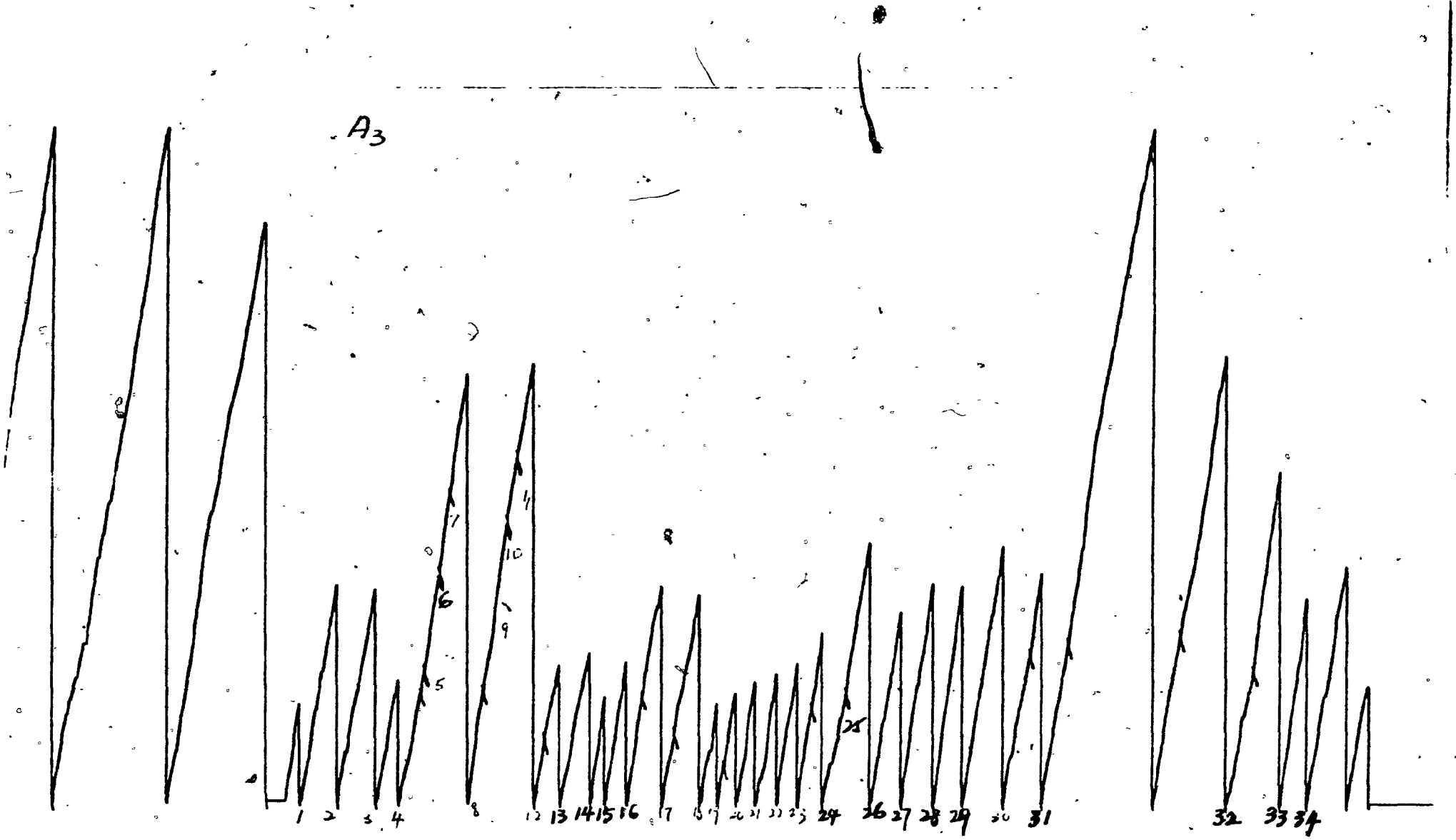
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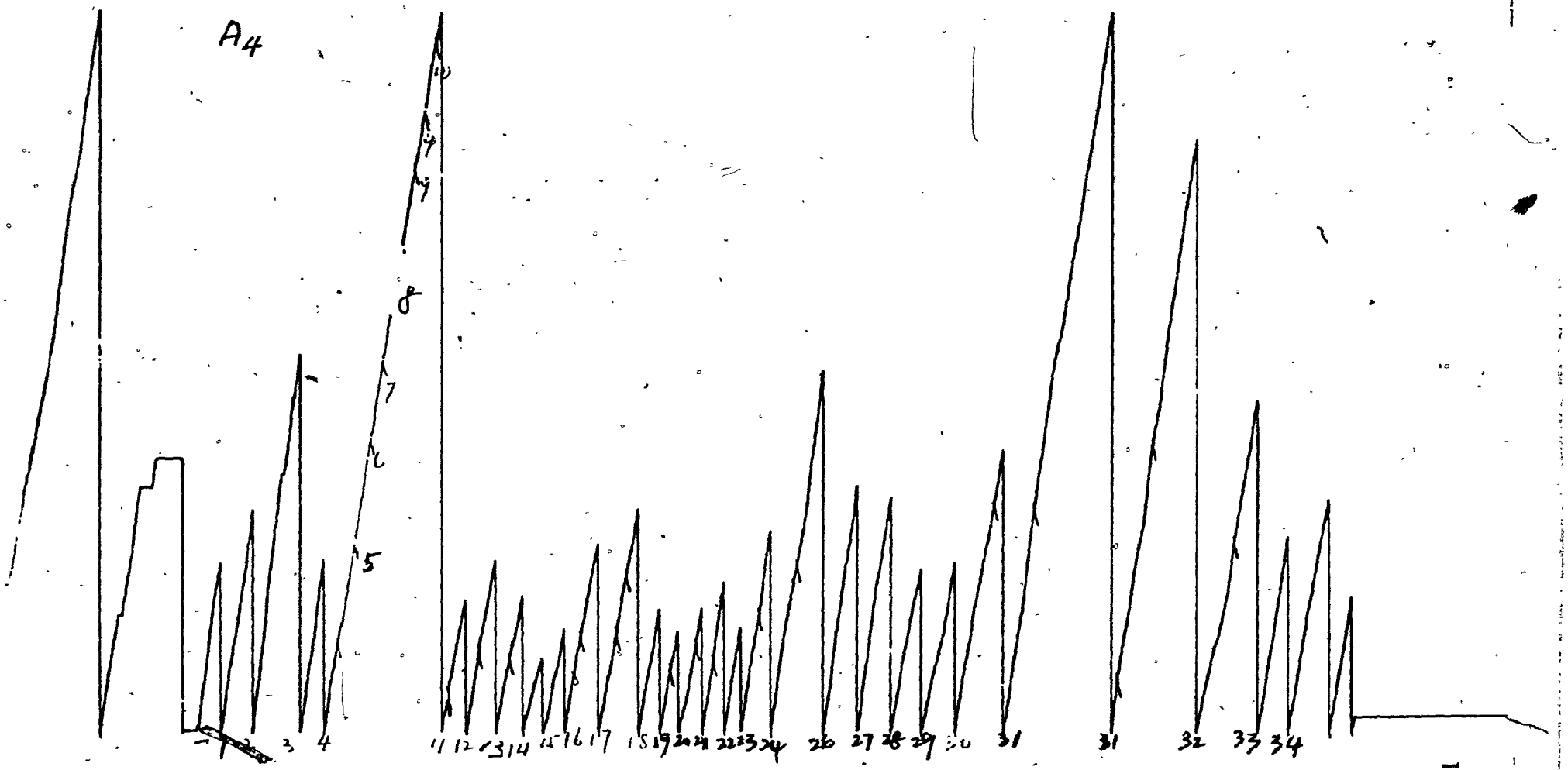
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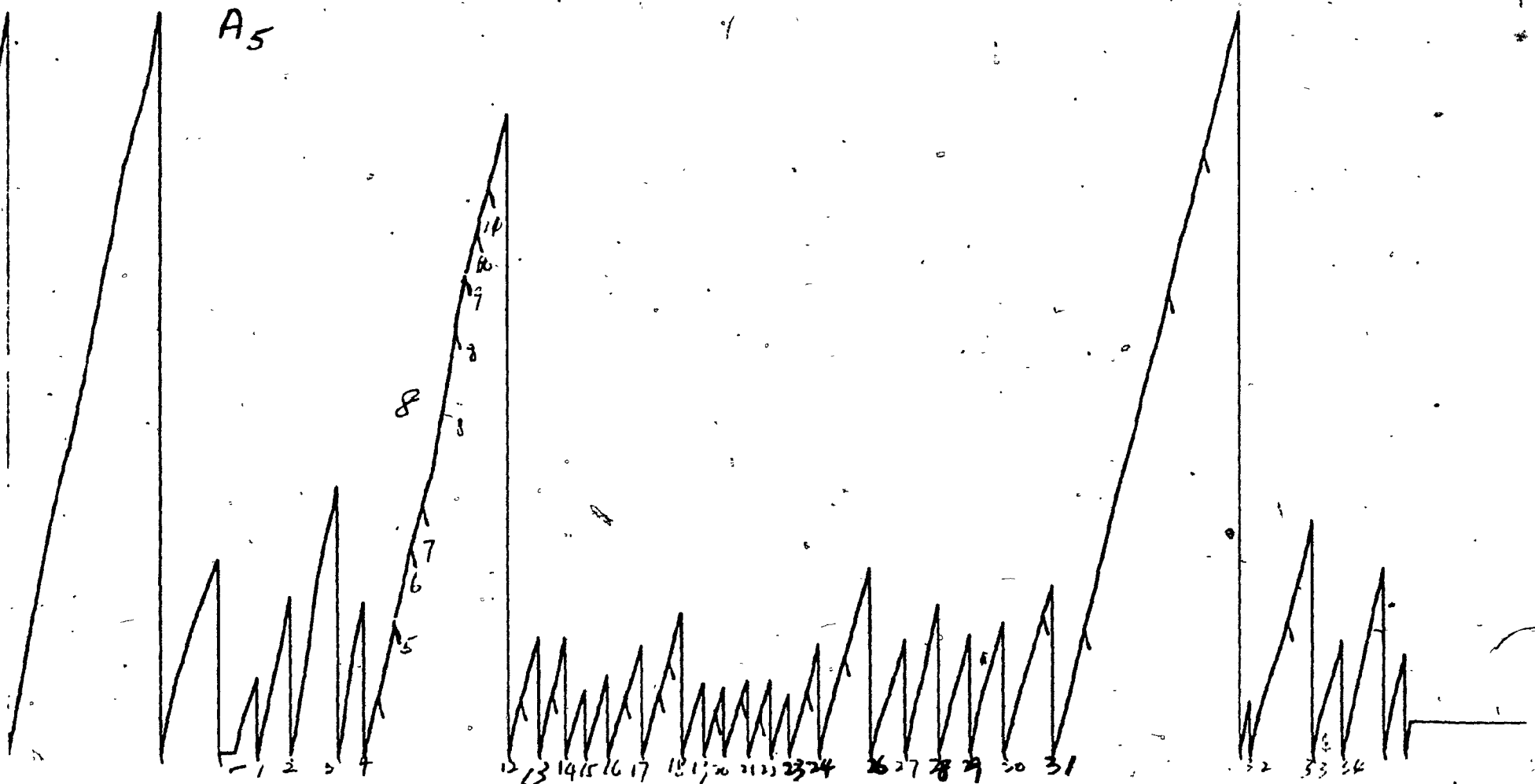
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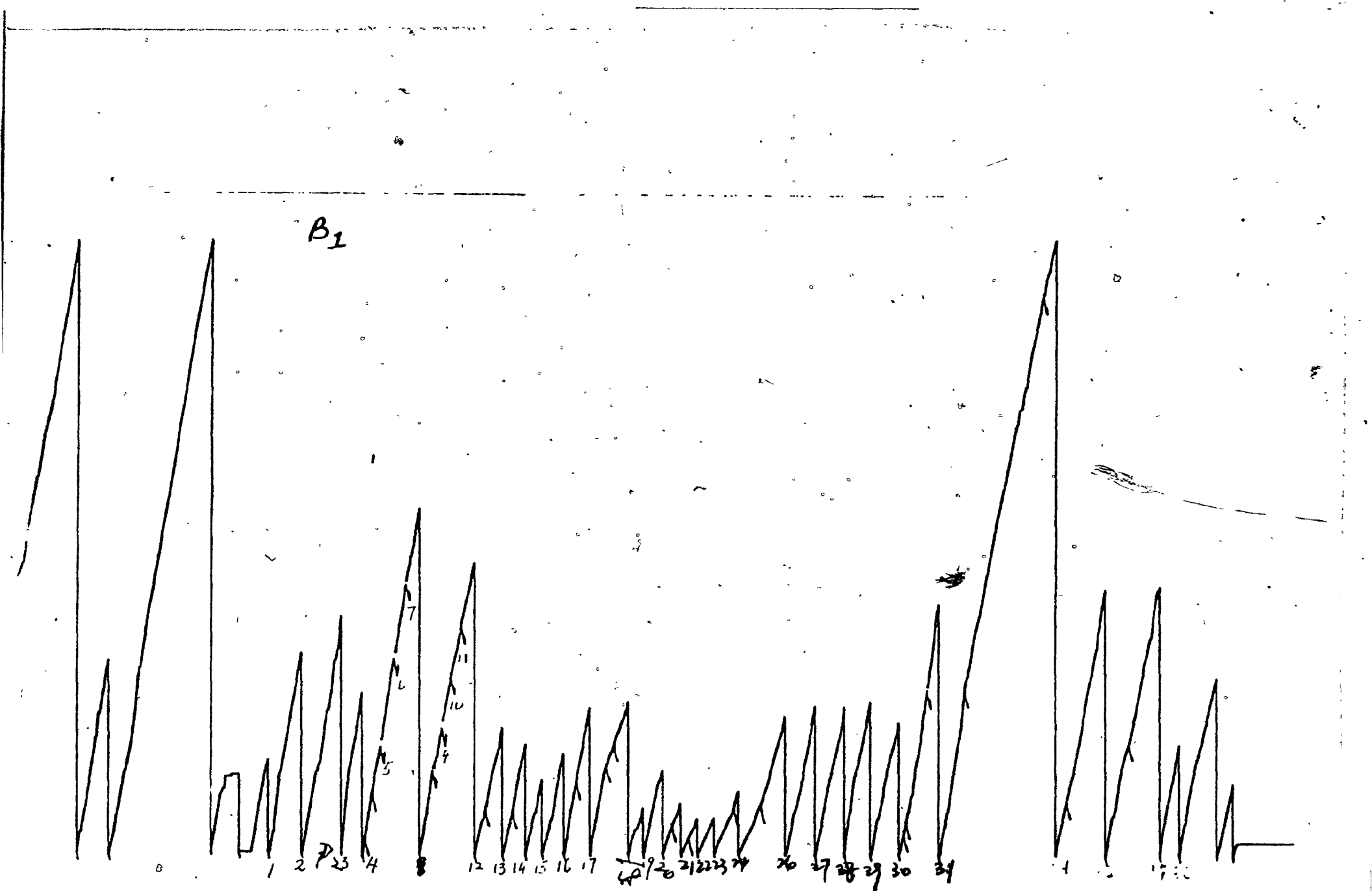
