

AN ABSTRACT OF THE THESIS OF

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TO THE VISUAL MOTOR PERFORMANCE OF COLLEGE STUDENTS

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The purpose of the study was to compare the visual-motor performance of college students who reported ingestion of certain drugs with those college students who reported no drug ingestion. The study drugs included the following drugs or groups of drugs: tobacco, alcohol, marijuana, LSD, mescaline, barbiturates, and amphetamines.

A total of 201 students from Chico State College and Pacific Union College volunteered as subjects to participate in the study, with 151 subjects in the Experimental Group (drug users) and 50 in the Control Group (non-drug users). A confidential questionnaire was given concerning the subject's drug use involving frequency and length of time. The Bender-Gestalt Test was administered to determine visual-motor performance. The Bender-Gestalt Tests were evaluated and rated on a scale of performance by three highly-qualified psychologists.

One tailed t-tests were employed to test six hypotheses that significant differences would occur in favor of the Control Group (non-drug users) over the Experimental Group (drug users) on the

Bender-Gestalt Test in all drug or combination of drug usage. The .05 level of significance was chosen as the critical region of rejection.

The findings indicated that there was a significant difference in the visual-motor performance in favor of the Control Group (non-drug users) over the entire Experimental Groups (drug users) and also in the "Tobacco, Alcohol, Marijuana, Barbiturate, and Amphetamine Group". It was determined that there was no significant difference in visual-motor performance between the non-drug users and other single or multiple drug groups in the study. However, in all cases the mean difference between the groups was consistently in the direction of the non-drug users. Therefore, the non-drug users consistently performed better on the visual-motor performance test than the drug users in all categories.

It is recommended that further investigation into the visual-motor performance of drug users be continued for reasons of personal health, public health and safety.

**A Study of The Relationship of The Use of
Various Drugs to the Visual-Motor Performance
of College Students**

by

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A STUDY OF THE RELATIONSHIP OF THE USE OF VARIOUS DRUGS TO THE VISUAL-MOTOR PERFORMANCE OF COLLEGE STUDENTS

CHAPTER I

INTRODUCTION

The use of particular drugs by college students has increased in the past four years (18). These drugs include marijuana, LSD, and other hallucinogens, barbituates, and amphetamines, as well as the traditional drug alcohol. There are reported incidences in the literature of psychotic reactions; the development of schizophrenia and personality changes, spontaneous recurrences, and chronic brain syndrome related to the use of particular drugs (4, 5, 9, 12, 12, 20, 24, 28, 29, 32). It has been established by Knisely at the Medical School of the University of South Carolina as reported by Everett (8) that with the amount of alcohol necessary to make one feel "high" there is a "sludge" action in the capillaries that prevents the transfer of oxygen to the brain cells that surround the capillaries. The implication being that small numbers of brain cells are damaged or destroyed as a result of this "sludging" process. Smith (25) has reported incidences of spontaneous recurrences from LSD and other hallucinogens. Ungerleider (31) has treated many users of LSD for psychotic reactions to the drug. Keeler (12) reported "flashbacks" from the use of marijuana. Smith (27) has stated that toxic reactions to marijuana include paranoia, psychotic breaks, short term memory loss, confusional states, and a variety of perceptual alterations. Smith (26) also reported that psychosis results from methamphetamine

abuse and Ehrich (7) in histological examinations of brain tissues reported cellular deterioration. Lemere (15) referred to pathological evidence of permanent organic brain damage due to methamphetamine abuse. A review of the literature indicated that there were no studies investigating the relationship of tobacco use and visual-motor performance, however, the researcher felt that the relationship of the use of tobacco to visual-motor performance should be investigated because of the presence of toxic compounds that could have a relationship to visual-motor performance.

In citing the various psychological dysfunctional aspects induced by particular drug ingestion, the researcher was concerned that there may be a relationship between visual-motor impairment and experiences of psychotic reactions, perceptual alterations, cellular changes or destruction, and spontaneous recurrences. There may be a gradual deterioration of visual-motor performance that is not perceived by the individual. Therefore, it seemed appropriate to the researcher that an investigation of the relationship of drug ingestion to visual-motor performance be conducted.

The Bender-Gestalt Test (3) has the ability to illustrate gestalt function in the diagnosis of various brain disorders, the major psychoses, and psychoneuroses. It may also be employed to determine organic damage. The American Psychiatric Association recommends it as a very reliable instrument for the testing of visual-motor performance.

Purpose of the Study

The purpose of the study was to compare the visual-motor performance of college students who reported ingestion of certain drugs with the visual-motor performance of college students who reported no drug ingestion.

Hypotheses

The following hypotheses were tested in this study:

- Hypothesis I: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group (non-drug users) over the Experimental Group (drug users).
- Hypothesis II: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group (non-drug users) over the "Alcohol Group". (Those students who used alcohol only.)
- Hypothesis III: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group (non-drug users) over the "Tobacco and Alcohol Group". (Those students who used tobacco and alcohol only.)
- Hypothesis IV: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Tobacco, Alcohol, and Marijuana Group". (Those students who used tobacco, alcohol, and marijuana only.)
- Hypothesis V: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control

Group over the "Tobacco, Alcohol, Marijuana, and Amphetamine Group." (Those students who used tobacco, alcohol, marijuana, and amphetamines only.)

Hypothesis VI: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Tobacco, Alcohol, Marijuana, Barbituates, and Amphetamine Group." (Those students who used the afore mentioned drugs only.)

Hypothesis VII: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the LSD and other Hallucinogens Group." (Those students who used LSD and other hallucinogens only.)

Importance of the Study

The study is important to the field of health science for the following reasons:

1. The results will contribute to knowledge concerning the relationship of the study drugs on visual-motor performance. This may have important implications for safety, hand-eye coordination, and various mental processes.
2. The results could provide evidence that would contribute to preventative drug education.
3. The results could act as a deterrent to those contemplating the use of the study drugs.

4. The results could provide evidence to those using the study drugs of the potential visual-motor impairment, thus serving as a basis for discontinuing their use of drugs.

Limitations of the Study

1. The Visual Motor Gestalt Test is considered to be a valid instrument by the American Psychiatric Association and will act as a valid screening test for visual motor impairment, however, the expertise level of the evaluator may be a limiting factor.
2. The data collected from the sample concerning the history of drug use may not be reliable.
3. The sample only involved college population, other population groups may have provided different results.
4. The sample was not a random selection so there may be a factor in the reasons why the students of Chico State College elected to enroll in a drug abuse course.
5. The sample taken at Pacific Union College was primarily of a particular religious faith which could have influenced the results.

Definition of Terms

Acute Toxic Reaction: An adverse psychological reaction to a drug that is temporary in duration, (panic reaction-anxiety, paranoia) commonly referred to as the "bummer".

Bender-Gestalt Test: A test of visual-motor ability for the diagnosis of various brain disorders, the major psychoses or psychoneuroses.

Chronic Toxic Reactions: An adverse psychological or physiological reaction to a drug that causes a dysfunction of sustained duration.

Hallucinogens: A classification of drugs that induce hallucinations and profound alterations in sensory perception of the environment (i.e., LSD, mescaline, DMT, and other drugs).

LSD: d-lysergic acid diethylamide tartrate.

Paranoid: Individual who has fixed, systemized delusions, is suspicious, has a persecution complex and is resentful, bitter, and a megalomaniac (delusions of grandeur).

Psychoactive Drug: A drug that changes mental processes and effects mood alterations (alcohol, marijuana, tranquilizer).

Psychotogenic: A drug that induces a mental state similar to psychosis.

Psychotomimetic Drug: A drug that will induce mental states similar to psychosis (LSD, mescaline, DMT, and other drugs).

Spontaneous Recurrences: The hallucinatory experience that returns involuntarily after previously using an hallucinogenic drug.

CHAPTER II

RELATED LITERATURE

The researcher will investigate the literature that primarily deals with acute and chronic toxic psychological reactions to the study drugs. It appears logical that the discussion of psychological dysfunction would contribute most to a relationship of visual motor performance.

It seems most appropriate that the discussion begin with one of the most potent of the hallucinogens, d-lysergic acid diethylamide tartrate. LSD is a semi-synthetic compound, the lysergic acid portion of which is a natural product of the ergot fungus Claviceps purpurea, which grows on rye and other grains and on certain other plants. The toxicity of LSD has some significant implications for man. Serious complications arising from the use of LSD cannot be considered infrequent. According to Giarman (10), severe reactions to LSD may be classified into three groups: (1) acute reactions; (2) recurrent reactions; and, (3) prolonged (chronic) effects. Smart and Bateman (22) reviewed 225 cases of unfavorable reactions to LSD. Among this group of patients there were 124 cases of prolonged psychotic reactions (mental illness of long duration), 11 spontaneous recurrences (flashbacks), 19 attempted suicides, 11 successful suicides and 63 nonpsychotic reactions such as panic, confusion, depressing antisocial and psychopathic behavior. Ungerleider and Fisher (30), two physicians from the Department of Psychiatry of the University of California at Los Angeles Medical Center, reported that late in the summer of 1966 the medical profession became aware of the fact that suddenly there were increasing numbers of persons

arriving at psychiatric clinics and medical emergency facilities with psychotic symptoms following the use of LSD. Kleber (13) conducted a study at a large northeastern university in which the subjects consisted of 21 male students (17 undergraduates and 4 graduates). Nine of these had consulted the mental hygiene division at some time during their college career for problems not directly related to drug use. Two had come directly because of reactions to their drug use, and 10 had no formal contact with the clinic. The composite subject was from a prosperous middle to upper middle class background who had prepared for college at a private school, was doing fairly well academically, and was taking part in campus activities. Twenty of the 21 students had taken mescaline in the form of peyote buttons. One had taken morning glory seeds. One had taken LSD in addition to peyote and nine had also used marijuana. There was a combined total of over 100 experiences with the hallucinogenic drugs for the 21 subjects (excluding marijuana). Two subjects had unpleasant reactions; they were frightened, panic stricken, and afraid they would never come out from under the drug. Kleber (13) reported that three other subjects had mixed reactions with prolonged elation and prolonged fright both occurring in the course of the experience. One of these subjects could not move for a while and wondered if he had been slipped curare instead of mescaline. Another accused his friends of making homosexual advances and had to be forcibly restrained from fighting with them. The third crouched in fear for an hour beside a building listening to footsteps coming toward him but never reaching him.

Serious injury might have occurred on three occasions described by the subjects. Two of these involved crossing streets. The students saw cars approaching and were aware that they could get out of the way but did not desire to do so. In both instances they were pulled to safety by friends. In a third case a subject felt he was immortal and attempted to stab himself in the heart to prove it. His friends were able to take the scissors from him.

Five students, according to Kleber (13), had prolonged adverse reactions. These included one case of acute anxiety, one case of persistent hallucinosis, two cases of aggravation of previously existing psychiatric difficulties, and one case of psychological habituation with abandonment of social responsibilities. Twenty-four percent of the students were judged to have adverse effects. Included in these were anxiety reactions, persistent hallucinosis, worsening of psychiatric symptoms, and psychological habituation.

A psychiatrist at the Tufts University School of Medicine, Dr. Welpton (32), observed ten male chronic users of LSD who volunteered to participate in his research. The range of use varied from six months to five years. Two of the subjects had used LSD about 100 times, however, the average was 38 times. One of the subjects had initially taken LSD under medical supervision experimentally, but the other nine subjects had been started by friends who had obtained the drug from illicit sources. All of the subjects had experienced panic reactions, paranoid feelings, and prolonged toxic reactions such as spontaneous recurrences. Eight of the ten subjects were habitual drug users and had used a variety of other hallucinogens. All the subjects had used marijuana and eight

had extensive experiences with amphetamines. The subjects viewed the use of alcohol with contempt and described the effects as unpleasant. Two of the subjects had tried heroin, but did not continue because they became ill from the drug.

A research psychiatrist, Dr. Denson (6) of the Saskatchewan Department of Public Health and University of Saskatchewan Medical School reports that his review of the medical literature shows that the harmful effects of LSD include suicide, attempted suicide, epilepsy, schizophrenic reactions, severe depressions, anxiety, paranoid psychosis, and aggravation of previous mental illness.

McGlothlin, Cohen and McGlothlin (16), of the Department of Psychology at the University of South Carolina report a study with 72 subjects. They were tested for anxiety, attitude, values, personality, aesthetic sensitivity, and creativity. Twenty-four subjects were given 20 milligrams of amphetamines, 24 others were given 200 micrograms of LSD and the remaining 24 subjects were given 25 micrograms of LSD. There were three drug sessions, after which the subjects were tested in two weeks and again after six months. The changes noted were quite small. There was some evidence of a more introspective and passive orientation, but, no evidence of enhanced performance in the art tests or creativity. Fifty-eight percent of the experimental group reports that they still felt some effects of the LSD after six months, but this was not measured by the psychological tests used in the study, if changes had occurred.

It is significant to note that the effects are variable depending upon the setting in which the drug is used. Nowlis (18) states that it is the psychological effects of LSD which are often profound and that it is

important to point out that there are no uniform effects in all individuals. Ungerleider (31) has treated many young patients who have used LSD. One patient in particular has continued to hallucinate although it has been several months since his bad LSD trip.

The American Medical Association reports that a variety of complications have been reported in the medical literature, but three appear to be most prevalent:

- 1) The reappearance of the hallucinated, disorganized state without further ingestion of an hallucinogen is one type of complication. This has occurred in subjects within two months after a series of relatively few exposures. It also has occurred more than 12 months after a series of more than 200 exposures that had extended over a period of years.
- 2) Panic is a frequent complication. Hospitalization may be sought by the user or his companion, neither of whom can cope with the sense of terror.
- 3) A third relatively common complication is the development of an extended period of psychosis, sometimes after a single exposure, and usually involving a person who was prepsychotic or had a history of current or previous psychosis. There is no available evidence to suggest that the massive, disorganizing experience resulting from the taking of hallucinogens has been therapeutic for any psychotic patient. Quite the contrary! One study describes three patients

hospitalized for extended psychosis after single injections of LSD. All previously were schizophrenics who attempted to gain 'new understanding of themselves' through the drug (2, p. 47).

One of the most serious considerations concerning the ingestion of hallucinogens is the spontaneous recurrence or "flashback". This psychological phenomenon, according to Smith (25), does actually occur and is not uncommon following the use of drugs like LSD, mescaline, psilocybin, DMT, etc. The incidence of "flashback" will vary among individuals, but may occur after one experience with a hallucinogen but there is a higher incidence after numerous experiences with these types of drugs.

The spontaneous recurrence can last for only seconds or as long as several hours. They may occur many times daily and in any situation. Their highest incidence, however, seems to be just prior to sleep, while an individual is driving, or when under the influence of another psychoactive drug like marijuana, alcohol, amphetamines or tranquilizers or while in periods of unusual emotional stress. It is possible, and without question, that a spontaneous recurrence can occur when a person is under no apparent stresses and is in a normal functioning state (24).

Dr. David Smith (24) describes three distinct types of spontaneous recurrences. The first and most common being the perceptual. In this psychological dysfunction the individual has hallucinations, both visual and auditory. He could also see flashes of light or color in the peripheral vision. The second type of spontaneous recurrence is that of the somatic-category. It may resemble a psychosomatic

manifestation. Smith (24) reports that an individual had come to the Haight Ashbury Clinic for medical assistance complaining of a recurrence of a "bummer" he had experienced some six months earlier while on an LSD trip. The patient described his problem as a progressive numbness beginning in his toes, then legs, then moving to the genitals. This threw him into a panic reaction while under the influence of LSD. Some six months later he again experienced the same somatic manifestations a few times without having used LSD. He was quite disturbed mentally about his condition and displayed a high anxiety level. The third type of spontaneous recurrence is the emotional. According to Smith (24) this is the most serious. The individual drops sharply into a severe state of psychological depression from which he may manifest marked suicidal tendencies. In this depressed state the person sees little hope of moving up into a normal range of psychological well-being thus becoming overwhelmed by the depression resulting in attempts at suicide.

The literature concerning marijuana will include only that which discusses the acute and chronic toxic psychological reactions to the drug.

Toxic reactions to marijuana may be considered as any effects that result in physical or psychological damage, that are subjectively experienced as unpleasant by the user, or that produce significant interference with adequate social functioning (27, p. 65).

The researcher is concerned with only the psychological toxic reactions with a view toward the relationship to psychological dysfunction.

It is unproven that any actual physical damage resulting from the use of marijuana exists. There are claims that chronic use of cannabis in India has resulted in brain damage, however, it is not well

established since nutritional deficiencies is a possible causative factor along with the chronic use of the drug (27).

Some of the more serious acute toxic effects which may occur with marijuana intoxication are

Confusional states, a variety of perceptual alterations, short term memory loss, disorientation, and paranoia. Anxiety reactions, psychotic breaks, and overdose reactions, are the major acute toxic reactions (27, p. 66).

They can be serious enough to cause the individual to seek medical assistance.

The researcher has reviewed previously the fact that potent hallucinogens cause spontaneous recurrence in some users. Keeler, et al., (12) have reported that marijuana has caused "flashbacks" in four subjects. Spontaneous recurrences are not considered within the normal psychological functioning and are considered to be a toxic reaction. Keeler (12) states, "spontaneous recurrence of drug effect may be relatively common".

The chronic heavy marijuana user can develop an amotivational syndrome. There is a loss of desire to work, to face challenges, and to compete. The individual's primary interest may center around his compulsive use of marijuana. He may drop out of school or leave work, ignore personal hygiene, experience a loss of sex drive, and avoid most social interaction (27, p. 75).

In reviewing the literature concerned with amphetamine abuse and toxic psychological reactions there appears to be considerable evidence of dysfunction. According to the American Medical Association

amphetamines produce an acute and florid paranoid psychosis in some persons. The syndrome is characterized by a paranoid state with auditory and/or visual hallucinations (1, p. 1023).

The acute psychiatric problems that result from high dose amphetamine use include four categories: the acute anxiety reaction; the psychotic reaction; the exhaustion reaction and the withdrawal reaction (26). The acute anxiety reaction often comes as a result of amphetamine use, especially during a "speed run". The "amphetamine psychosis" almost always follows prolonged high dose use. The person that uses amphetamines over a period of time will demonstrate particular personality changes that take on irritability, anxiety, and paranoid manifestations. The exhaustion syndrome comes as a result of prolonged use of amphetamines as a result of a "speed run" leaving the individual exhausted, fatigued, and severely depressed. If prolonged high dosage levels of methamphetamines have been used, there can be produced a moderate abstinence syndrome upon cessation of the drug.

Another psychological aspect of amphetamine use is the development of insomnia. Sleep deprivation or perhaps the absence of dreaming, contributes to the diminishing of performance, hallucinations and misperception according to Pasnau (19).

Ehrich et al., (7) report that histologic examinations of the brain tissues of monkeys, dogs, and other animals has at times shown some cellular deterioration. Lemere (15) refers to pathological evidence of permanent organic brain damage due to methamphetamines abuse. Kramer (14, p. 1) states that "in two of six deaths due to amphetamine overdose reported by the San Francisco Coroner petechial hemorrhages were noted in brain tissue". It is quite obvious that the use of amphetamines over a prolonged period of time can have severe psychological implications as to dysfunction in relation to visual motor performance.

It is a well established fact that alcoholics suffer serious brain damage, but most physicians have not considered cellular damage in the light of the moderate drinker (8). Psychological and physical dysfunction has been viewed by most medical authorities as the result of heavy chronic drinking. Everett (8) reports that at the Medical University of South Carolina, they have recently discovered that brain damage is not merely an effect of chronic drinking, but occurs at low dosage levels. Knisely's research indicates that the circulating red blood cells become agglutinated when alcohol is ingested and he refers to this as the "sludging phenomenon". When the red cells group together in the capillary bed the surrounding cells are deprived of oxygen. Even subjects with as low as .025 percent showed agglutination of blood cells (8, p. 8).

As sludge resists passage of the blood through the capillaries, anoxia (absence of oxygen) occurs in nearby tissues. Ultimately, as the level of alcohol increases, many small vessels become plugged, and blood flow through them stops entirely. Deprived of oxygen, they stop their normal functioning. If complete oxygen deprivation lasts for three minutes or more, they are seriously damaged. If it persists for fifteen or twenty minutes, the damage is permanent - the nerve cell or neuron, dies (8, p. 6).

Nervous tissue, once destroyed, is not reproduced. The continued use of alcohol could have serious implications concerning psychological processes over a period of time even with low dosage levels.

CHAPTER III

PROCEDURE

A total of 201 students volunteered from Chico State College and Pacific Union College for this study. The subjects at Chico State College came from two sections of Health Science 220 (Drug Abuse) and one section of Health Science 10, a freshman health class. The subjects at Pacific Union College volunteered from a random selection of classes of wide variety such as education, biology, sociology, and psychology.

Chico State College, located in Chico, California, is a typical campus in that it has a normal cross section of students primarily of the middle class. Pacific Union College, located in Angwin, California, is a private college of the Seventh Day Adventist religion. This campus was selected as part of the study for purposes of obtaining a larger than normal sampling of non-drug users for the Control Group.

The subjects were given a confidential questionnaire (Appendix B) which indicated sex, age, year in college, particular drug use, frequency of use, and length of time of use. The subjects drew a confidential number by a chance selection from a box passed among them and were also provided with a #2 pencil. The subjects were then instructed to write the number at the upper left hand corner of the answer sheet (Appendix C) of the confidential questionnaire. The significance of being candid in completing the confidential questionnaire was explained as well as emphasizing the fact that anonymity was completely insured by the procedures of the study. It was indicated to the researcher by the subjects that they would fully cooperate concerning their answers on the

confidential questionnaire. The subjects were instructed to complete the questionnaire.

Following the completion of the questionnaire, the subjects were then given blank sheets of 8 ½ inch by 11 inch white paper. They were instructed to place their confidential number on the blank sheets to insure that it could be matched with the questionnaire answer sheet.

The subjects were then provided with the Bender-Gestalt Test. They were instructed to copy the symbols as accurately as possible on the sheet of paper, just as they perceived them on the cards. They were told that they could take as long as they wish to complete the test and that they may erase if they so desired. The subjects were instructed to bring the study materials to the researcher upon completion of the test.

A Control Group was formed from both the Chico State College and Pacific Union College samples of those students who had never used any of the study drugs (Appendix D). An Experimental Group was formed from both samples by establishing the criteria of having used any drug on the questionnaire (Appendix E).

The results of the performances on the Bender-Gestalt Tests (Appendix F and G) were evaluated by a committee of three psychologists with expertise concerning the Bender-Gestalt Test. The performances were ranked on a scale of 0 through 4 as follows:

- 0 - severe impairment
- 1 - moderate impairment
- 2 - questionable as to impairment
- 3 - probably no impairment
- 4 - clear evidence of no impairment

The psychologists involved in the interpretation of the Bender-Gestalt Tests were:

1. Dr. Arnold Oettel, Professor of Psychology,
Chico State College, Chico, California.
2. Dr. Kent Bennington, Professor of Psychology,
University of California, Davis, California.
3. Dr. Leon Addis, Assistant Professor of Psychology,
Sacramento State College and Counseling Psychologist,
California Youth Authority, Sacramento, California.

The role of the psychologists was to interpret and rate the Bender Gestalt Test performance of each of the subjects on the scale previously described. Each psychologist interpreted and rated the subjects performance independently and without knowledge of the others' ratings. They did not know which subjects were Control and which were Experimental. These ratings were recorded by the researcher and a mean was calculated for the Experimental Groups as well as for the Control Group.

The psychologists were chosen through recommendations from within their particular educational institution. The selection process was accomplished by contacting the psychology departments at the three institutions mentioned above and soliciting their recommendation for the most qualified faculty member in the department based upon experience and qualification to interpret the Bender-Gestalt Tests.

CHAPTER IV

ANALYSIS OF DATA

The purpose of the study was to compare the visual-motor performance of college students who reported ingestion of certain drugs with those college students who reported no drug ingestion.

The Experimental Group (drug users) included 68 males and 83 females for a total of 151 subjects. The Control group (non-drug users) included ten (10) males and 40 females for a total of 50 subjects. The mean age of the Experimental Group males was 25 years while the Experimental Group female mean age was 22.5 years. The Control Group mean age was 20.6 years for males and 22.2 years for the females.

The researcher investigated the particular drug or combination of drugs used by the subjects (Table 1).

TABLE 1. Number of Subjects Having Used Only a Particular Drug or Combination of Drugs.

Drug or Drug Group	N	Drug or Drug Group	N
Tobacco	4	Barbiturates	1
Tobacco and Alcohol	26	Amphetamines	1
Alcohol	21	LSD	0
Marijuana	0	Tobacco, Alcohol, Marijuana and Amphetamines	15
Alcohol and Marijuana	4		
Tobacco, Alcohol, and Marijuana	20	Tobacco, Alcohol, Marijuana, Amphetamines, and Barbiturates	9
LSD, Marijuana, and Mescaline	0		

It was interesting to note that there were no subjects in the category that had used only marijuana or only LSD. Nor had any subjects used only the combination LSD, marijuana, and mescaline. There were four (4) subjects that had used only tobacco and four (4) that had used the combination of alcohol and marijuana only. One subject had used barbiturates solely and only one had used only amphetamines. This precluded an analysis of those single or multiple drug groups. Hypothesis VII was therefore not tested. The most often used combination was tobacco and alcohol with 28 subjects having used them. The next two most frequently used categories were alcohol only, and tobacco, alcohol and marijuana as a combination with 26 and 21 subjects respectively limiting their drug usage to these drugs.

In analyzing the data, the mean, the difference between the mean and the standard deviation were computed for the Experimental and Control Groups. One tailed t-tests at the .05 level of significance were chosen to test the hypotheses. It was necessary to pool the variance in the t-ratio analysis due to the wide spread of the number of subjects in the Experimental and Control Groups. The t-ratio formula used in analyzing the data:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

This formula was taken from the following publication: Standard Mathematical Tables, Chemical Rubber Publication, Cleveland, Ohio, Twelfth Edition, 1962. p. 251.

The psychologists rated the performance by the students on the Bender-Gestalt Test on a scale ranging from 0 to 4. (0=severe impairment; 1=moderate impairment; 2=questionable as to impairment; 3=probably no impairment; 4=clear evidence of no impairment.) The mean performance

was determined by taking the average of the three ratings for the Experimental Groups (Appendix F) and for the Control Groups (Appendix G).

Hypothesis I: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the Experimental Group. (Table II)

TABLE II. Test Means, Difference Between the Means, Standard Deviations, and t-Ratio for the Experimental Group and the Control Group.

BENDER-GESTALT TEST		
Group	Experimental	Control
N	151	50
Mean	2.6159	2.8467
$\bar{X}_C - \bar{X}_E$.2308	
SD	.8460	.7102
t-.95	1.650	*significant at the .05 level
t	1.7530*	

When analyzing the data to test the hypothesis the difference between the means was computed to be .2308 in favor of the Control Group. In order for the difference between the means to be significant at the .05 level, it is necessary that the t-value be 1.650 or above. The t-value was computed to be 1.7540 indicating a significant difference. This means that the group of non-drug users performed significantly better on the visual-motor performance test than the total group of drug users.

Hypothesis II: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Alcohol Group." (Table III)

TABLE III. Test Means, Difference Between the Means, Standard Deviations, and t-Ratio for the "Alcohol Group" and Control Group.

BENDER-GESTALT TEST		
Group	Alcohol	Control
N	21	50
Mean	2.6032	2.8467
$\bar{X}_C - \bar{X}_E$.2435	
SD	.8795	.7102
t-.95	1.650	*Not significant at .05 level
t	1.2270*	

The analysis of the data concerning the "Alcohol Group" and the Control Group revealed that the difference between the means was .2435 in the direction of the Control Group (non-drug users). The t-value was computed at 1.2270 which is not large enough to be significant. Therefore, Hypothesis II is rejected. However, the direction of the difference which did exist between the groups revealed that there is a better performance in the non-drug group than in the "Alcohol Group," even though it was not great enough to be significant.

Hypothesis III: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Tobacco and Alcohol Group." (Table IV)

TABLE IV. Test Means, Difference Between the Means, Standard Deviations, and t-Ratio for the "Tobacco and Alcohol Group" and the Control Group.

BENDER-GESTALT TEST		
Group	Tobacco and Alcohol	Control
N	26	50
Mean	2.6923	2.8467
$\bar{X}_C - \bar{X}_E$.1544	
SD	.8533	.7102
t-.95	1.650	*Not significant at the .05 level
t	.8383*	

In analyzing the data for the "Tobacco and Alcohol Group" as compared to the Control Group the difference between the means was computed at .1544. The t-value necessary at the .05 level for the determination of the significance is 1.65. The t-value computed to be .8383. The analysis of the data revealed that there is no significant difference, therefore, Hypothesis III is rejected. However, the non-drug group performed better than the "Tobacco and Alcohol Group" but not enough to be significant.

Hypothesis IV: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Tobacco, Alcohol, and Marijuana Group". (Table V)

TABLE V. Test Means, Difference Between the Means, Standard Deviations, and t-Ratio for the "Tobacco, Alcohol, and Marijuana Group" and the Control Group.

BENDER-GESTALT TEST		
Group	Tobacco, Alcohol, Marijuana	Control
N	20	50
Mean	2.7500	2.8467
$\bar{X}_C - \bar{X}_E$.0967	
SD	.7638	.7102
t-.95	1.650	*Not significant at the .05 level
t	.0536*	

The difference between the means of the "Tobacco, Alcohol, and Marijuana Group" and the Control Group is .0967. The t-value necessary at the .05 level to be significant must be 1.650. The t-value was computed at .0536 which is not significant, therefore, Hypothesis IV is rejected. However, the performance of the non-drug group was better but it was not statistically significant.

Hypothesis V: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Tobacco, Alcohol, Marijuana, and Amphetamine Group." (Table VI)

TABLE VI. Test Means, Difference Between the Means, Standard Deviations, and t-Ratio for the "Tobacco, Alcohol, Marijuana, Amphetamines Group" and the Control Group.

BENDER-GESTALT TEST		
Group	Tobacco, Alcohol Marijuana, Amphetamines	Control
N	15	50
Mean	2.5556	2.8467
$\bar{X}_C - \bar{X}_E$.2911	
SD	.9143	.7102
t-.95	1.650	*Not significant at the .05 level
t	1.3005*	

The difference between the means for the "Tobacco, Alcohol, Marijuana and Amphetamine Group" and the Control Group was computed to be .2911 in the direction of the Control Group. The t-value was computed to be 1.3005 which is not great enough to meet the necessary t-value of 1.650. Therefore, Hypothesis V is rejected. However, the non-drug group performed better on the visual-motor performance test than the "Tobacco, Alcohol, Marijuana and Amphetamine Group" but not enough to be statistically significant.

Hypothesis VI: There is a significant difference in performance on the Bender-Gestalt Test in favor of the Control Group over the "Tobacco, Alcohol, Marijuana, Barbiturate and Amphetamine Group." (Table VII)

TABLE VII. Test Means, Difference Between the Means, Standard Deviations, and t-Ratio for the "Tobacco, Alcohol, Marijuana, Barbiturate, Amphetamine Group" and the Control Group.

BENDER-GESTALT TEST		
Group	Tobacco, Alcohol, Marijuana Barbiturates, Amphetamine	Control
N	9	50
Mean	2.3333	2.8467
$\bar{X}_C - \bar{X}_E$.5133	
SD	.9428	.7102
t-.95	1.650	*significant at the .05 level
t	1.8973*	

In analyzing the data for the "Tobacco, Alcohol, Marijuana, Barbiturate, and Amphetamine Group" in comparison to the Control Group (non-drug) the difference between the means of these groups was computed to be .5133 in the direction of the Control or non-drug Group. The t-value necessary for significance was 1.650. The t-value computed was 1.8973 which is greater, therefore, Hypothesis VI is accepted. This means that the non-drug group performed significantly better on the visual-motor performance test than the group that had used tobacco, alcohol, marijuana, barbiturates, and amphetamines.

The frequencies and length of time of specific drug usage for females are illustrated in Table VII and Table IX, and for males in Table X and Table XI.

TABLE VIII. Frequency of Drug Use Among Female Subjects (83)

Frequency		T	A	M	B	Am	Me	L	H	O	
Never	F	7	1	10	17	13	20	20	20	18	126
	S	4	0	4	4	3	4	4	4	4	31
	J	3	0	5	4	5	7	7	8	7	46
	Sr	8	0	11	18	18	22	23	25	20	145
	G	8	3	11	17	17	24	25	26	23	154
Total		30	4	41	60	56	77	79	83	72	0
Once or Twice	F	5	3	1	2	3	0	0	0	1	15
	S	0	2	0	0	1	0	0	0	0	3
	J	0	2	1	2	1	0	0	0	0	6
	Sr	4	5	1	3	3	1	2	0	1	20
	G	4	3	2	3	2	0	1	0	2	17
Total		13	15	5	10	10	1	3	0	4	0
3 to 9 Times	F	2	3	5	0	2	0	0	0	0	12
	S	0	1	0	0	0	0	0	0	0	1
	J	0	0	0	0	1	1	1	0	1	4
	Sr	3	1	5	2	1	2	0	0	0	14
	G	1	0	5	4	1	2	0	0	1	14
Total		6	5	15	6	5	5	1	0	2	0
10 to 49 Times	F	1	9	2	0	0	0	0	0	0	12
	S	0	1	0	0	0	0	0	0	0	1
	J	1	2	0	1	1	0	0	0	0	5
	Sr	2	8	5	2	3	0	0	0	2	22
	G	0	6	5	2	4	0	0	0	0	17
Total		4	26	12	5	8	0	0	0	2	0
50 or More Times	F	5	4	2	1	2	0	0	0	1	15
	S	0	0	0	0	0	0	0	0	0	0
	J	4	4	2	1	0	0	0	0	0	11
	Sr	8	11	3	0	0	0	0	0	2	24
	G	13	14	3	0	2	0	0	0	0	32
Total		30	33	10	2	4	0	0	0	3	0

KEY: T=Tobacco; A=Alcohol; M=Marijuana; B=Barbiturates; Am=Amphetamines; Me=Mescaline; L=LSD; H=Heroin
O=Other

TABLE IX. Length of Time of Drug Use Among Female Subjects (83)

Length of Time		T	A	M	B	Am	Me	L	H	O
Less than 6 Months	F	9	2	3	0	3	0	0	0	2
	S	0	1	0	0	1	0	0	0	0
	J	0	2	0	1	0	0	0	0	1
	Sr	8	6	2	5	4	1	2	0	2
	G	5	3	4	6	6	1	1	0	2
Total		22	14	9	11	14	2	3	0	7
6 Months to 1 Year	F	2	5	4	0	1	0	0	0	0
	S	0	1	0	0	0	0	0	0	0
	J	3	0	1	2	0	1	1	0	0
	Sr	4	0	3	1	2	0	0	0	2
	G	1	0	3	0	1	0	0	0	0
Total		10	6	11	3	4	1	1	0	2
1-2 Years	F	2	6	2	2	2	0	0	0	0
	S	0	1	0	0	0	0	0	0	0
	J	0	0	0	0	0	0	0	0	0
	Sr	1	2	3	0	0	1	0	0	0
	G	2	3	3	1	2	1	0	0	1
Total		5	12	8	3	4	2	0	0	1
2-5 Years	F	0	5	1	1	1	0	0	0	0
	S	0	1	0	0	0	0	0	0	0
	J	2	4	2	1	2	0	0	0	0
	Sr	1	13	6	1	1	1	0	0	0
	G	7	10	5	0	0	0	0	0	0
Total		10	33	14	3	4	1	0	0	0
5 or More Years	F	0	1	0	0	0	0	0	0	0
	S	0	0	0	0	0	0	0	0	0
	J	0	2	0	0	1	0	0	0	0
	Sr	3	4	0	0	0	0	0	0	1
	G	3	7	0	2	0	0	0	0	0
Total		6	14	0	2	1	0	0	0	1
Total Range 6 Months to 5 Years	F	13	19	10	3	7	0	0	0	2
	S	0	4	0	0	1	0	0	0	0
	J	5	8	3	4	3	1	1	0	1
	Sr	17	25	14	7	7	3	2	0	5
	G	18	23	15	9	9	2	1	0	3

KEY:
T=Tobacco
A=Alcohol
M=Marijuana
B=Barbiturates
Am=Amphetamines
Me=Mescaline
L=LSD
H=Heroin
O=Other

TABLE X. Frequency of Drug Use Among Male Subjects (68)

Frequency		T	A	M	B	Am	Me	L	H	O
Never	F	3	1	3	9	8	7	9	10	10
	S	0	1	1	1	1	1	1	1	1
	J	2	0	5	6	5	8	8	9	8
	Sr	1	0	6	13	9	17	20	21	17
	G	7	5	19	23	18	24	26	26	22
Total		13	7	34	52	41	57	64	67	58
Once or Twice	F	1	1	2	0	0	1	0	0	0
	S	1	0	0	0	0	0	0	0	0
	J	2	2	0	1	1	0	0	0	0
	Sr	6	2	2	3	4	2	1	1	3
	G	3	2	3	1	4	2	0	0	2
Total		13	7	7	5	9	5	1	1	5
3 to 9 Times	F	2	2	2	1	1	1	0	0	0
	S	0	0	0	0	0	0	0	0	0
	J	1	1	2	1	1	1	1	0	0
	Sr	3	0	3	3	2	0	1	0	1
	G	5	4	1	0	1	0	0	0	1
Total		11	7	8	5	5	2	2	0	2
10 to 49 Times	F	1	1	1	0	1	1	1	0	0
	S	0	0	0	0	0	0	0	0	0
	J	1	2	1	0	1	0	0	0	1
	Sr	3	3	7	2	4	1	0	0	1
	G	2	4	1	2	2	0	0	0	1
Total		7	10	10	4	8	2	1	0	3
50 or More Times	F	3	5	2	0	0	0	0	0	0
	S	0	0	0	0	0	0	0	0	0
	J	3	4	1	1	1	0	0	0	0
	Sr	9	17	4	1	3	2	0	0	0
	G	9	11	2	0	1	0	0	0	0
Total		24	37	9	2	5	2	0	0	0

KEY: T=Tobacco; A=Alcohol; M=Marijuana; B=Barbiturates; Am=Amphetamines; Me=Mescaline; L=LSD;
H=Heroin; O=Other

TABLE XI. Length of Time Drug Use Among Male Subjects (68)

Length of Time		T	A	M	B	Am	Me	L	H	O
Less than 6 Months	F	4	2	4	1	1	1	0	0	0
	S	1	0	0	0	0	0	0	0	0
	J	2	1	1	1	2	0	0	0	0
	Sr	10	2	2	5	5	2	2	1	5
	G	9	6	3	1	6	2	0	0	4
Total		26	11	10	8	14	5	2	1	9
6 Months to 1 Year	F	0	2	1	0	1	1	0	0	0
	S	0	0	0	0	0	0	0	0	0
	J	0	1	2	0	1	1	1	0	0
	Sr	1	1	3	3	1	0	0	0	0
	G	3	1	2	0	0	0	0	0	0
Total		4	5	8	3	3	2	1	0	0
1 - 2 Years	F	2	0	2	0	0	1	1	0	0
	S	0	0	0	0	0	0	0	0	0
	J	2	2	0	1	0	0	0	0	1
	Sr	0	4	4	1	3	2	0	0	0
	G	3	1	0	1	2	0	0	0	0
Total		7	7	6	3	5	3	1	0	0
2-5 Years	F	1	2	0	0	0	0	0	0	0
	S	0	0	0	0	0	0	0	0	0
	J	3	3	1	1	1	0	0	0	0
	Sr	5	4	7	0	4	1	0	0	0
	G	1	2	2	1	0	0	0	0	0
Total		10	11	10	2	5	1	0	0	0
Five or More Years	F	0	3	0	0	0	0	0	0	0
	S	0	0	0	0	0	0	0	0	0
	J	0	2	0	0	0	0	0	0	0
	Sr	5	11	0	0	0	0	0	0	0
	G	3	11	0	0	0	0	0	0	0
Total		8	27	0	0	0	0	0	0	0
6 Months to 5 Years	F	7	9	7	1	2	3	1	0	0
	S	1	0	0	0	0	0	0	0	0
	J	7	9	4	3	4	1	1	0	1
	Sr	21	22	16	9	13	5	2	1	5
	G	19	21	7	3	8	2	0	0	4
Total										

KEY:

T=Tobacco

A=Alcohol

M=Marijuana

B=Barbiturates

Am=Amphetamine

Me=Mescaline

L=LSD

H=Heroin

O=Other

Discussion of Findings

In analyzing the data, there was a consistent direction that is important to recognize as a result of computing the difference between the means of the Experimental Groups (drug users) and the Control Group (non-drug users). The consistency was that the difference between the means was always in the direction of the control or non-drug group. In two instances, Hypothesis I and VI, the differences were shown to be significantly better in the visual-motor performance of the Control Group (non-drug users) over the Experimental or drug user groups. In testing Hypothesis VI, the drug group had used tobacco, alcohol, marijuana, barbiturates, and amphetamines which points to an indication that multiple drug use may show more relationship to visual-motor performance since in all the drug user groups there was a consistently poorer performance although not significant. There was an indication that an accumulation of the mean differences in all testing toward the non-drug group could account for the t-value being significant in favor of the non-drug group over the total drug user group in Hypothesis I. There is an indication that even though there may be many variables in the sampling such as life styles, diet, and religious practices, the findings tend to show consistency with the related research. One may expect to find some degree of relationship to visual-motor impairment in the drug user groups, and especially so in individuals who use many different drugs.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem was to determine whether the visual-motor performance of college students is impaired by particular drug ingestion. The study drugs included tobacco, alcohol, marijuana, LSD, mescaline, barbiturates, amphetamines and heroin.