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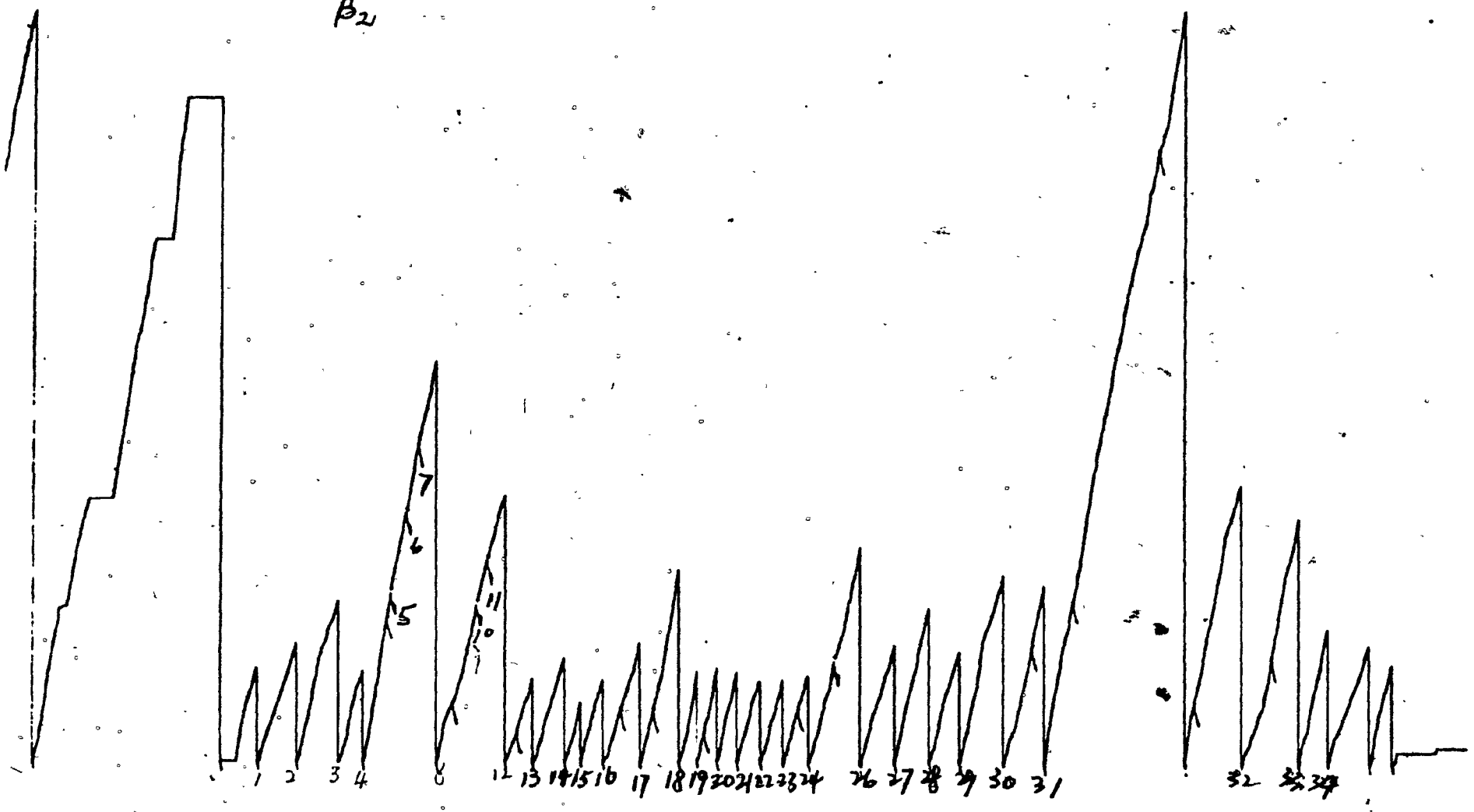
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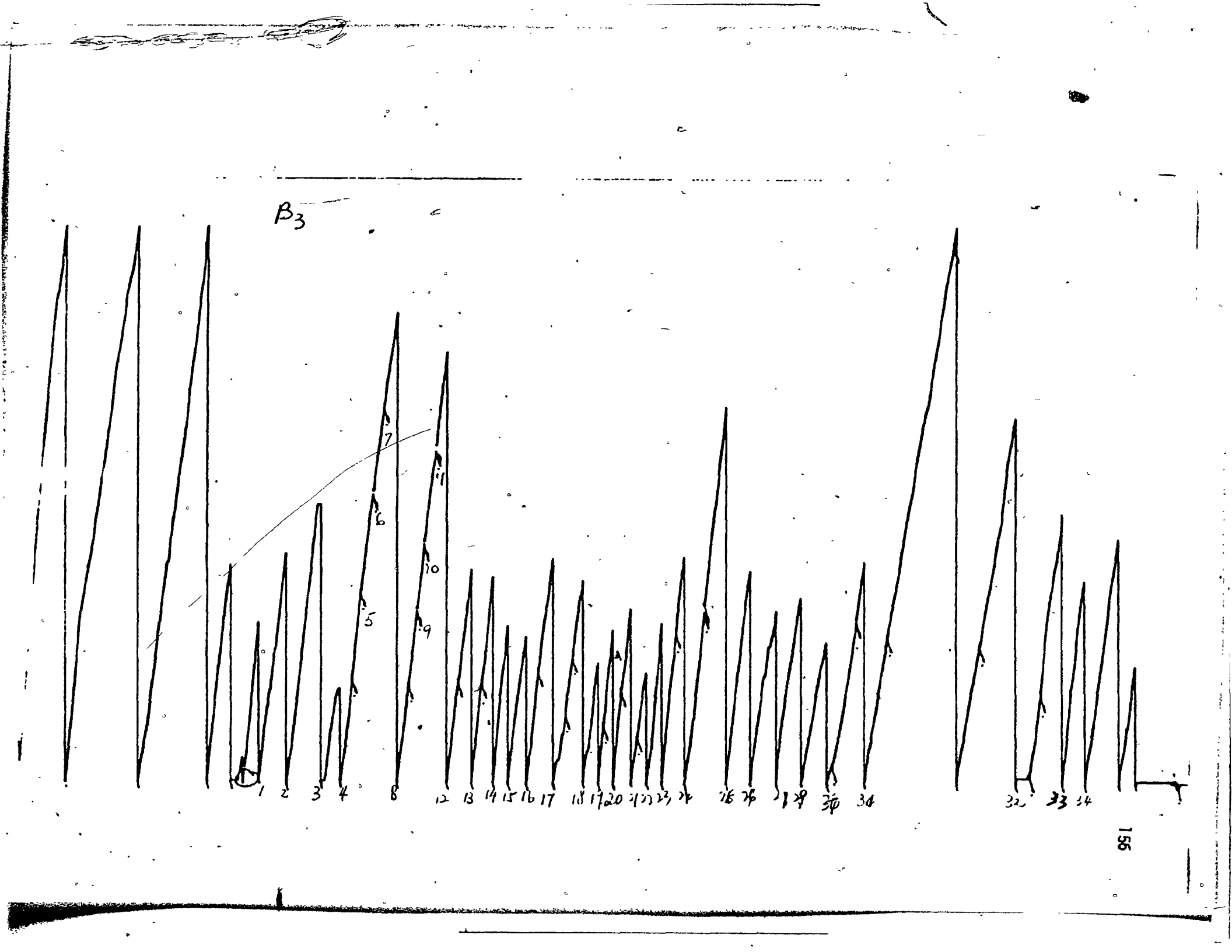
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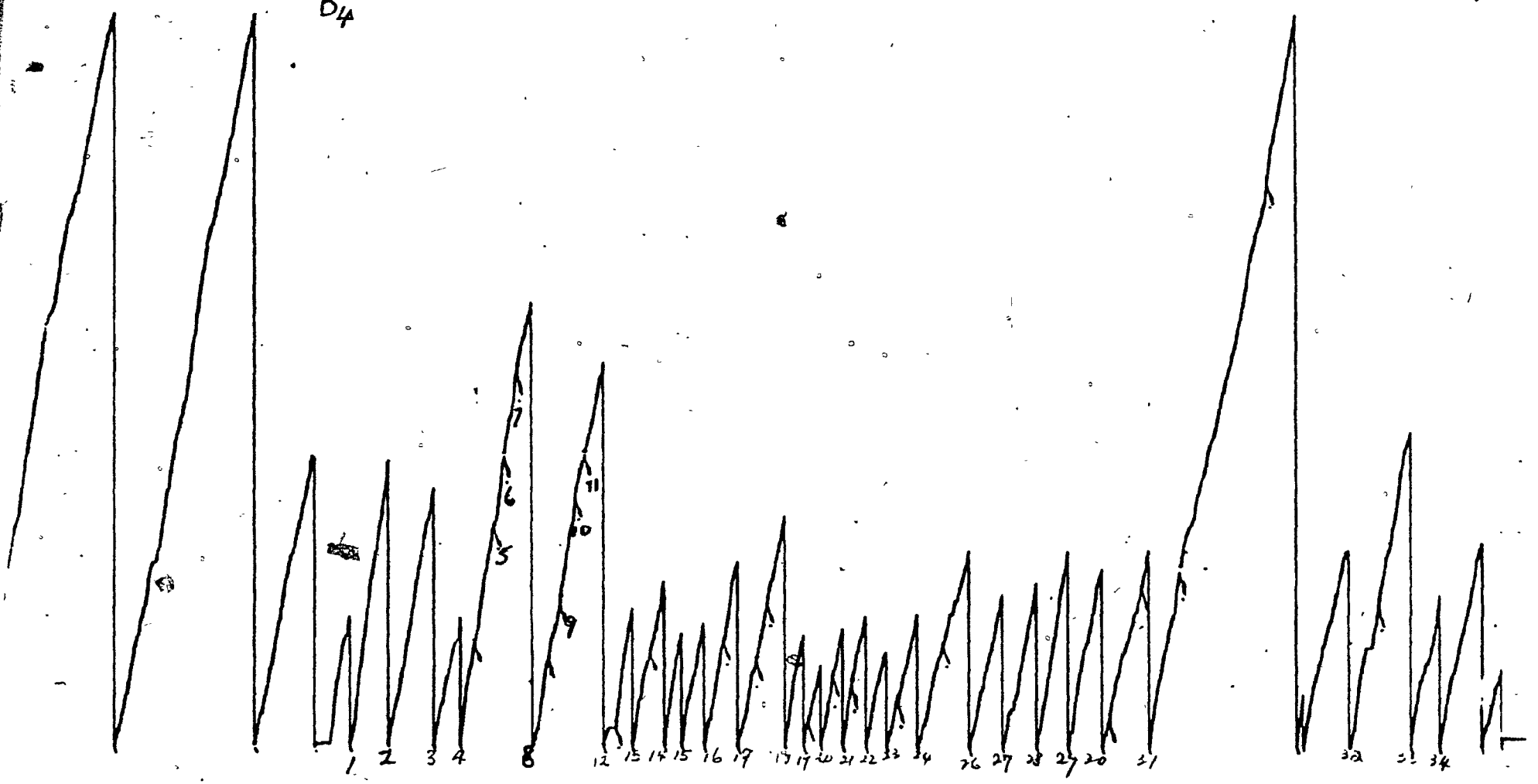