A total of 201 college students volunteered for the study. The Experimental Group (drug users) had 151 subjects and the Control Group (non drug users) had 50 subjects. The subjects volunteered from Chico State College and Pacific Union College. Pacific Union College students were used in the study to obtain a larger than normal sampling of non drug users for the Control Group. Pacific Union College is a private college of the Seventh Day Adventist Church.

The subjects were given a confidential questionnaire which indicated sex, age, year in college, particular drug use, and length of time of use. The subjects completed the confidential questionnaire, then were administered the Bender-Gestalt Test.

The Bender-Gestalt Tests were evaluated by a committee of three highly qualified psychologists. The test means, difference between the means, and standard deviations were computed for both the Experimental Group and the Control Group.

One tailed t-tests were employed to test the hypothesis that significant differences would occur in favor of the Control Group over the Experimental Group on the Bender-Gestalt Test in all drug or

combination of drug usage. The .05 level of significance was chosen as the region of rejection of the null hypothesis.

Conclusions

The data were analyzed and the following conclusions were made:

1. There is a significant difference in the visual-motor performance as measured by the Bender-Gestalt Test in favor of the Control Group over the Experimental Group.
2. There is no significant difference in visual-motor performance as measured by the Bender-Gestalt Test between the "Alcohol Group" and the Control Group.
3. There is no significant difference in visual-motor performance as measured by the Bender-Gestalt Test between the "Tobacco and Alcohol Group" and the Control Group.
4. There is no significant difference in visual-motor performance as measured by the Bender-Gestalt Test between the "Tobacco, Alcohol, and Marijuana Group" and the Control Group.
5. There is no significant difference in visual-motor performance as measured by the Bender-Gestalt Test between the "Tobacco, Alcohol, Marijuana, and Amphetamine Group" and the Control Group.
6. There is a significant difference in visual-motor performance as measured by the Bender-Gestalt Test in favor of the Control Group over the "Tobacco, Alcohol, Marijuana, Barbiturate, and Amphetamine Group."

7. The non-drug group consistently performed better on the visual-motor performance test than the drug groups even though it was not a significantly better performance in the testing of each hypothesis. This is consistent with what would be expected from the evidence of the research in the related literature.
8. The drugs most commonly used by college females in this study in order of use are alcohol, tobacco, marijuana, amphetamines, barbiturates, mescaline and LSD.
9. The drugs most commonly used by college males in this study in order of use are alcohol, tobacco, marijuana, amphetamines, barbiturates, mescaline, and LSD. One male subject had used heroin.

Recommendations for Further Study

1. It is recommended that further investigation into the visual-motor performance of drug users be continued for reasons of personal and public health and safety.
2. It is recommended that a larger sample be obtained which would include those who had been using drugs for long periods of time with high frequencies to more effectively determine the long range effects of particular drugs upon visual-motor performance.
3. There were no individuals in the "Marijuana only Group", the "LSD only Group" or the "Marijuana,

LSD, Mescaline only Group" for investigation, nor was it possible to statistically analyze the groups involving only tobacco, amphetamines, or barbiturates, due to the low number of subjects indicating that particular drug usage. Therefore, it is recommended that research be continued with single drug categories.

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APPENDICES

APPENDIX A

BENDER GESTALT TEST

The following represents a chapter from a book (Clinical Use of the Revised Bender-Gestalt Test) soon to be published by Dr. Max L. Hutt, Associate Professor, Department of Psychology, University of Michigan.

Application of the principles and findings in terms of a clinical subject can be found in Chapter 23 of:

Schneidman, Edwin S., et al.
Thematic Test Analysis
Grune & Stratton, New York, 1951

Methods of Interpretation

An inspection technique may be employed to secure a rapid, over-all evaluation of the test record. Such a method is applicable when the subject presents a significantly distorted set of responses so that his record may be characterized as that of a psychotic or as that of an individual with organic brain damage, for example. The findings relating to the various nosological groups which may be used as a basis for the inspection technique will be presented after our discussion of all of the factors relating to test interpretation. It is thought that an acquaintance with these factors, which are essential for a detailed evaluation of the test record, will also be helpful to the examiner who wishes to use only the rapid inspection technique.

1. Test Factors and their Significance

It is useful to categorize the various factors used in interpreting the records in six groups.

A. Organizational factors:

1. Sequence. Sequence refers to the successive positions of the drawings as they are reproduced by the subject on the page. For example, some subjects start at about the middle of the page, near the top, and place the subsequent drawings in a straight line going right down the middle of the page. Other subjects will start near the upper left hand corner of the page, next move across the page on a horizontal line, then go back to the left hand side of the page and proceed again going to the right on a straight line, and so on. Other subjects, usually those who are more disturbed, will show a much more irregular sequence. They may start at some point on the page, and then place the subsequent figures in a haphazard or even in a chaotic order, scattering their drawings around on the page in a way which is neither logical nor meaningful to the observer. We characterize the sequence

shown in the record as: (a) overly methodical; (b) orderly; (c) irregular; (d) confused or chaotic. An overly methodical sequence is one in which the subject places his drawings in a fixed sequence, never deviating from this sequence in his placement of any of the figures, maintaining an undeviating rigidity in this sequence. For example, the subject may start in the upper left hand corner, and then place his subsequent drawings directly on the left hand margin of the page, always starting them against the margin, and not changing from this procedure until he has moved all the way down to the bottom of the page, at which time he may then move to the right hand side of the page and use the right hand margin for the remaining figures. An overly methodical sequence can usually be determined easily from inspection by virtue of the fact that the placement of the drawings seems forced and does not take into account the actual shape or characteristics of the drawing itself which would ordinarily lead the subject to shift the position to a more appropriate one, even though this might change the order of sequence slightly. An orderly sequence is one in which the subject follows a regular succession throughout his production of all of the drawings, although one exception or inversion is allowed. The succession may be from left to right, or from top to bottom or may follow some other simple and logical arrangement. An irregular sequence is one in which more than one individual error is evident. For example, the subject may start at the left hand side of the page, then move to the right, then start going down for the next drawing (this is the first inversion, then changes his course again and start at the left moving from that point to the right. This is his second inversion), and then goes from right to left instead of from left to right (this is his third inversion). Although the movement shows more than one inversion or change of direction when his sequence is characterized as irregular, it is still possible to determine, by inspection, the logic or change of logic in his sequence. On the other hand, the confused or chaotic order is characterized by a jumble or lack of any apparent plan by which the drawings are placed upon the page. This last type of sequence is most frequently found in the case of psychotics who are actively disturbed and, less frequently, in the case of subjects who are suffering from intense and overwhelming anxiety. There is a special kind of sequence which may occasionally be observed and to which the author has attached the name "symbolic". For example, one subject arranged his drawings in such a way that they followed the configuration of the figure eight. We characterized this sequence as orderly, even though it was unusual and had a special symbolic meaning for the subject.

(Psychological meaning of sequence). In general, the sequence of the subject tells us something about his methods of intellectual functioning. The more rigid the sequence the more rigid and over-controlled is his intellectual functioning. Normal subjects will usually manifest an orderly, and occasionally an irregular, sequence. Some individuals who are compulsive but might still be classified as normally adjusted, may show an overly methodical sequence, although this type of sequence is more frequently found among compulsive neurotics. The way in which the ego controls behavior, making it overly rigid or encouraging its spontaneity in functioning, is important in the total

evaluation of the personality and it is for this reason that in our analysis of test records we consider this factor very early in the process of interpretation.

2. Position of the figure. This category is probably self-explanatory. About two-thirds of 'unselected adult subjects place the first figure in a locus which is near the center and slightly below the top of the page. If we think of the area bounded by a rectangle starting about two inches from the left side and about an inch or slightly more below the top margin and extending over the right to a similar position with respect to the right margin and going down approximately two inches, we have a fair conception of the typical first position of the first figure of our normal subjects. The second most frequent position for the first figure is in the upper left hand corner of the page, although some subjects place their drawing in the extreme corner of the page and some allow some margin around the figure. The third most frequent position for the first figure is approximately in the center of the page, while other positions less frequent in occurrence are: upper right hand corner of the page; middle portion on the left margin of the page; and scattered positions over any of the remaining portions of the page.

(Psychological meaning). Analysis of our data indicates that there is a correlation between the position of the first figure and the individual's approach to the test situation. Very often, this approach is characteristic not only of the test but also of his contemporary methods of adaptation, initially, to any new situation. Timid and fearful individuals tend to place their drawings in the upper left hand corner of the page and frequently, as another one of their characteristics, reduce the size of the figure from that of the stimulus. Narcissistic, egocentric and psychopathic individuals most frequently place their first drawing in the middle of the page. In the case of psychopaths, a frequent phenomenon is the use of a separate sheet of paper for each of the drawings, the position of each drawing usually being one middle of the page. An atypical or bizarre position for the first figure is always suspect, and while it may occasionally represent a temporary reaction to intense anxiety, it more frequently represents a profound disturbance in personality organization.

3. Use of space. This factor refers to the amount of space between any two successive drawings of the test. Recent analysis of our data has suggested the following normal limits for the amount of space between successive drawings; between one quarter of an inch to one half of an inch. The measure of space is obtained by inspecting the nearest adjacent points of the two successive figures. Although these 'norms' are not entirely adequate in the case of individuals who modify the size of drawings excessively, either by increasing them or decreasing them very markedly, they will be found useful in most cases.

(Psychological meaning). An excessive amount of space between successive drawings, as the typical pattern for the test is indicative of strong, overt hostile strivings. Aggressive and rebellious individuals

usually show an excessive use of space. On the other hand, an inordinately small amount of space between successive drawings is indicative of repressed hostility, occasionally turned inwards in the form of masochistic strivings or needs. In short, the individual's use of space is thought to be characteristic of his perception of the world around him; i.e., whether he regards the world as hostile or friendly and whether he is able to express his hostility or has to repress or suppress it. In the case of actively paranoid individuals, the most common characteristic, with respect to space, is the use of excessive space between drawings, together with a decrease in the size of the drawings, and the utilization of only a small portion of the page for all of the drawings. Their drawings appear to be compressed on the page and a large amount of white space is available which they have not made use of. In a literal sense, they have withdrawn from the world which they regard as menacing and hostile. Our findings indicate that persons with very strict superegos tend to reduce the size of their figures, place all the drawings in a small portion of the page, but leave a large amount of unused space on the page, while the psychopath, by contrast used lots of paper, and has a considerable amount of space around each of his figures on the various pages which he uses.

4. Cohesion-collision. This factor is related to the one above and represents an extreme condition of the former factor. Collision refers to the tendency of figures to overlap or actually to collide.

(Psychological meaning). As might be inferred from the paragraph above, cohesion-collision is related to the continuum of acceptance and rejection. More specifically, it is indicative of the subject's present planning capacity and is therefore an index of his current ego strength. Individuals who manifest an actual collision between successive drawings or even a collision tendency, that is a near-collision, almost always show a very marked disturbance in ego function. The outstanding example of this sort is the case of individuals who are suffering from psychological disturbance resulting from brain damage. In the case of actively disturbed or deteriorated psychotics, this sign is also frequently present.

5. Use of the margin. This refers to the tendencies of the subject to place his drawings along the margin of the paper, using this position as a prop to bolster him against insecurity or anxiety. Excessive use of the margin is scored when the subject places at least seven of his nine figures within one quarter inch of any of the margin of the page.

(Psychological meaning). Our findings indicate that such an individual very frequently tends to manifest considerable internal tension, perceives himself as being inadequate, and has a considerable amount of anxiety although this anxiety may not be manifest at an overt level.

6. Shift in the position of the paper. (This should not be confused with the factor called "rotation".) This factor simply refers

to the subject's rotation of the paper more than or at least equal to 90 degrees from the original position at which the paper was presented to him. As will be recalled, the paper is presented to the subject so that its long axis is at the right angles to his body.

B. Determinants relating to size:

It may be noted that the subject may modify the size of the figures without in any way changing their Gestalt. For an adequate analysis the examiner must consider simultaneously both the change in size of the figure and the presence of other deviant manifestations.

7. Over-all increase or decrease in size of the figures. A figure is considered to be increased or decreased in size when either its vertical or horizontal axis is greater by one quarter or more than the axis of the stimulus figure. Over-all increase in size is defined as an increase in the majority of the figures.

(Psychological meaning). When the subject manifests an over-all increase in size, we may conclude that he is showing a reaction formation to marked feelings of anxiety. This is one of his methods of denying his anxiety and he may show, in his behavior, boastfulness, excessive aspiration level, or other such manifestations. An over-all decrease in size of the figures is correlated with the presence of active and overt anxiety. In the latter case, it is likely that the subject is experiencing conflictual demands against which he has been unable to defend himself.

8. Progressive increase or decrease in size. This refers to the tendency to make each successive figure either larger or smaller than the preceding one.

(Psychological meaning). In either case, that is whether the figures tend to get larger or whether they tend to get smaller, we have good evidence of low frustration tolerance. Such individuals are likely to be characterized irritable, explosive, and even dangerous, or may engage in considerable amount of "acting out".

9. Increase or decrease in size of a particular figure or of parts of some figures. Our clinical findings suggest that increases or decreases of figures or parts of figures, particularly if they are out of line with the characteristics of the size of the other figures are indicative of symbolic conflicts or the symbolic expression of conflicts of the subject. It is well to pay special attention to the types of exaggeration or diminution in the figures which the subject makes. Most frequently, sexual disturbances are manifest in these types of modifications in size. In addition to the more obvious aspects of disturbance in phallic-looking figures, increases in size may occur in the vertical plane, in figures having a general up and down orientation, or in the lateral plane when the figures which are wider than they are high. In the former case, we look for evidence of difficulty in relation to

authority figures. In the latter case we suspect difficulty, generally, in maintaining interpersonal relations or in establishing adequate and satisfying cathexes.

C. Changes in the form of the Gestalt:

10. Closure difficulty. This refers to difficulty, manifest in the drawing, in bringing the joinings of parts of a figure together, or in bringing the joining between two figures together. For example, in the case of Figure A, the subject may find it difficult to bring the end of his circular sweep together with the beginning of that sweep, so that he may show overlapping at the point of junction, or an excessive amount of drawing at that point. On the same figure, he may have difficulty in joining the circle with the square and again may manifest this by overlapping of the two figures, or by an excessive amount of drawing at the point of junction. Closure difficulty is correlated specifically with fearfulness in interpersonal relationships. Psychologically it seems to represent an inability to maintain a constant cathexis with adequate objects of the environment.

11. Crossing difficulty. This refers to difficulty, manifest in the drawing, at points where one line crosses another.

(Psychological meaning). The presence of this sign is indicative of psychological blocking. It is correlated with abulia, indecision, compulsive doubting, and specific phobias. It is one of the characteristics of the so-called psychasthenic individual.

12. Changes in curvature (modification in the rectangularity of figures). In general, curved figures seem to represent an emotional stimulus to the subject. By changes in curvature, we mean an increase or decrease in the rectangularity in the curvature of the figure as manifest in the drawing by the subject.

(Psychological meaning). When the subject increased the amount of curvature, we take this to be a sign of over-response to an emotional stimulus. Similarly, when the subject decreases the amount of curvature, that is, makes the figures more nearly rectangular, we take this to be an indication of suppression of affect, or an insensitivity to emotional stimuli from without. Our findings indicate that emotionally labile individuals show an excessive amount of increase in the curvature of the curved lines, while the converse is true for individuals who are constricted in their emotional responsiveness.

13. Changes in angulation. This refers to the angle of intersection between parts of the figures or changes in degree of the angle in the drawing from that which was present in the stimulus. An example of change in angulation occurs frequently in connection with figure 6. In this figure, the two sinusoidal curves intersect each other so that the angle of intersection is obtuse on one side and acute on the other. A change in angulation, for example, would involve drawing these two figures

so that they intersected at right angles, or to increase the obtuseness of the angle of intersection. We judge the drawing to have an increase in angulation when the acute angles in the original figure are made more acute; similarly, we consider the change to be a manifestation of decreased angulation when the acute angles are made less acute in the reproduction. One further example may make this clearer. In the case of figure 2, the subject will sometimes arrange the columns of circles so that they appear to be at right angles to the horizontal plane. This represents a decrease in angulation since the original, acute angles of the columns from the horizontal plane are made less acute, in fact, being made at right angles in the illustration given.

(Psychological meaning). Our findings indicate a high correlation between the evidence for factor number 13 and for factor number 12. Increased angulation indicates excessive relation to emotional stimuli, while decreased angulation indicates the reverse. Evidence from the two factors just described, numbers 12 and 13, is very helpful in determining the characteristic modes of response to external emotional trauma. This type of evidence is very helpful in assessing the probable effect, for example, of "uncovering" therapy or of an unduly stimulating environmental situation.

D. Distortion of the Gestalt:

The various types of distortion which are described below are to be regarded as evidences of pathological functioning and these types of responses are most characteristic of the psychotic population. While distortion may occur among neurotic groups, and may very frequently be found in the records of relatively well adjusted individuals who are suffering from some situational difficulty of an extreme nature, the presence of one of these factors is regarded as prima facie evidence of a psychotic process, even though the personality structure of the subject may not altogether be that of a psychotic individual. In any case, such distortions are indicative of loss of ego control and, therefore, are of major significance in the interpretation of the records.

14. Rotation. This refers to the reproduction of the drawing with an actual rotation of the major axis of the drawing. It is to be distinguished from cases in which the subject rotates the stimulus card and then copies it accurately in that position, and also from cases in which the subject produced a rotation in the response due to some shift in the position of the drawing paper while engaged in the drawing. The latter types of cases, therefore, should not be called rotation, and if present in the records should be accurately described by the examiner in some appropriate way. Rotation of the axis may be very mild, such as 10 or 15 degrees, or it may be more severe such as approximately 90 degrees or 180 degrees. In the last case, the rotation is referred to as reversal.

(Clinical significance). The minor types of rotation, say 10 to 15 degrees are indicative of depressive trends with the rotation is

in a clockwise direction, and of antagonistic or oppositional trends when the rotation is counter-clockwise. While severe rotation is most frequent among the schizophrenic group, approximately 30 percent of schizophrenics, especially in the early stages of this disease, show little or no rotation. However, in such records, careful analysis will usually reveal other evidence of the psychotic process. In most instances when rotation does not appear in the records of a schizophrenic, one may expect to find that the illness is of a blend or episodic variety.

15. Retrogression. This factor refers to the substitution by the subject of a more primitive Gestalt for the Gestalt which the stimulus presents. Examples of retrogression are the use of loops instead of circles or well formed curves, the persistent use of dashes instead of dots, and the like. The true presence of retrogression must be judged by a comparative study of the evidence of the retrogressed material with other evidence in the Gestalt reproductions of more mature Gestalt form. Since, in the normal development of the individual, some of the "retrogressed" signs may appear as part of that early stage of growth, retrogression refers only to instances where there is concrete evidence that the individual has attained an over-all higher maturational level, but is showing more primitive Gestalten in the instances under consideration. It is debatable whether, in the case of retrogression, the individual has truly reverted to a method of behavior which is entirely that of a former period in his development or whether he is simply showing only some of the characteristics of an earlier stage in his development.

(Clinical Significance). In any case, retrogression means that the individual is showing a loss in effectiveness of his ego functions, and such a loss is characteristic of a profound disturbance in the personality. It is always interesting to note where the retrogression occurs and to see whether, in the standard part of the procedure or in the method of elaboration, there can be some inference regarding the nature of the conflict or trauma which has precipitated the retrogressive phenomenon.

16. Concretion or simplification. This factor is distinguishable from retrogression in that the reproduction of the Gestalt is inaccurate but is not a reversion, a more primitive form. Rather the Gestalt is replaced by a different form, which logically may seem to be more complex, but which from the point of view of the task is more simple for the subject. An example may help to make this clear. In the case of design number 7, the overlapping figures, the individual may draw one or both of these as rectangles, or he may draw them as octagons. Another example of simplification is the drawing of these figures as non-overlapping figures, although each of the figures may be reproduced accurately. Simplification represents an attempt by the subject to meet a situation which is too difficult for him by the utilization of a less appropriate although somewhat relevant response.

(Clinical significance). By itself, it does necessarily indicate the presence of a psychotic process, although it is frequently associated with such a process and hence is included in this general

category of factors, but it represents in any case an inability to meet or deal effectively with the reality situation. It is most frequently found in cases in which marked feelings of importance are manifest. For these reasons, one may expect to find it, and does, in those cases of brain damage in which the individual is aware of his severely handicapped capacities and is struggling, without affective solution, to meet the difficulty. In such cases there is usually some verbally expressed comment by the subject of his inability to produce the correct Gestalt. Simplification is more serious, and is more likely to be indicative of a psychotic process, when the subject, even under questioning, is unable to note the difference between his Gestalt and the original stimulus.

17. Fragmentation. This factor is evidenced when the subject breaks up the original Gestalt and reproduces only part of it. It most frequently is manifest in incomplete drawings, but occasionally is shown in drawings in which the part of an integral whole are dissociated. It is to be distinguished from simplification in that there is a basic destruction of the Gestalt, even though all the separate elements may be present.

(Clinical significance). This phenomenon is present frequently in severe cases of psychosis, and in cases involving frontal brain damage; it is found in about one-third of the cases showing hysterical, and more especially amnesic, signs.

18. Overlapping difficulty. We refer here to difficulty in figures which overlap, especially figures 6 and 7. We score for overlapping when there is any evidence of difficulty in completing the figure in its original form with the characteristic overlapping present, in the stimulus. Very often this factor is associated with simplification and fragmentation and it may be that it is not a separate factor at all, although our present evidence suggests that it may be present without the occurrence of the other factors. Overlapping difficulty occurs most frequently in the cases of organic brain damage involving the occipital-parietal regions.

19. Elaboration or doodling. This factor is the one which is most dubiously placed under the category of items which we have called distortion. Among adults, it occurs most frequently in the manic psychotic group, but it does occur frequently enough among other psychiatric groups in which agitation and poor capacity for concentration are manifest. Nevertheless, the attempt by the subject to elaborate the figure by adding additional lines not present in the original, is indicative of such a severe loss in ego functioning, that it is included in this general category.

E. Movement determinants:

20. Direction of movement. While most subjects use both clockwise and counter-clockwise direction in their drawing, the characteristic direction of movement is in a counter-clockwise orientation.

(Clinical significance). For most subjects this will clearly be the predominant direction. When the characteristic direction of movement is in a clockwise fashion, we suspect the presence of pathology. There are other features concerning the direction of movement which have been inadequately studied up to the present time, but concerning which we may offer some tentative suggestions. One of these is the characteristic tendency to draw vertical lines from the bottom up rather than from the top down. We have found this to be frequently associated with neurotic fear of authority figures. Similarly, characteristic movement from the outside of the page to the inside of the page, that is from the outside of the figure to the internal part of the figure, has been found to be associated with strong narcissistic trends and generally with egocentric personalities. Unfortunately, evidence is lacking concerning the effect of original handedness upon the characteristic direction of movement. However, it is our judgment that even in the case of converted sinistrals the presence of a characteristic of predominant clockwise movement is indicative of some pathology.

21. Consistency of the direction of movement. We refer here to the fact that most individuals characteristically utilize one or another of the movement orientations. When a subject shows discrepancies between his characteristic movement orientation on one figure and his movement on another similar part of a figure, we refer to this as inconsistency in the direction of movement.

(Clinical significance). Such inconsistencies are related to psychic blocking and are usually indicative of current attempts by the subject to work out strongly conflictual trends in his personality. Evidence of this kind has some favorable connotations since the subject is still actively striving to work out a solution to his difficulties.

F. Miscellaneous factors:

22. Sketching. This factor refers to the concurrent re-sketching of simple lines together with other behavioral expressions of anxiety on the part of the subject. It is to be distinguished from that type of sketching which is characteristic of some art behavior in which the final product is a well conceived and well reproduced Gestalt. In the sketching to which we refer, the subject makes many abortive line movements, and his final product is definitely inferior in quality and occasionally results in an inaccurate production of the Gestalt.

(Clinical significance). Sketching is an anxiety indicator and may be present in a variety of psychiatric conditions.

23. Perseveration. This factor refers, in this test, to the persistence of drawing behavior which was appropriate for a previous stimulus, but is inappropriate to the present one. For example, the subject may replace the circles in figure 2 with dots, due to perseveration of the dot performing behavior required in figure 1. In the same way a subject may reproduce figure 3 using circles instead of dots,

because he is perseverating on the basis of the circles in figure 2. Occasionally what appears to be perseveration may be due to some other factor, which then needs to be investigated.

(Clinical significance). Perseveration is indicative of groups in which a rather profound disturbance has occurred or in which there has been an arrest in development. It is not surprising to find this evidence therefore in cases involving brain damage and in cases of mental deficiency.

24. Motor incoordination. This factor refers to the appearance of irregular line movements and to poor motor control resulting from tremors, other types of muscular spasms, and some forms of paralysis. Of course, motor incoordination may occur simply as a result of tension and anxiety.

G. Methods of work:

There are many aspects of a subject's method or methods of work which might be mentioned. We have singled out three which seem to us to be of outstanding significance.

25. Over-attention to detail. This factor refers to the pre-occupation by the subject with some part of the design, not necessarily the most difficult portion, which has some unusual attraction for him. He may draw and re-draw that section of the design, he may erase it frequently even though the production appears to be adequate, and he may use very heavy pressure in drawing that part of the figure. We call attention to this factor because it frequently offers clues to the nature of the subject's conflicts. It is particularly advisable to attempt to correlate the evidence of over-attention to detail found in the basic part of the test with the same type of evidence for the same figure found in the elaboration part of the test and to investigate the nature of the association to this figure or to this part of the figure.

26. Impulsivity. This refers to the subject's overly rapid drawing of a figure or figures. Although we do not record time, common experience will often suffice to indicate that the subject is plunging into the drawing without preliminary planning and critical judgment, or is carrying through his performance in great haste. Such behavior is indicative of many factors in the personality, but we wish to call attention particularly to its correlation with "acting out" and with the subject's inability to tolerate frustration.

27. Use of guide lines. There are various ways in which the subject may use guide lines, the outstanding example of which is the characteristic, of some subjects, to draw lines between successive figures on the page. This latter type of behavior is not only indicative of perceived inadequacy on the part of the subject, but when a persistent part of the performance is indicative of "isolation" and frequently of more than this: a psychotic process. Less severe manifestations of the use of guide lines may occur and the examiner will do well to investigate

the association to the figures where such lines are drawn and to ferret out the special significance which this may have for the particular subject.

11. Inspection Method

The Bender-Gestalt test and its revision have been applied to a variety of clinical cases, but at this time we shall report only those "patterns" which either clinical experience or specific research studies have borne out. It must be emphasized that these patterns are still tentative and that further study and clinical application will undoubtedly result in some revision. Some of the specific factors have been studied extensively, as indicated above, and may be used as guides to the interpretation.

It hardly needs to be stated that no single test furnishes sufficiently conclusive evidence to warrant its use as the sole basis upon which to make a diagnosis. Diagnosis should always involve all of the clinical findings considered in the light of the specific social-cultural-physical milieu of the patient. Nevertheless, the Revised Bender-Gestalt Test is of special values in contributing to the diagnostic formulation, especially in doubtful cases of schizophrenia and organic brain damage. It is particularly valuable in those cases in which the individual is able to utilize his verbal defenses, often the ones last to be disturbed in consciously concealing his pathology. Also, because of its brevity, especially if the Basic Method alone, is employed, it may contribute significantly to the total evaluation.

In using the Inspection Method, care must be taken to avoid the error of superficial conclusion that "no pathology exists" merely because a cursory inspection of the record reveals no gross abnormalities. The occurrence of striking features in the test record of abnormality is often gratifying to the hurried and harried examiner. However, whenever minor evidences of pathology occur, such as perseveration, collision tendency, or a tendency toward simplification, the record should be examined more closely. In any case, it would be well to report results when the findings appear to be negative for pathology in some such terms as "evidence appears to be lacking to support a diagnosis of _____" rather than "there is no organic brain damage."

The following patterns for each psychiatric classification are divided into two sections each: one for the most frequently associated factors; the other for occasionally associated factors. All of the patterns are based upon findings with adult patients and subjects.

A. Schizophrenia. (These patterns vary depending upon the type, duration and severity of the illness.)

1. Most frequent findings.*

*See preceding pages for criteria listed.

Rotation; Retrogression; Cohesion; Extreme change in angulation; Simplification; Elaboration (especially if bizarre); Fragmentation; Bizarre association to the "Elaborations".

2. Occasionally seen:

Chaotic order; Perseveration; Marked decrease in curvature or angulation; Marked inconsistency in direction of movement; Marked progressive increase in size of figure; Frank elaboration of phallic symbols (especially on Elaboration).

B. Organic Brain Damage. (The types of psychological deficit will vary with the personality of the patient as well as the type, intensity and history of damage or disease.)

1. Most frequent findings:

Rotation; Sketching; Difficulty with overlapping figures; Marked perseveration; Distortion of the Gestalt; Frequent repetition of figures; Simplification; Fragmentation; Simplification, initial difficulty (destruction of Gestalt) followed by successful completion; Collision; Behavioral expressions of perplexity or impotence.

2. Occasionally seen:

Marked reduction in size; Difficulty with angles; Irregular sequence; Motor incoordination; Irregular use of space; Close difficulty; Impulsivity.

C. Psychoneurosis. (It goes without saying that there is tremendous variability in the patterns of response of psychoneurotics. Difficulties in classifying psychoneurotics are not the least of the contributors to this variability. In addition, the type, seriousness, and duration of the illness are important. In this brief chapter, the psychoneuroses are treated as one population. There is no single neurotic syndrome for the test, but the following findings are based upon a total group of 250 definitely diagnosed cases of psychoneurosis contrasted with a carefully selected, comparable group of normals. All subjects were adults, ranging in age from 20 to 40 years with the median age of 27 years. It may be said, on the basis of our evidence, that the presence of a total of four signs from the first group and the absence of more serious pathological signs are indicative of a well developed neurotic condition. It will be noted that in this condition the Gestalten are usually not destroyed, but the patient's conflicts produce characteristic projections in the test protocol.)

1. Frequently occurring factors:

Overly methodical sequence or irregular sequence; Modification in size (especially severe reductions in size); Excessive use of the margin; Change in size of parts of the figures (especially phallic

symbols); Changes in curvature; Changes in angulation; Over-attention to detail; Closure difficulty.

2. Factors occurring occasionally:

Crossing difficulty; Marked behavioral resistance to the test; Unusual position of the first figure; Irregular use of white space; Rotation of the paper; Sketching.

D. Mental Deficiency. (Signs will vary depending upon the degree of deficiency as well as the cause. To rule out cases of true mental deficiency, as contrasted with cases of emotional blocking, none of the more difficult figures, i.e., figures 7 and 8, should be performed better than the simple figures.)

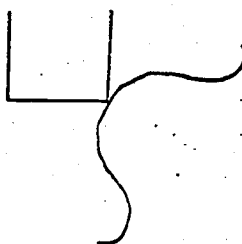
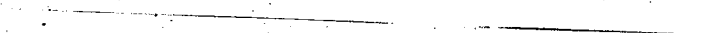
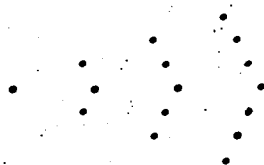
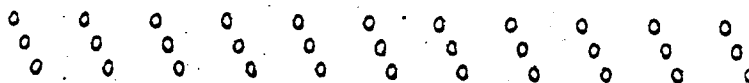
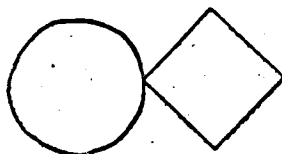
1. Frequency occurring factors:

Retrogression (especially primitive scribbles and loops); Perseveration; Irregular sequence; Simplification; Excessive difficulty with figures 7 and 8 (more so than on other figures); Slow but not anxious.

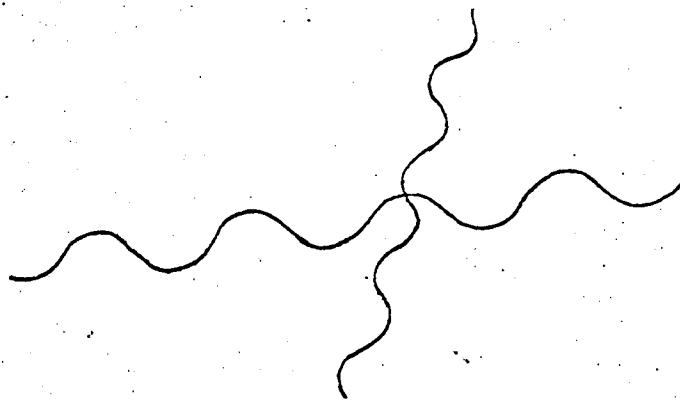
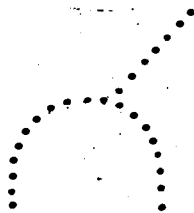
2. Factors occurring occasionally:

Closure difficulty; Changes in angulation; Increase in size; Doodling.

Bender Gestalt Test Symbols



Bender Gestalt Test Symbols..



APPENDIX B

CONFIDENTIAL QUESTIONNAIRE

A. SEX: (Mark the appropriate space)

☐ Female☐ Male

B. BIRTHDATE: _____

C. YEAR IN COLLEGE: _____

1. Please indicate your drug use concerning the following items:

FREQUENCY:

- A - Never
B - Once or Twice
C - 3 to 9 times
D - 10 to 49 times
E - 50 or more times

LENGTH OF TIME:

- A - Less than 6 months
B - 6 months to 1 year
C - 1 to 2 years
D - 2 to 5 years
E - 5 or more years

1. Tobacco (cigarette smoking)
2. Length of time
3. Alcohol
4. Length of time
5. Marijuana
6. Length of time
7. Barbiturates (reds, yellows, etc.)
8. Length of time
9. Amphetamines (uppers, beans, etc.)
10. Length of time
11. Mescaline
12. Length of time
13. LSD
14. Length of time
15. Heroin
16. Length of time
17. Other _____
18. Length of time

APPENDIX C

PRINT YOUR NAME IN THE BOXES PROVIDED. THEN
BLACKEN THE LETTER BOX BELOW WHICH MATCHES
EACH LETTER OF YOUR NAME.

YOUR LAST NAME		YOUR FIRST NAME		YOUR FIRST NAME (MI)	
A	A	A	A	A	A
B	B	B	B	B	B
C	C	C	C	C	C
D	D	D	D	D	D
E	E	E	E	E	E
F	F	F	F	F	F
G	G	G	G	G	G
H	H	H	H	H	H
I	I	I	I	I	I
J	J	J	J	J	J
K	K	K	K	K	K
L	L	L	L	L	L
M	M	M	M	M	M
N	N	N	N	N	N
O	O	O	O	O	O
P	P	P	P	P	P
Q	Q	Q	Q	Q	Q
R	R	R	R	R	R
S	S	S	S	S	S
T	T	T	T	T	T
U	U	U	U	U	U
V	V	V	V	V	V
W	W	W	W	W	W
X	X	X	X	X	X
Y	Y	Y	Y	Y	Y
Z	Z	Z	Z	Z	Z

TEACHER ONLY: STUDENT ABSENT FOR PART: I II III IV

FORM OF THIS TEST IS: A 1 B 2 C 3 D 4

SEMESTER FALL SPRING

BIRTH DATE MONTH YEAR

STUDENT NUMBER

SCHOOL CITY GRADE INSTRUCTOR TEST

I 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

II 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

III 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120

IV 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160

STANDARD ANSWER SHEET-A

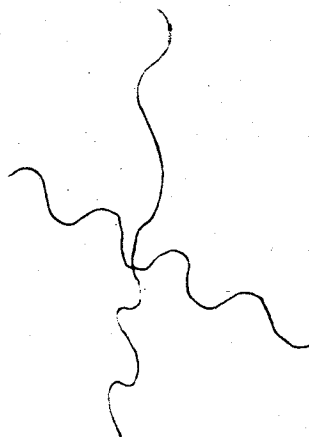
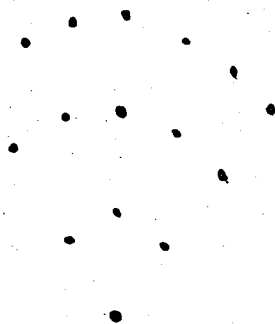
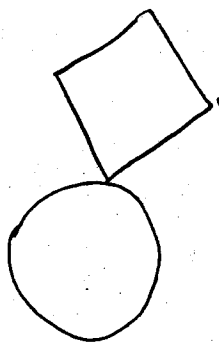
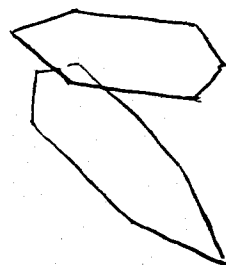
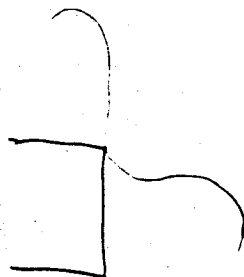
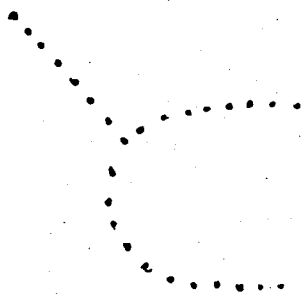
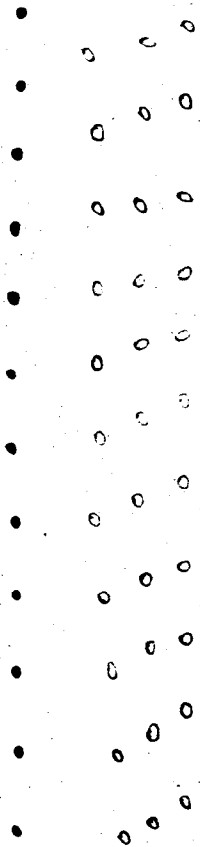
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APPENDIX D

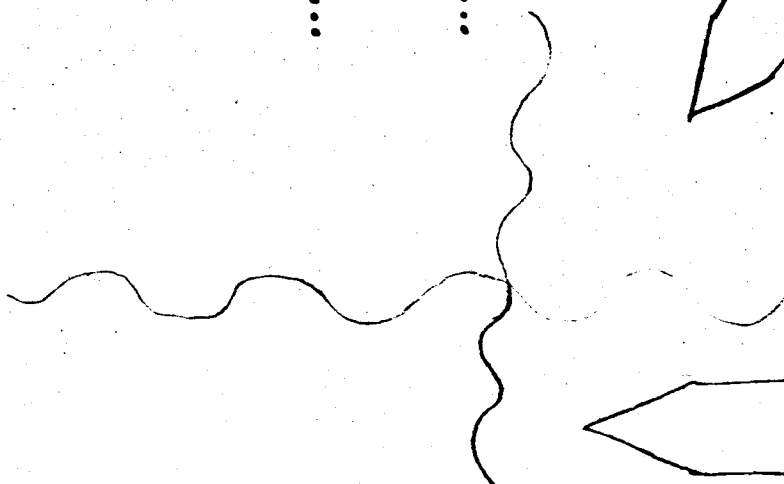
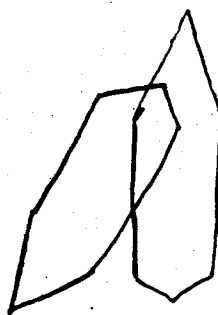
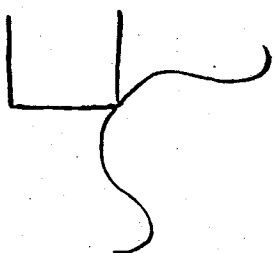
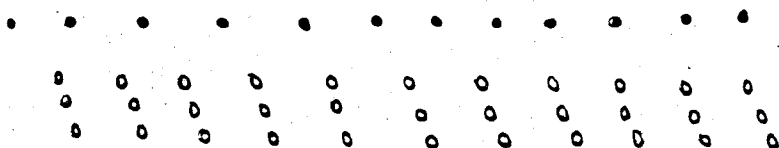
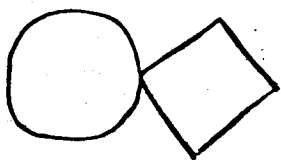
CONTROL GROUP

BENDER GESTALT TESTS

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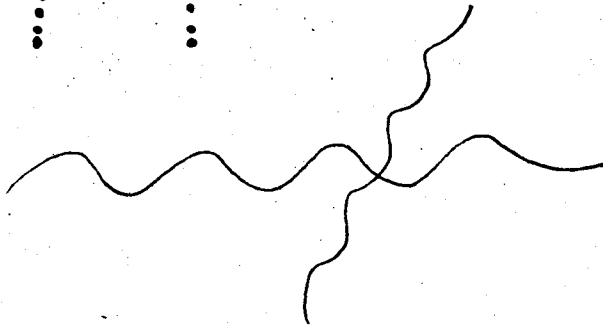
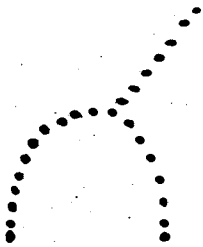
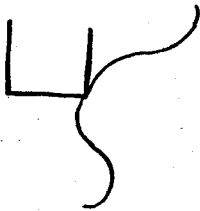
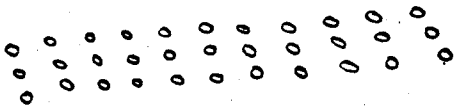
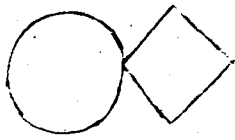


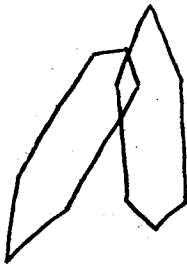
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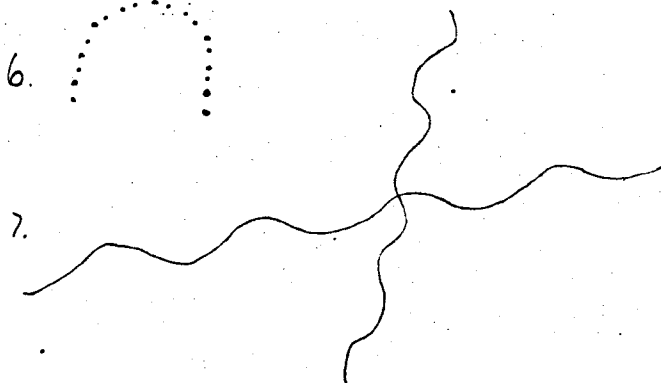
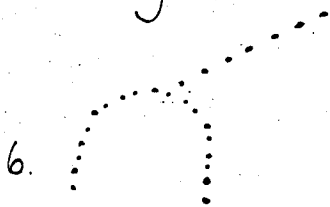
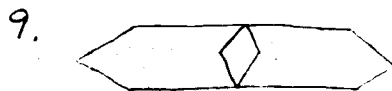
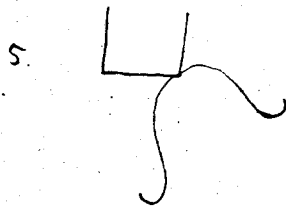
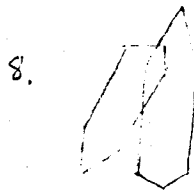
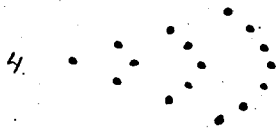
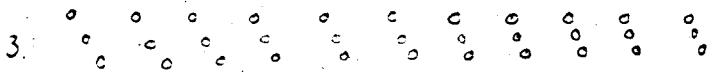
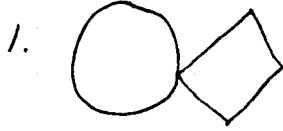


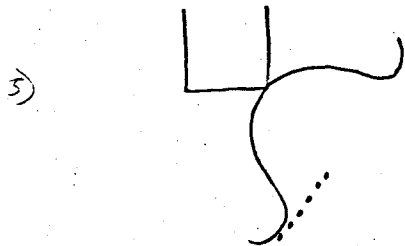
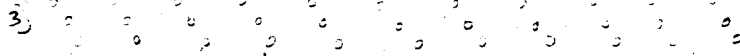
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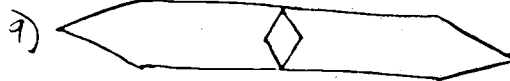
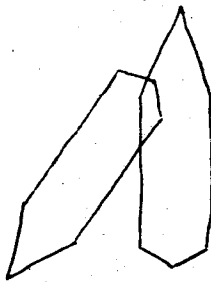




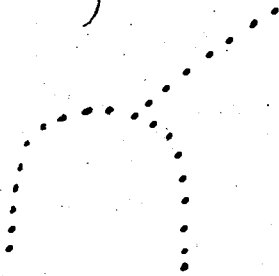
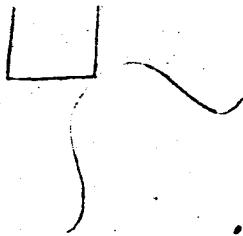
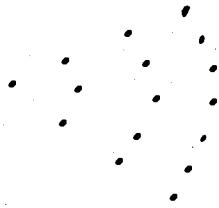
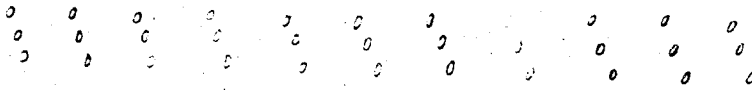
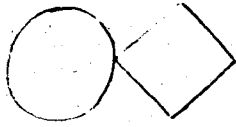


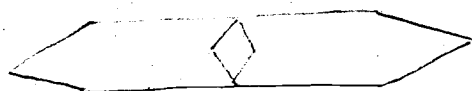
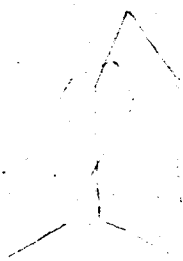
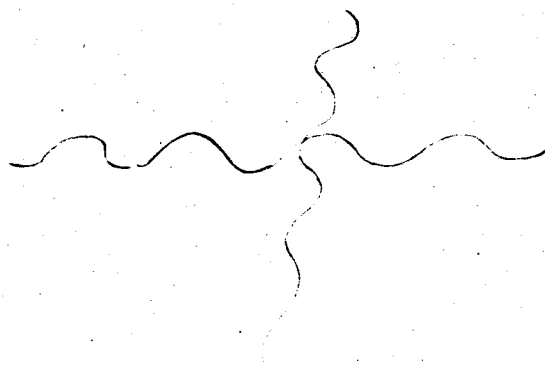
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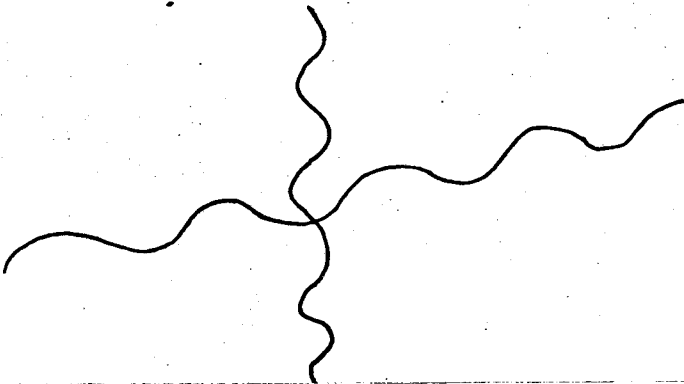
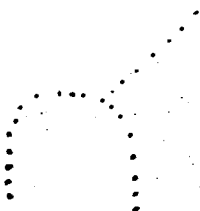
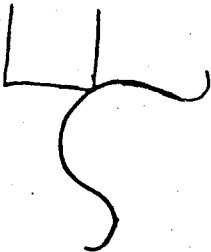
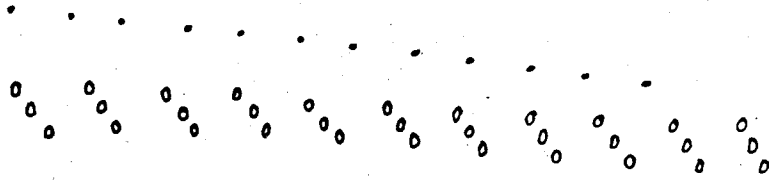
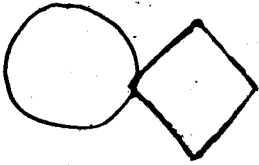
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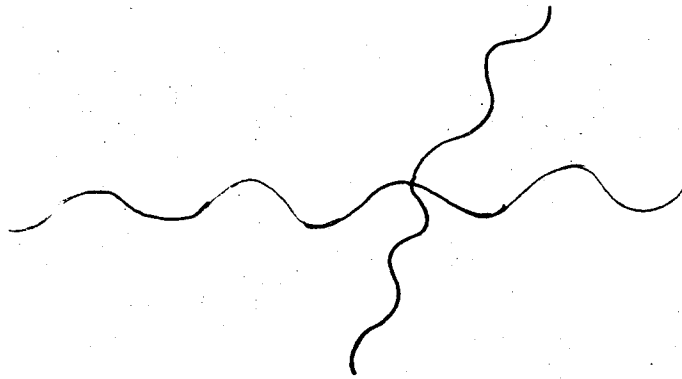
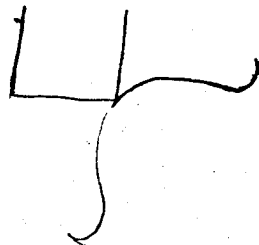
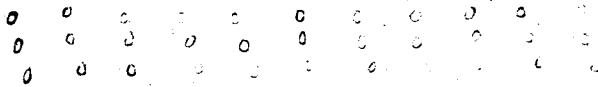


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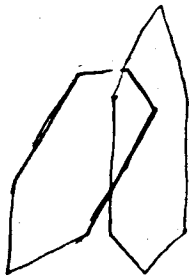


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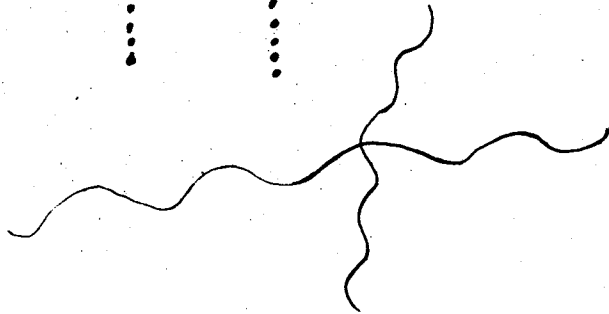
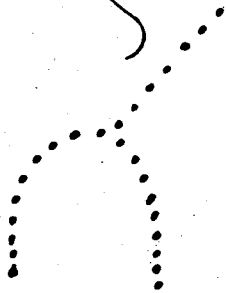
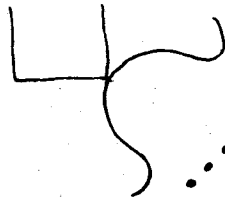
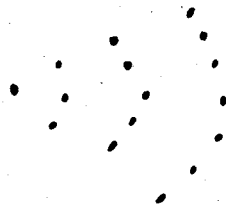
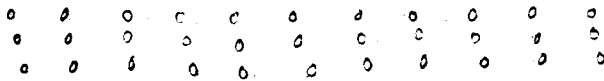
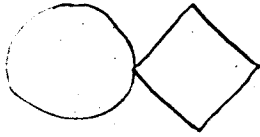


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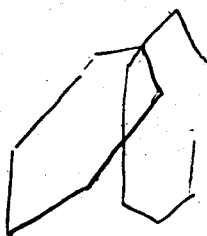


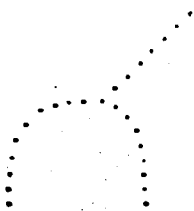
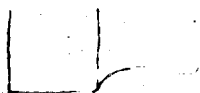
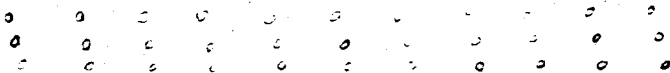
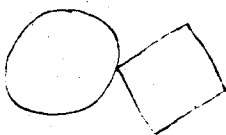
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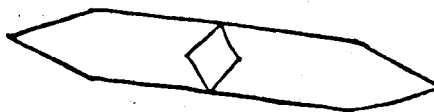
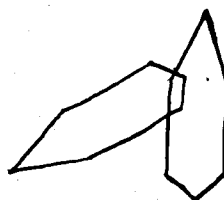
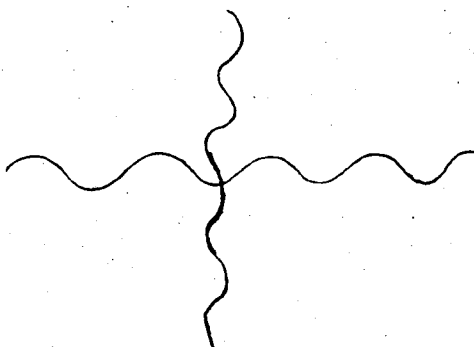
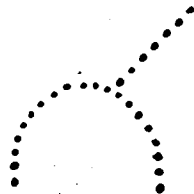
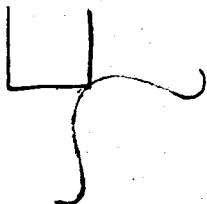
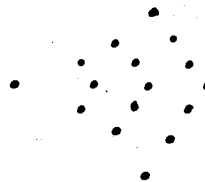
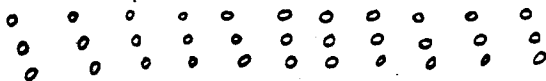
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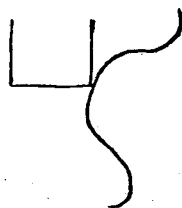
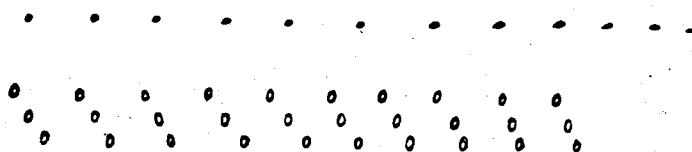


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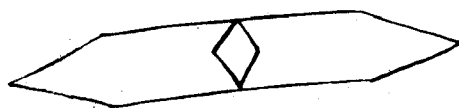
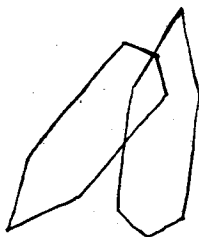
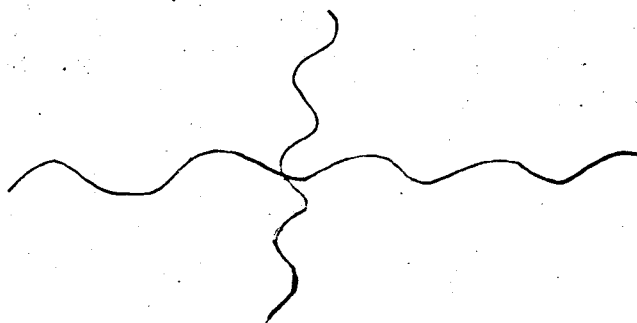
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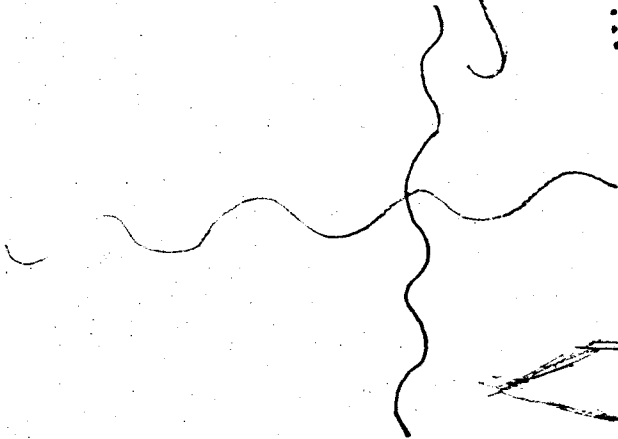
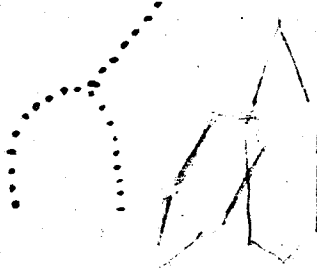
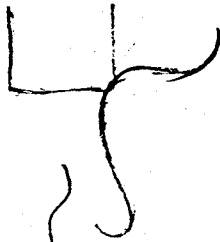
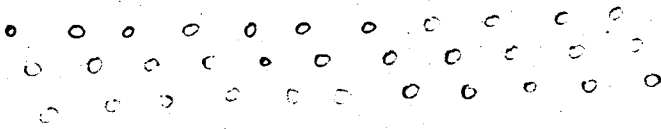
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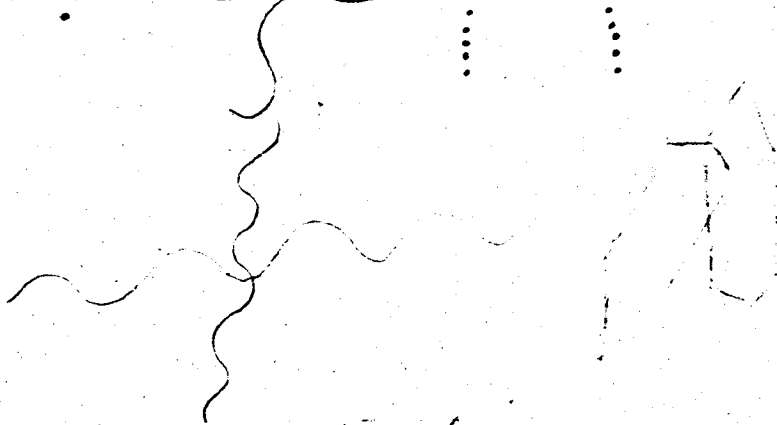
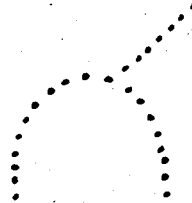
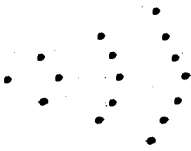
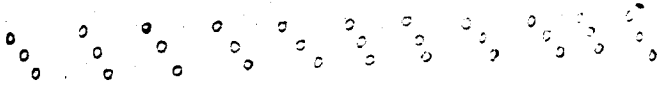
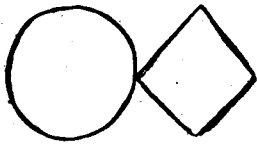
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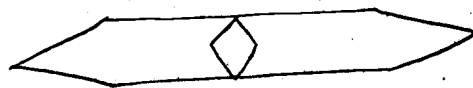
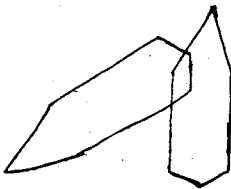
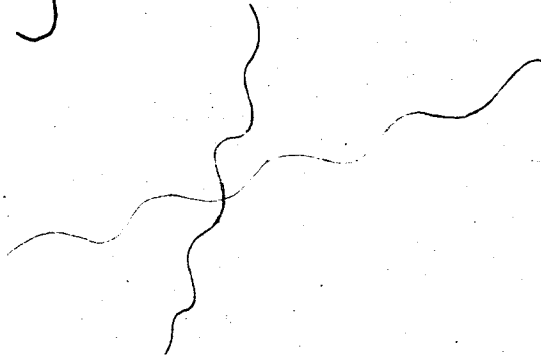
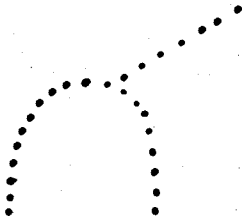
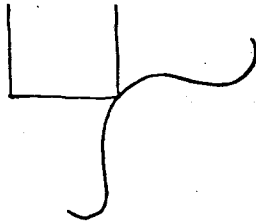
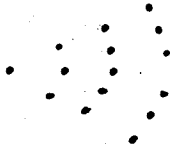
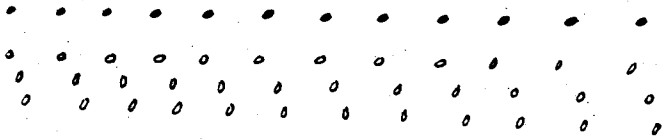
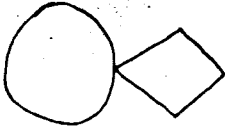
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72

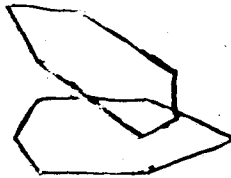
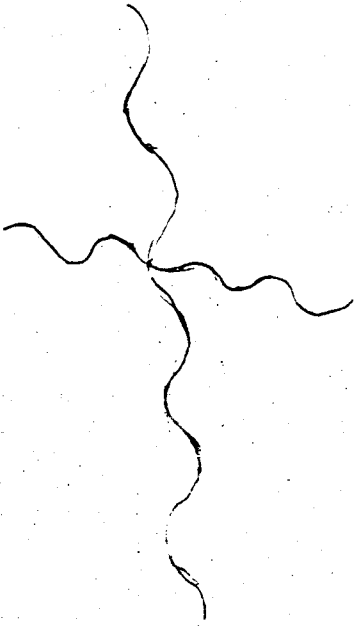
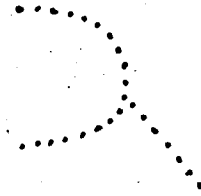
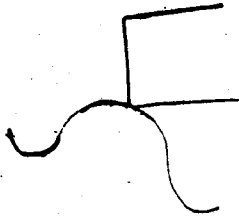
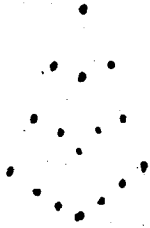
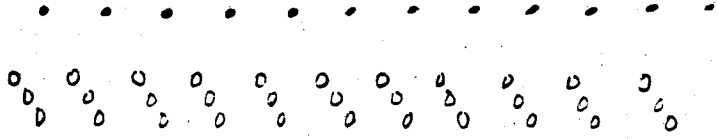
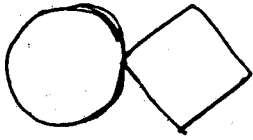


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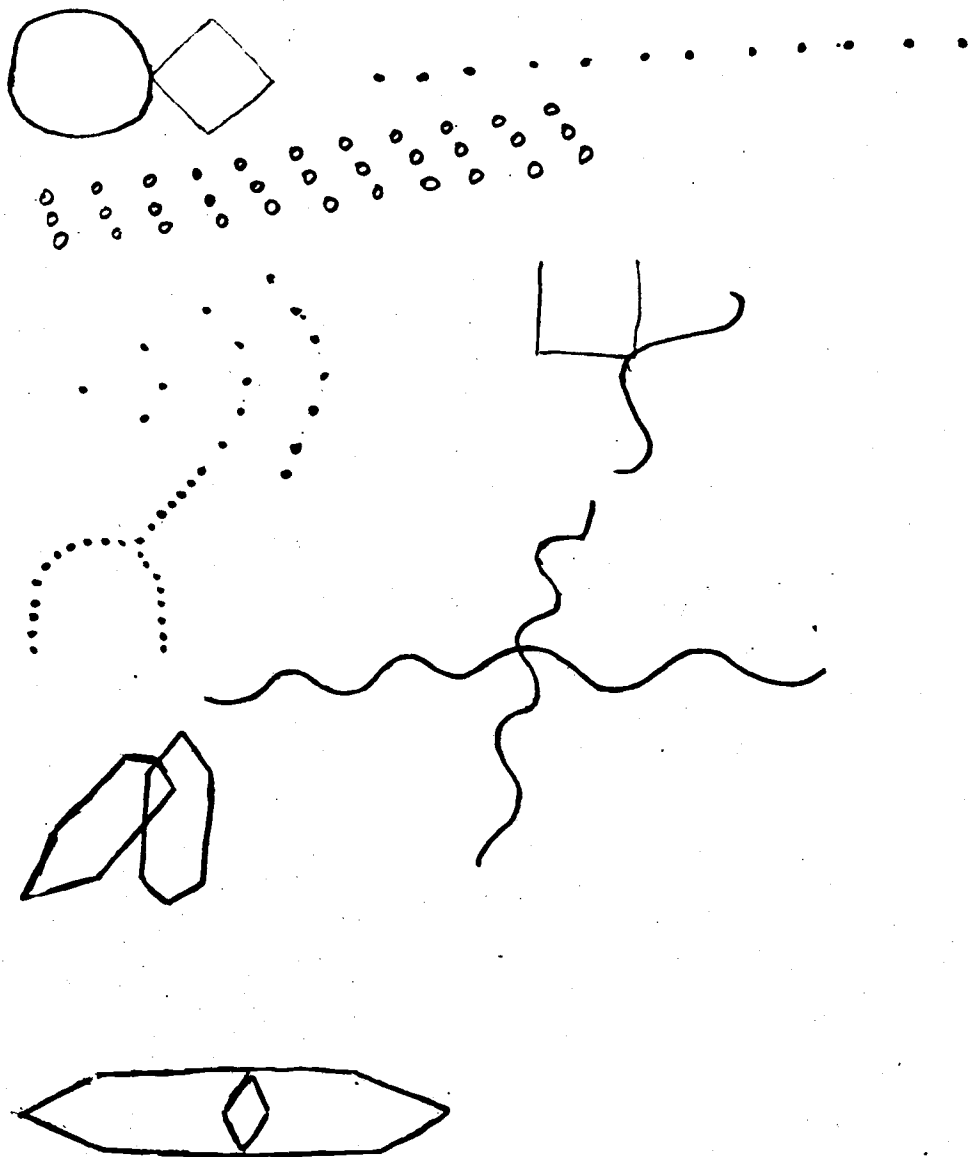
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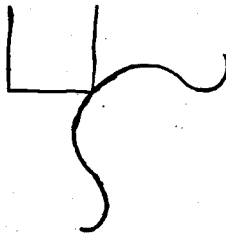
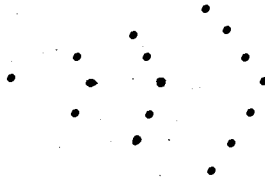
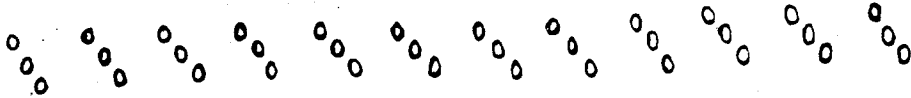
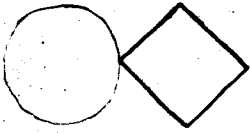
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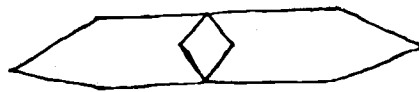
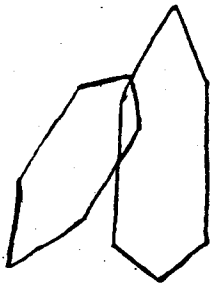
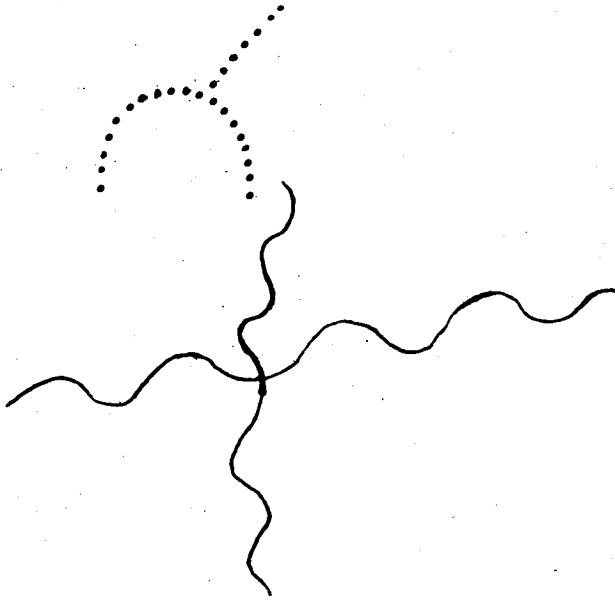


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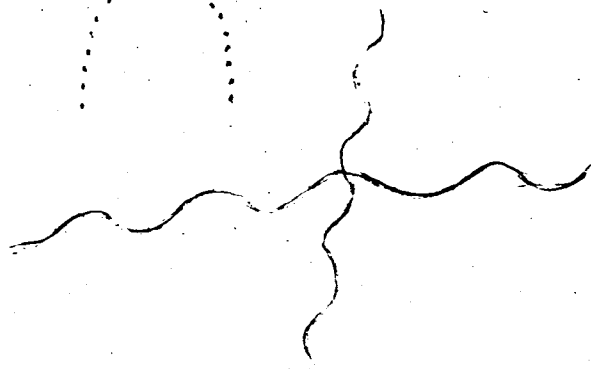
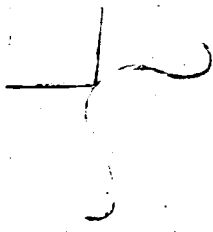
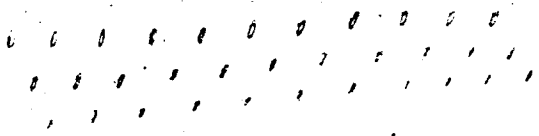
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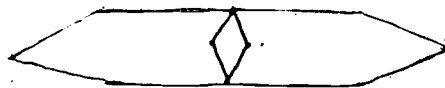
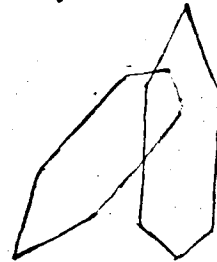
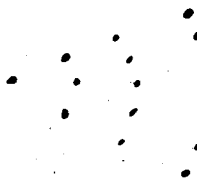
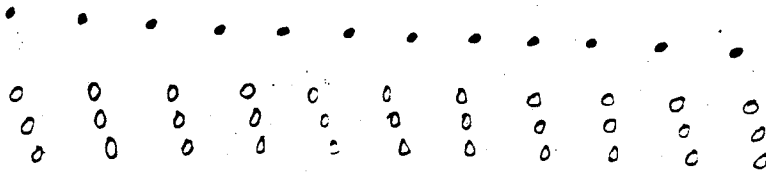
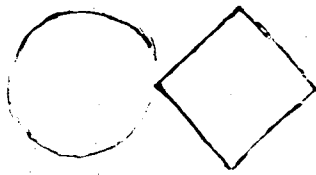


82



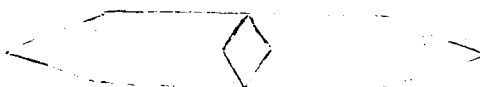
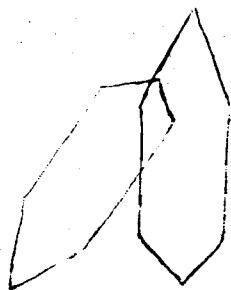
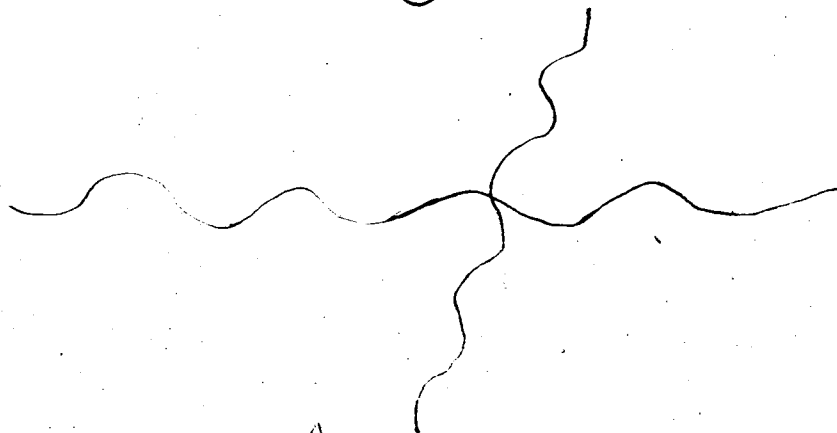
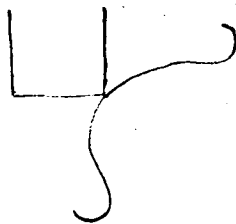
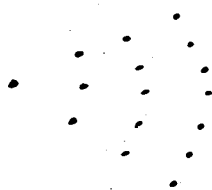
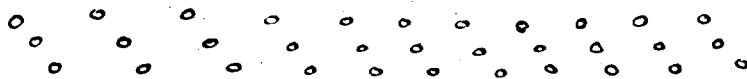
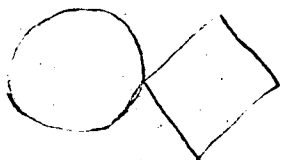
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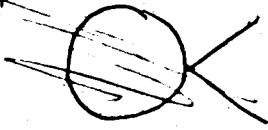


86

86

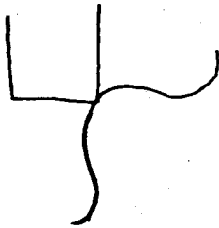
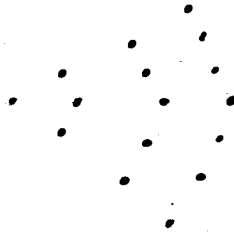
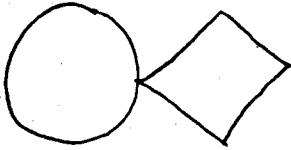