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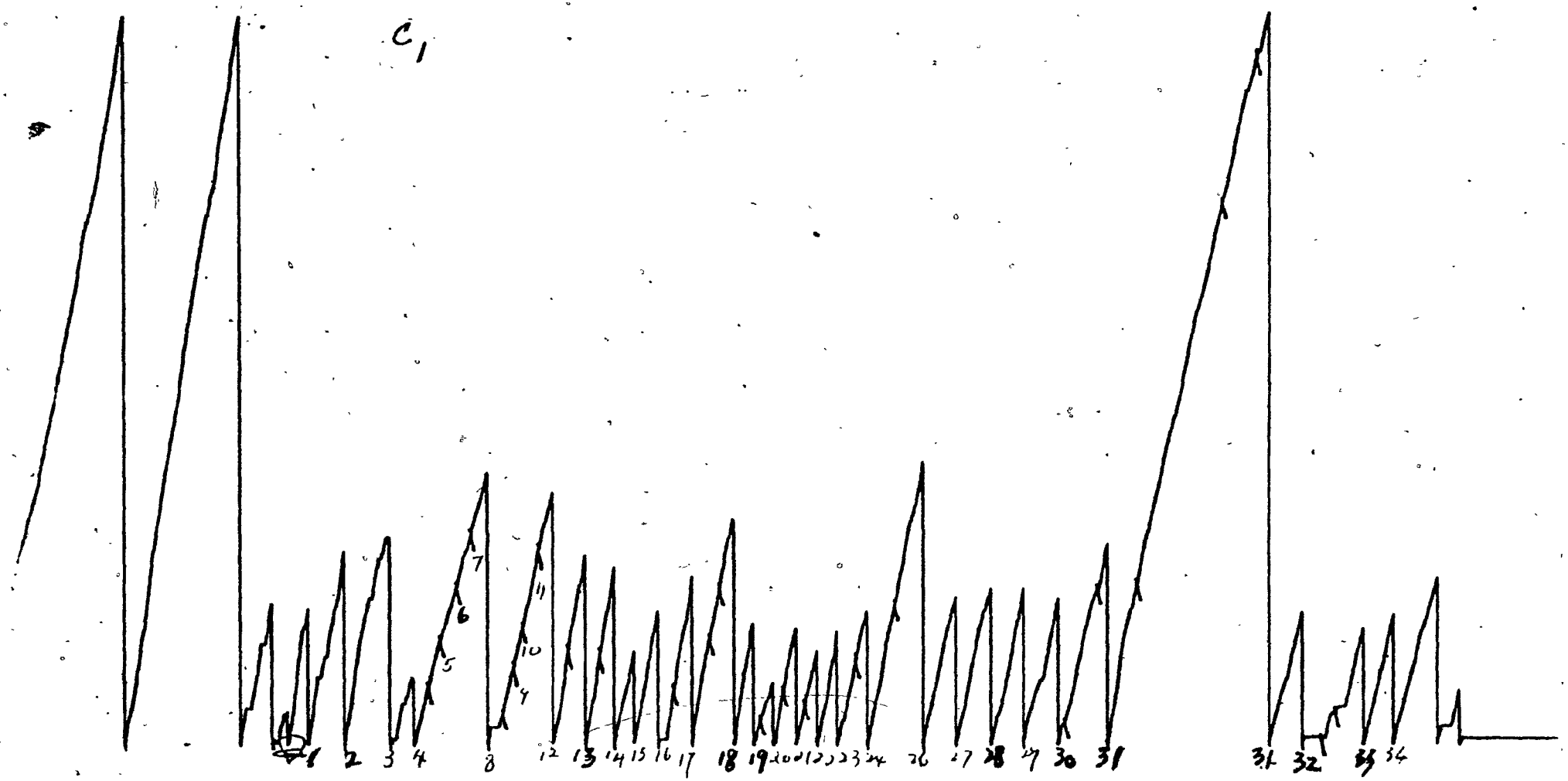
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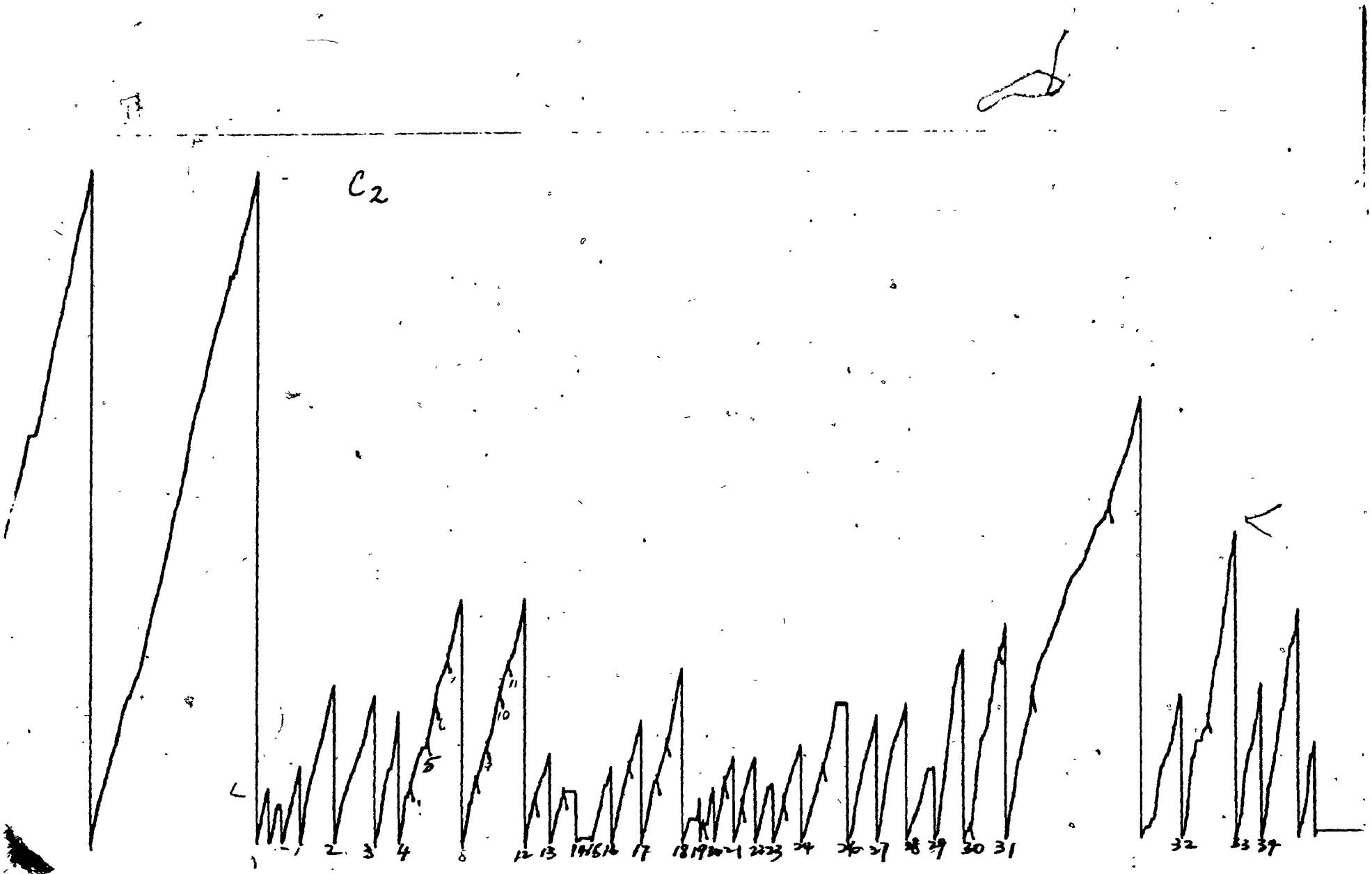
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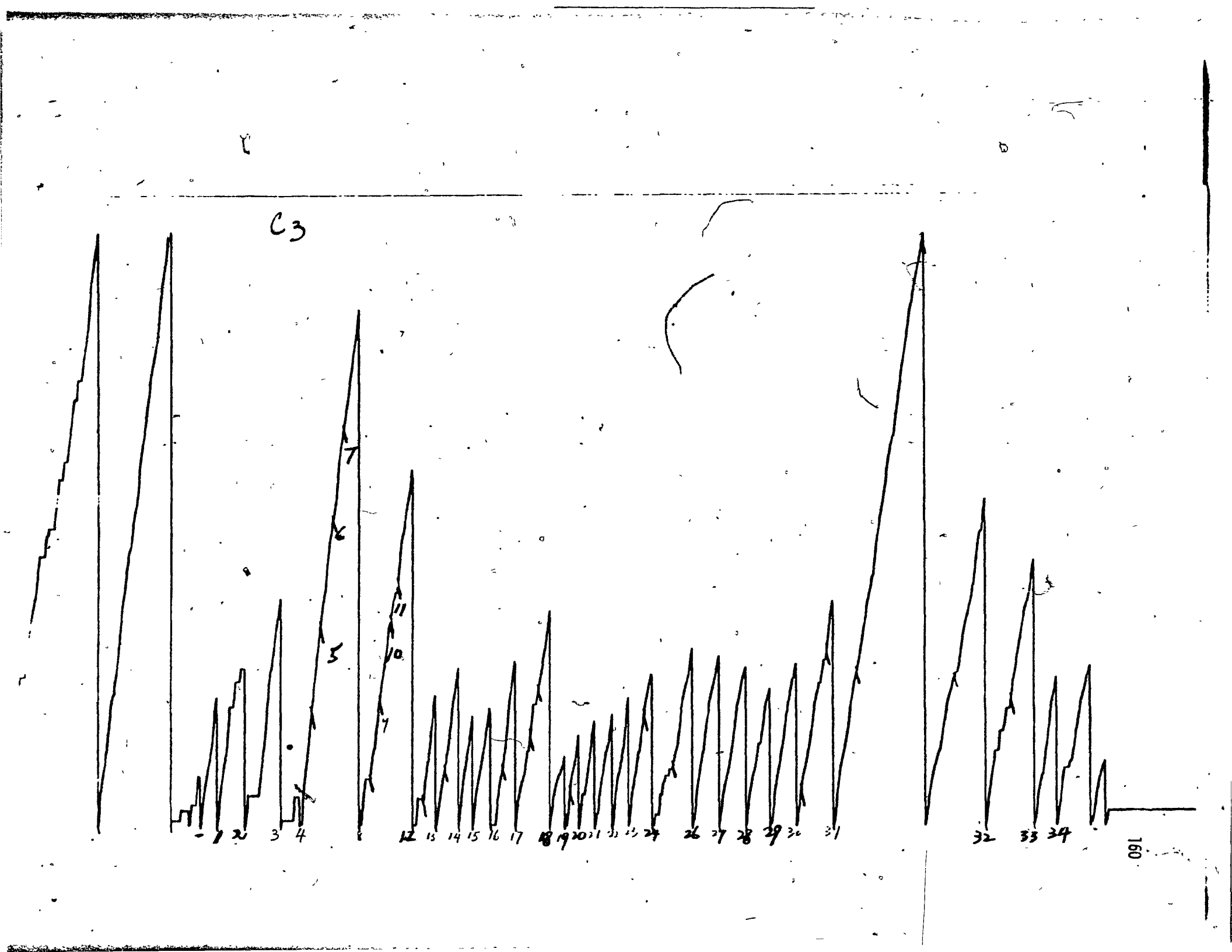
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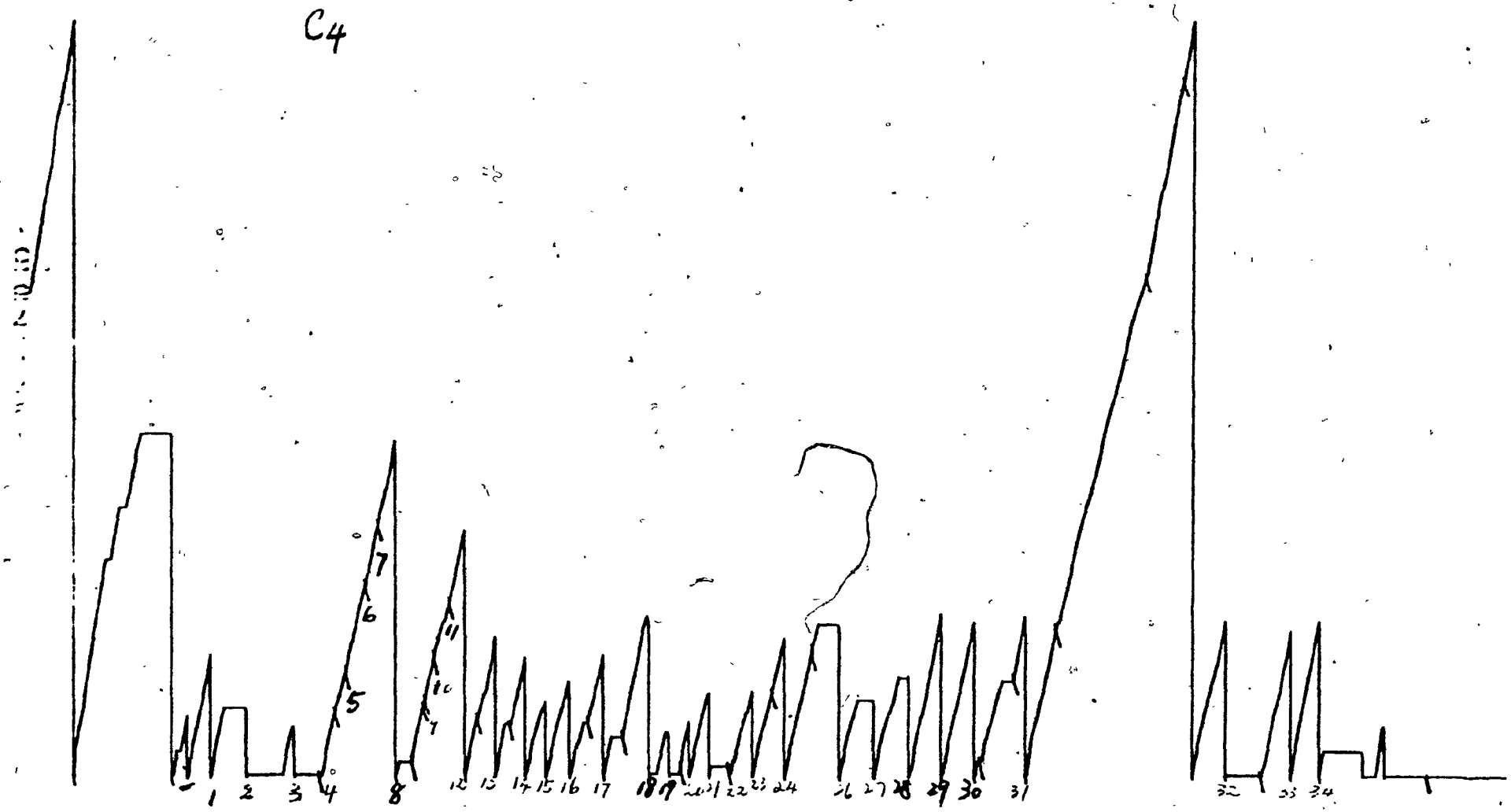
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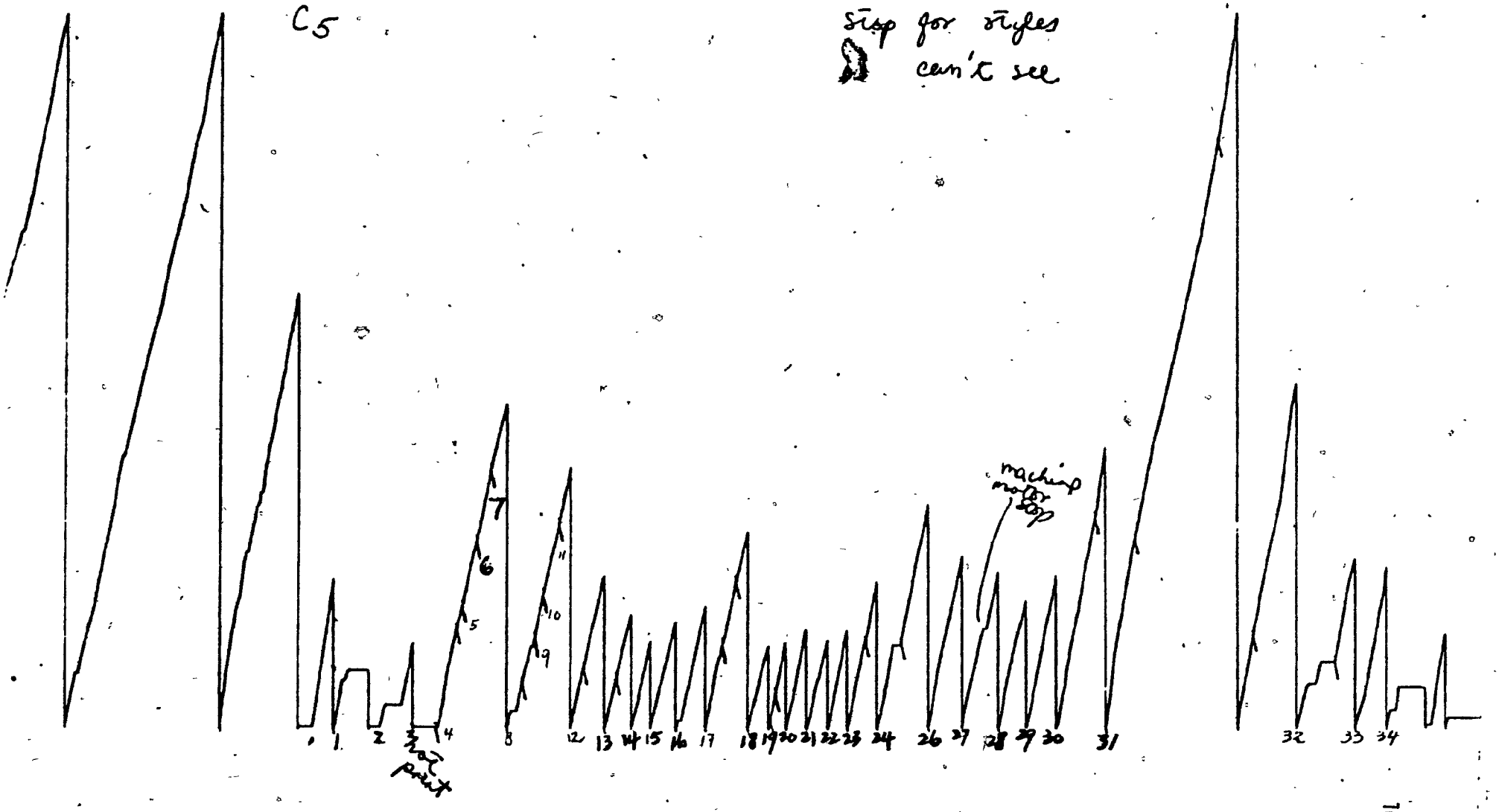
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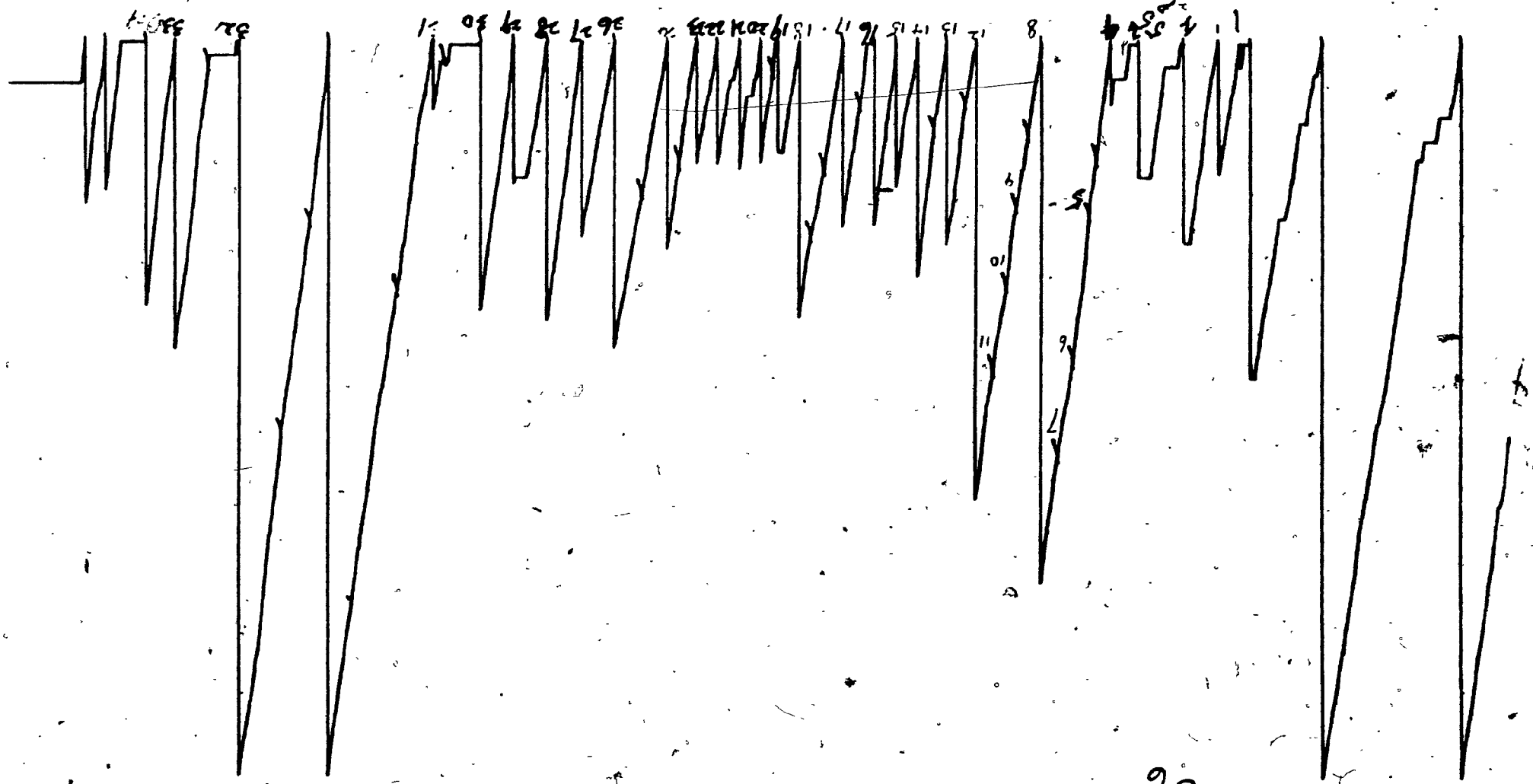