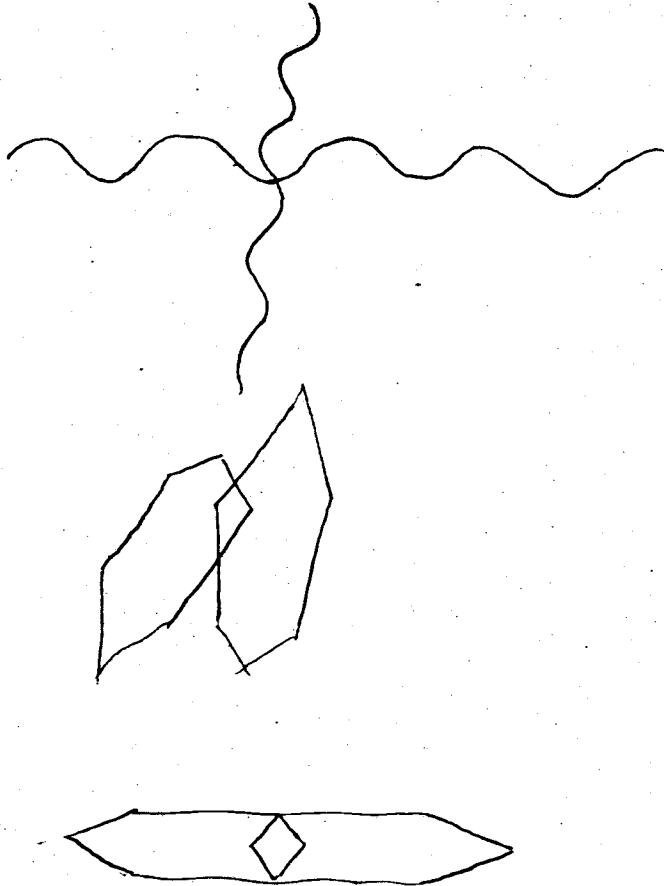
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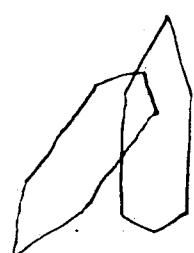
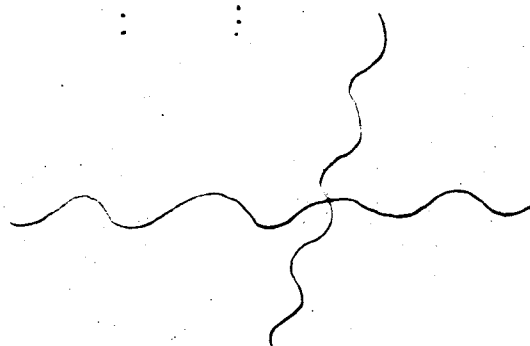
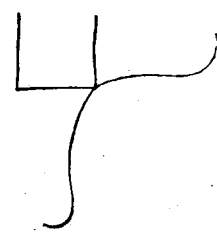
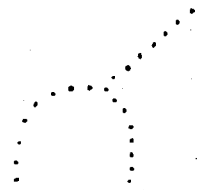
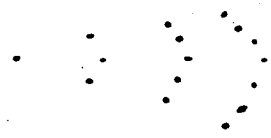
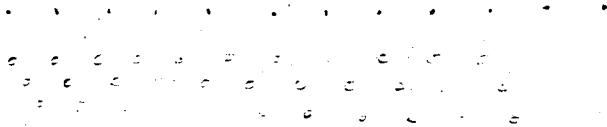
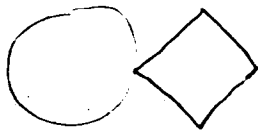


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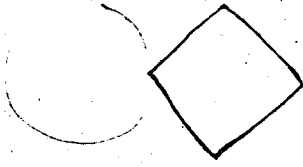
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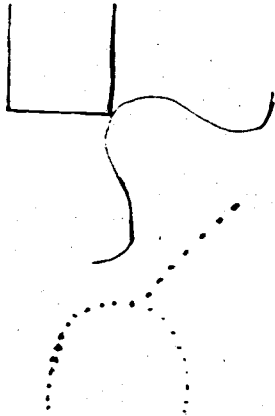
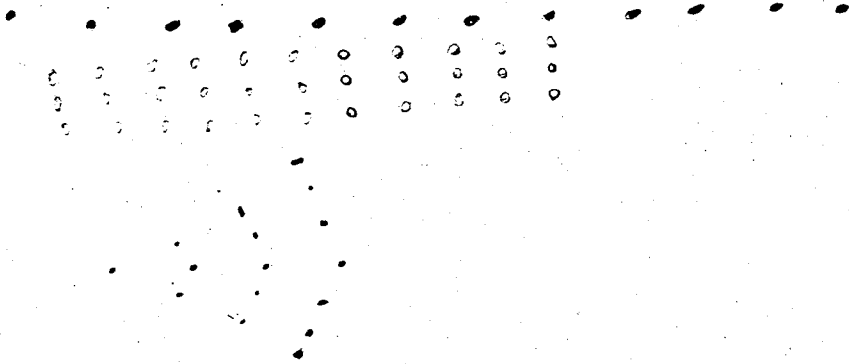




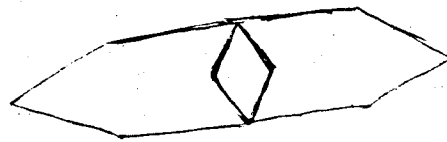
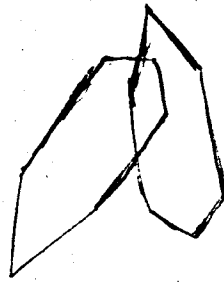
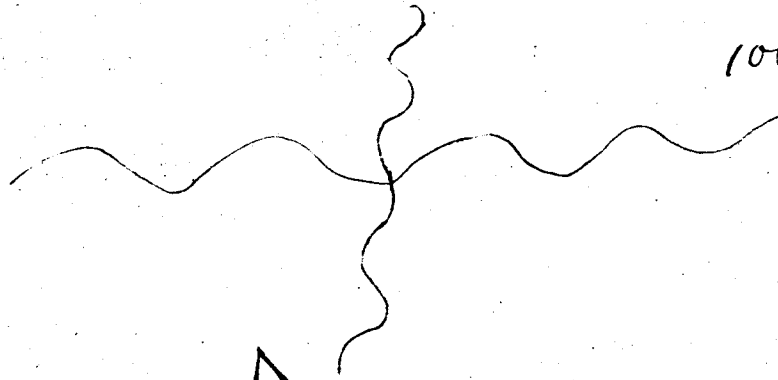
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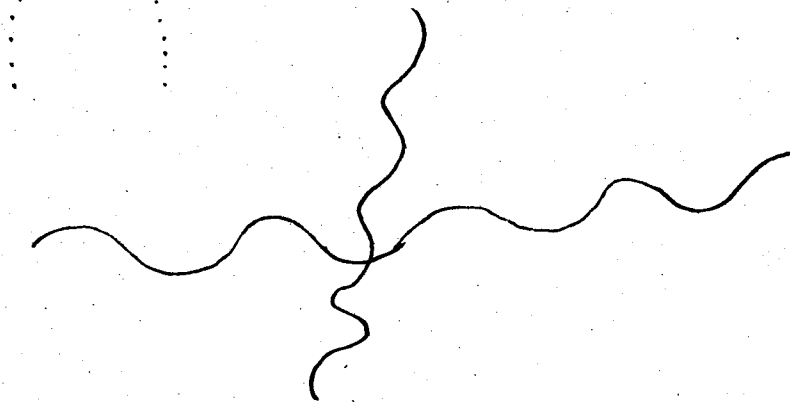
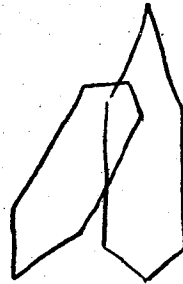
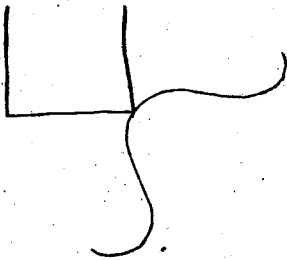
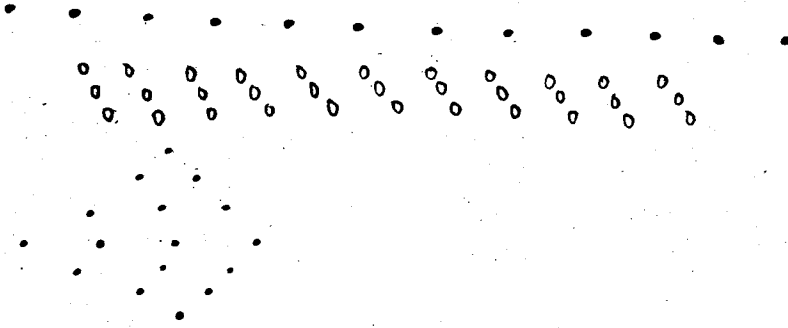
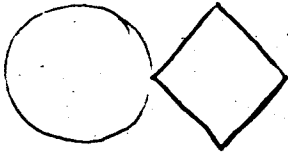
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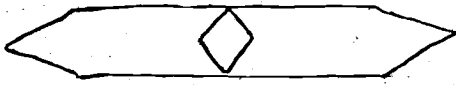
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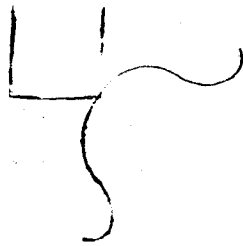
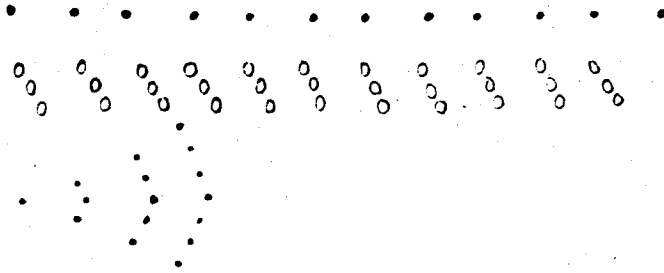
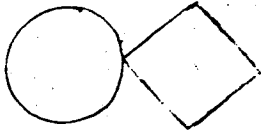
102



over

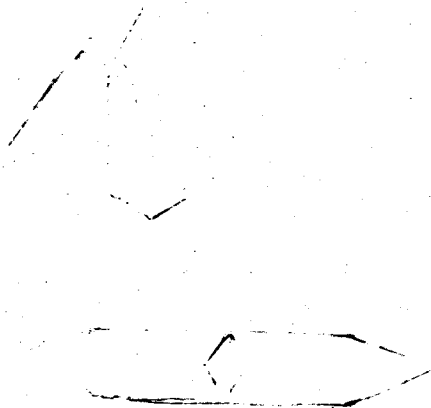


102



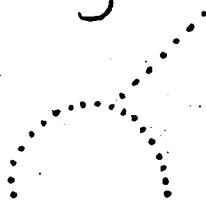
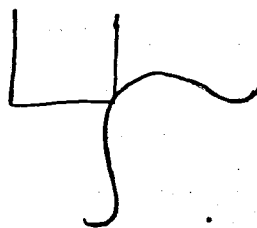
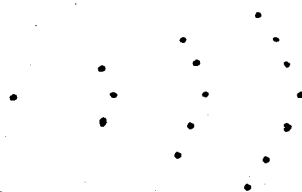
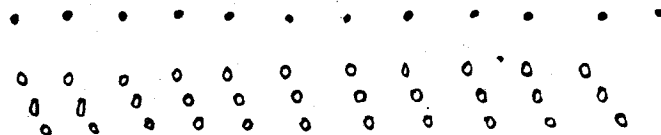
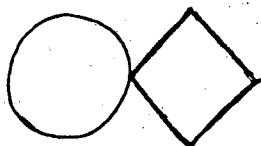
(over)

103



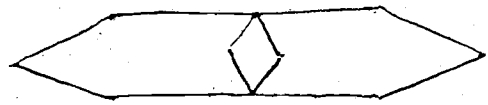
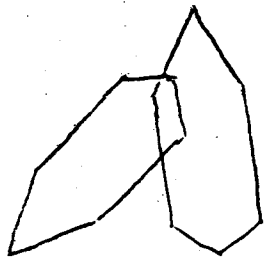
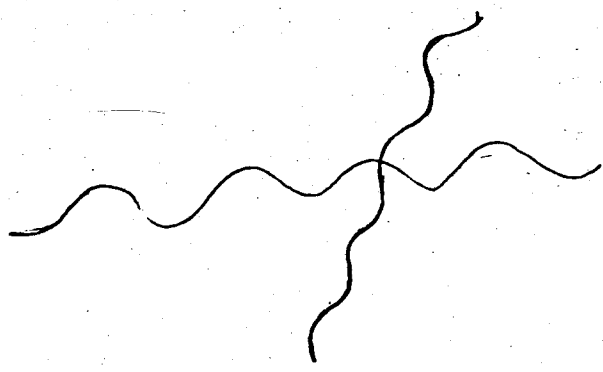
112

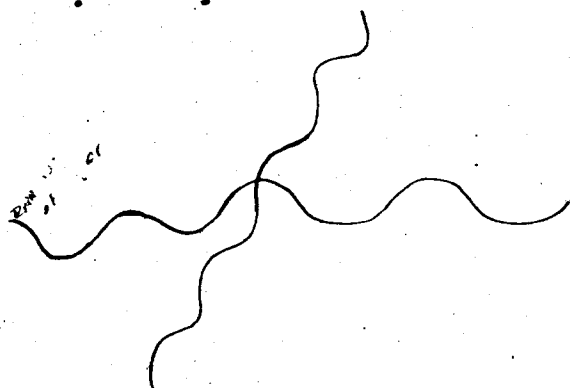
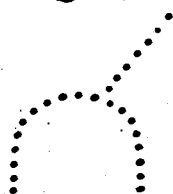
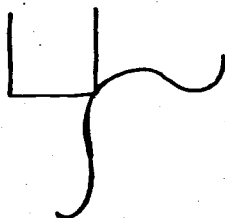
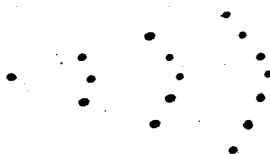
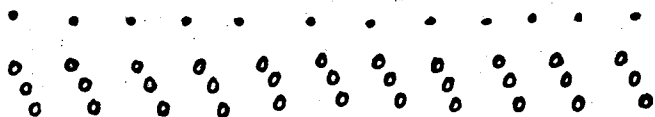
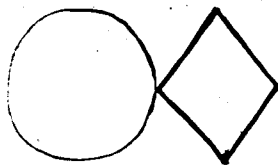
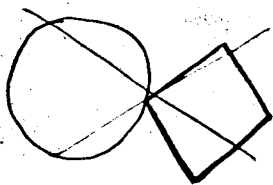
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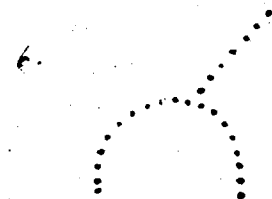
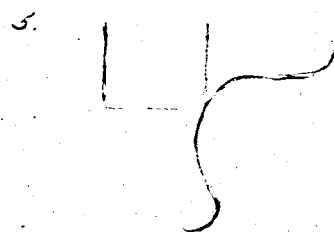
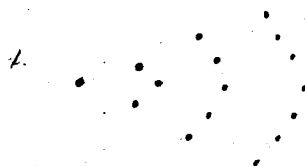
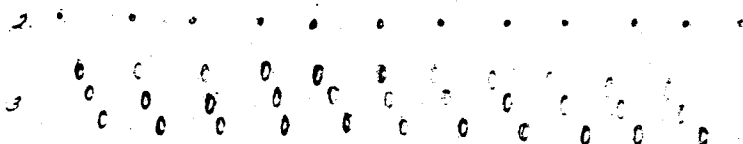


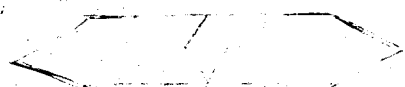
OVER

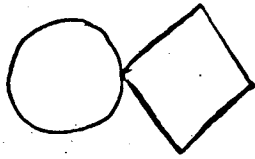
12



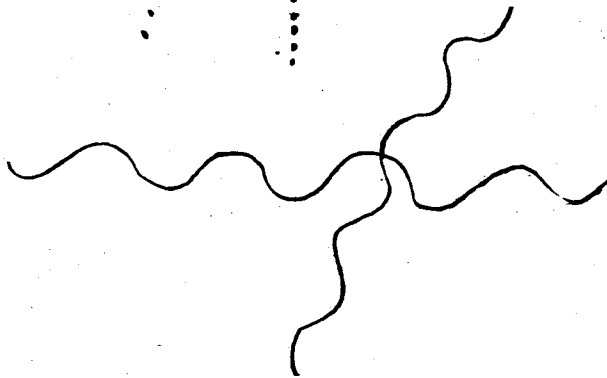
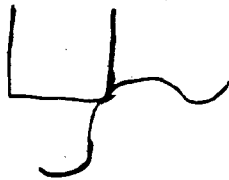
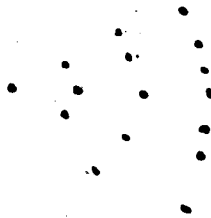
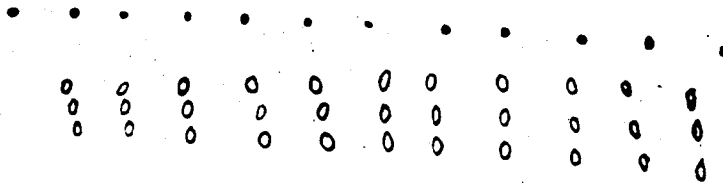




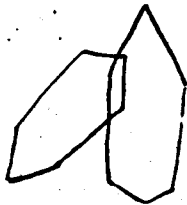




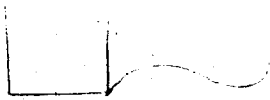
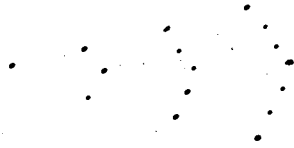
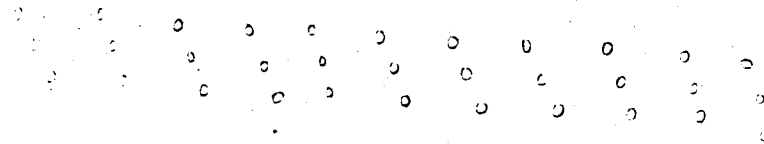
121



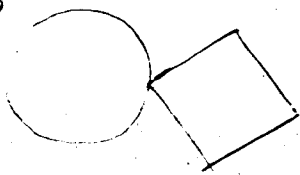
121



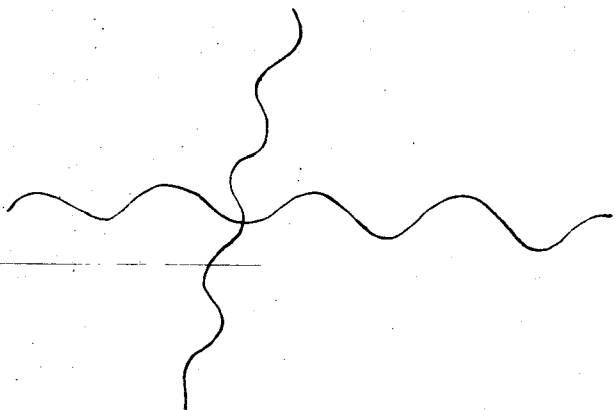
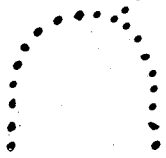
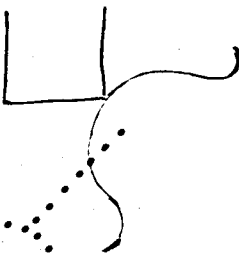
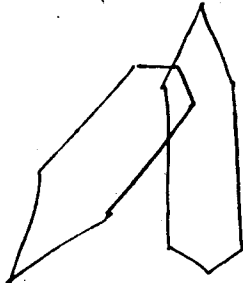
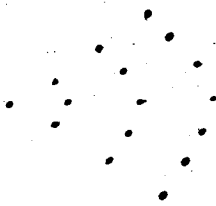
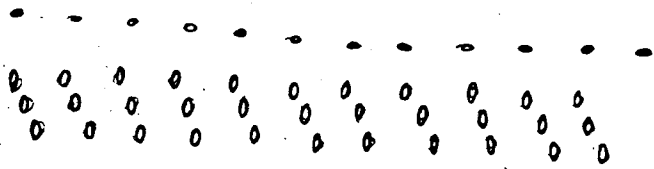
122



123

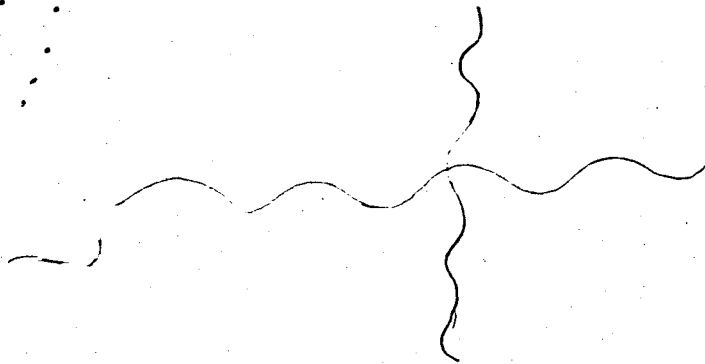
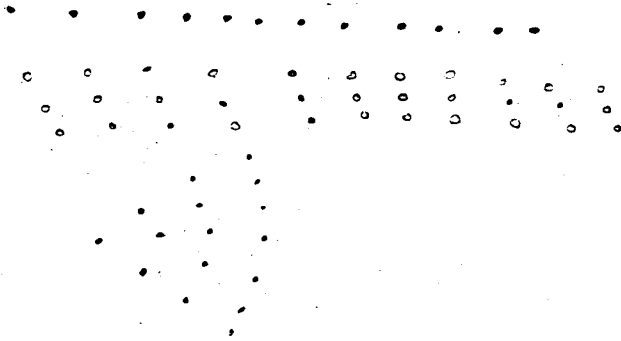


123



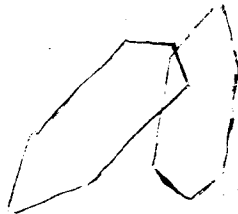
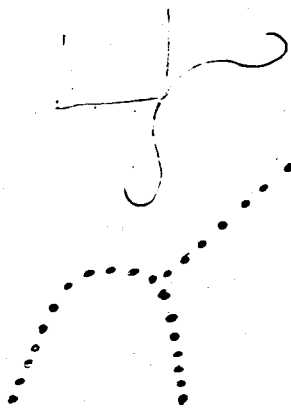
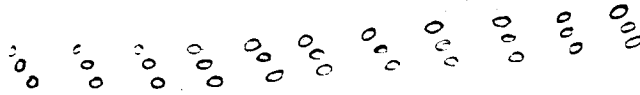
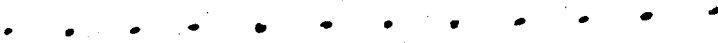
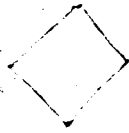
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125

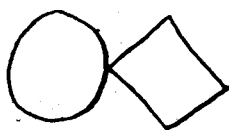


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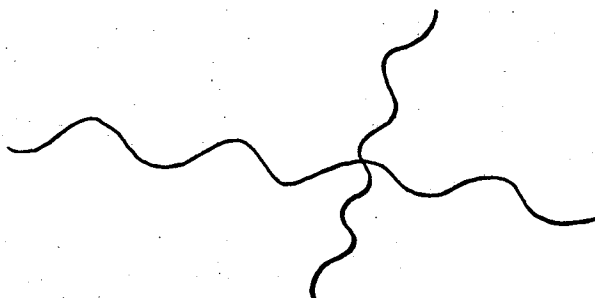
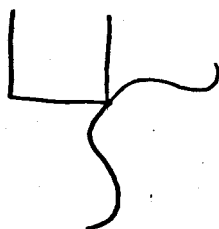
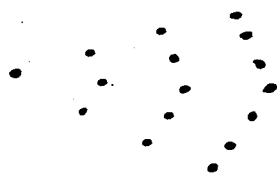
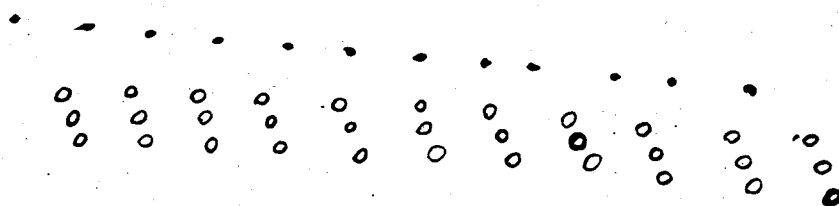
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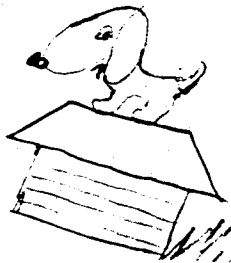
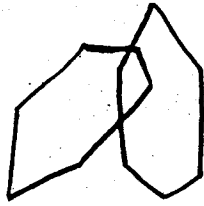
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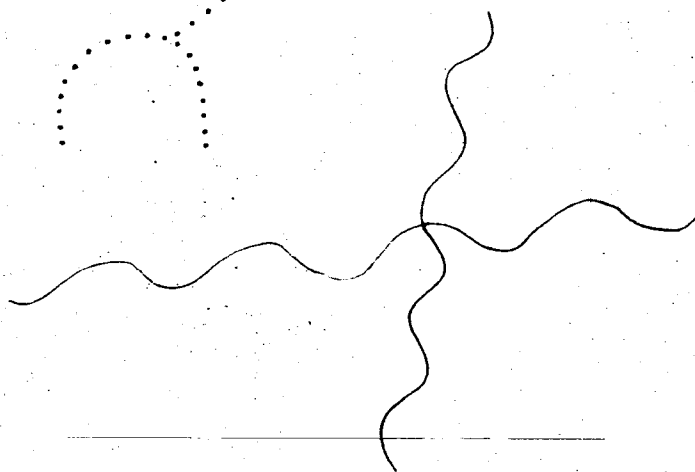
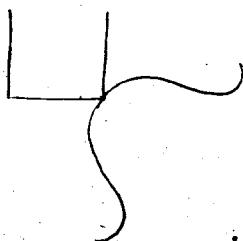
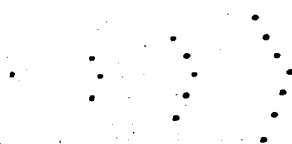
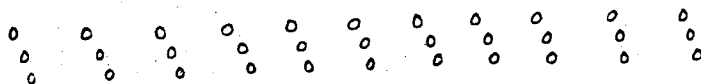
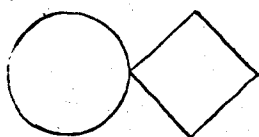


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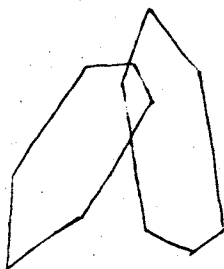


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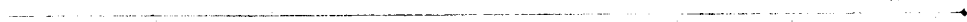
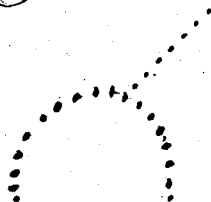
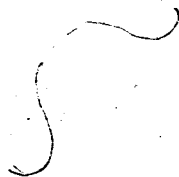


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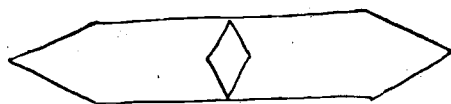


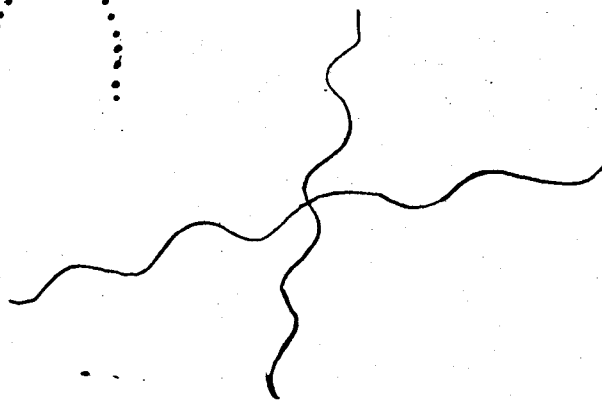
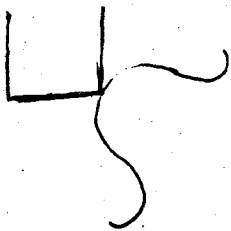
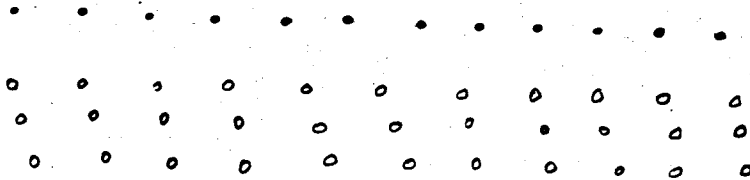
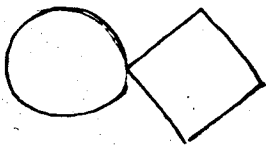
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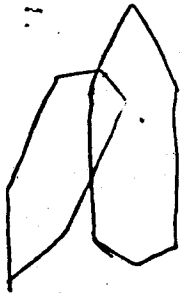
146



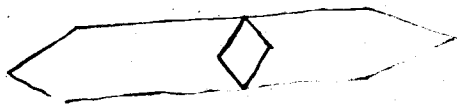
170

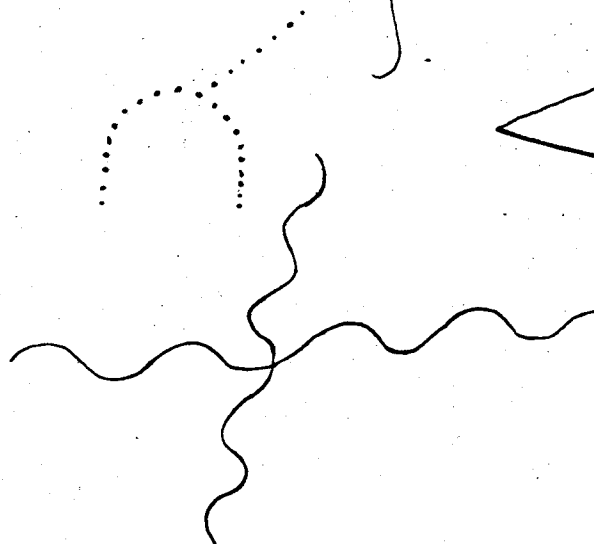
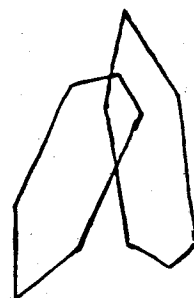
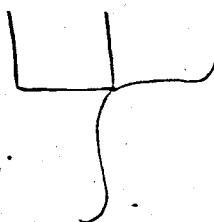
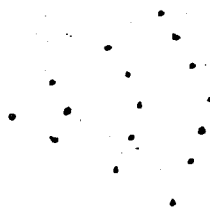
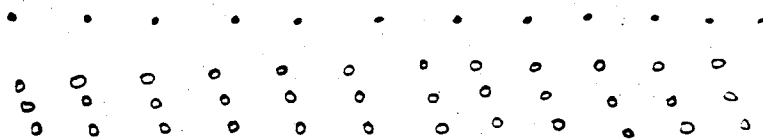
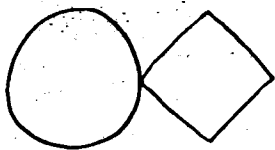




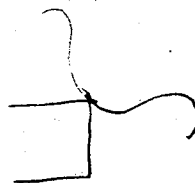
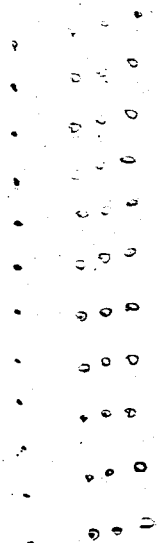
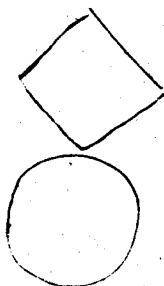
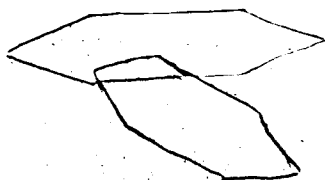


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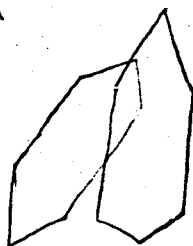
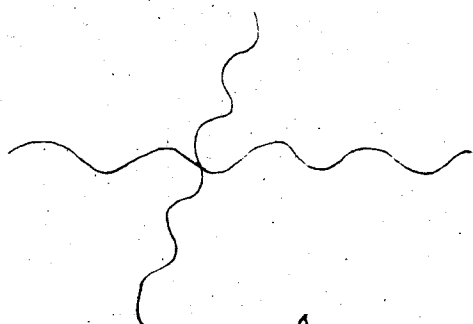
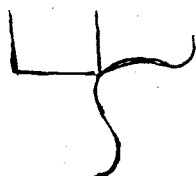
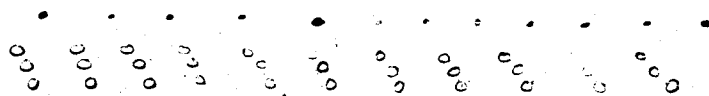


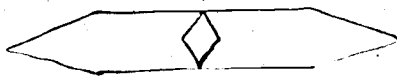
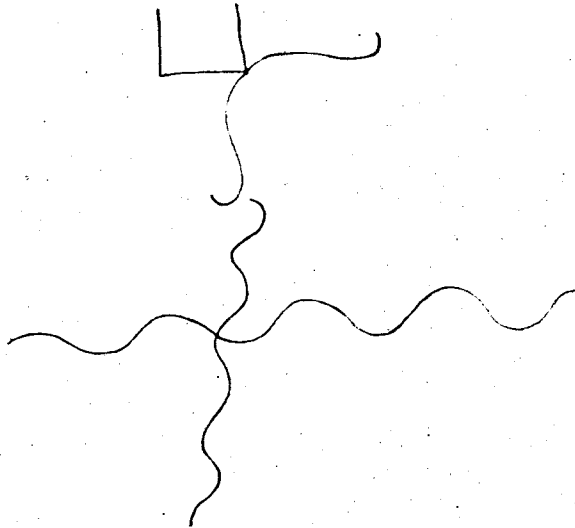
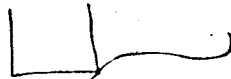
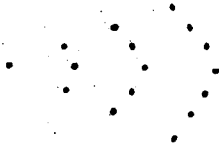
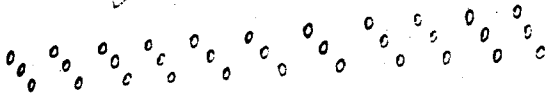
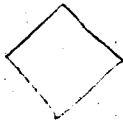


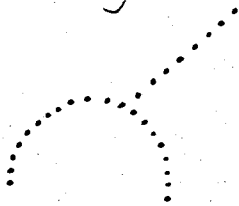
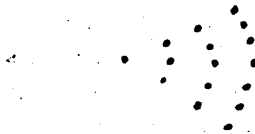
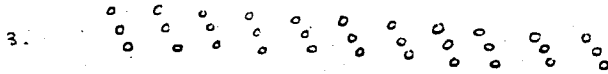
159



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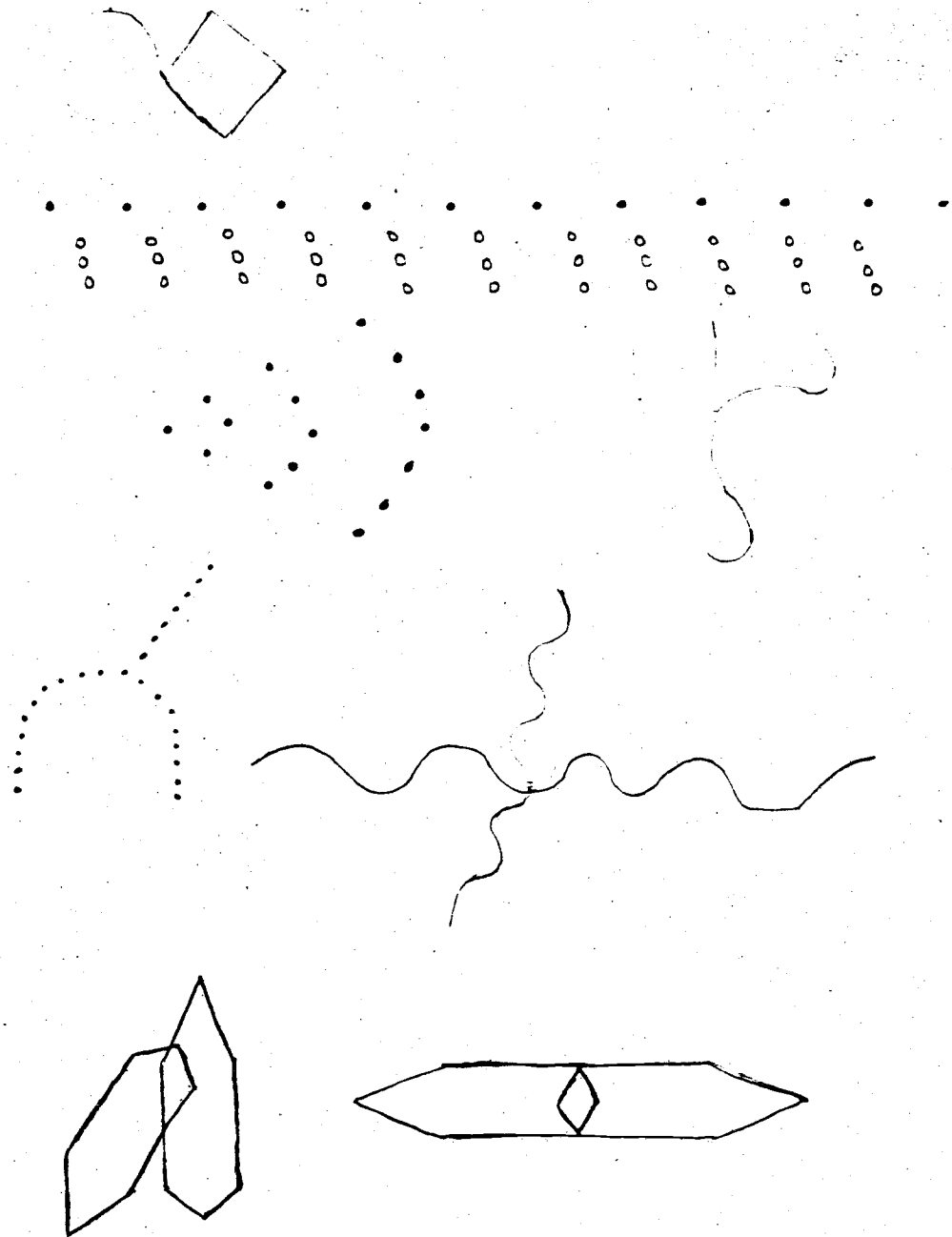






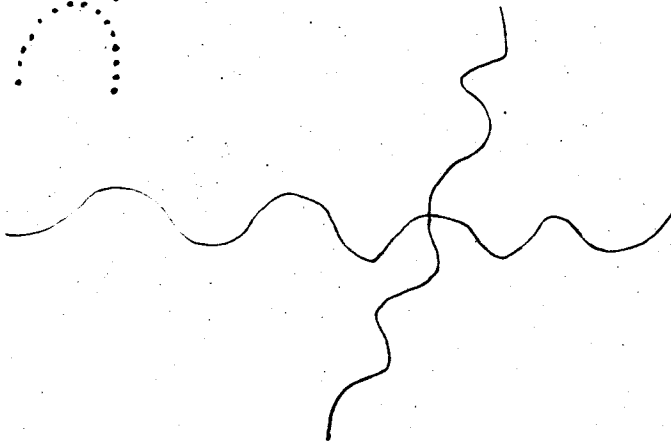
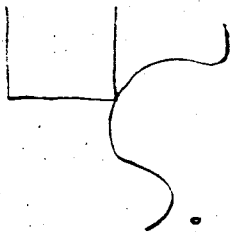
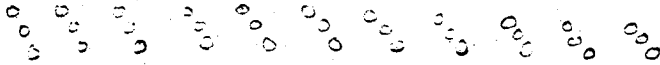
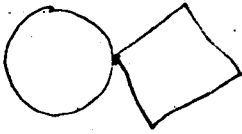
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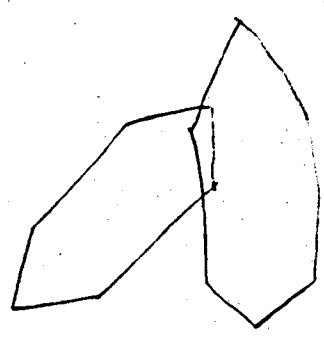


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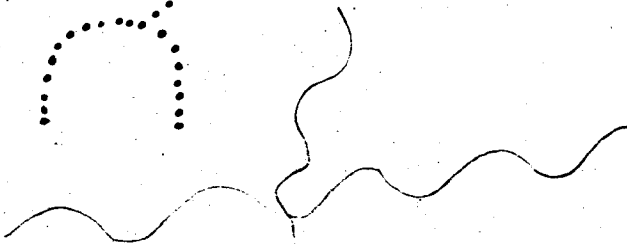
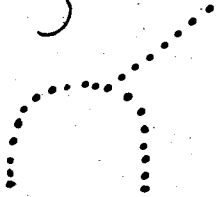
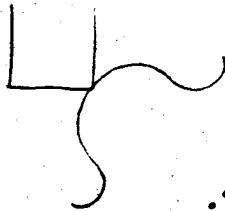
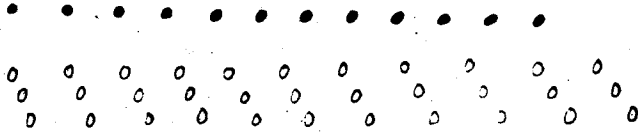
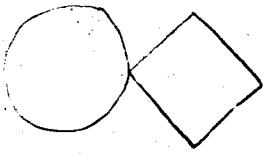
179



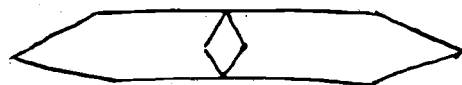
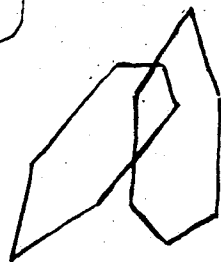
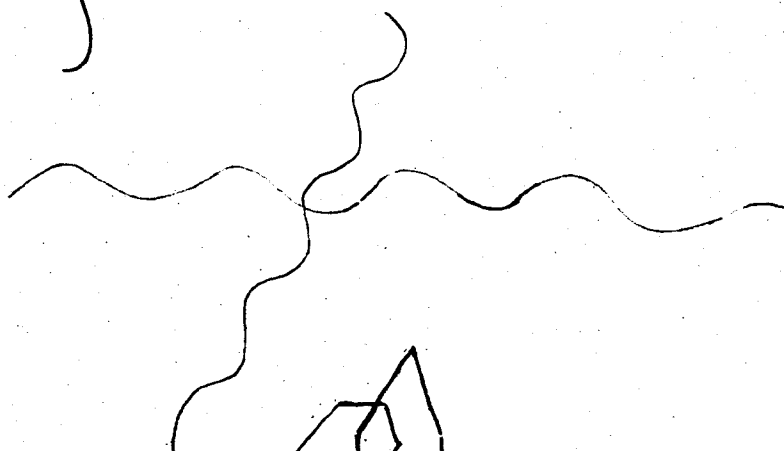
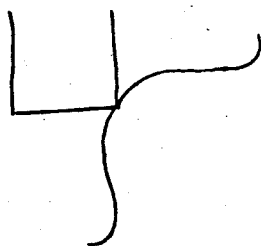
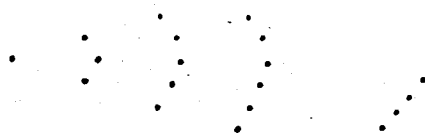
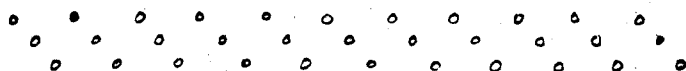
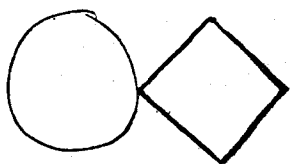
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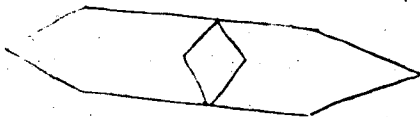
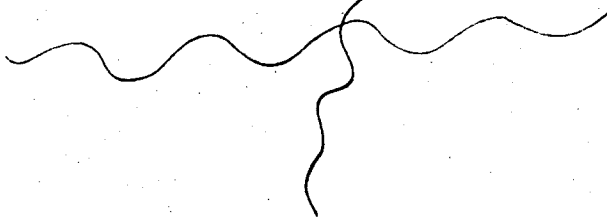
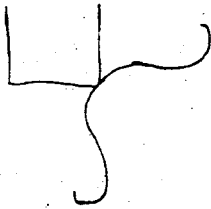
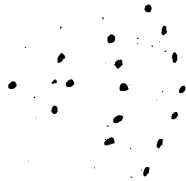
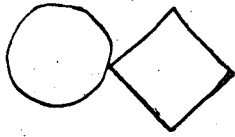


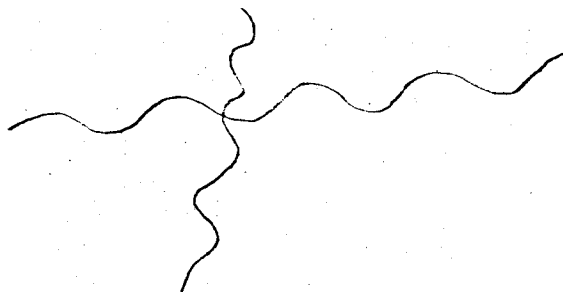
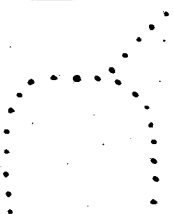
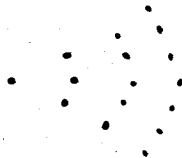
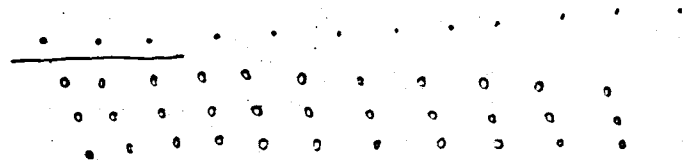
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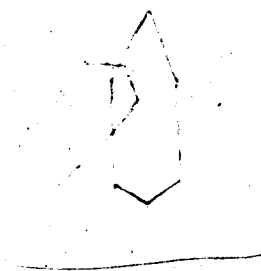


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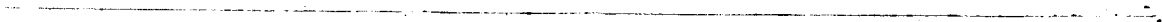
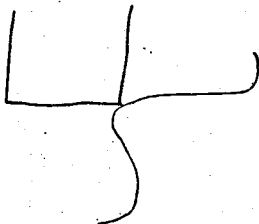
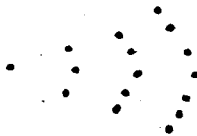
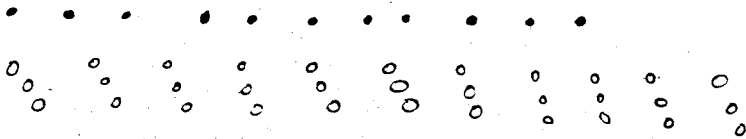
APPENDIX E

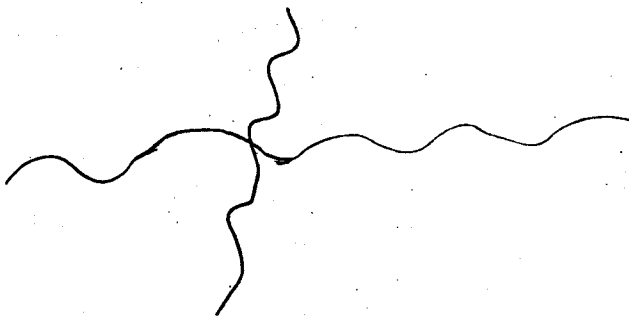
EXPERIMENTAL GROUP

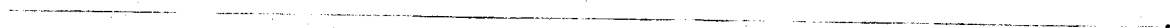
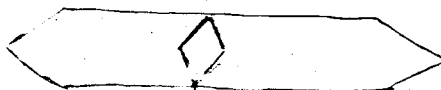
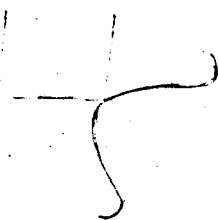
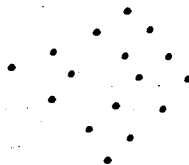
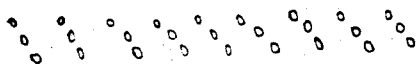
BENDER GESTALT TESTS

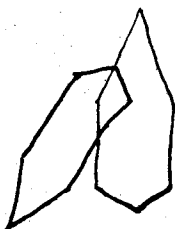
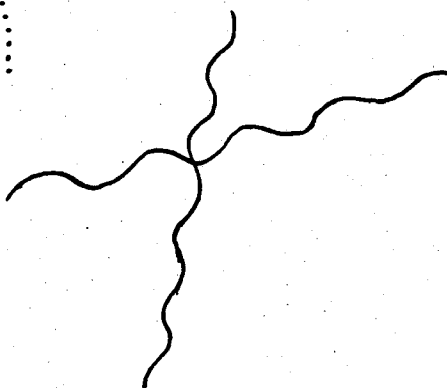
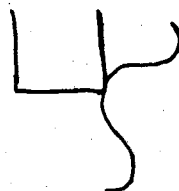
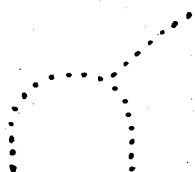
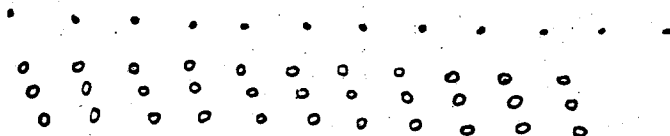
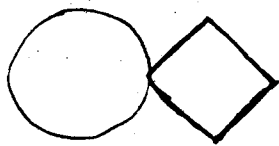
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1

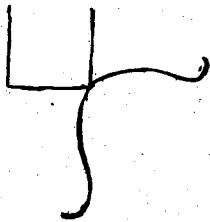
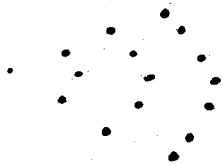
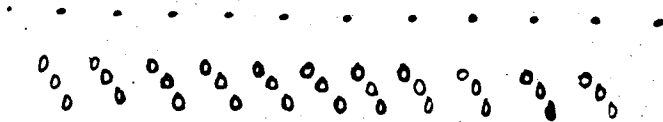
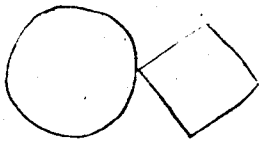


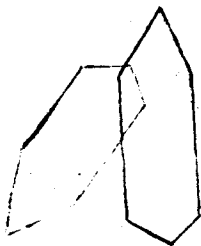
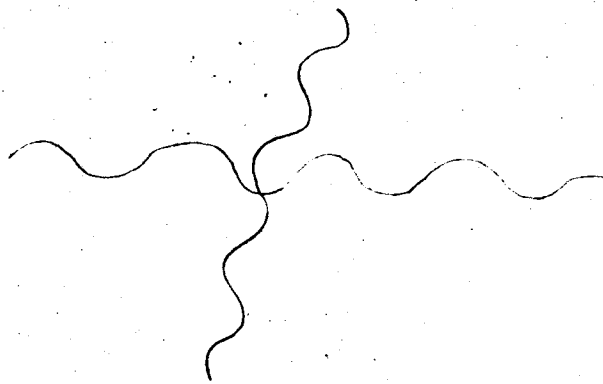


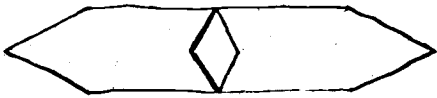
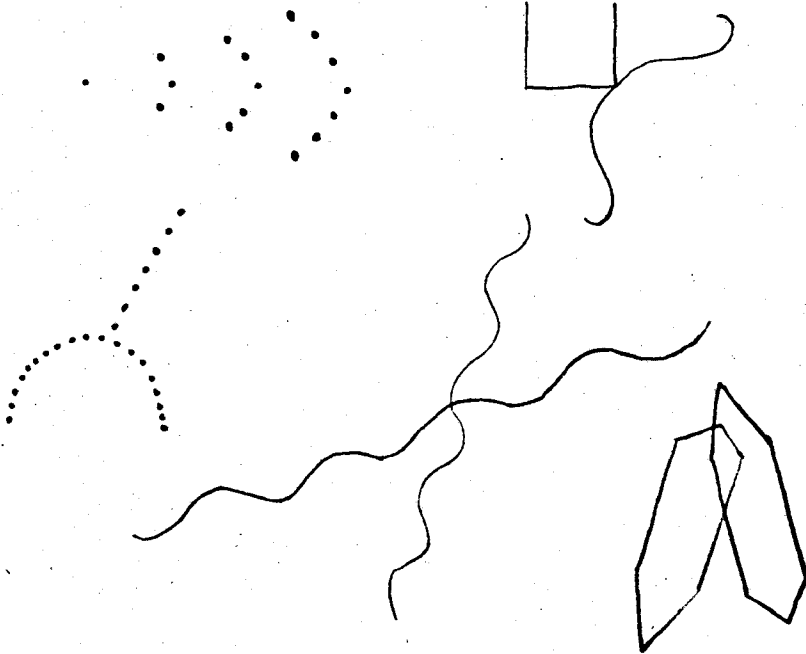
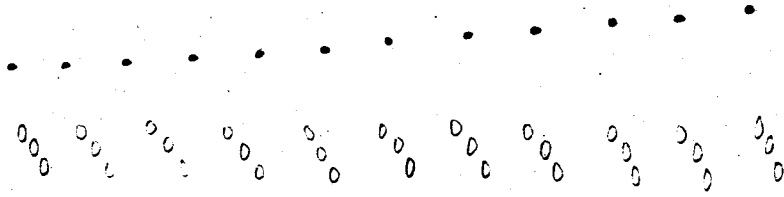
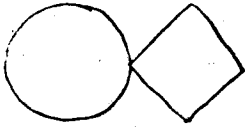


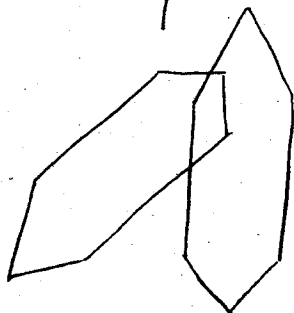
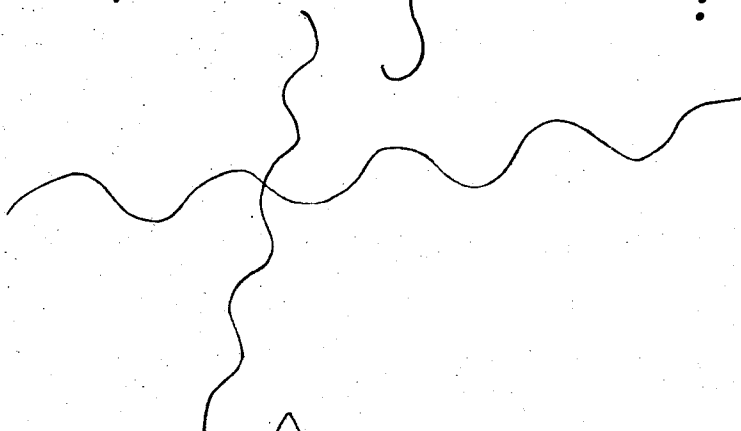
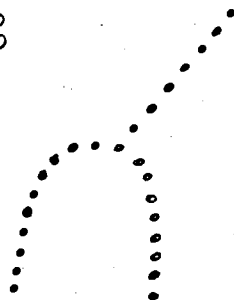
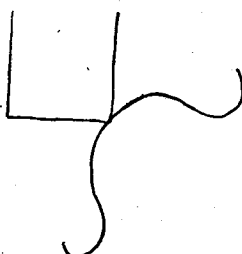
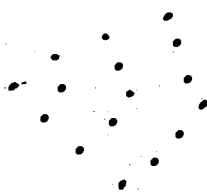
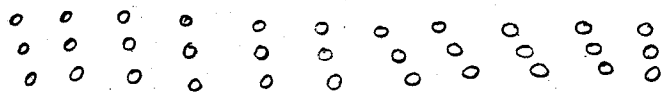
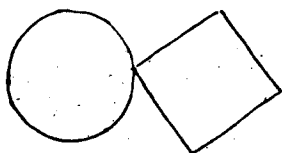


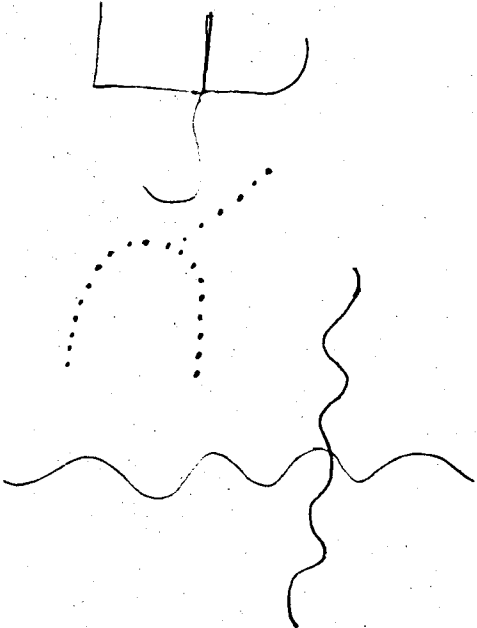
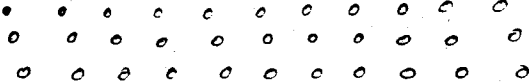
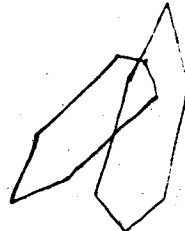
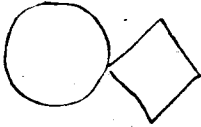
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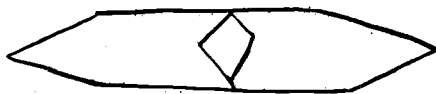
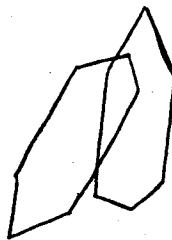
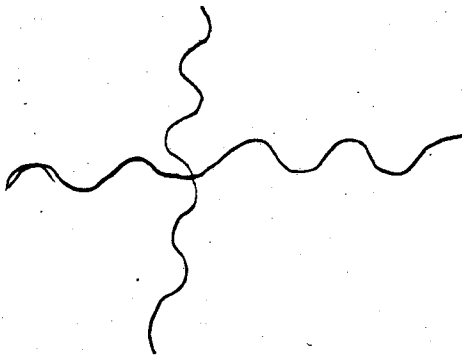
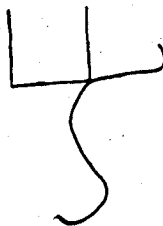
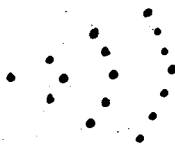
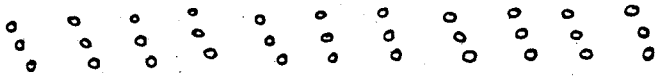
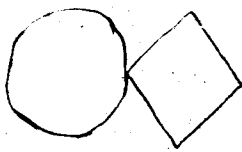


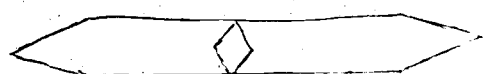
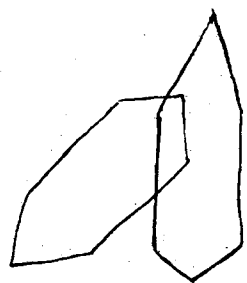
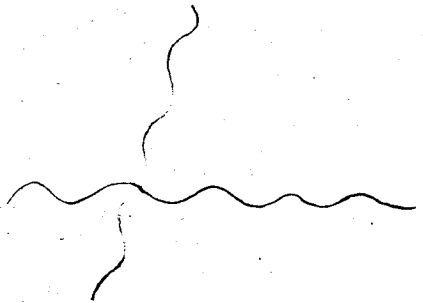
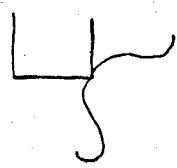
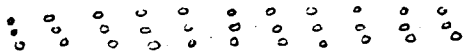
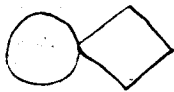




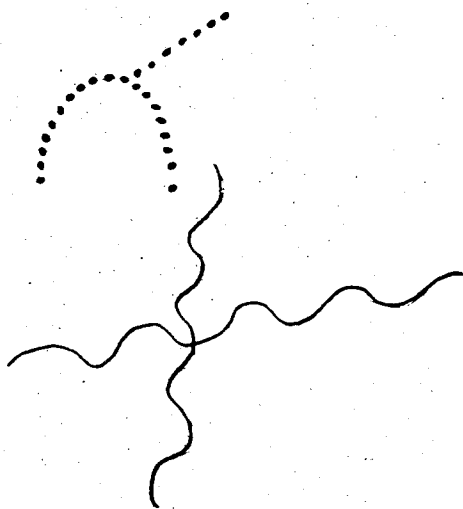
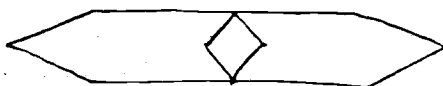
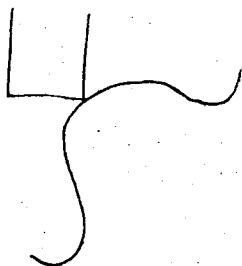
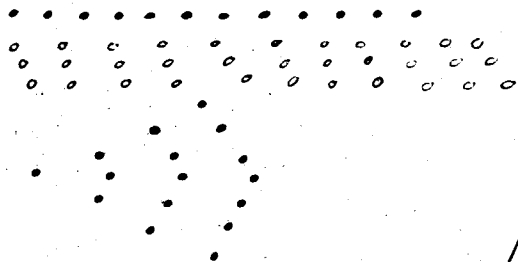
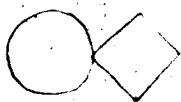


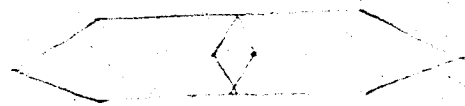
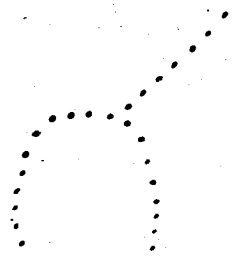
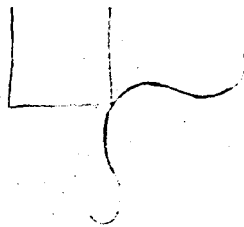


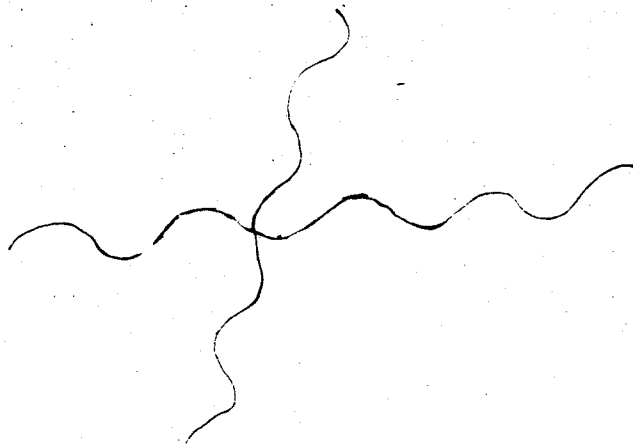
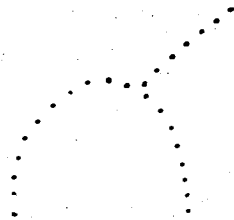
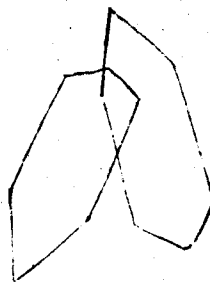
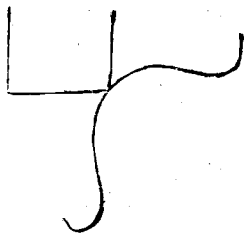
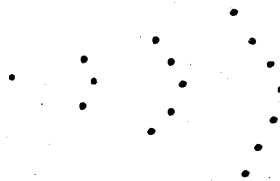
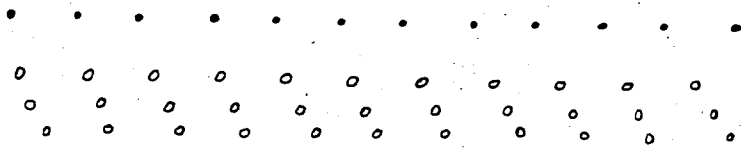
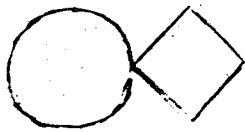




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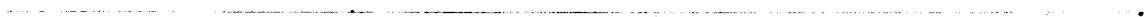
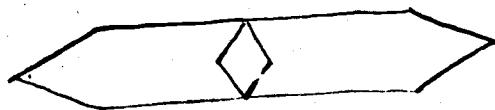
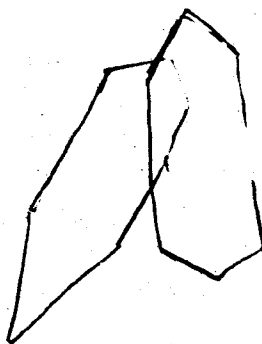
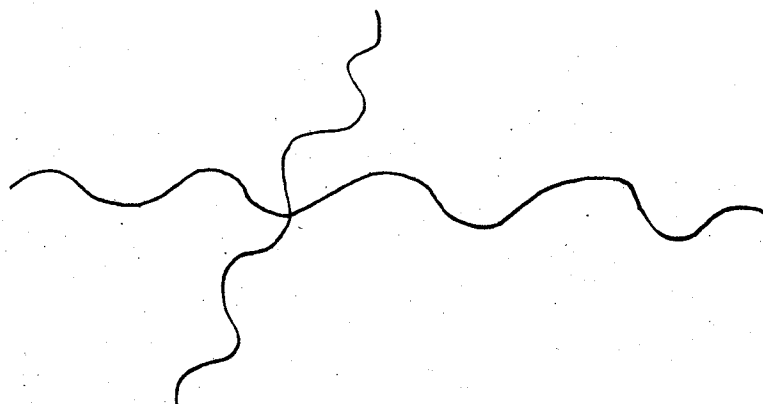
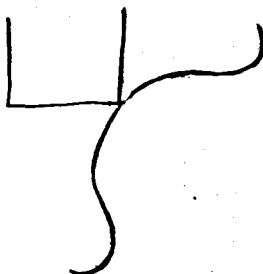
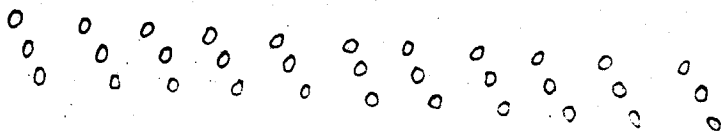
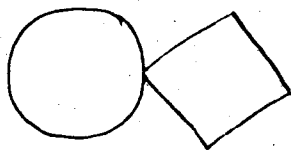




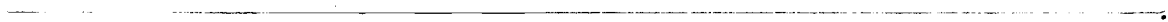
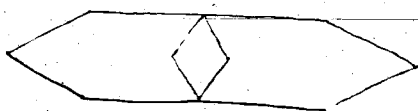
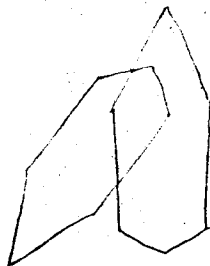
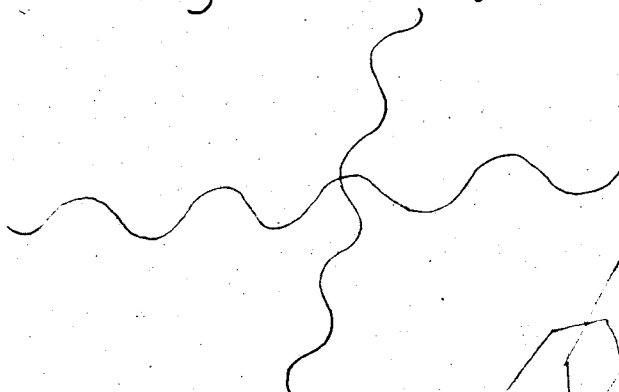
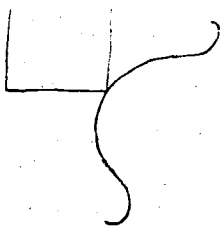
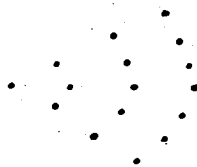
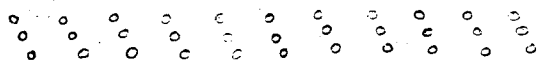
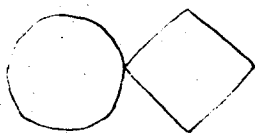


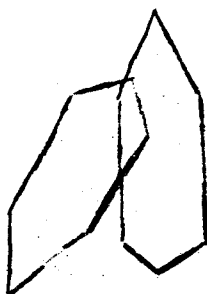
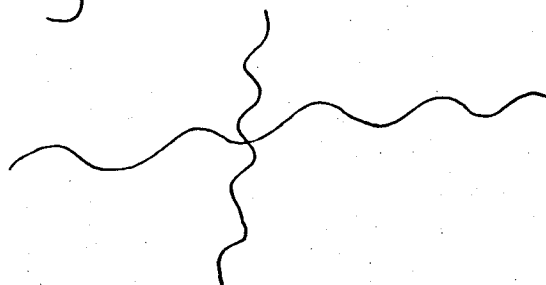
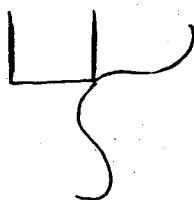
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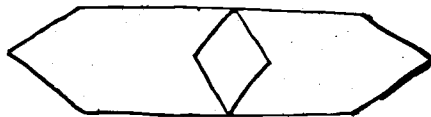
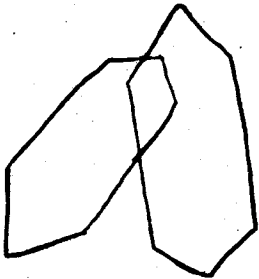
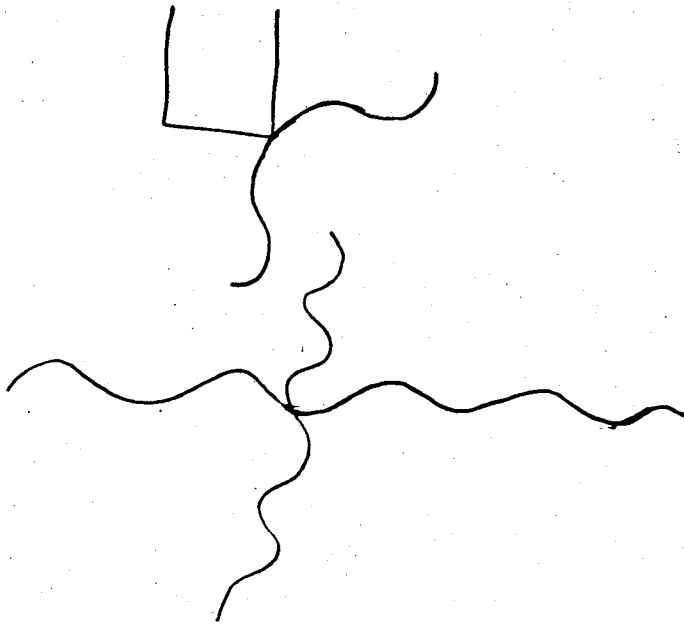
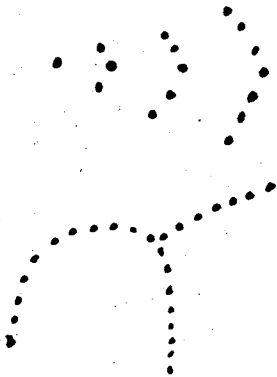
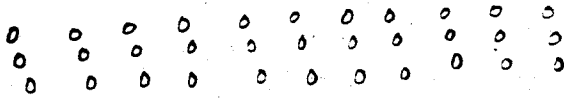
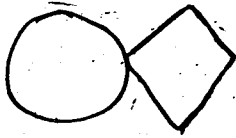
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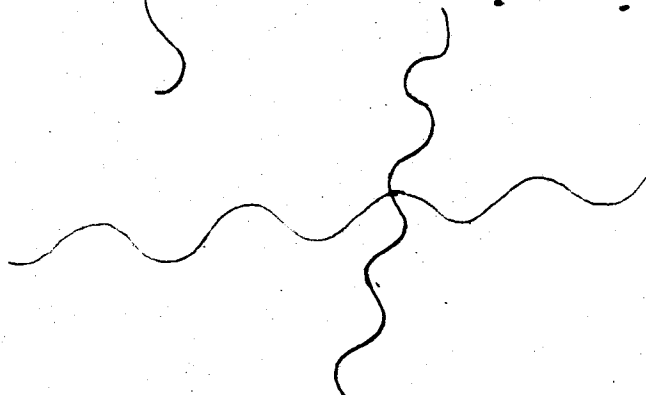
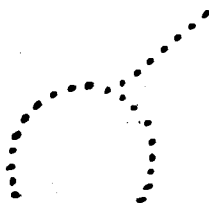
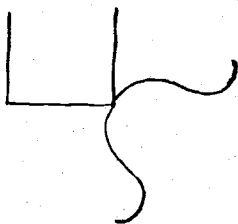
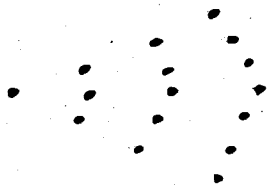
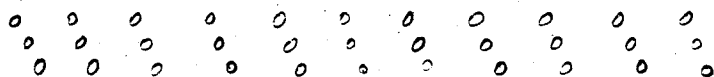
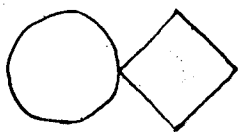


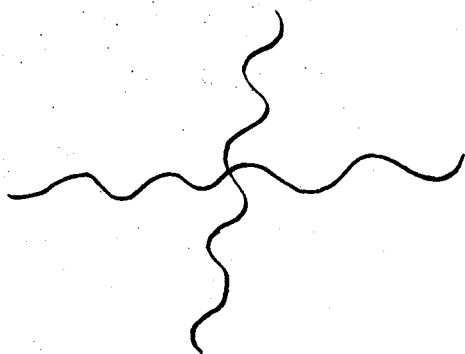
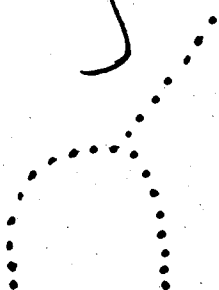
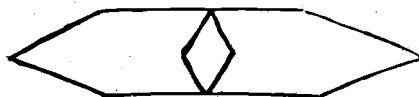
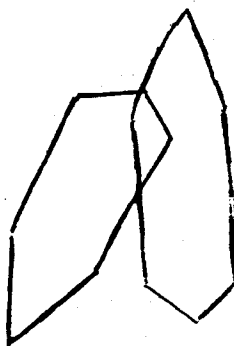
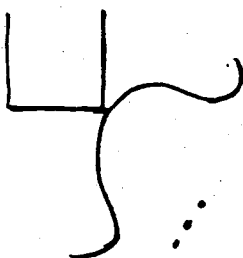
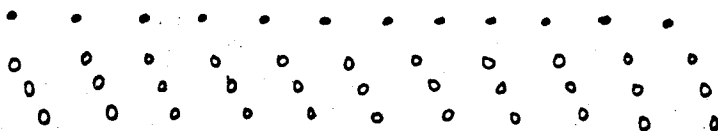
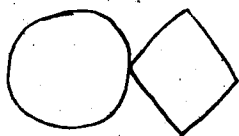