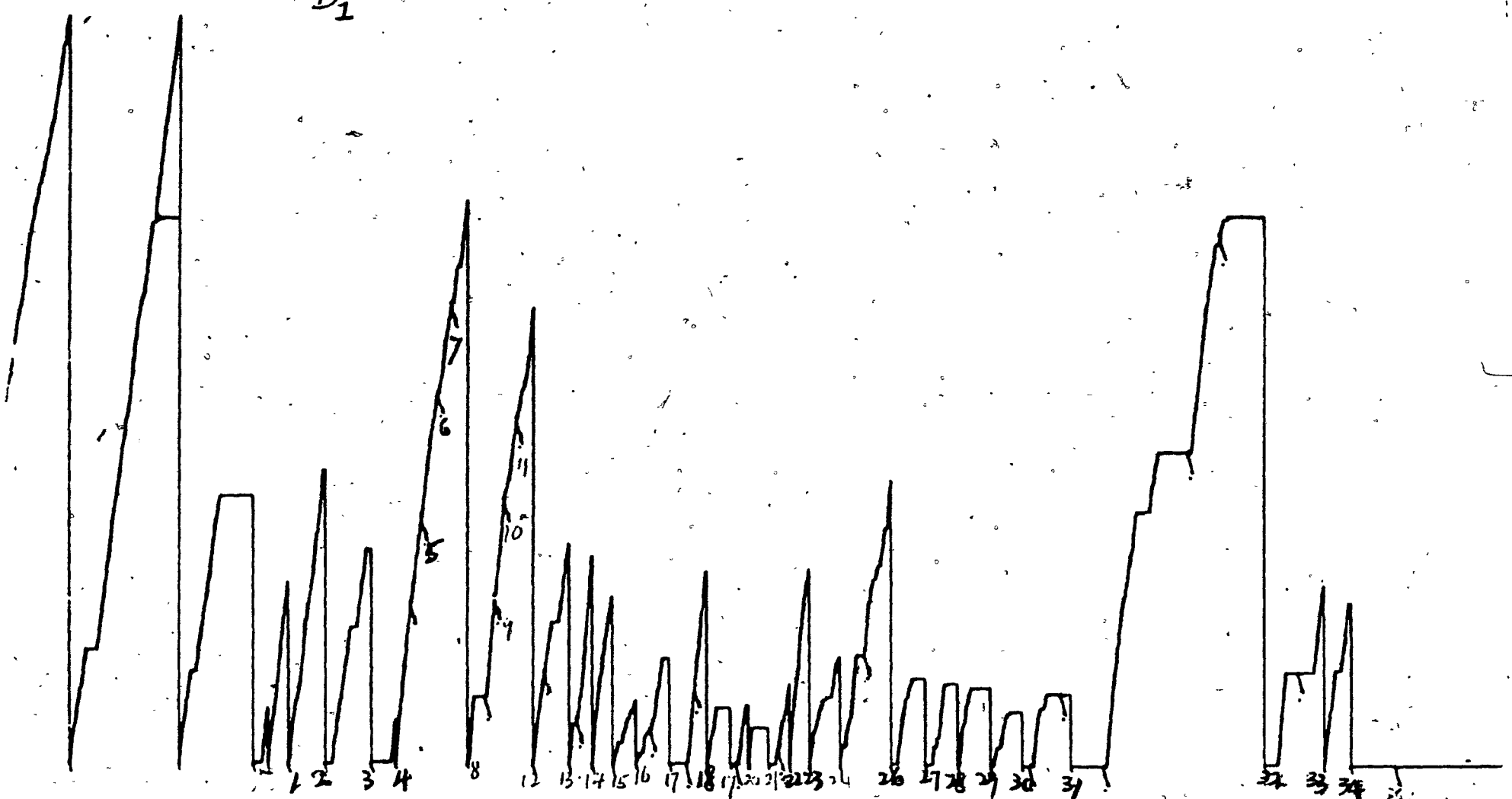
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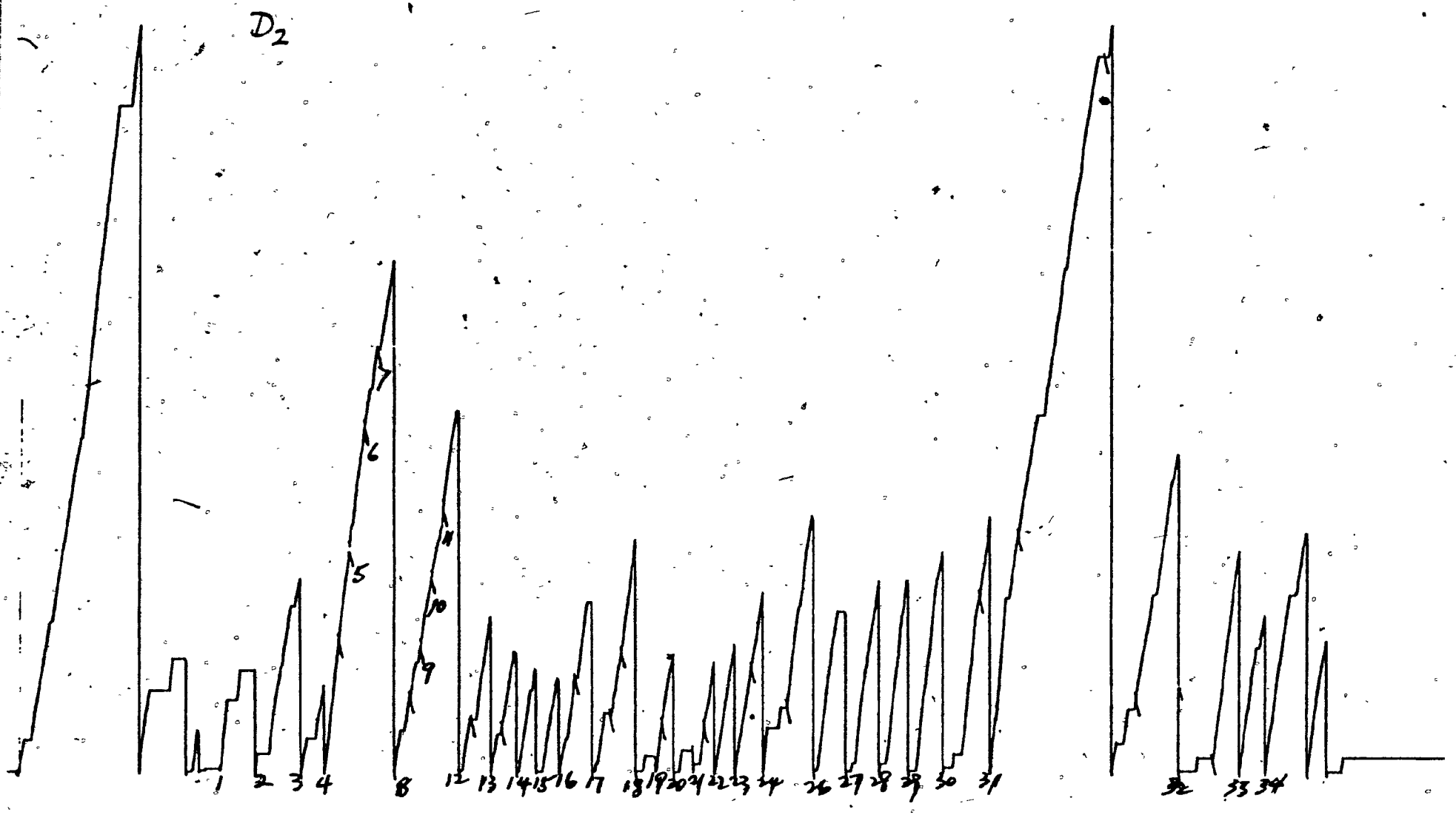
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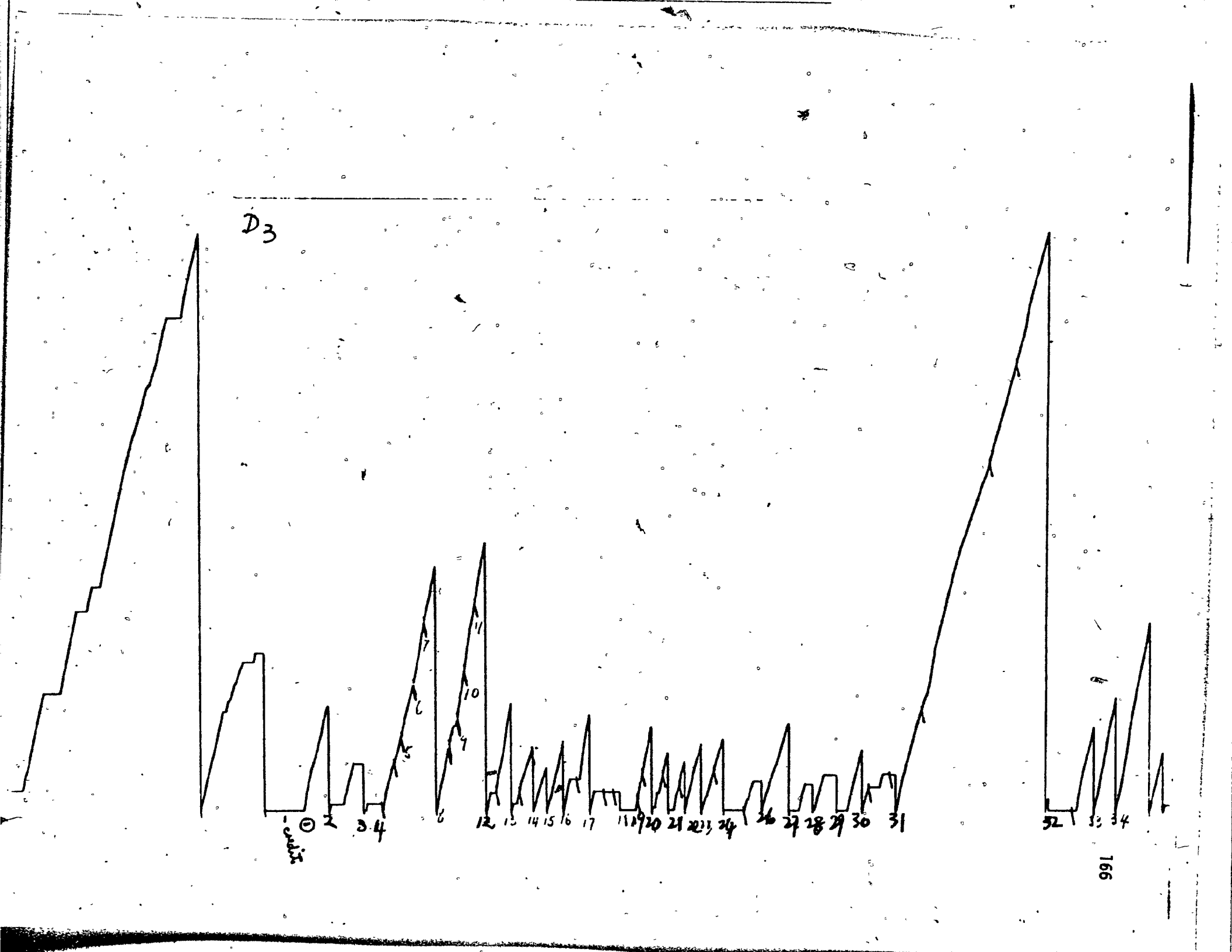
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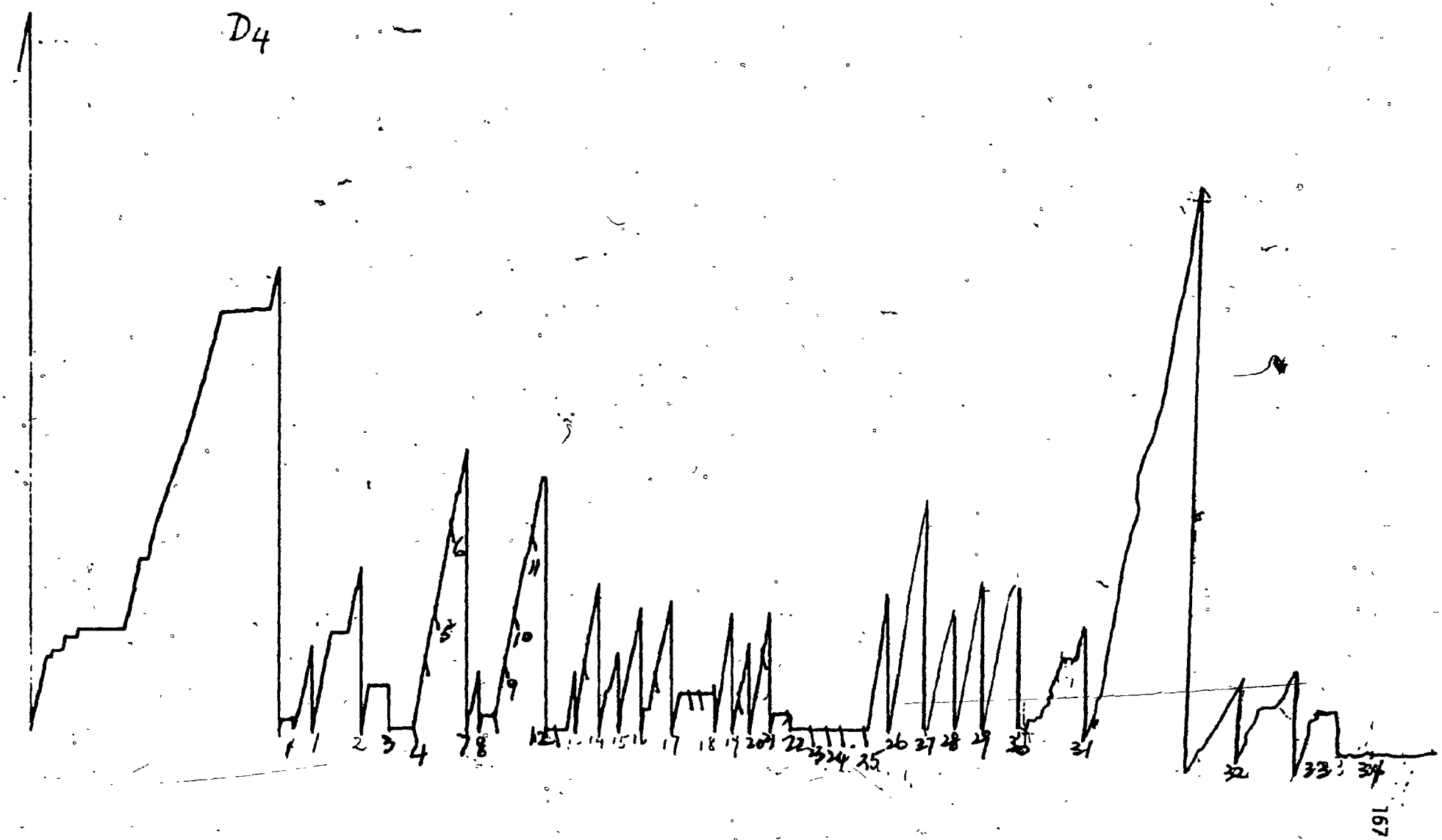
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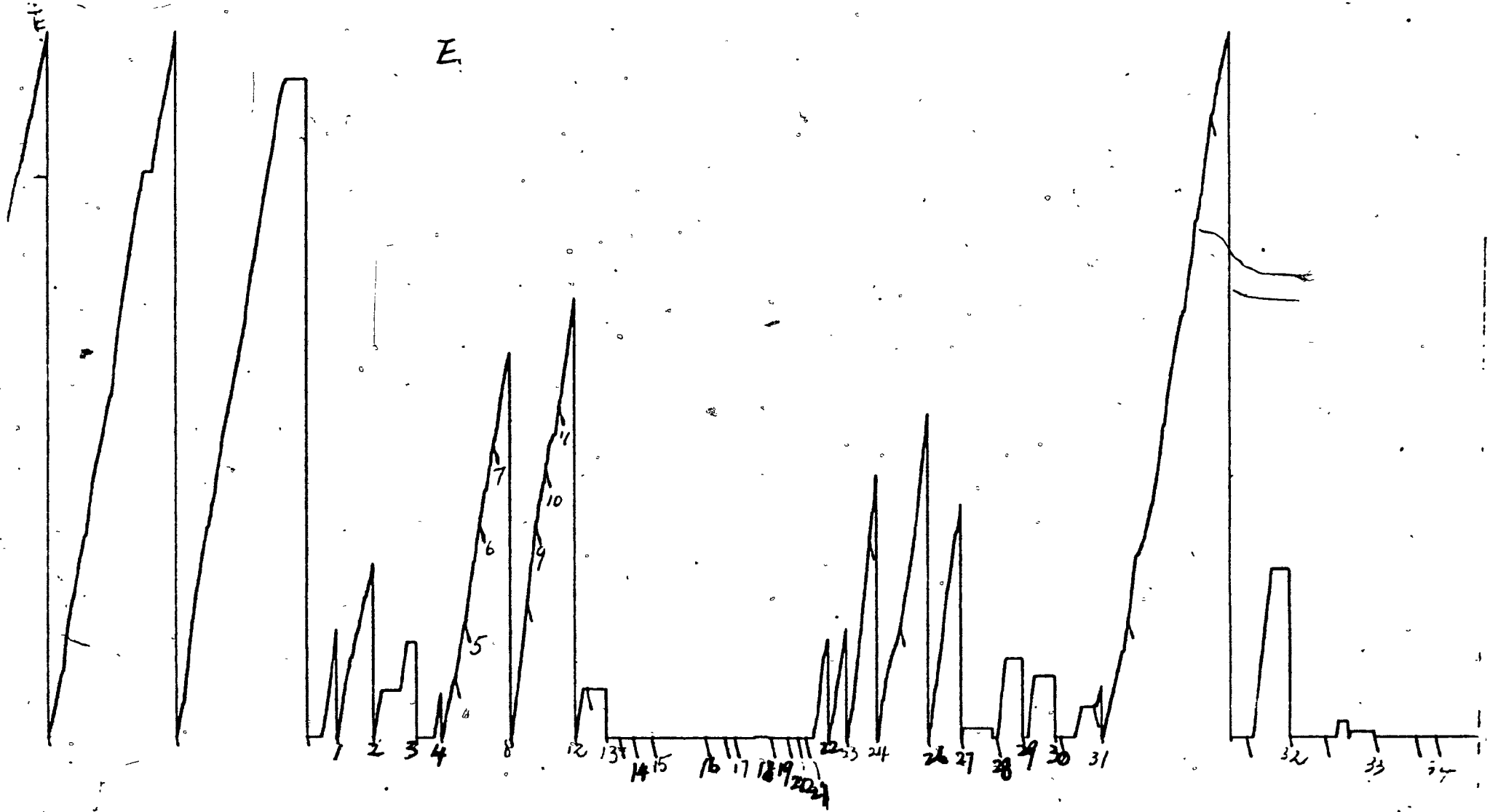
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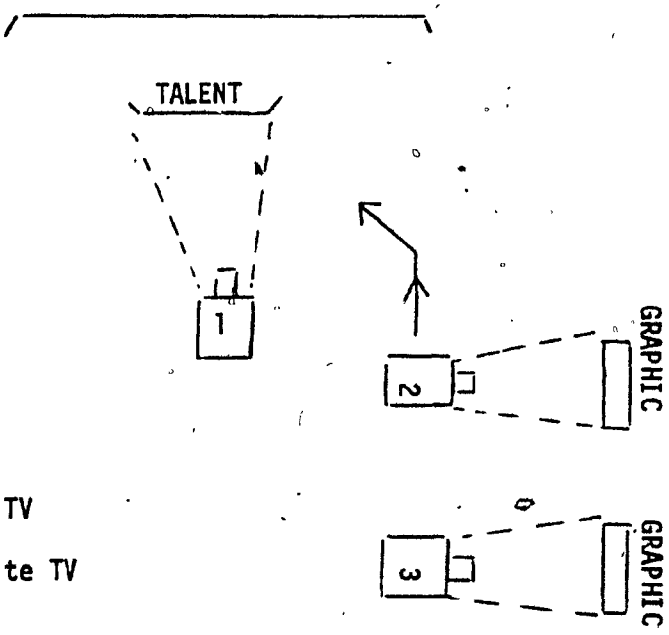
APPENDIX 5

SCRIPT OF TV PRODUCTION IN THIS STUDY (Please Turn Over)

"CHINESE CALLIGRAPHY AND PAINTING"



CAM 1 & 2 = Colour TV

CAM 3 = Black & White TV

Set Ups in Studio A, Concordia University, Montreal, Quebec.

	VIDEO	AUDIO
1.	S=SLIDE; G=GRAPHIC FADE IN TELECINE (S1) FADE IN MUSIC SUPER CAMERA 3 LOSE SUPER FADE OUT AUDIO MIX TO CAMERA 1 (Long Shot) cue talent	CHINESE CALLIGRAPHY IS AN ART WITH A TRADITION AS HIGH AS THE CULTURE ITSELF. FOR NEARLY TWO THOUSAND YEARS, THE BASIC MEDIA, THE MAJOR SCRIPT VARIATIONS, AND THE STANDARD OF EXCELLENCE OF THE ART HAVE REMAINED ALMOST UNCHANGED. CALLIGRAPHY MAY ALSO BE REGARDED AS A PRECURSOR AND A COMPANION OF THE ART OF PAINTING IN CHINA. IN FACT, THE TWO ARTS, CALLIGRAPHY AND PAINTING ARE INTIMATELY RELATED TO EACH OTHER.
2.	ZOOM TO MEDIUM CLOSE UP	CALLIGRAPHY, AS A GENERAL TERM, SIMPLY MEANS GROUPS OF WORDS IN ANY LANGUAGE, CONVEY HUMAN THOUGHT AND WRITTEN BY HAND. IT IS VERY RARELY CONSIDERED, AS IN CHINA, TO BE AN ART. IN STUDYING THE CALLIGRAPHY OF CHINA ONE MUST LEARN SOMETHING OF THE ORIGINS OF HER LANGUAGE, OF THE SOURCES WHICH GIVE RISE TO THE CHARACTERS, AND OF HOW THEY WERE ORIGINALLY WRITTEN. FOR IN THEIR WRITTEN FORM, CHINESE CHARACTERS NOT ONLY SERVE THE PURPOSE OF CONVEYING THOUGHT BUT ALSO EXPRESS IN A PECULIAR VISUAL WAY THE BEAUTY OF THE THOUGHT.
3.		FROM ARCHEOLOGICAL EVIDENCE DATING BACK MORE THAN FOUR THOUSAND YEARS, IT APPEARS THAT PICTORIAL SYMBOLS WERE DEVISED TO REPRESENT OBJECTS, NATURAL PHENOMENA AND CONCEPTS. AT THAT TIME, HUMAN AFFAIRS WERE COMPARATIVELY SIMPLE. HUNTING AND FIGHTING OCCUPY A LARGE PART OF MAN'S LIVES.

	VIDEO	AUDIO
4.	TAKE TELECINE (S2)	NOW, WHAT YOU SEE ARE THE ENGRAVINGS OF PICTURE-CHARACTERS ON MANY TORTOISE-SHELL AND ANIMAL BONES OF THE SHANG YIN DYNASTY AROUND 18th CENTURY B.C.
	CHANGE SLIDE (S3)	WE CAN ALSO GET SOME IDEA OF WHAT EARLY CHARACTERS
	CHANGE SLIDE (S4)	LOOKED LIKE FROM BRONZES OF THE SAME DYNASTY. —
5.	CUT TO CAM 2 (G1)	HERE ARE SOME EXAMPLES:
		THE CHARACTER SUN (日) —
	MIX TO TELECINE (S5)	NOTICE HOW THESE SYMBOLS PICK OUT THE SOLAR ATTRIBUTES OF ROUNDNESS AND RADIATING BEAMS. —
6.	CUT TO CAM 2 (G2)	NEXT, THE CHARACTER WATER (水) —
	MIX TO TELECINE (S6)	RIPPLES ON THE SURFACE OF MOVING WATER—
7.	CUT TO CAM 2 (G3)	NOW, THE WORD SHEEP (羊) —
	MIX TO TELECINE (S7)	HERE, WE HAVE THE WHOLE ANIMAL—
	MIX TO CAM 2 (G4)	BUT SOMETIMES IN SIMPLIFIED SYMBOLS. —
8.	CUT TO CAM 1 (MCU)	THESE FEW EXAMPLES OF ANCIENT CHINESE CHARACTERS ARE SIMPLY PICTURES OR IMAGES OF THINGS. WE CALL THESE SHELL AND BONE SCRIPT. BASICALLY, CHINESE CHARACTERS CAN BE CLASSIFIED INTO SIX CATEGORIES. THE FIRST CATEGORY IS <u>IMITATIVE SYMBOLS</u>
	SUPER CAM 3(G5)	
	LOSE SUPER	—OR IMAGES SKETCHING REPRESENTING AN OBJECT, LIKE THIS
9.	CUT TO CAM 2 (G6)	THE WORD, CART (車)
	MIX TO TELECINE (S8)	
10.	CUT TO CAM 2 (G7)	THE WORD, STANDING TOGETHER (並)
	cue talent	
	MIX TO TELECINE (S9)	
	CUT TO CAM 2 (G8) cue talent	OR SOME MORE COMPLEX FIGURES
11.		THE CHARACTER, BOUNDARY (疆)
	MIX TO TELECINE (S10)	
	MIX TO CAM 2 (G9)	

	VIDEO	AUDIO
12.	CUT TO CAM 1 (C.U.) cue talent	NOW, WE GO TO THE SECOND CATEGORY: INDICATIVE SYMBOLS.
	SUPER CAM 3 (G10) lose super	THEY ARE FIGURES WHICH SUGGEST THE MEANING, OFTEN BY THE IDEA OF SOME MOTIONS.
	MIX TO CAM 2 (G11)	FOR EXAMPLE, THE SYMBOL OF THE CHARACTER TO REACH OR TO GO TO (至): THE UPPER PART INDICATES A BIRD, AND THE LOWER PART, LAND. THAT IS, A BIRD FLYING DOWN
	MIX TO TELECINE (S11)	TO LAND. —
13.	CUT TO CAM 1 (CU) cue talent	LET US NOW LOOK AT THE THIRD CATEGORY OF CHINESE CHARACTERS: PHONETIC COMPOUNDS.
	SUPER CAM 3 (G 12) lose super	ONE ELEMENT INDICATES THE MEANING, THE OTHER THE PRONOUNCIATION.
	MIX TO TELECINE (S12)	FOR EXAMPLE, THE CHARACTER RIVER (河): THE LEFT HAND ELEMENT SIGNIFIES SIMPLY WATER, AND THE RIGHT HAND ELEMENT, THE SOUND OF WATER FLOWING.
14.	CHANGE SLIDE (S13)	NOW, THE WORD; TO ASK (問)—
	MIX TO CAM 2 (G13)	DOOR (門) IS THE PHONETIC —
	MIX TO TELECINE (S14)	AND, THIS IS THE WORD, MOUTH (口) —
	MIX TO CAM " (G14)	SO, A MOUTH IN A DOORWAY SUGGEST ASKING.
15.	TAKE TELECINE (S15)	NEXT, WE GO TO THE FOURTH CATEGORY
	SUPER CAM 3 (G15) lose super	LOGICAL COMBINATIONS. — THIS WORD MEANS "MULTITUDE", "MANY", OR "MAJORITY"
	MIX TO CAM 2 (G16)	ORIGINALLY IT WAS A SYMBOL COMPOSED OF THREE MEN.
16.	CUT TO CAM 1 (MCU)	WE HAVE EXAMINE THE FIRST FOUR CATEGORY OF CHINESE
	SUPER CAM 3 (G17)	CHARACTERS, NOW, WE MOVE ON TO THE FIFTH CATEGORY CHUAN CHU (轉注) CHARACTERS OF THIS TYPE ARE LIKE WATER POURED FROM ONE BOTTLE TO ANOTHER.
	MIX TO CAM 2 (G18)	FOR EXAMPLE, THE WORD OLD (老), IF THE FINAL UPWARD STROKE IS TURNED DOWNWARD BECOMES "TO EXAMINE" (考) BECAUSE YOUNGSTERS ARE GENERALLY EXAMINED BY THEIR ADULTS.

	VIDEO	AUDIO
17.	CUT TO CAM 1 (CU) SUPER CAM 3 (G19) lose super MIX TO TELECINE (S16) CHANGE SLIDE (S17)	NOW, WE COME TO THE LAST CATEGORY: CHIA CHIEH, THAT IS, BORROWED CHARACTERS. THEY ARE USED IN SENSES NOT ORIGINALLY THEIR OWN, EITHER BY REASON OF THEIR SOUND OR THROUGH ASSOCIATION, OR DERIVED MEANING. FOR INSTANCE, THE WORD "LING" (令) ORIGINALLY MEANT "AN ORDER" HAS BEEN BORROWED FOR THE MEANING "TO GIVE AN ORDER". LIKEWISE, THE CHARACTER "CHANG" (長) MEANS "LONG" AS OPPOSED TO "SHORT" HAS BEEN BORROWED TO REPRESENT THE MEANING OF "AN ADULT".
18.	MIX TO CAM 1 (MCU)	IN ENGLISH, THERE ARE 26 LETTERS IN THE ALPHABETS. ALL LETTERS ARE COMPOSED OF CIRCLES, CURVES, STRAIGHT AND INCLINED LINES. CHINESE CHARACTERS, ON THE OTHER HAND, DISPLAY A HANDSOME VARIETY IN THE SHAPES OF THE STROKES.
19.	MIX TO CAM 2 (G20) MIX TO TELECINE (S18) MIX TO CAM 2 (G21)	CHINESE CHARACTER IS FORMED IN AN IMAGINARY SQUARE WHICH IT CAN FILL IN A VARIETY OF BEAUTIFUL WAYS. —
20.	MIX TO CAM 1 (CU) MIX TO CAM 2 (G22) MIX TO TELECINE (S19)	EACH STROKE MAY CONTAIN AN INDIVIDUAL VARIATION OF FORM, PASSING FROM THE SLENDER TO THE BOLD. THE DEFINITE AND WELL-KNITTED STROKES OF A CHINESE CHARACTER CAN BE COMPOSED INTO MANY INDIVIDUAL PATTERNS ACCORDING TO THE TALENT OF THE CALLIGRAPHER. —
21.	CUT TO CAM 1 (MLS) cue talent MIX TO CAM 2 (CU of paper)	OUR TECHNIQUE OF WRITING ALSO DIFFERS FROM THAT OF THE WEST. IT IS OUR CUSTOM TO WRITE FROM THE RIGHT SIDE OF THE PAGE TO THE LEFT. THE PAPER USED IS THE SAME FOR WRITING AS FOR PAINTING: COARSE IN WEAVE AND MORE PORSUS THAN WHICH YOU ARE FAMILIAR WITH THE WEST.
22.	MIX TO TELECINE (S20)	THE BRUSH PEN CONTAINS OF A BAMBOO OR WOODEN STEM. IT IS MADE OF FROM HAIRS OF DEER, SHEEP, RABBIT OR WOLF,