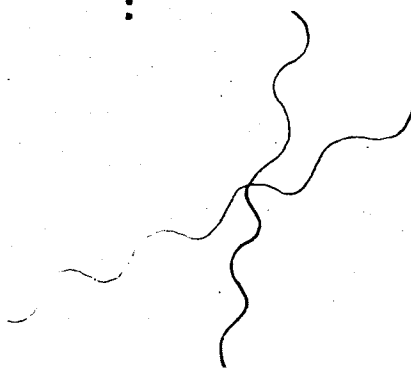
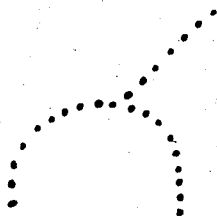
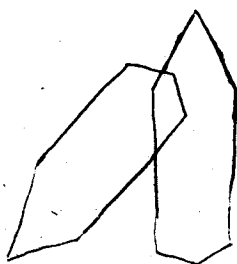
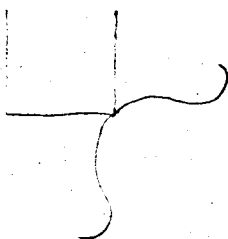
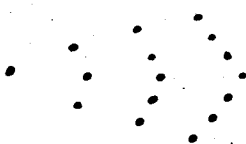
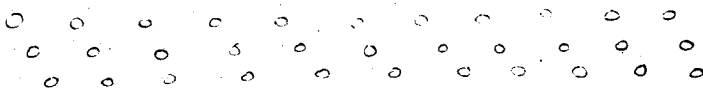
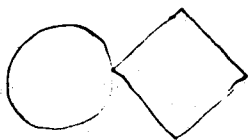
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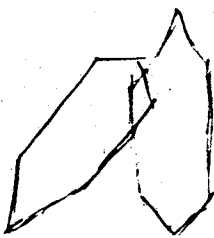
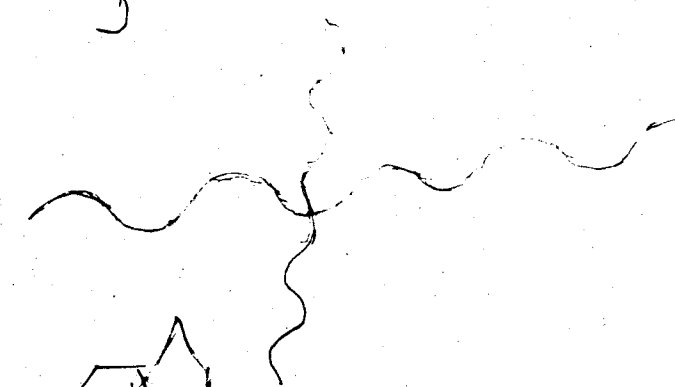
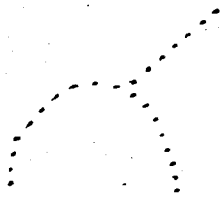
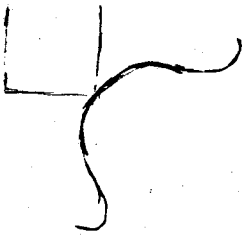
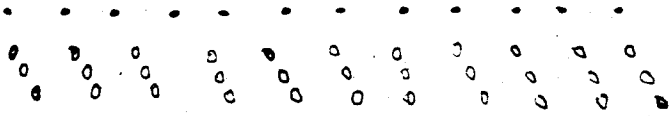
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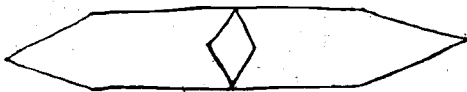
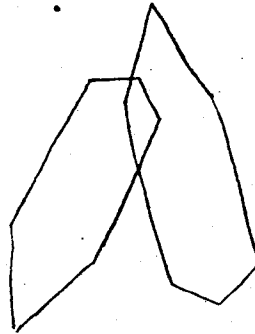
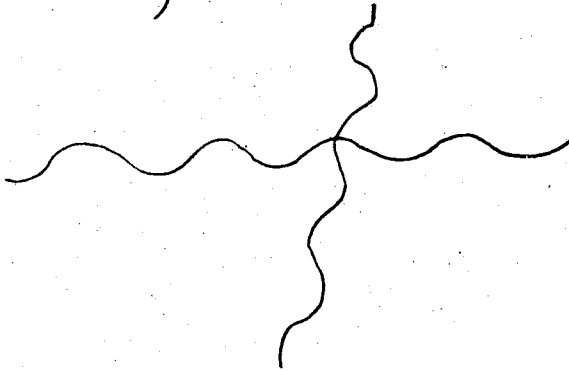
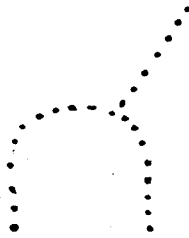
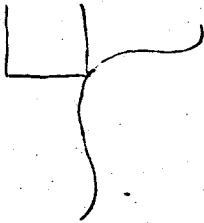
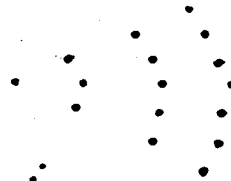
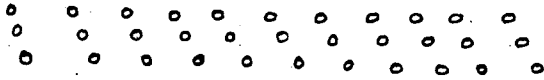
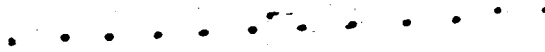
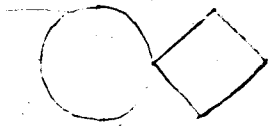






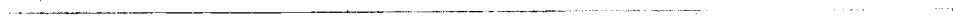
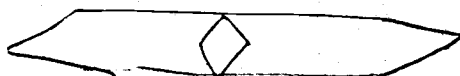
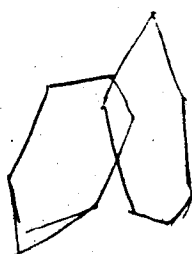
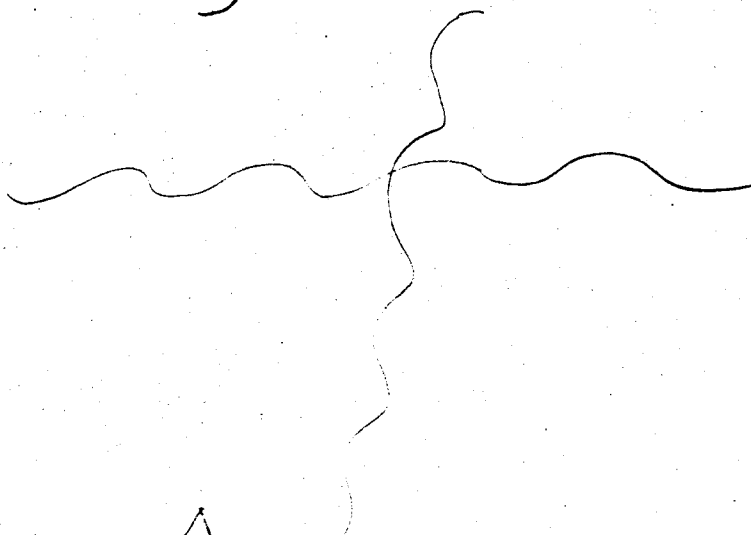
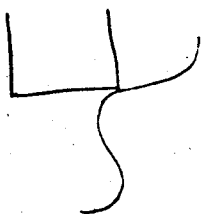
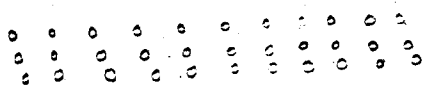
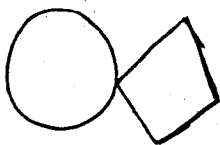
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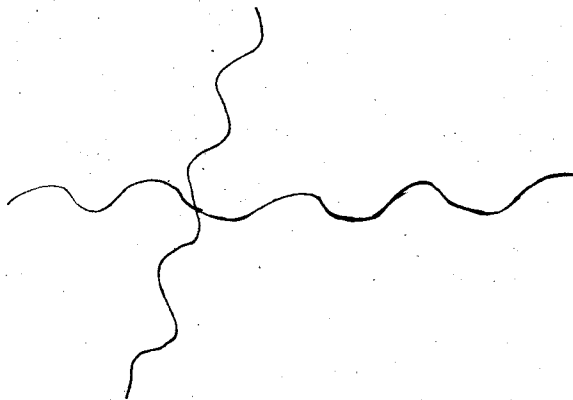
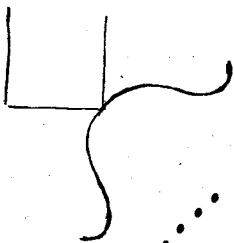
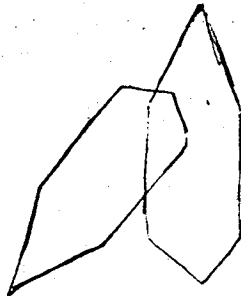
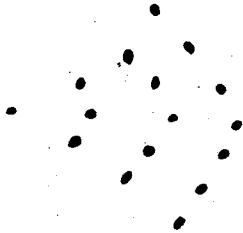
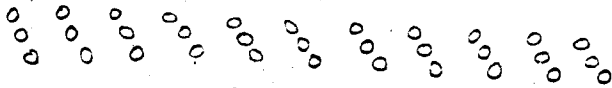


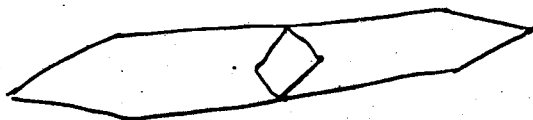
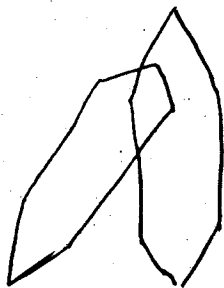
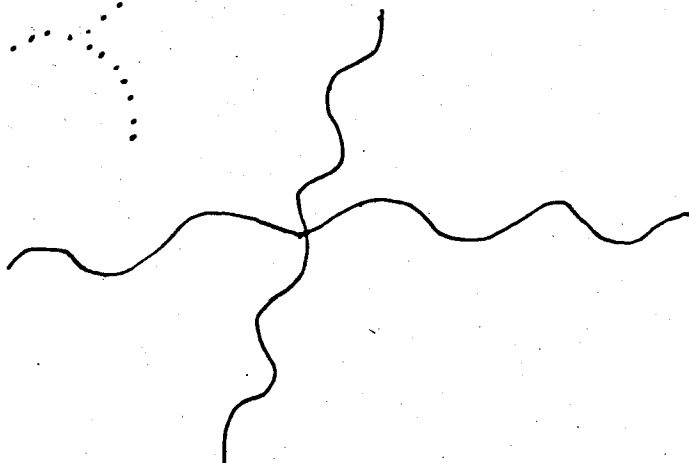
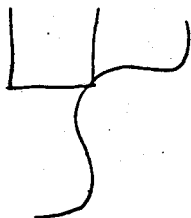
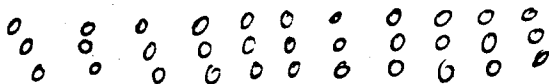
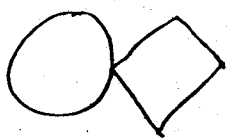
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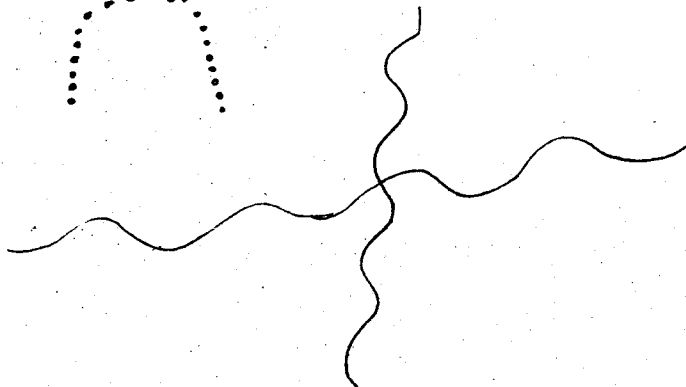
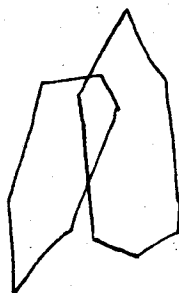
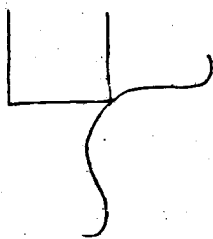
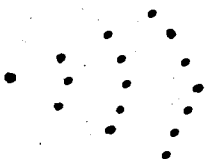
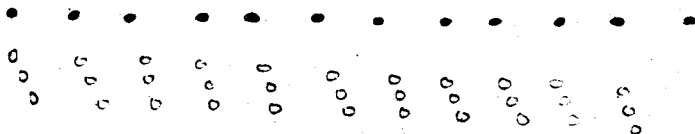
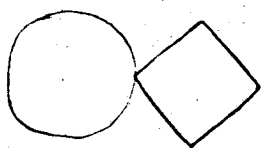
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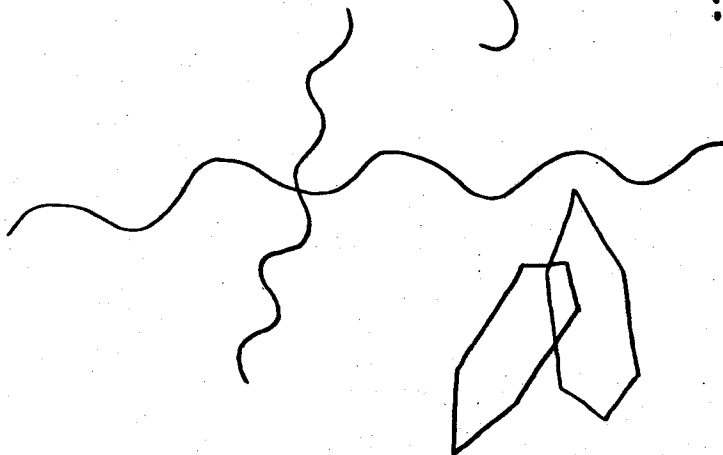
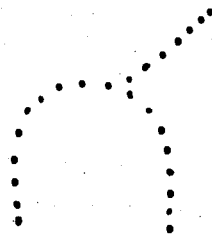
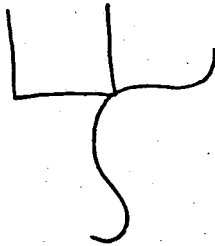
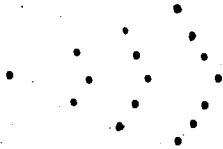
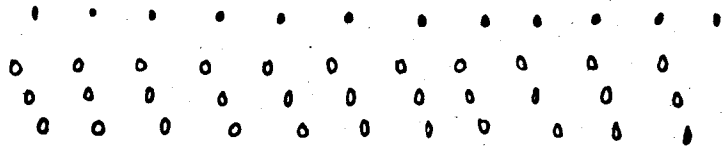
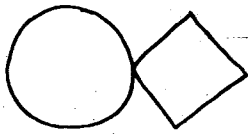






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①



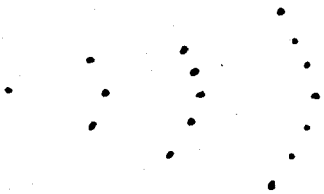
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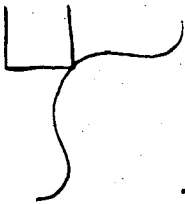
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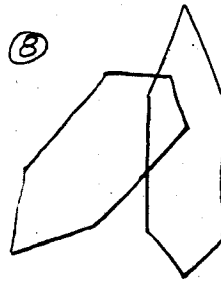
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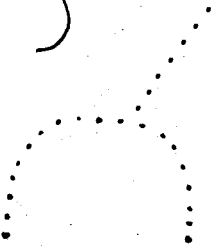
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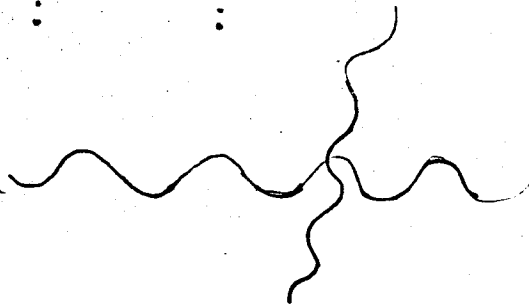
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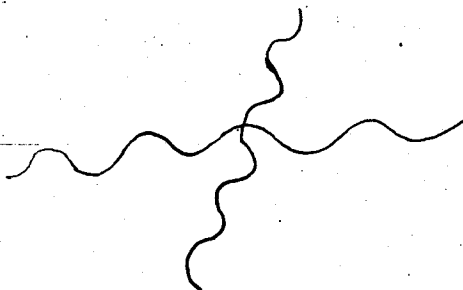
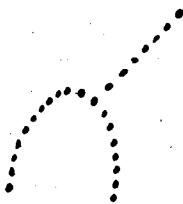
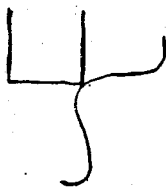
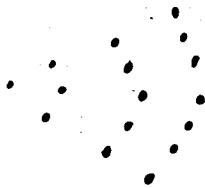
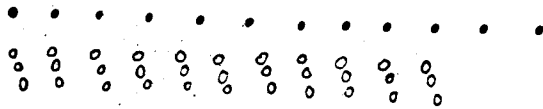


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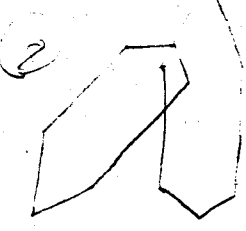
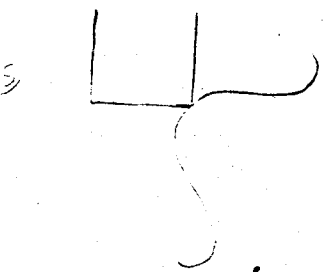
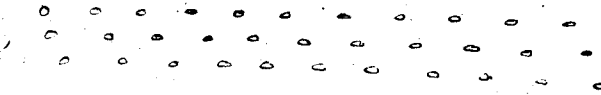
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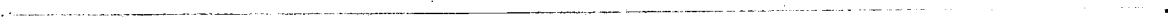
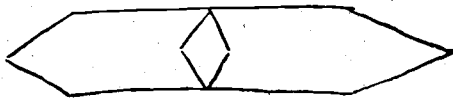
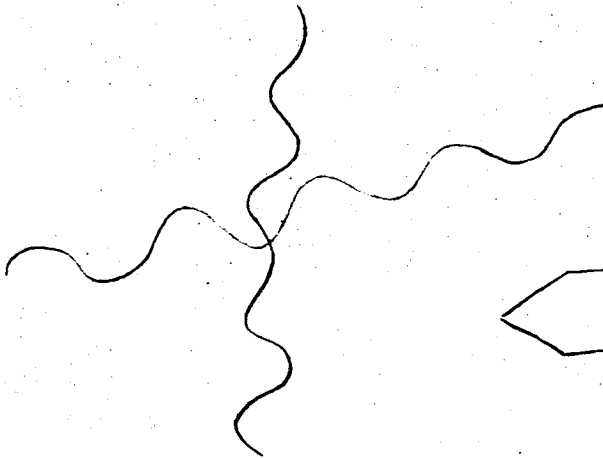
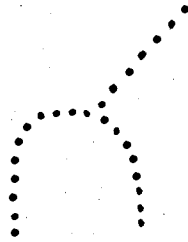
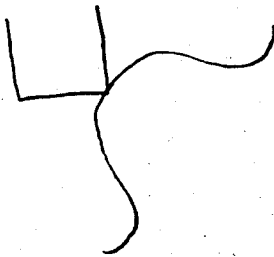
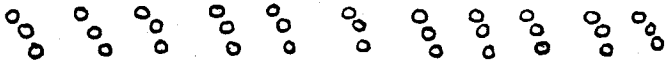
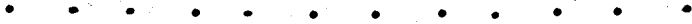
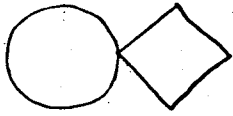
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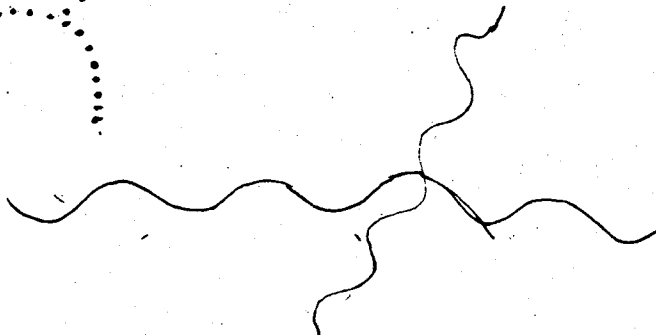
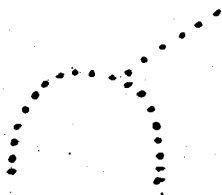
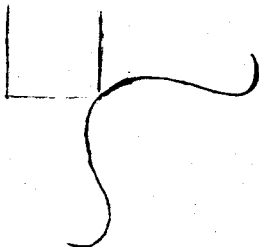
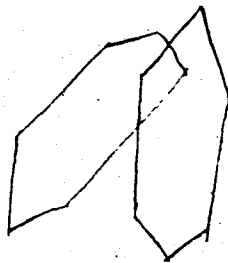
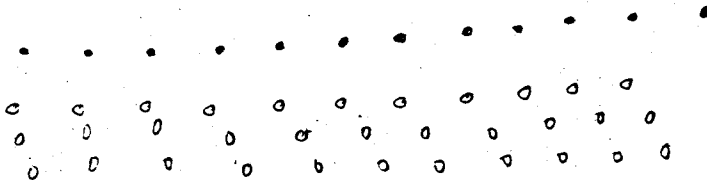
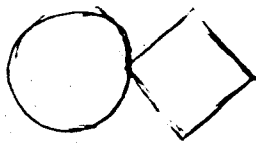
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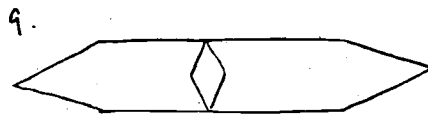
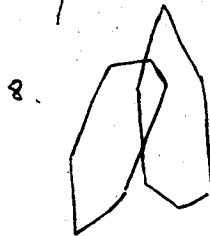
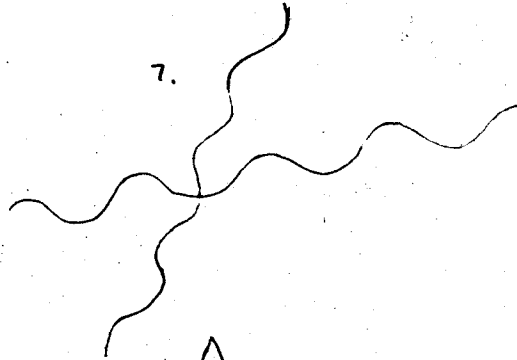
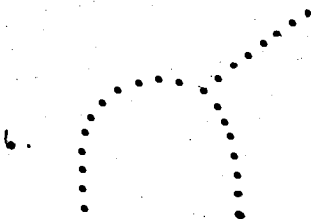
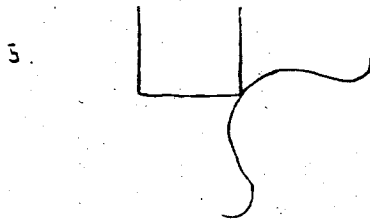
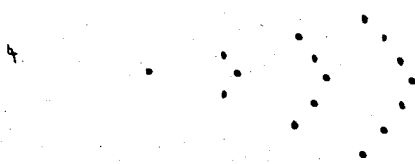
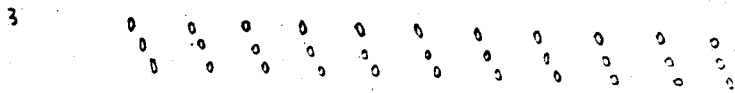




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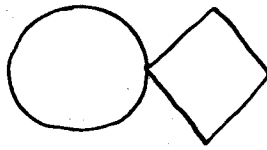




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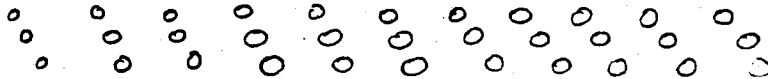
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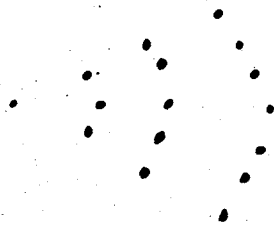
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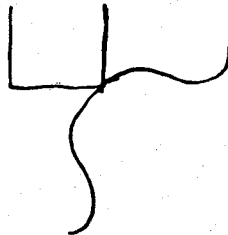
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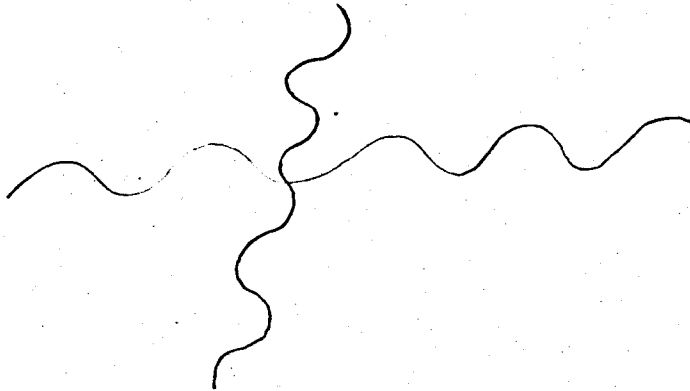
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6

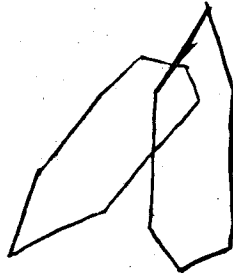
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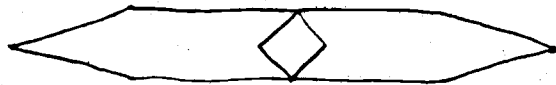
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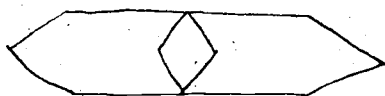
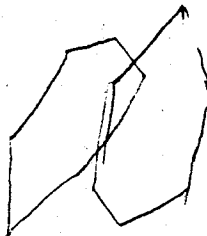
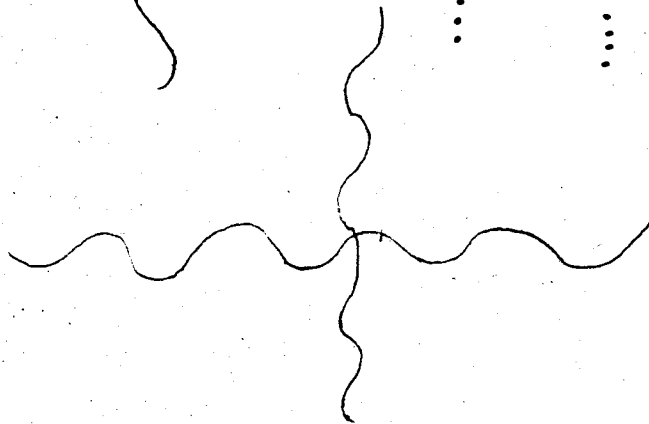
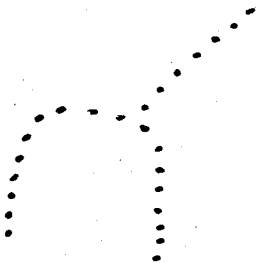
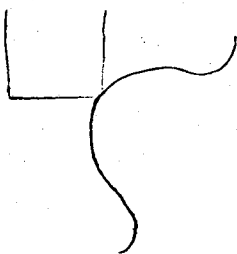
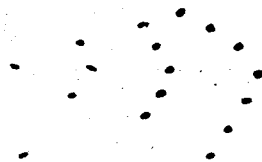
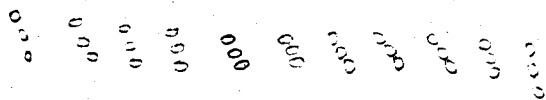
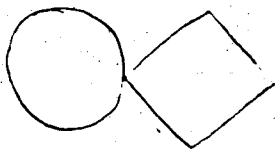


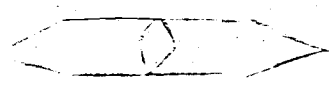
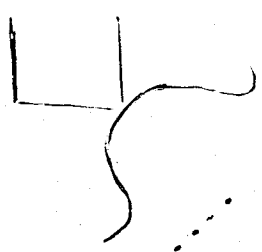
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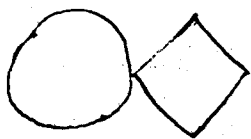
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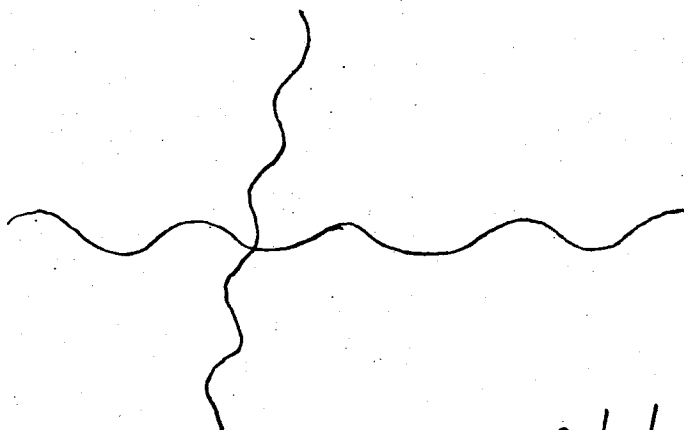
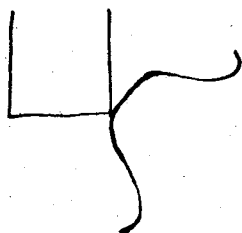
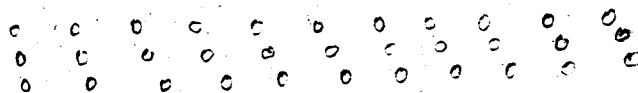




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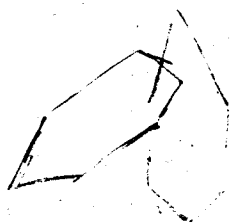
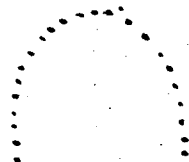
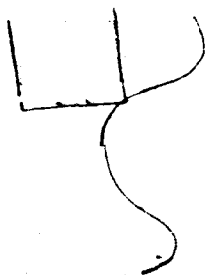
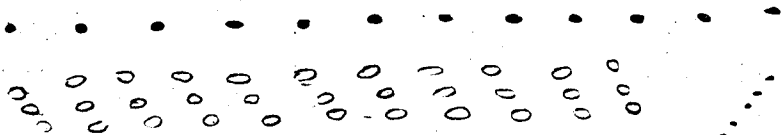
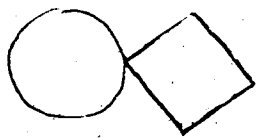
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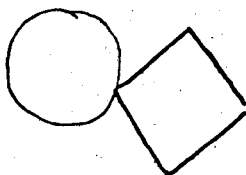
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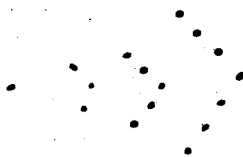


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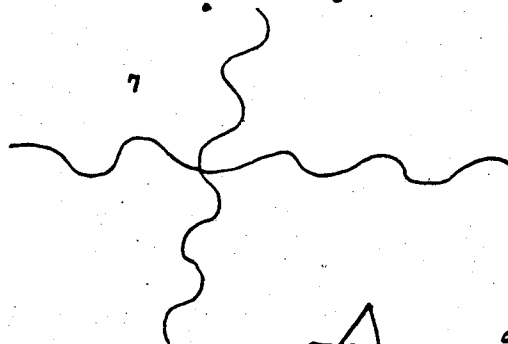
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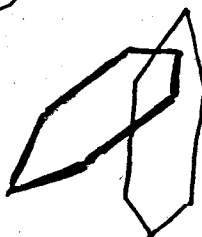
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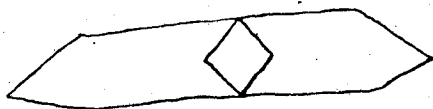
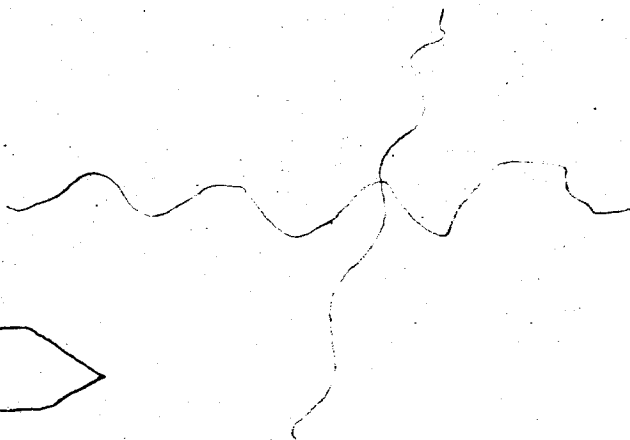
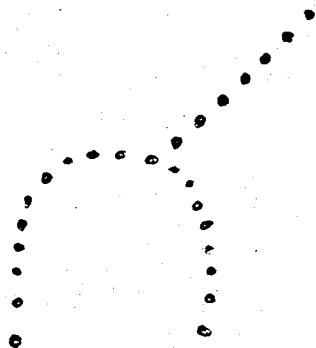
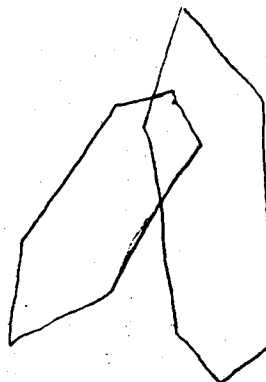
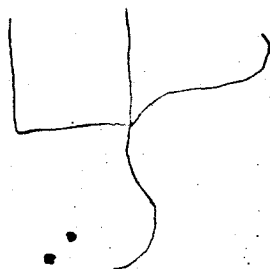
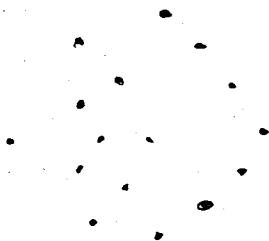
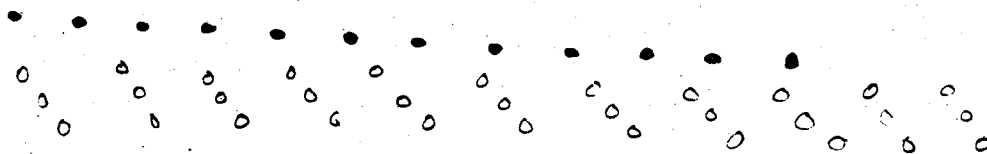
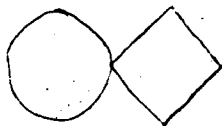


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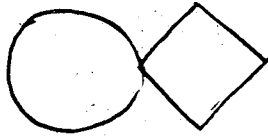


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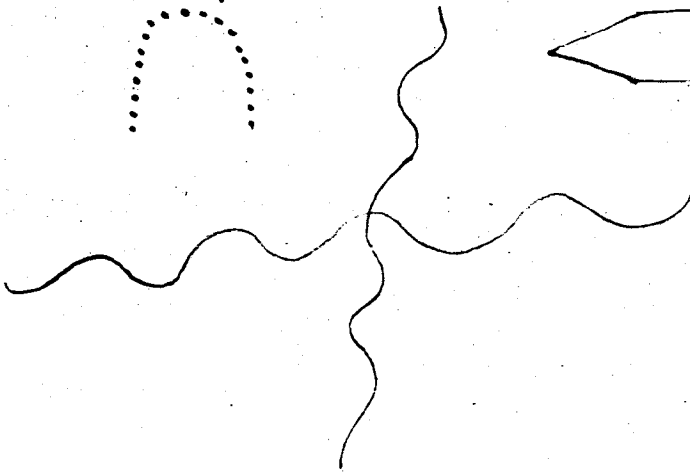
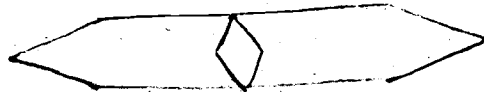
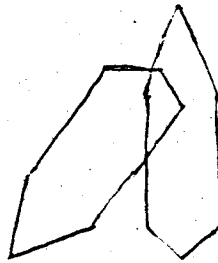
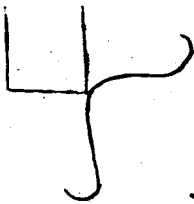
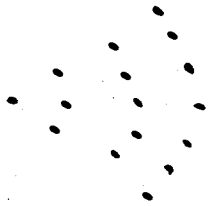
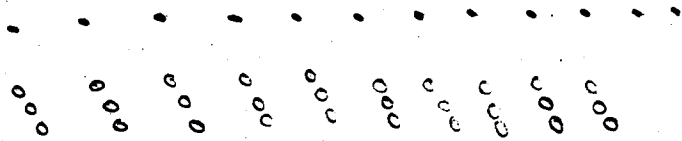




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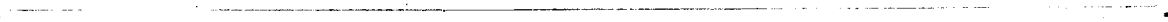
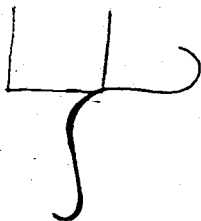
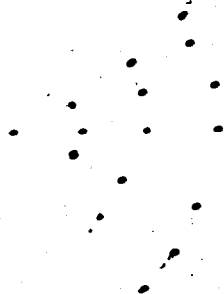
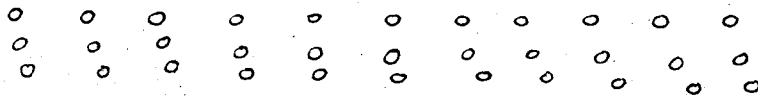
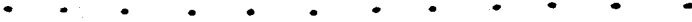
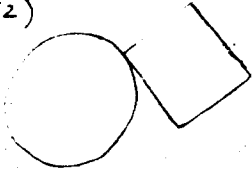


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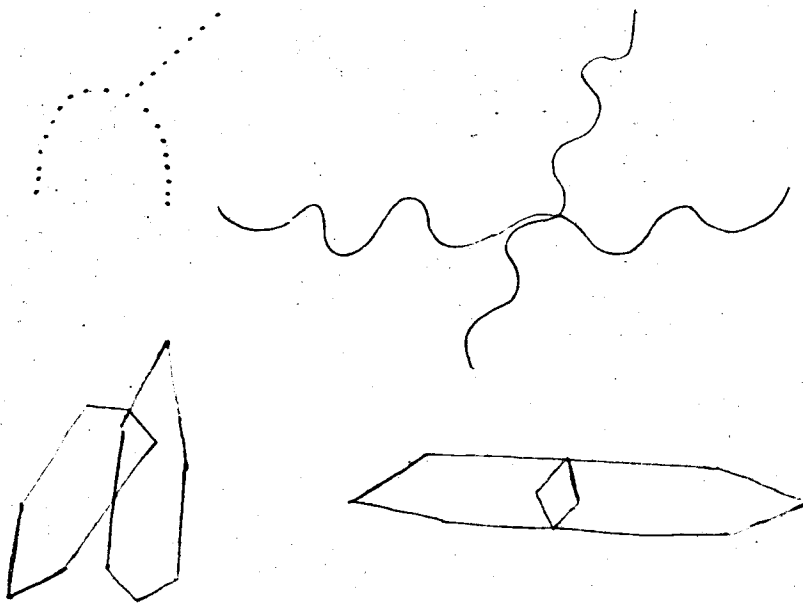


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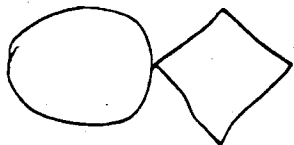
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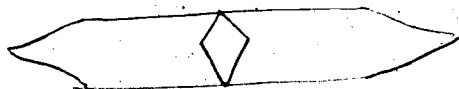
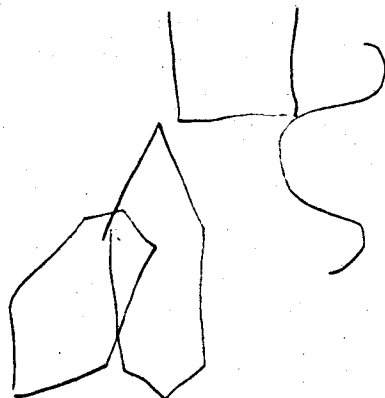
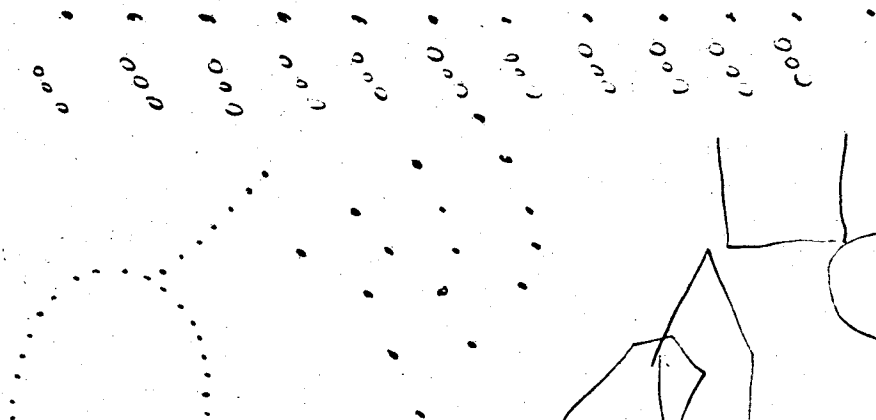
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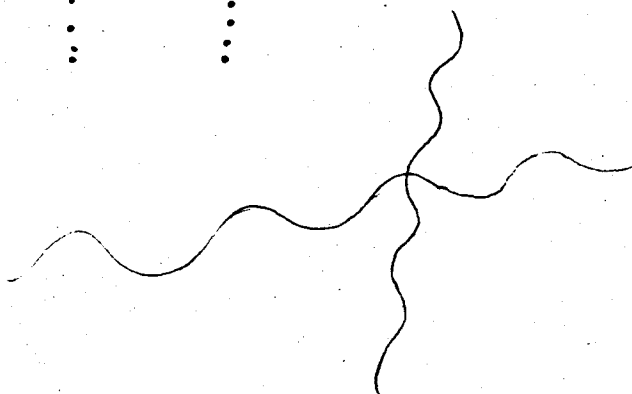
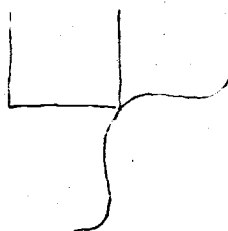
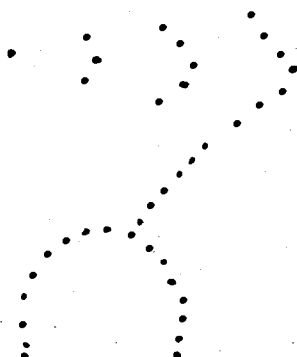
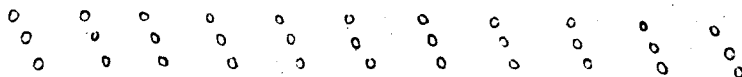
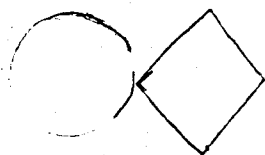


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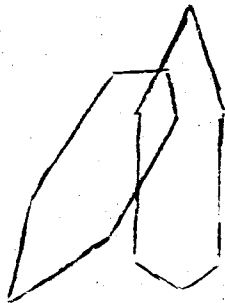
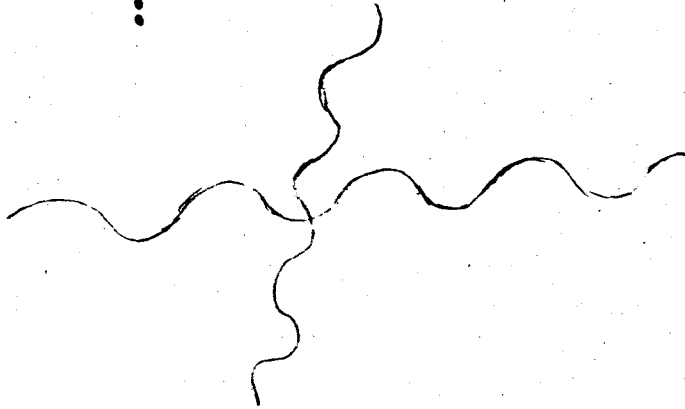
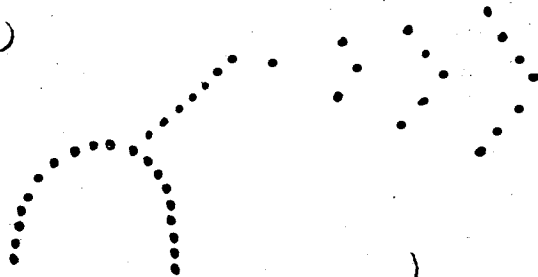
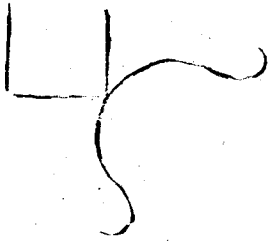
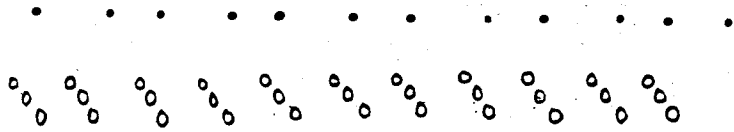
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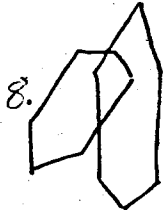
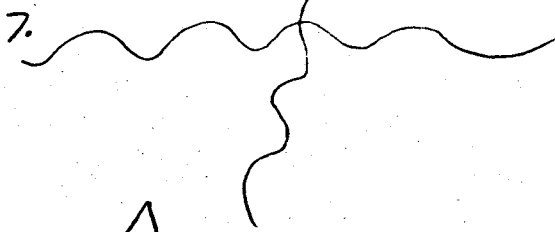
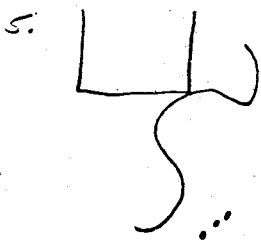
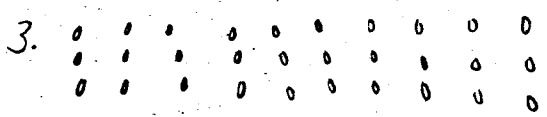
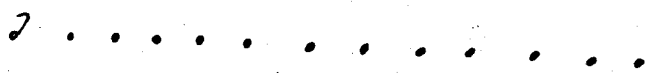
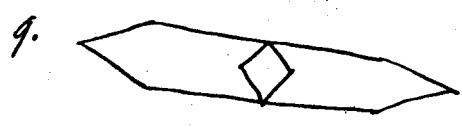
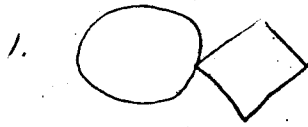


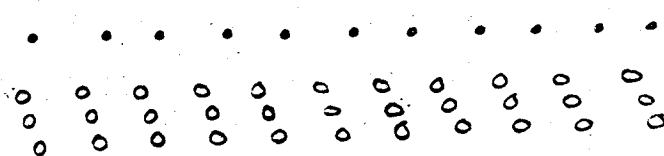
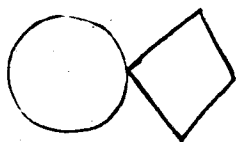


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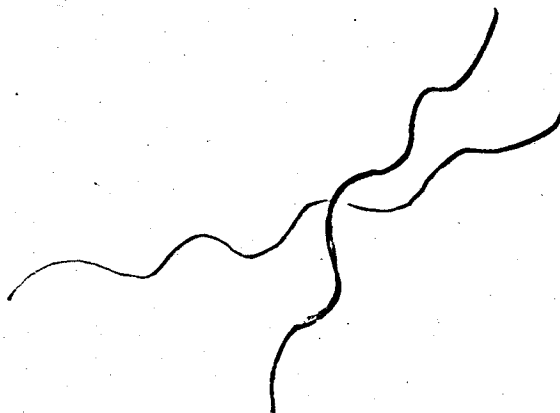
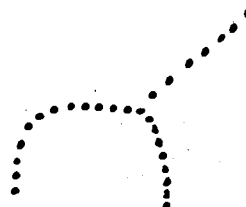
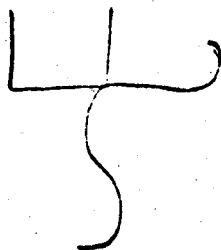
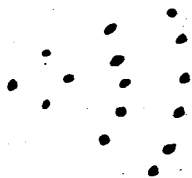
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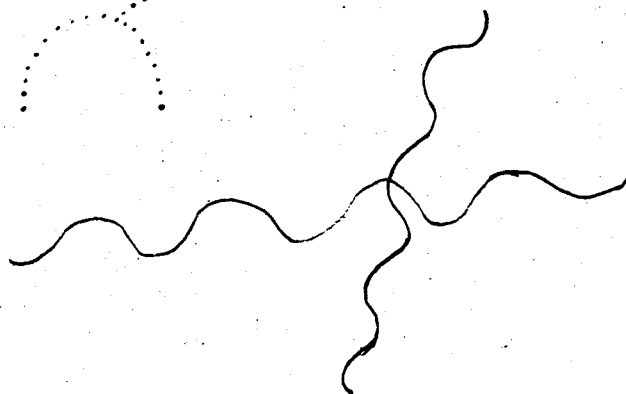
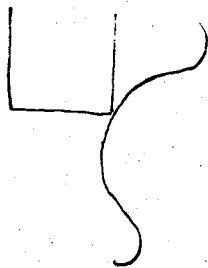
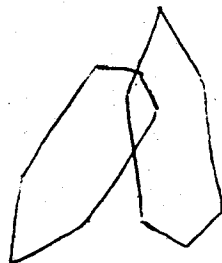
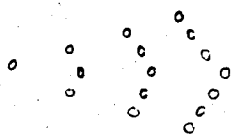
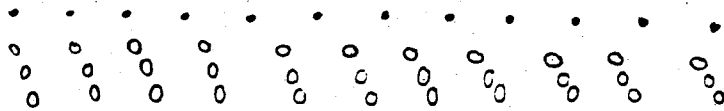
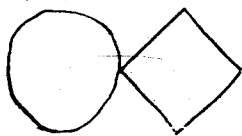


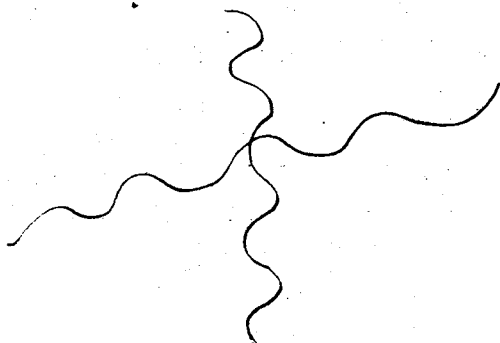
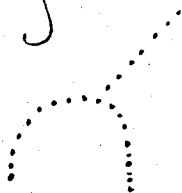
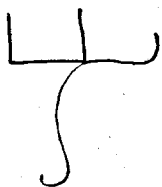
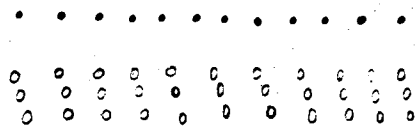
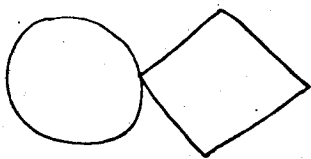


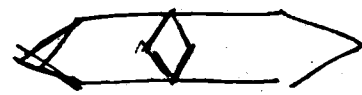
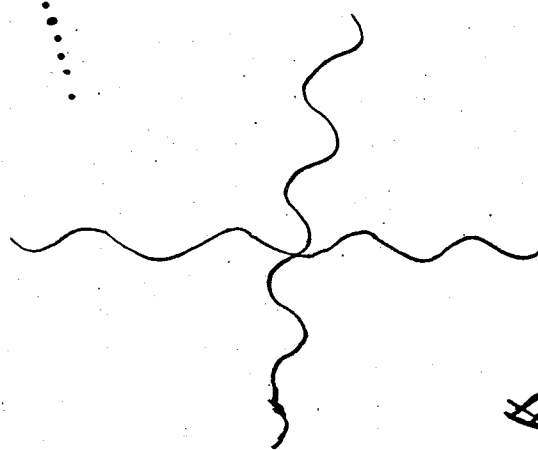
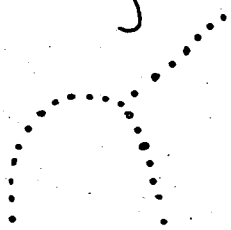
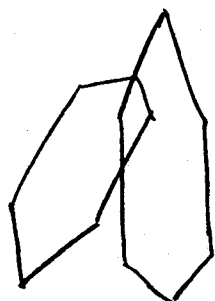
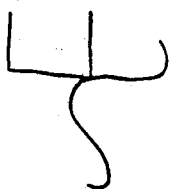
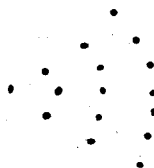
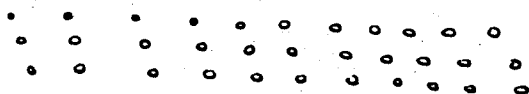
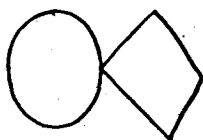


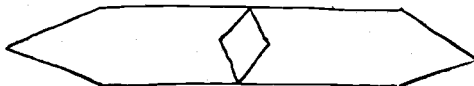
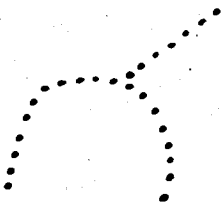
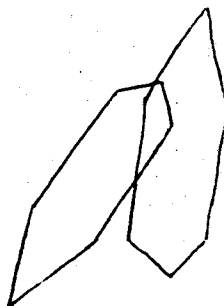
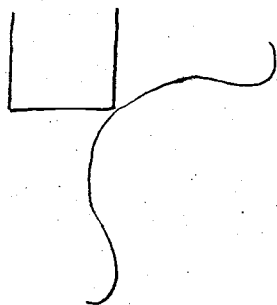
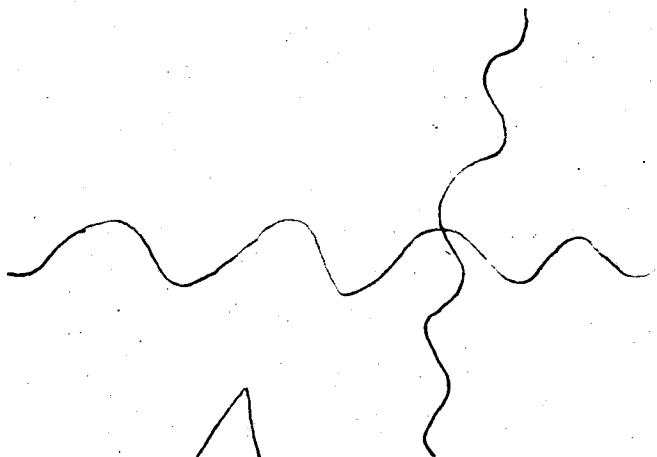
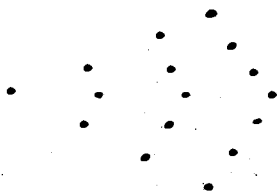
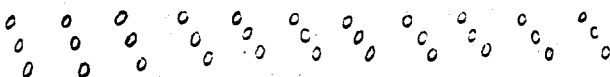
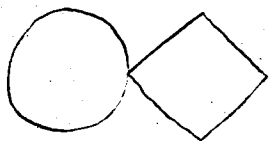
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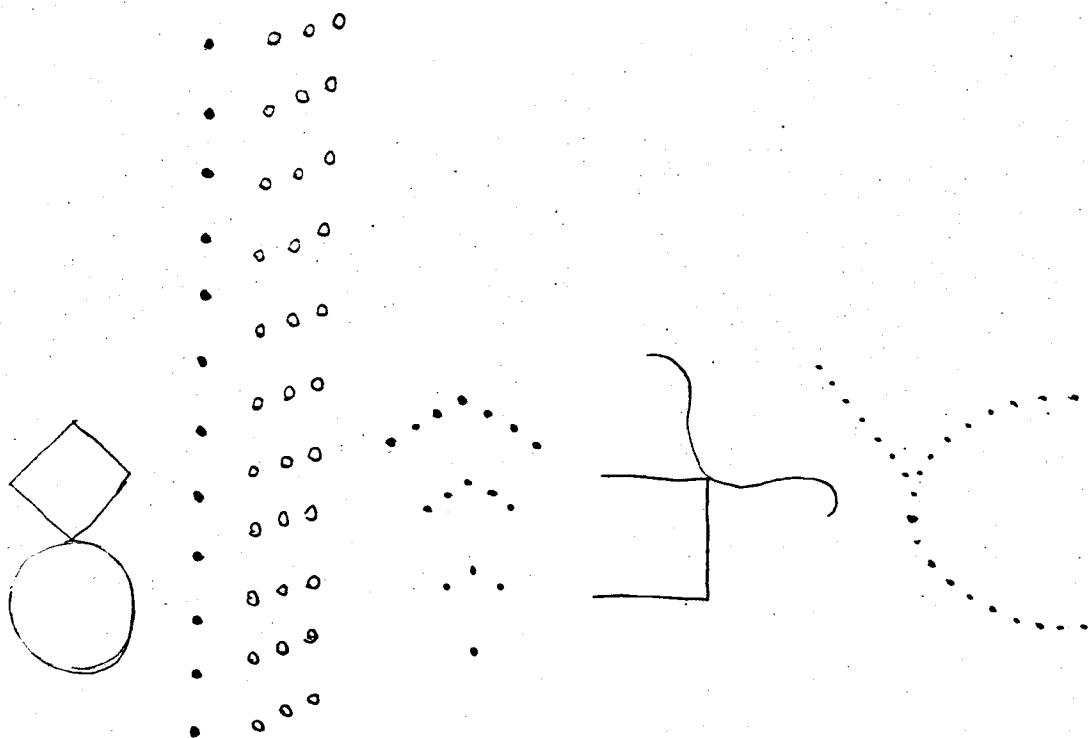
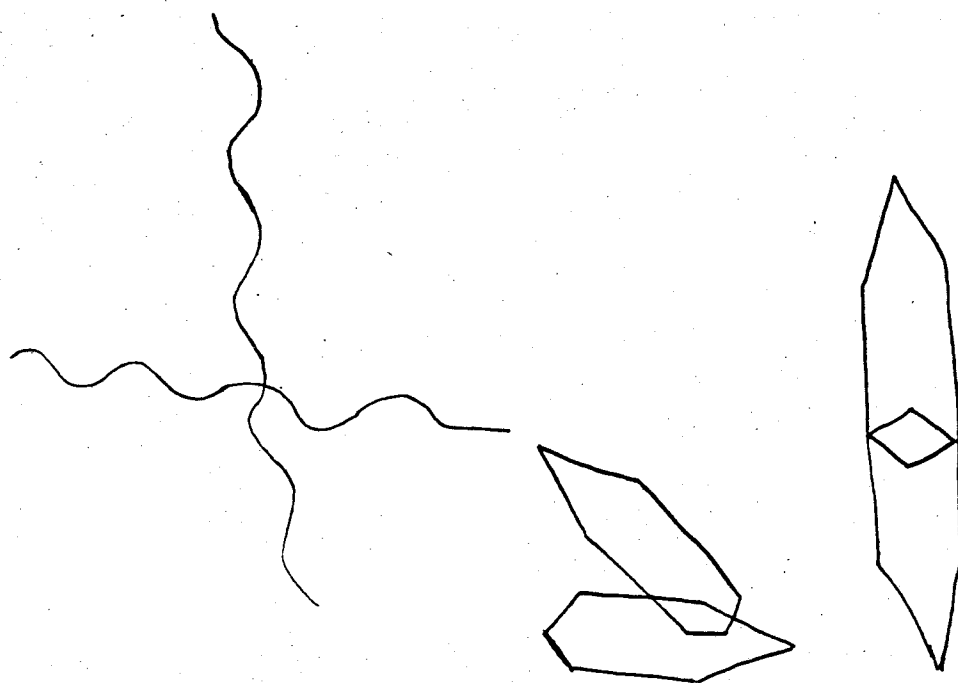




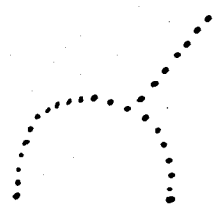
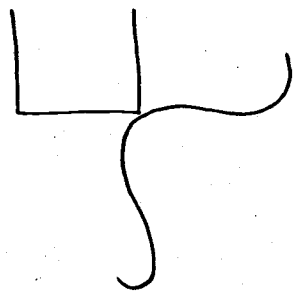
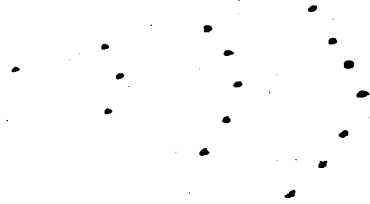
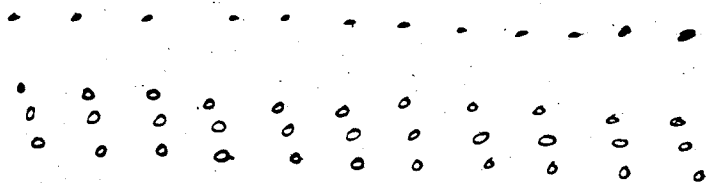
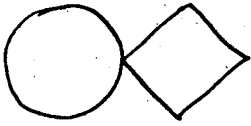




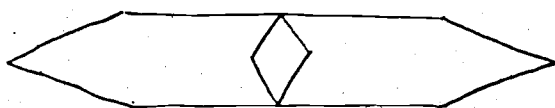
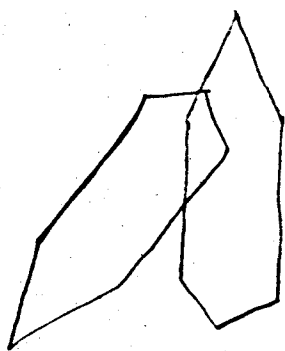
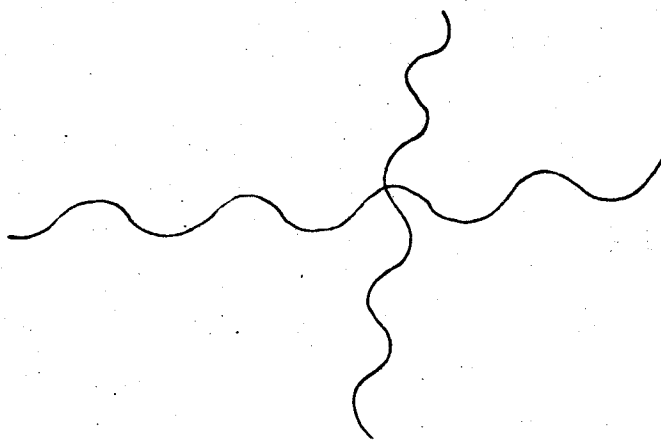


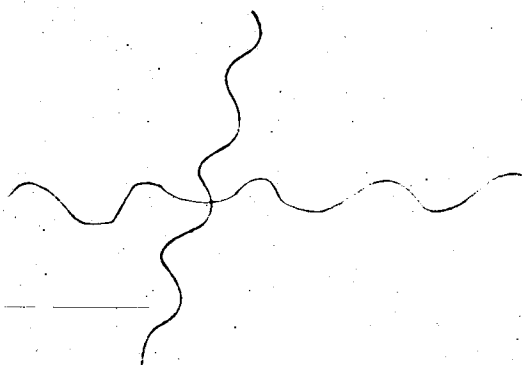
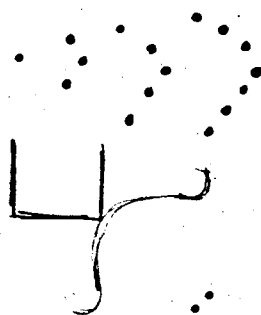
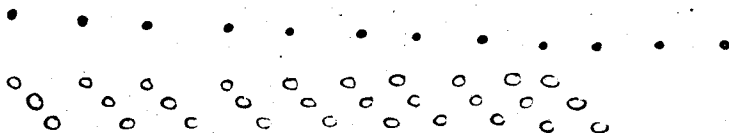


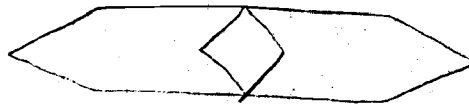
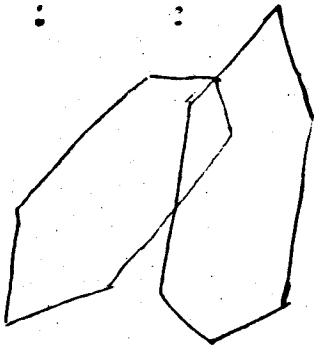
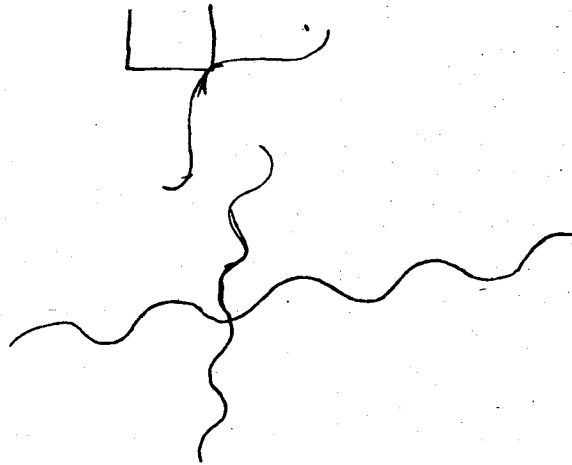
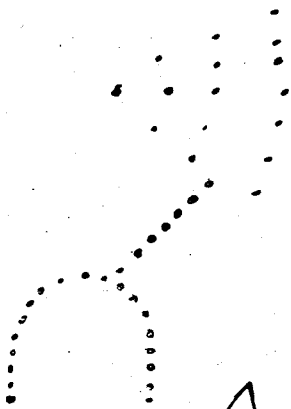
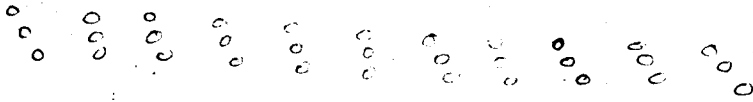
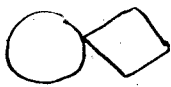
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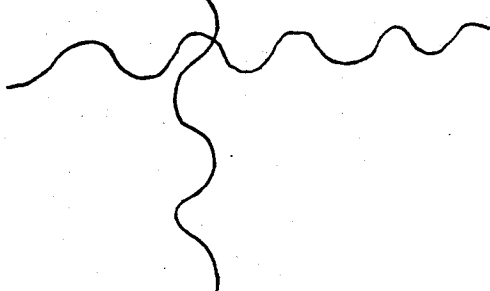
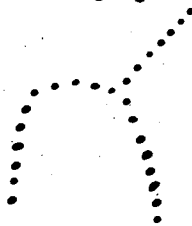
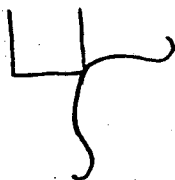
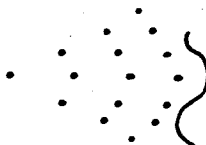
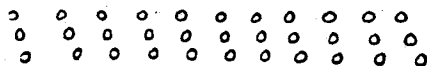
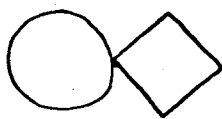
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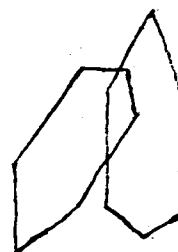
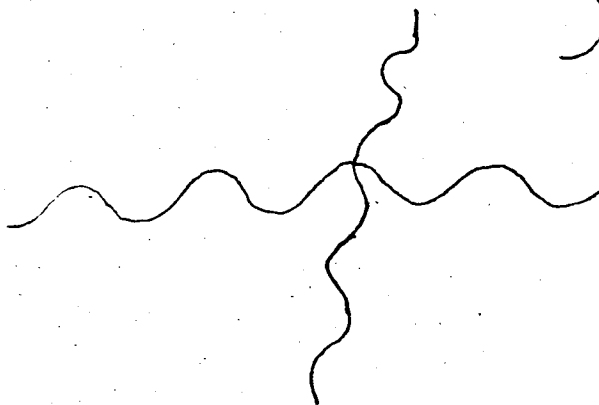
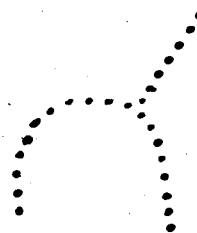
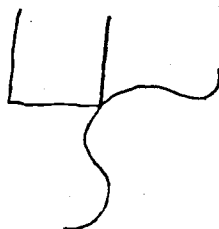
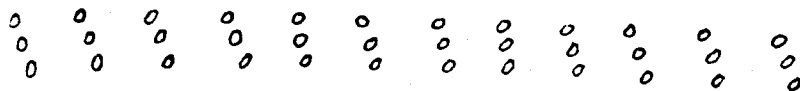
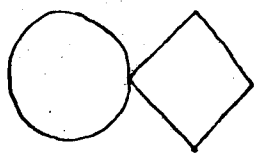


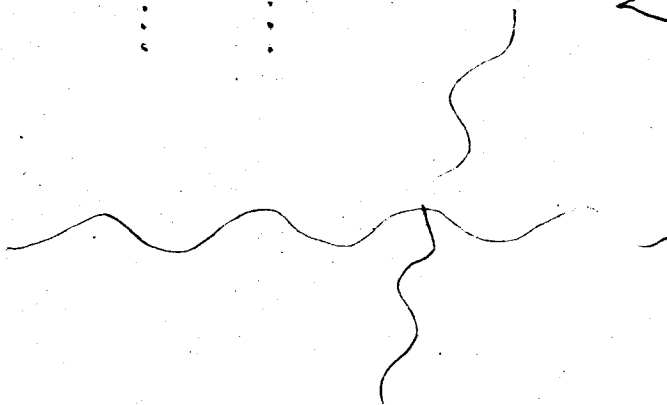
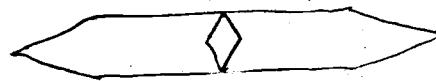
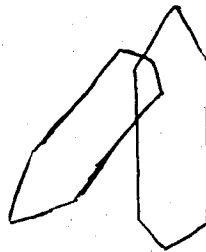
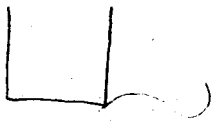
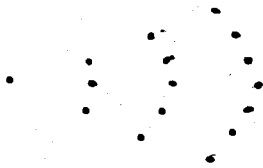
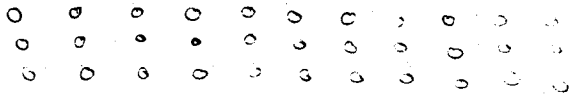
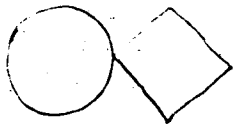




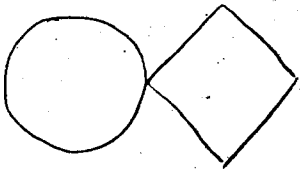
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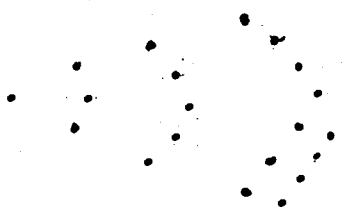
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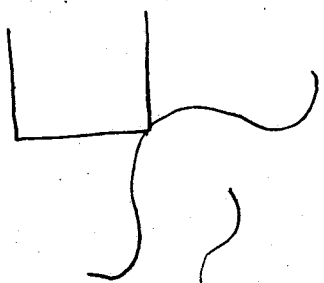
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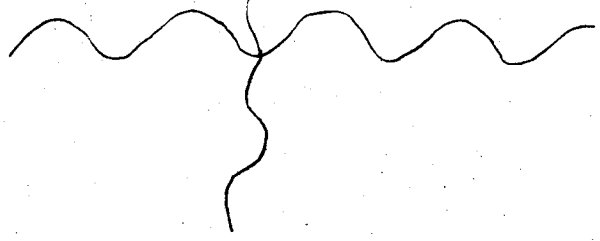
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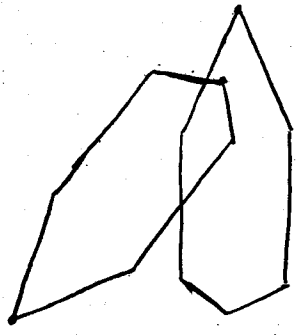
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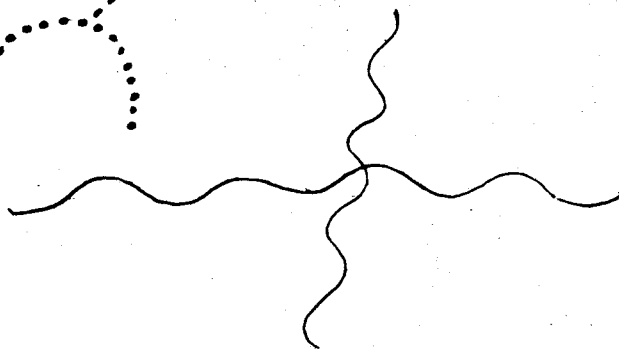
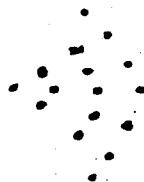
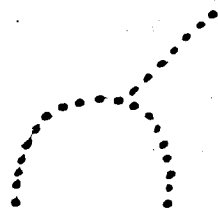
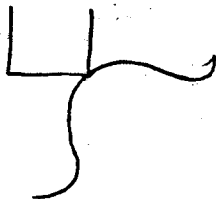
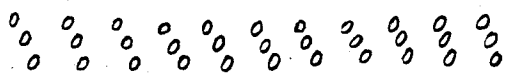
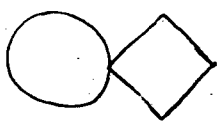


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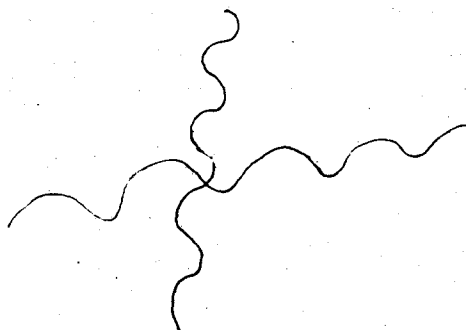
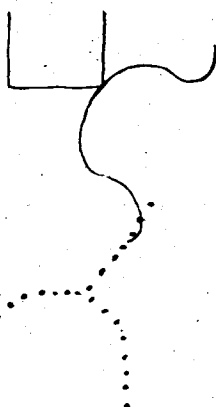
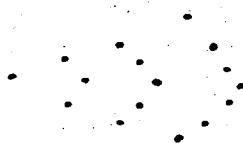
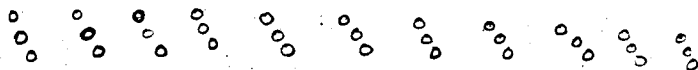
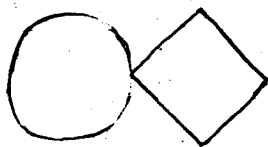
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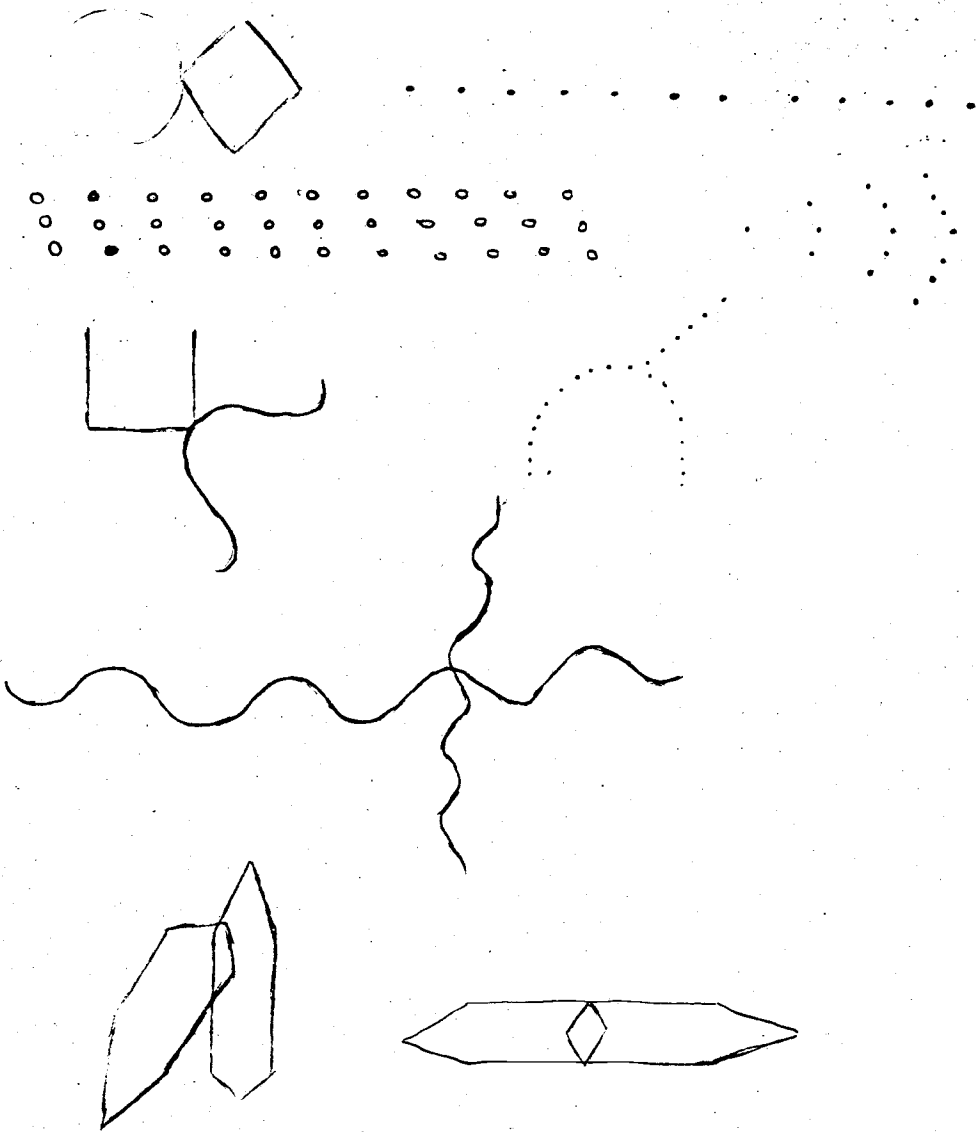