	VIDEO	AUDIO
		WITH VERY FINE POINTS AND DIFFERENT SIZES, ACCORDING TO THE TASTE OF THE WRITER'S REQUIREMENTS OF THE PARTICULAR STYLE.
23.	MIX TO CAM 2 (CU of ink) ROLL VTR INSERT CUT TO VTR	CHINESE INK, WHICH IS USED FOR BOTH CALLIGRAPHY AND PAINTING IS DIFFERENT FROM THAT OF THE WEST. IT IS BLACK AND NOT MADE IN LIQUID FORM, WHEN ABOUT TO WRITE OR PAINT, THE CALLIGRAPHER OR PAINTER GRINDS THIS STICK UPON THE INK STONE WITH A LITTLE WATER. —
24.	CUT TO CAM 1 (MCU)	ALTHOUGH CALLIGRAPHY IS INTIMATELY LINKED WITH THE CONTENT OF LANGUAGE, ITS BEAUTY IS NOT DEPENDED UPON THE QUALITY OF COMPOSITION OR FORM, BUT IN ITS DYNAMIC SPIRIT AND INDIVIDUAL EXPRESSIONS. THERE ARE COUNTLESS VARIETY OF STYLES EXPRESSED BY INUMERABLE CALLIGRAPHERS. HOWEVER, THERE ARE FIVE BASIC STYLES.
25.	MIX TO TELECINE (S21) FADE IN MUSIC SOFTLY—UP MIX TO CAM 2 (G23) MIX TO TELECINE (S22)	THE FIRST IS ANCIENT STYLE—
26.	CUT TO CAM 2 (G24) cue talent HOLD MUSIC UNDER TALENT'S VOICE MUSIC UP MIX TO TELECINE (S23) MIX TO CAM 2 (G25) MIX TO TELECINE (S24)	THE SECOND IS OFFICIAL STYLE. THIS IS USED MOSTLY IN GOVERNMENT RECORDS AND OFFICIAL MONUMENTS. —
27.	CUT TO CAM 2 (G26) cue talent HOLD MUSIC UNDER VOICE MIX TO TELECINE (S25) MUSIC UP MIX TO CAM 2 (G27) MIX TO TELECINE (S26)	THE THIRD ONE: REGULAR STYLE WHICH IS CHARACTERISED BY EVENNESS AND CONTROLLED EXECUTION OF THE STROKES. IT HAS REMAINED THE STANDARD SCRIPT FOR FORMAL PURPOSES AND IS THE FIRST COURSE OF STUDY FOR ALL BEGINNERS.—
28.	CUT TO CAM 2 (G28) cue talent HOLD MUSIC UNDER VOICE. music up MIX TO TELECINE (S27) MIX TO CAM 2 (G29)	THIS IS THE RUNNING STYLE . AS THE NAME SUGGESTED, IT ALLOWS FREER HANDLING AND MORE VIVID MOVEMENT. —

	VIDEO	AUDIO
29.	MIX TO TELECINE (S28)	
	CUT TO CAM 2 (G30) cue talent	HERE COMES THE LAST, BUT NOT THE LEAST, GRASS STYLE.
	HOLD MUSIC UNDER VOICE	THIS IS A "SKETCHING" SCRIPT WHICH CAN BE WRITTEN WITH CONSIDERABLE SPEED AND FREEDOM, A FAVORITE VEHICLE OF ARTISTIC EXPRESSION.——
	MUSIC UP	
	MIX TO TELECINE (S29)	
	MIX TO CAM2 (G31)	
	MIX TO TELECINE (S30)	
30.	FADE OUT MUSIC, MIX TO CAM 1 (CU) cue talent	AT THIS POINT, YOU'VE GOT SOME IDEA ABOUT THE ART OF CALLIGRAPHY, LET'S NOW TAKE A LOOK AT PAINTING. IN CHINA, THE ART OF PAINTING AND CALLIGRAPHY IS CLOSELY RELATED. BOTH DERIVED FROM ANCIENT CHINESE SCRIPTS, USED THE SAME TYPE OF BRUSH AND INK, MONO-CHROME IS PREFERRED FOR MOST PAINTING WHICH IS ALSO THE INK OF CALLIGRAPHY. MOREOVER, IT IS A CUSTOM FOR US TO SPEAK NOT OF "PAINTING A PICTURE, BUT OF "WRITING" IT. THE TREATMENT OF THE BRUSH STROKE IS
	MIX TO TELECINE (S31)	THE BASIS FOR BOTH CALLIGRAPHY AND PAINTING. IT MUST BE SURE AND SPONTANEOUS, GIVING AN IMPRESSION OF LIFE ——
	CHANGE SLIDE (S32)	
31.	FADE IN MUSIC: ROLL VTR	
	CUT TO VTR	GENERALLY THE BRUSH CAN BE USED IN TWO MANNERS, THE VERTICAL STROKE AND THE SLANTING STROKE.
	HOLD MUSIC UNDER TALENT, CUE TALENT	FOR CHINESE, PAINTING IS ESSENTIALLY SUBJECTIVE, ITS AIM IS NOT TO DEPICT AN OBJECT AS IT SCIENTIFICALLY IS, BUT AS A UNIQUE INDIVIDUAL EXPRESSION. THE ESSENTIAL ELEMENT IS ITS RHYTHMIC VITALITY.——
	MUSIC UP	
	FADE OUT MUSIC	
32.	CUT TO CAM 1 (MCU) cue talent	IN CONCLUSION, THEN, CHINESE PAINTING AND

	VIDEO	AUDIO
		CALLIGRAPHY ARE RELATED IN SPIRIT AND TECHNIQUE. BOTH EMPHASIZED THE INDIVIDUAL EXPRESSIONS, FEELINGS AND MOOD THROUGH THE JUXTAPOSITION OF MOVEMENT, REPOSE, HARMONY AND DISCORD, LIGHT AND SHADOWS, OF VARIOUS ARRANGEMENT OF STROKES.
	MIX TO CAM2 (Close Up of objects)	BESIDES PAINTING, CALLIGRAPHY IS ALSO CLOSELY CONNECTED WITH THE DAILY LIFE OF CHINESE PEOPLE. WE FREQUENTLY FIND POEMS, PAINTINGS OR CHARACTERS WRITTEN OR ENGRAVED ON BRUSHHOLDERS, BOWLS, CHOPSTICKS, FANS, STONES, OR BAMBOOS FOR DECORATION, AND SO ON.
33.	MIX TO CAM 1 (MLS)	IT IS ALSO A CUSTOM FOR US TO WRITE LINES OF POETRY OR CHARACTERS ON RED PAPERS. WE CALL THIS SPRING COUPLET. THEY ARE PASTED UPON THE DOOR OR WALLS IN THE CHINESE NEW YEAR, IN WEDDING OR BIRTHDAY FEASTS. IT IS SUPPOSED TO BRING GOOD LUCK IN THE COMING YEAR.
34.	MIX TO CAM 1 (CU)	INDEED, CHINESE CALLIGRAPHY OR PAINTING IS A FINE ART. IT IS SUBTLE AND ABSTRACT IN QUALITIES. BEAUTY IN CHINESE CALLIGRAPHY AND PAINTING IS DIFFICULT TO DEFINE, NEITHER IS IT EASY TO TELL WHY CERTAIN PIECES ARE MORE BEAUTIFUL THAN OTHERS.
	ZOOM OUT TO MS	I HOPE THAT IN THIS BRIEF INTRODUCTION, YOU WILL BEGIN TO APPRECIATE OR GRASP THE AESTHETICS OF THE ART. HOWEVER, THE ABILITY TO TELL THE DIFFERENCE BETWEEN MEDIOCRITY AND EXCELLENCE CAN ONLY BE ACQUIRED BY FREQUENT EXPOSURE TO GREAT WORKS, OR BETTER STILL, BY PRACTISING THE ART.
	FADE IN MUSIC MIX TO TELECINE (S33) SUPER CAM 3 (G32) ——Credits	
	FADE TO BLACK.	

Appendix 6

INSTRUCTIONS

Why do people watch a particular TV program? In our research, we are looking for an answer. We hope to find out how people decide whether to view or not to view a TV program and what kind of program is most interesting. In short, how do viewers judge a TV program?

In this experiment, you will be asked to watch a TV program. We hope to discover what percentage of viewers are interested in various portions of this and other audio-visual programs. We hope that a better understanding of the viewer's interest may help producers of educational television to meet their audience's needs. So, this is not a test of your I.Q. or your personality, and you are not expected to memorise the facts in the program. Rather, you will be expected to indicate your interest in the program. This will be determined by you using our special laboratory apparatus.

You can see a television set on the table in front of you. You are able to control the brightness of the picture on this TV set by pressing a small switch.,...like this (Demonstration).....By repeatedly pressing the switch, you will be able to watch the program. If you press at a slower rate the picture dims. When you stop pressing the switch, the television picture will fade to a blank screen. However, no matter how slowly or fast you press this switch, the audio portion of the TV set will be on always. Audio will be unaffected by this switch.

Our recording apparatus will give us an indication of the parts of the

program that you watch. The results from many viewers of different programs will be combined for our analysis.

When you are watching the program, feel free to change the switch from one hand to another if one hand happens to get tired.

Now please put on the headphones and adjust them until they are comfortable, and adjust the volume control also. Take the switch and start pressing when you hear the program beginning.

Please press the switch continuously and as rapidly as possible for the first five minutes, so that you will become used to using the switch to control the picture. After the initial five minutes, you can choose to press only when you feel like watching the picture.

.....THANK YOU VERY MUCH FOR YOUR COOPERATION.....

Appendix 7

INTEREST QUESTIONNAIRE

Please reply to each statement expressing your agreement or disagreement by marking an "X" in one of the spaces following each statement.

Mark "X" in SA if you strongly agree (SA) with the statement.

Mark "X" in A if you agree (A) with the statement.

Mark "X" in U if you are undecided (U) about the statement.

Mark "X" in D if you disagree (D) with the statement.

Mark "X" in SD if you strongly disagree (SD) with the statement.

SAMPLE ANSWER

The TV Program was enjoyable.

If you agreed with the above statement you would mark an "X" in space A.

*	*X	*	*	*
SA	A	U	D	SD

1.	The program was great.	* * * * * * / SA A U D SD
2.	I did not consider the program interesting.	* * * * * * / SA A U D SD
3.	The program was not worth watching.	* * * * * * / SA A U D SD
4.	I felt "wrapped up" in the program.	* * * * * * / SA A U D SD
5.	I thought the program was excellent.	* * * * * * / SA A U D SD
6.	I was absorbed in watching the program.	* * * * * * / SA A U D SD
7.	My attention wandered during the program.	* * * * * * / SA A U D SD
8.	I did not like the program	* * * * * * / SA A U D SD
9.	The program did not make me feel involved.	* * * * * * / SA A U D SD
10.	I thought the program was fantastic.	* * * * * * / SA A U D SD
11.	The program was a pleasure to watch.	* * * * * * / SA A U D SD
12.	I did not enjoy watching the program.	* * * * * * / SA A U D SD
13.	The program was powerful.	* * * * * * / SA A U D SD
14.	The program was not exciting.	* * * * * * / SA A U D SD
15.	I felt I wasted my time watching the program.	* * * * * * / SA A U D SD
16.	I liked the fast moving program.	* * * * * * / SA A U D SD

Please check each scale expressing your judgement to the Performer, the Program (Production Quality), and the Subject Matter of the TV Program you have just seen by marking an "X" in one of the seven spaces on each scale.

SAMPLE

RED CHINA

strong	___	_X_	___	___	___	___	___ : weak
passive	___	___	___	___	___	___	_X_ : active
pleasant	___	___	___	___	___	___	_X_ : unpleasant

According to the pattern of X's given by the respondent in the sample, he sees Red China as moderately strong, extremely active and extremely unpleasant.

PERFORMER

1.	Colorful	___	___	___	___	___	___	___ Colorless
2.	Unpleasant to listen to	___	___	___	___	___	___	___ Pleasant to listen to
3.	Hard to understand	___	___	___	___	___	___	___ Easy to understand
4.	Jumpy	___	___	___	___	___	___	___ Smooth
5.	Easy to watch	___	___	___	___	___	___	___ Hard to watch
6.	Friendly	___	___	___	___	___	___	___ Hostile
7.	Controversial	___	___	___	___	___	___	___ Neutral
8.	Strong personality	___	___	___	___	___	___	___ Weak personality
9.	Graceful	___	___	___	___	___	___	___ Awkward
10.	Solemn	___	___	___	___	___	___	___ Gay
11.	Exciting	___	___	___	___	___	___	___ Dull
12.	Warm	___	___	___	___	___	___	___ Cold
13.	High-brow	___	___	___	___	___	___	___ Common sense
14.	Boring	___	___	___	___	___	___	___ Entertaining
15.	Biased	___	___	___	___	___	___	___ Unbiased
16.	Impressive	___	___	___	___	___	___	___ Unimpressive
17.	Pleasant	___	___	___	___	___	___	___ Irritating
18.	Bad	___	___	___	___	___	___	___ Good
19.	Educational	___	___	___	___	___	___	___ Entertaining
20.	Impersonal	___	___	___	___	___	___	___ Personal
21.	Fast	___	___	___	___	___	___	___ Slow
22.	I dislike her	___	___	___	___	___	___	___ I like her
23.	Informative	___	___	___	___	___	___	___ Not informative
24.	Active	___	___	___	___	___	___	___ Passive
25.	Relaxed	___	___	___	___	___	___	___ Tense
26.	Insincere	___	___	___	___	___	___	___ Sincere
27.	Snobbish	___	___	___	___	___	___	___ Folksy
28.	Confusing	___	___	___	___	___	___	___ Clear
29.	Professional	___	___	___	___	___	___	___ Amateurish

PROGRAM

1.	Boring	___	___	___	___	___	___	___ Entertaining
2.	I learned little	___	___	___	___	___	___	___ I learned a lot
3.	Easy to watch	___	___	___	___	___	___	___ Hard to watch
4.	Meaningless	___	___	___	___	___	___	___ Meaningful
5.	Bad photography	___	___	___	___	___	___	___ Good photography
6.	Active	___	___	___	___	___	___	___ Passive
7.	Money well spent	___	___	___	___	___	___	___ Money wasted
8.	Important	___	___	___	___	___	___	___ Trivial
9.	Smooth	___	___	___	___	___	___	___ Jumpy
10.	Educational	___	___	___	___	___	___	___ Entertaining
11.	Confusing	___	___	___	___	___	___	___ Clear
12.	Professional	___	___	___	___	___	___	___ Amateurish
13.	Bad	___	___	___	___	___	___	___ Good
14.	Simple	___	___	___	___	___	___	___ Complicated
15.	Slow	___	___	___	___	___	___	___ Fast
16.	Informative	___	___	___	___	___	___	___ Not Informative
17.	I like it	___	___	___	___	___	___	___ I dislike it
18.	Too many facts	___	___	___	___	___	___	___ Too few facts
19.	Exciting	___	___	___	___	___	___	___ Dull
20.	Easy to understand	___	___	___	___	___	___	___ Hard to understand
21.	Pleasant	___	___	___	___	___	___	___ Irritating
22.	Worthwhile	___	___	___	___	___	___	___ Worthless
23.	Unpleasant to watch	___	___	___	___	___	___	___ Pleasant to watch
24.	Useful for me	___	___	___	___	___	___	___ Useless for me
25.	Enthusiastic	___	___	___	___	___	___	___ Not enthusiastic
26.	Factual	___	___	___	___	___	___	___ Opinionated

SUBJECT MATTER

1.	Controversial	___:	___:	___:	___:	___:	___:	___: Neutral
2.	Meaningful	___:	___:	___:	___:	___:	___:	___: Meaningless
3.	I like it	___:	___:	___:	___:	___:	___:	___: I dislike it
4.	Easy to understand	___:	___:	___:	___:	___:	___:	___: Hard to understand
5.	Entertaining	___:	___:	___:	___:	___:	___:	___: Boring
6.	Opinionated	___:	___:	___:	___:	___:	___:	___: Factual
7.	Pleasant	___:	___:	___:	___:	___:	___:	___: Irritating
8.	Uninteresting	___:	___:	___:	___:	___:	___:	___: Interesting
9.	Complicated	___:	___:	___:	___:	___:	___:	___: Simple
10.	Dull	___:	___:	___:	___:	___:	___:	___: Exciting
11.	Good	___:	___:	___:	___:	___:	___:	___: Bad
12.	Useful for me	___:	___:	___:	___:	___:	___:	___: Useless for me
13.	Entertaining	___:	___:	___:	___:	___:	___:	___: Educational
14.	Worthwhile	___:	___:	___:	___:	___:	___:	___: Worthless

Appendix 8

RECALL QUESTIONNAIRE

Please answer the following questions by putting the right answer in the blank space provided.

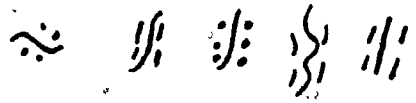
1. Chinese calligraphy and painting are _____.
   (a) not related to each other.
   (b) intimately related to each other.
   (c) sometimes related to each other.

2. Chinese calligraphy is _____.
   (a) simply a group of pictures.
   (b) a form of symbols that represents ideas.
   (c) a manner of writing.

3. The origin of Chinese characters is derived from _____.
   (a) alphabets which combines into single words.
   (b) pictorial symbols which represent objects and concepts.
   (c) a combination of ancient symbols.

4. The following script is the engravings of characters around 18th century B.C. on _____.
   (a) tortoise shells.
   (b) pieces of woods.
   (c) stones.

5. This is the word _____. 日,

6. This is the word _____. 水, 

7. This is the word _____. 羊,

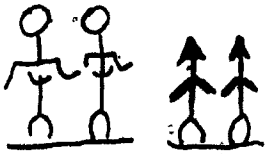
8. The examples of (5), (6), (7) ancient Chinese characters are simply pictures or images of things. They are called _____.
   (a) picture script.
   (b) ancient script.
   (c) shell and bone script.

9. Chinese characters can be classified into _____.
   (a) 6 categories.
   (b) 12 categories.
   (c) 4 categories.

10. The following words --(11), (12), (13)-- are images sketching representing an object. They are called _____.

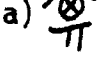
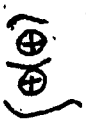
11. This is the word _____. 車,

12. This is the word--standing together _____.



(a) 立
(b) 並
(c) 眀

13. This is the word--boundary _____.

(a) 
(b)
(c) 

14. The category of Chinese characters which suggests the meaning, often by the idea of some motions is called _____.

15. This is the word 至 -- to reach or to go to.

(a)

(b)

(c)

16. One category is phonetic compounds, for example

河

(a) water
(b) river
(c) lake

Answer: _____

17. 口 - A mouth in a doorway 門 -----> 問

This is the word _____.

18. The word "multitude" is derived from a symbol composed of 3 man.

(a) 人
(b) 衆
(c) 从

Answer: _____

19. (18) is an example of category of characters called _____.

20. The category "Chuan Chu" is _____.

(a) just combinations of different symbols.
(b) representative in meaning.
(c) liked water poured from one bottle to another.

21. The word old (老) turn downward becomes (考)--the word _____.

22. The word "ling" (令) means an order has been transferred to the meanign "to give an order"; "chang" (長) means long has been transferred to the meaning "an adult". This is the category Chia Chieh which means _____.
    (a) twisted characters.
    (b) changed characters.
    (c) borrowed characters.

23. The main characteristics of Chinese characters is they are formed in an imaginery _____,
    (a) circle,
    (b) square,
    (c) shape,

24. which can fill in a variety of beautiful ways in the shapes of the _____.
    (a) strokes.
    (b) whole word.
    (c) curves.

25. The paper used for writing and painting is _____.
    (a) the same.
    (b) somewhat similar.
    (c) different.

26. The brush pen is made from animals hairs with a _____.
    (a) bamboo stem.
    (b) wooden stem.
    (c) both (a) and (b) are correct.

27. The type of ink used by the calligrapher or painter is the same. It is made in _____.
    (a) liquid form.
    (b) stick form.
    (c) jelly form.

28. The beauty of Chinese calligraphy is depended upon _____.
    (a) the kind of pen used to write it.
    (b) the content and style of the language.
    (c) its dynamic spirit and individual expressions.

29. There are five basic styles of calligraphy:
    ancient style, official style, regular style, running style, grass style.

Please indicate the style that the following calligraphy belongs to:

P.T.O.

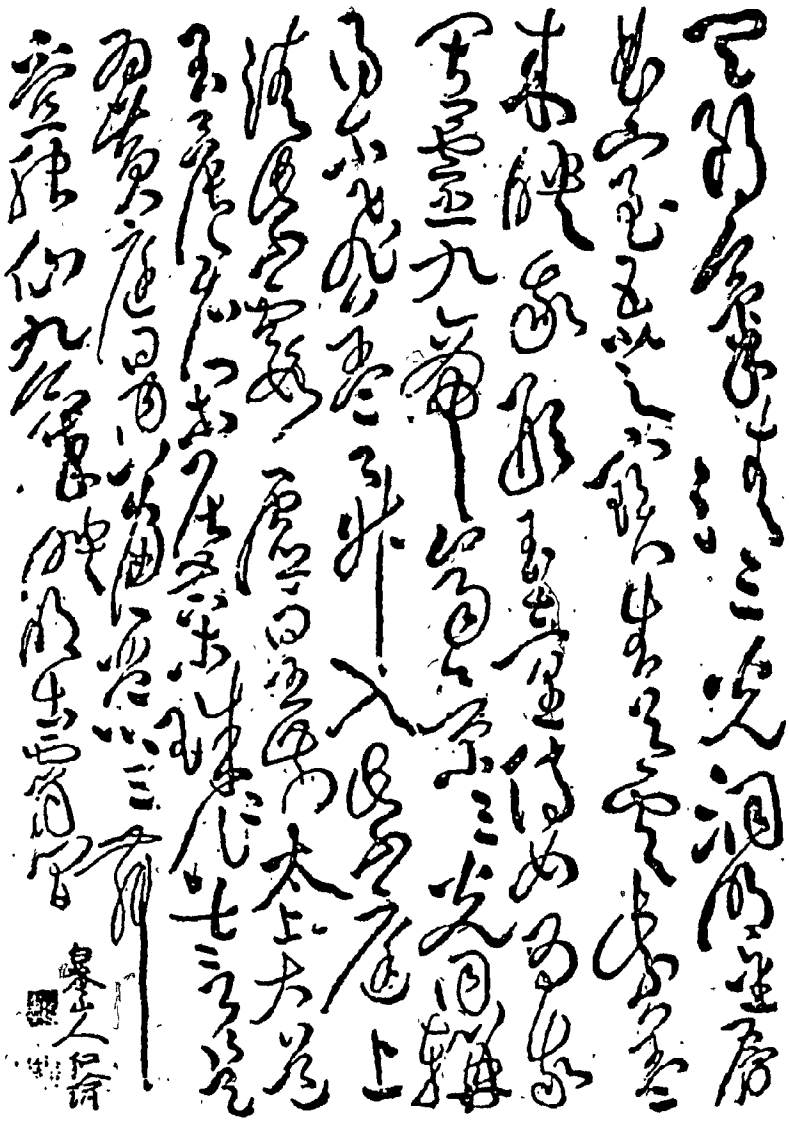
29. _____style:

異品殊葩共翠柯嫩紅拂拂
醉金荷春霏幾疊數丹陛雲
續重簪洽絳河玉鑑和鳴鸞
對舞寶枝連理錦成窠東
君造化勝前歲吟繞清香故
孫磨

30. _____ style.

士翰林院編脩乃成殤乃
殼仁鑰諸生君有兄喬平乃
奉鑰君命為之後乃喬平
刑部主事鑰恭乃人皆
人乃殼仁鑰諸生君有兄喬平乃
舉乃殼仁鑰奉君命為之後乃喬平
舉人刑部主事鑰恭乃人皆
山乃夠國學生員王宦戴恭乃思

31. _____style.



32. _____style.

33. _____style.

34. It is a custom to speak not of 'painting' a picture, but of 'writing' it. The ink of painting is also the ink of calligraphy.
    (a) multi-colour
    (b) monochrome _____ is preferred.
    (c) a combination of just a few colours

35. The following paintings (please turn to the next few pages) indicate that the beauty of painting, like calligraphy is emphasized in its _____.
    (a) brush strokes.
    (b) content.
    (c) colour.

36. Chinese calligraphy and painting is a fine art. It is not connected with the daily life of Chinese people. _____
    (a) true.
    (b) false.
    (c) not sure.

37. a) Did you know Chinese before you saw the program? _____
    b) Did you know anything abour Chinese Calligraphy before you saw the program? _____

PLATE XVIII

'Bamboo with Calligraphy' by Cheng Haieh (鄭燮), c. eighteenth century
(*Collection of Rudolph Schaeffer, San Francisco*)

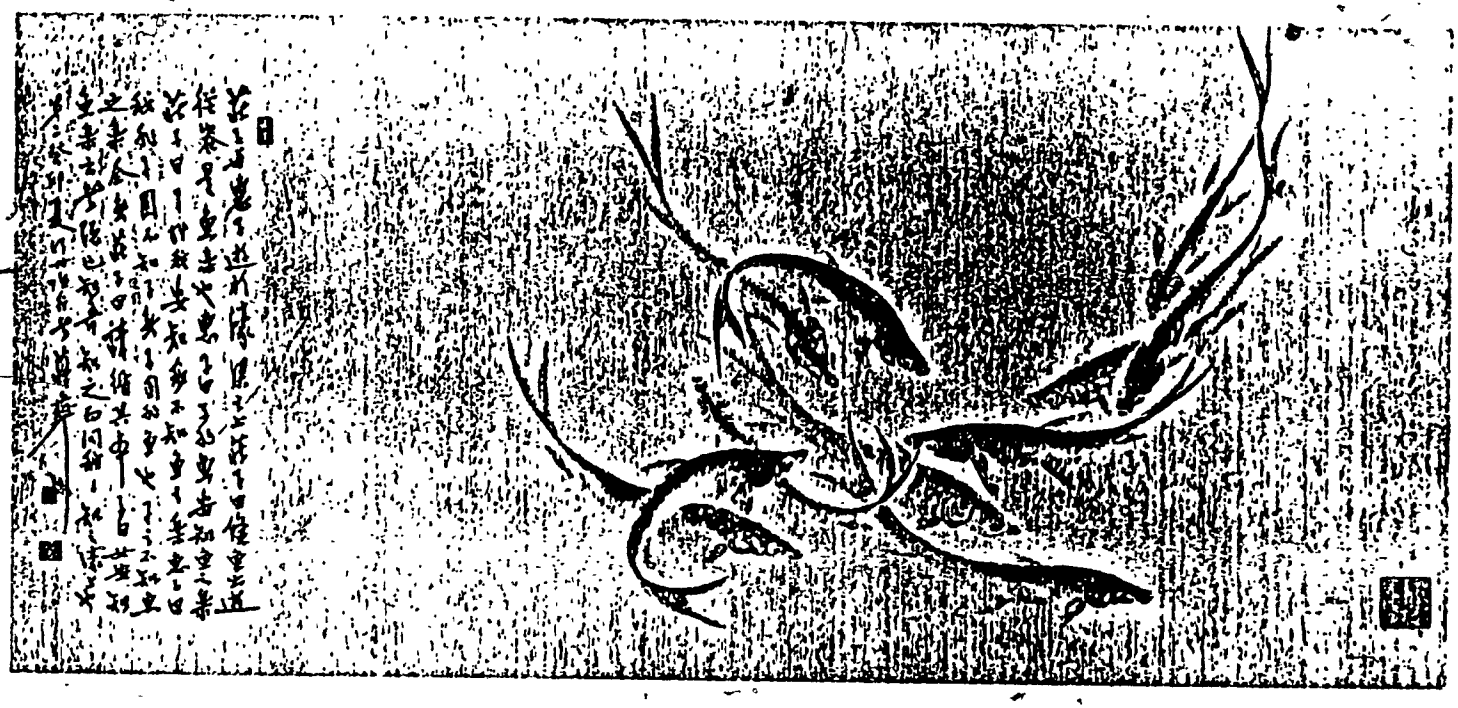


PLATE XXI

'The Happiness of the Fish' by Chiang Yee (蔣彝), 1903–
(In the collection of Utah State University)

PLATE XIX.

'Winter Plum Flowers' by Wu Ch'ang-shih (吳昌碩), 1844–1927
(*Private collection, Shanghai*)

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