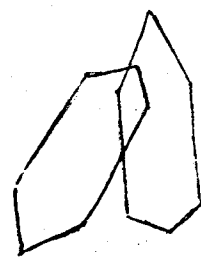
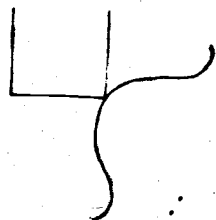
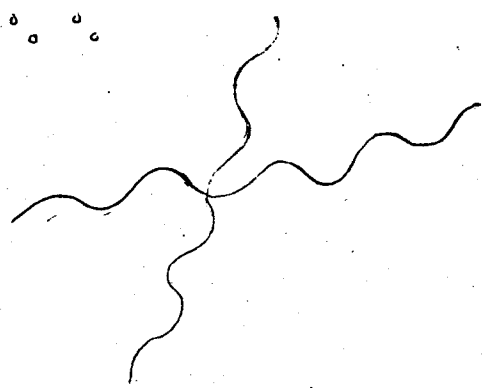
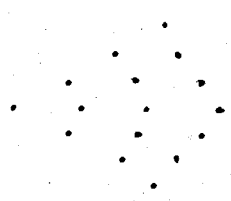
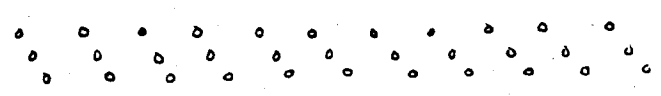
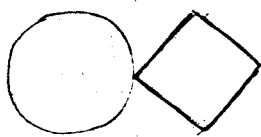


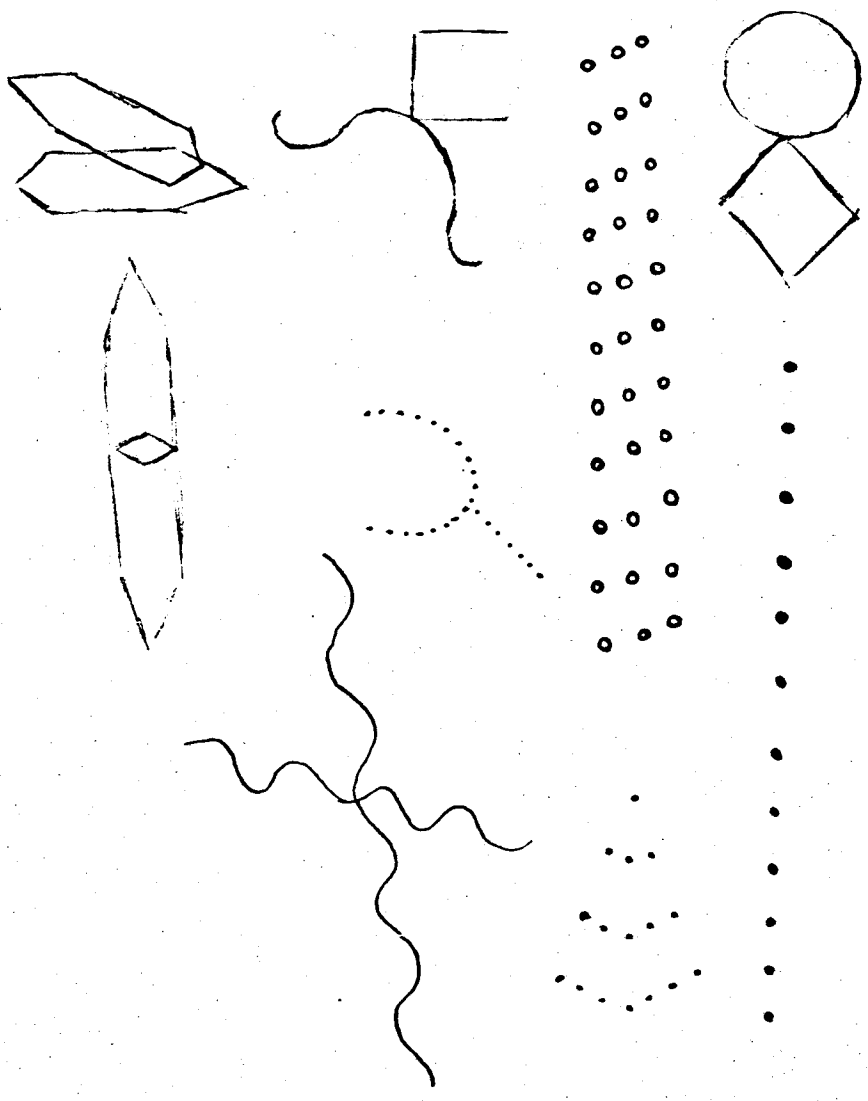
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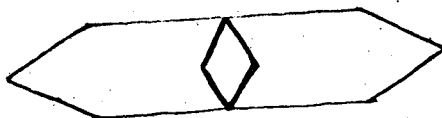
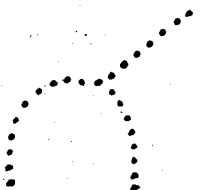
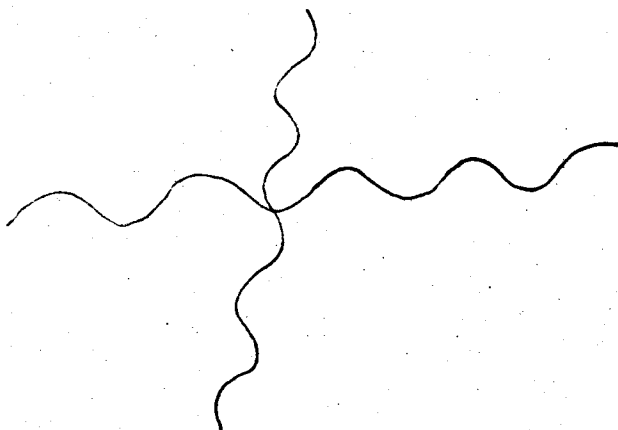
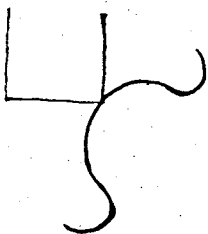
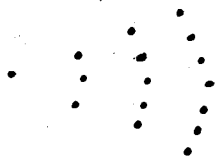
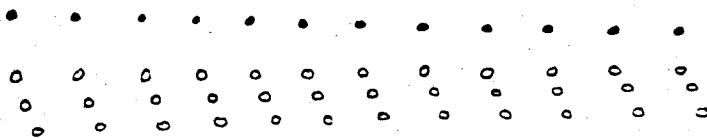
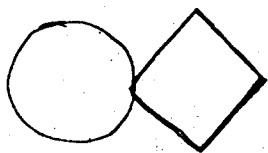






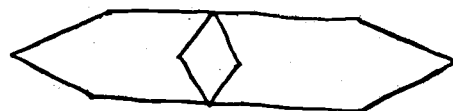
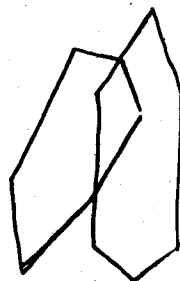
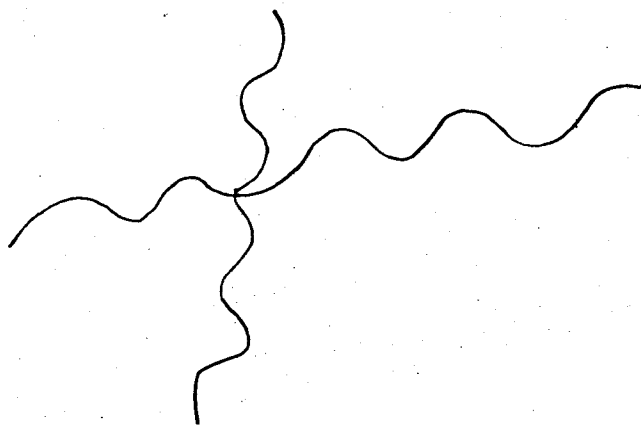
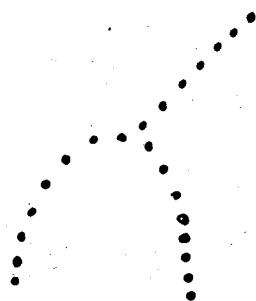
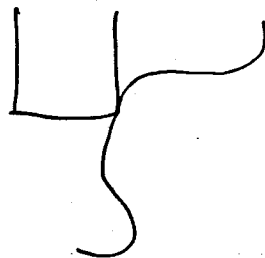
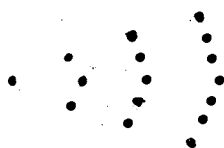
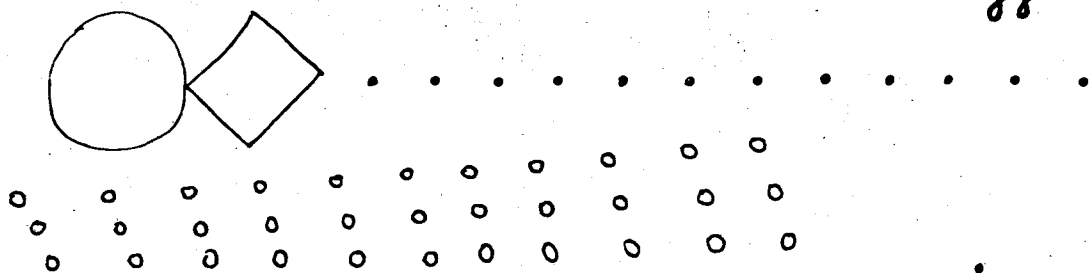


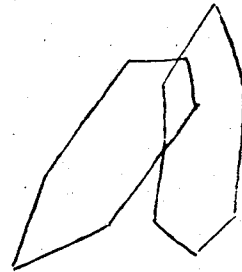
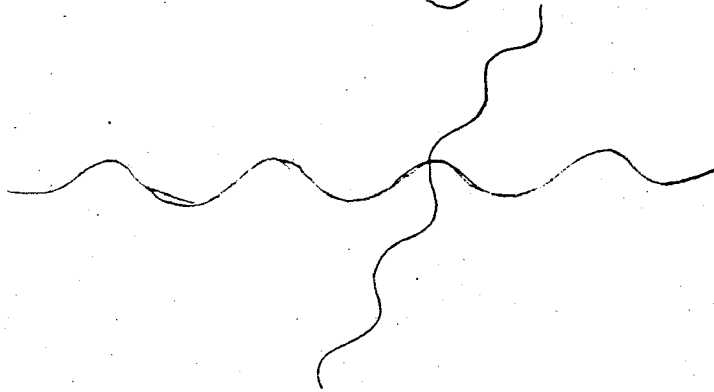
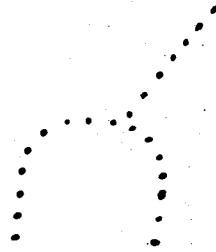
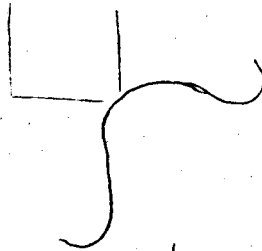
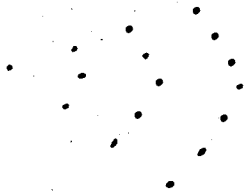
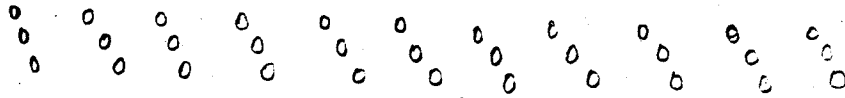
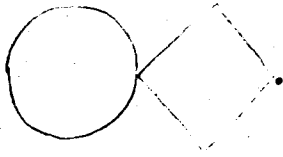
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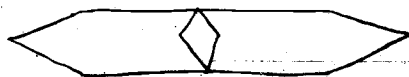
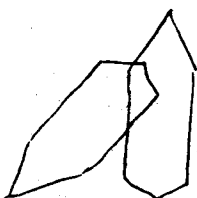
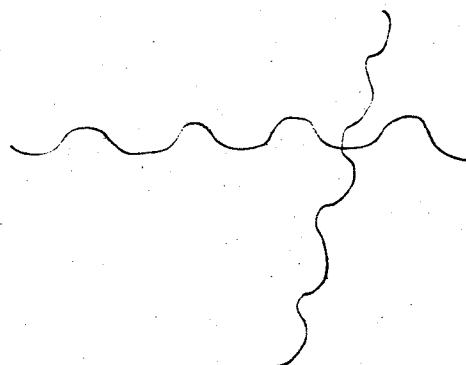
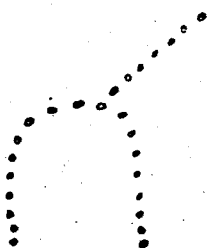
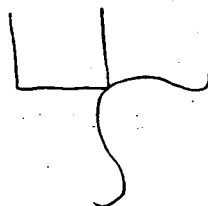
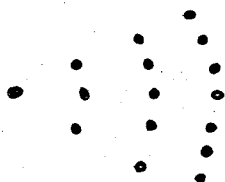
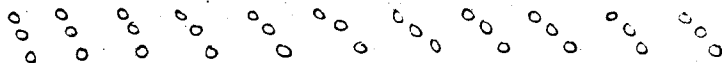
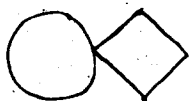


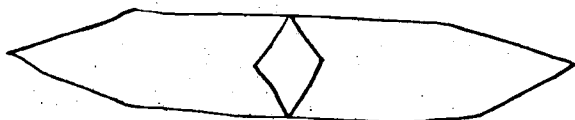
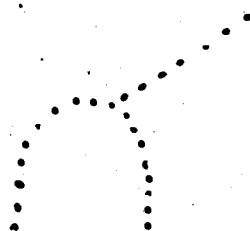
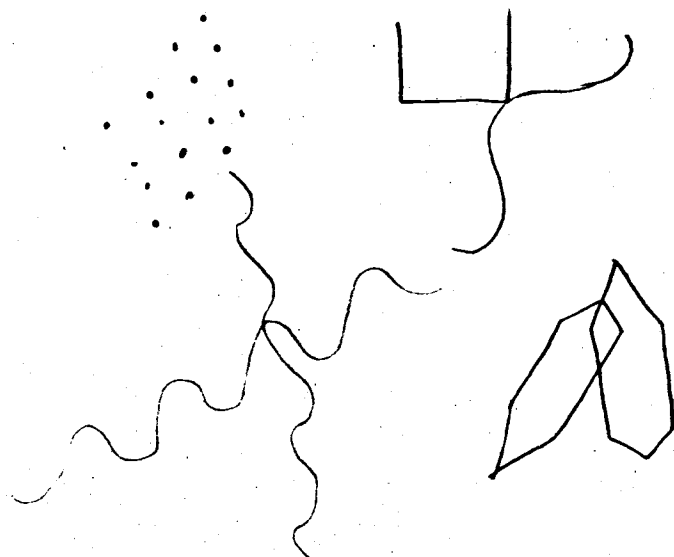
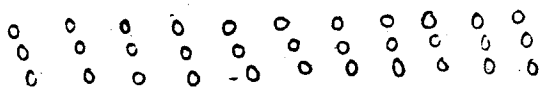
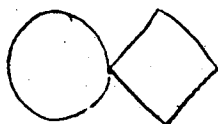
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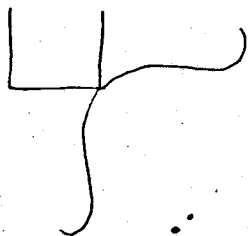
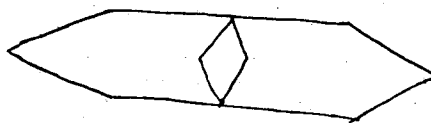
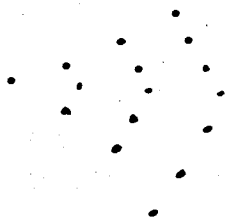
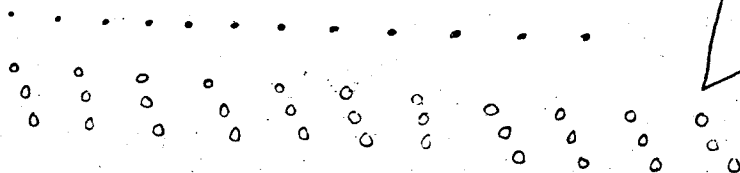
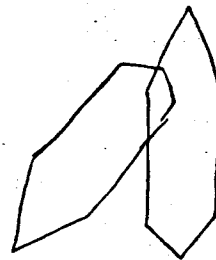
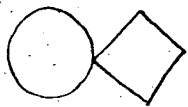


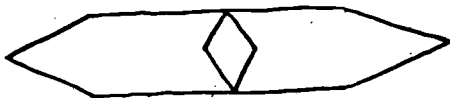
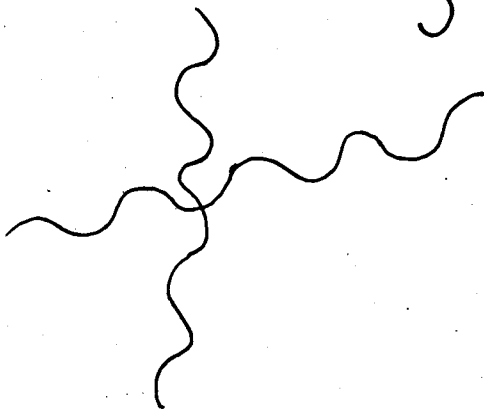
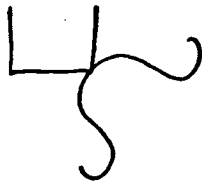
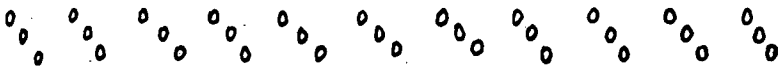
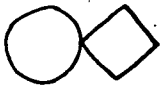


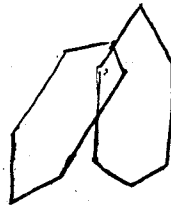
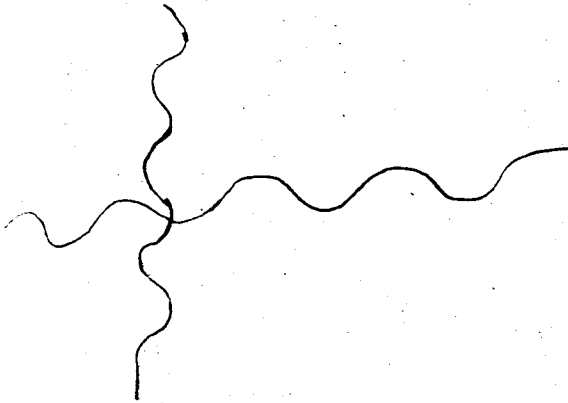
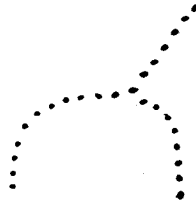
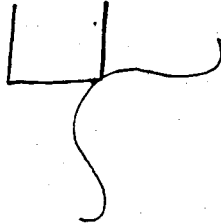
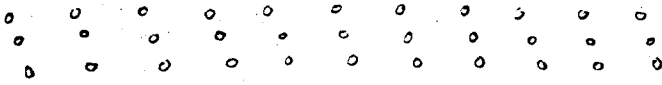
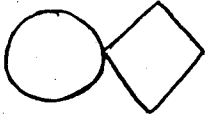


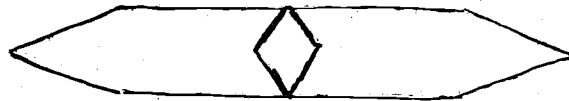
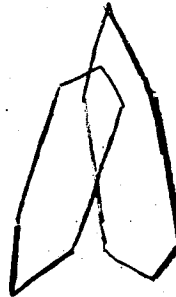
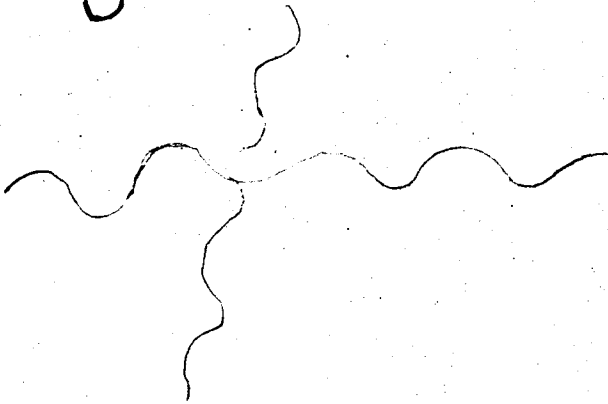
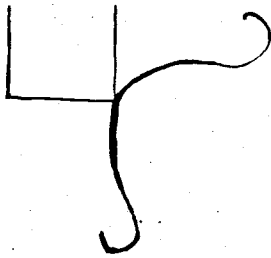
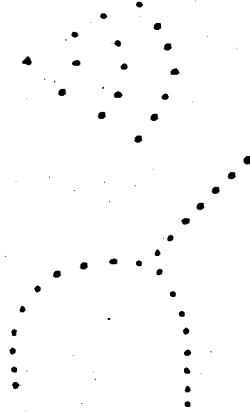
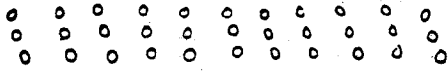
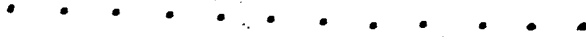
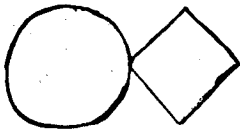












①



②



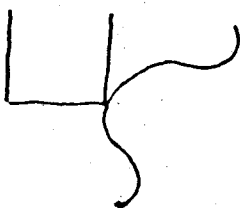
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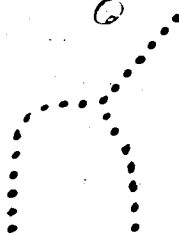
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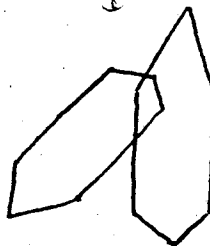
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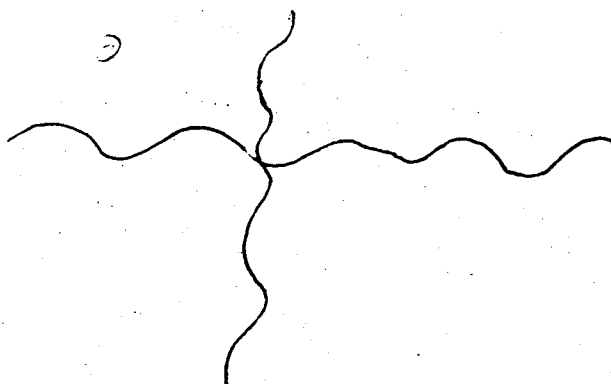
⑥



⑦



⑧

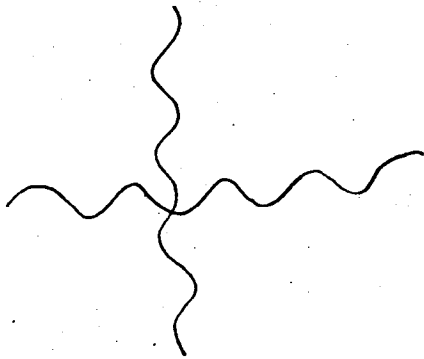
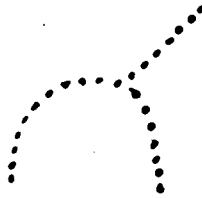
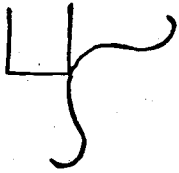
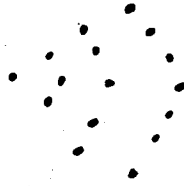
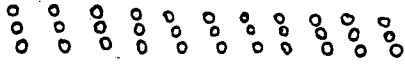


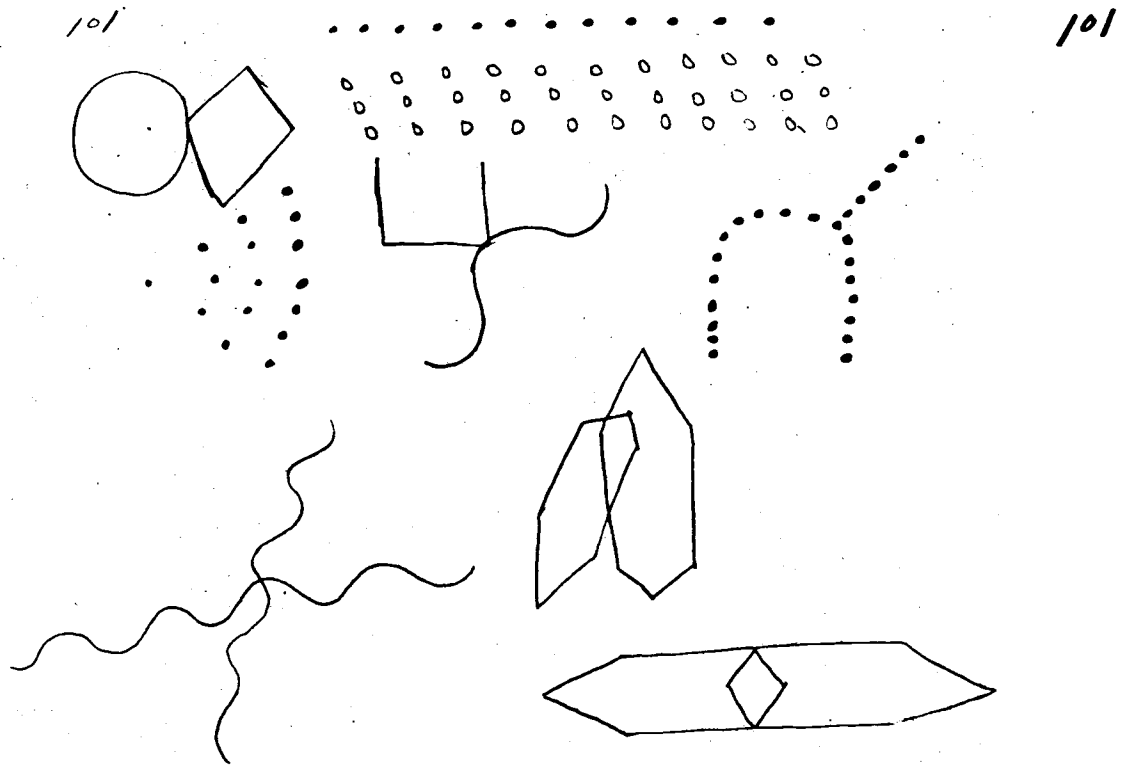
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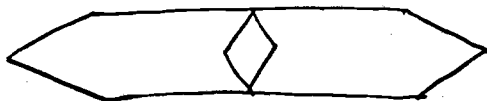
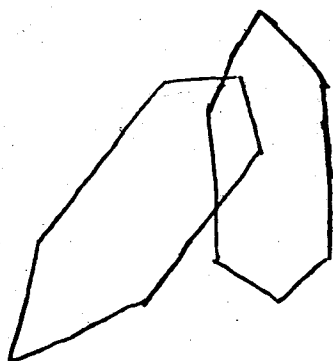
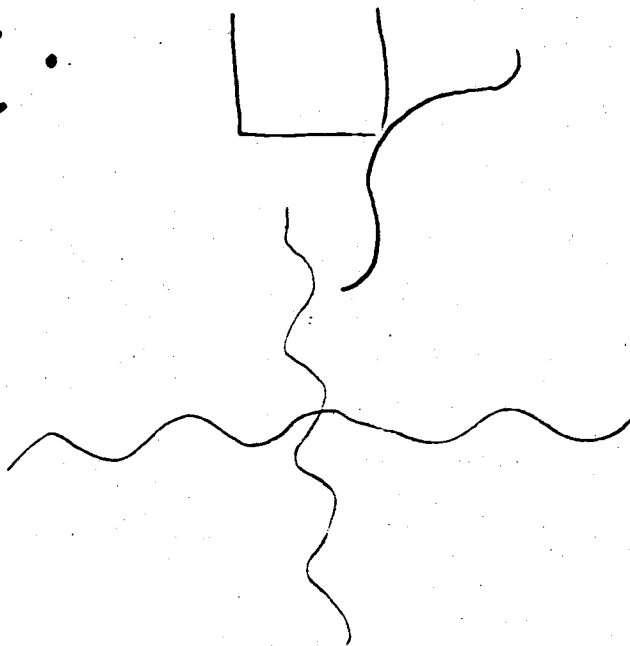
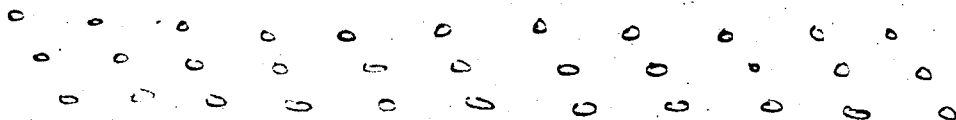
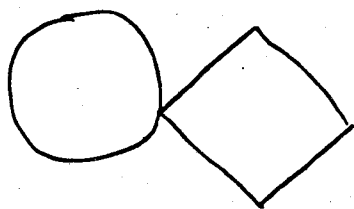
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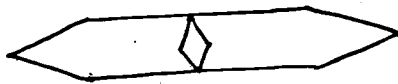
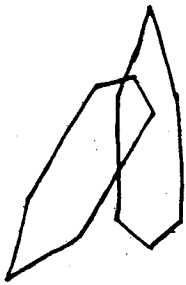
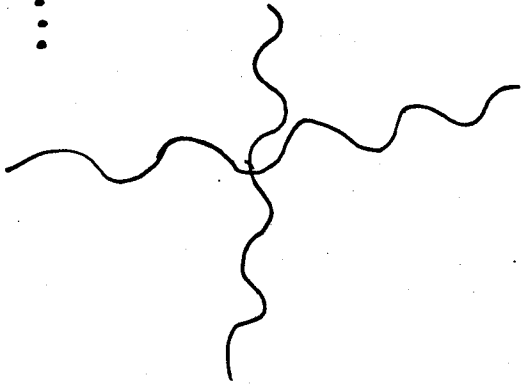
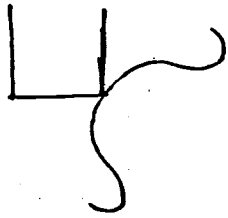
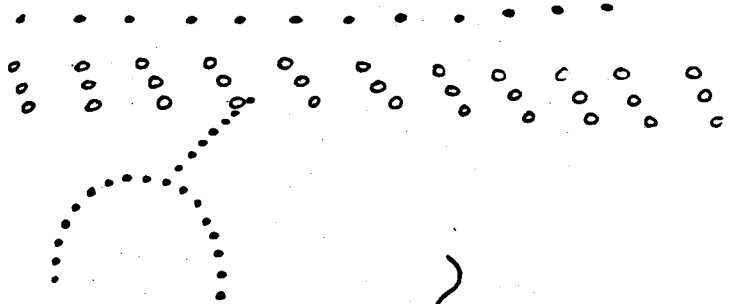
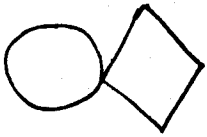


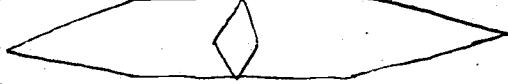
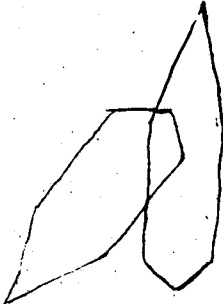
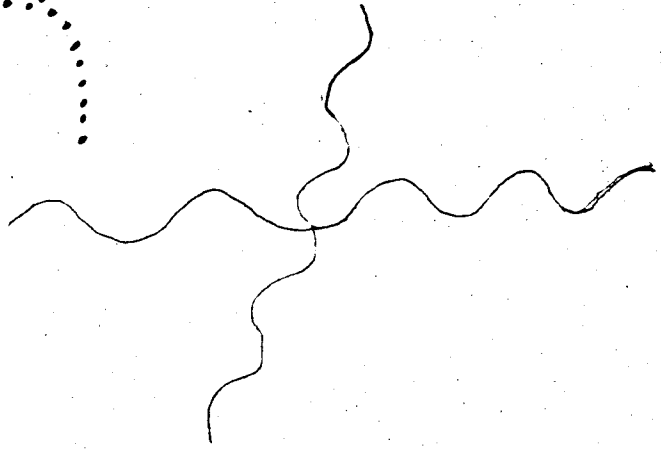
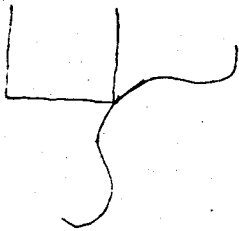
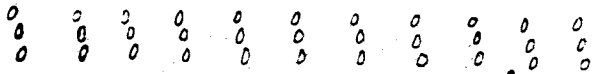
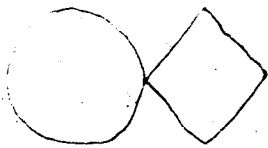


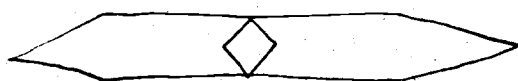
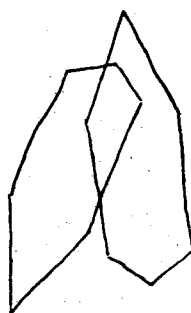
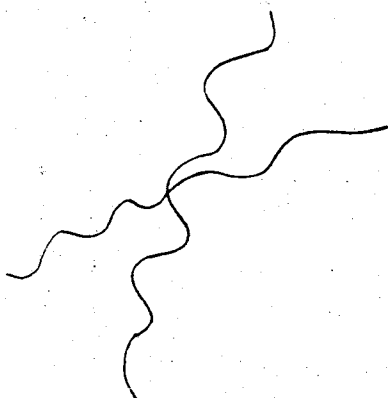
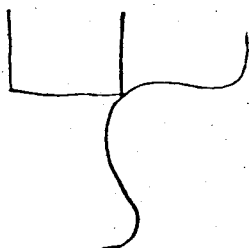
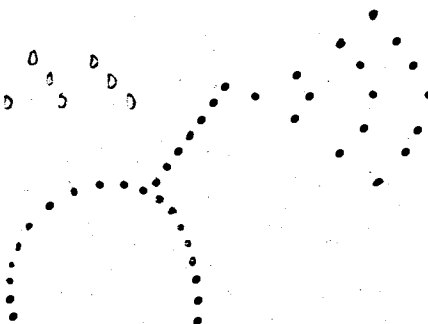
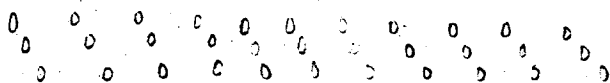
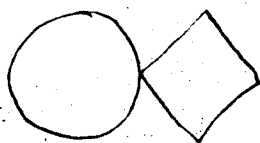
105

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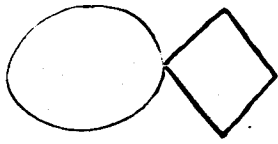




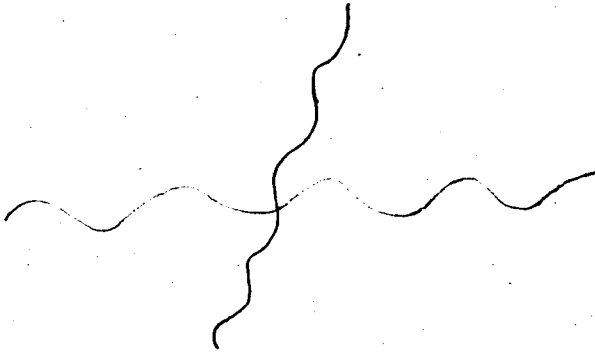
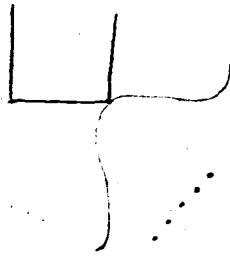
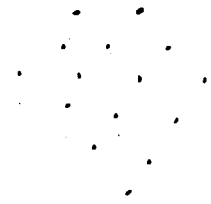
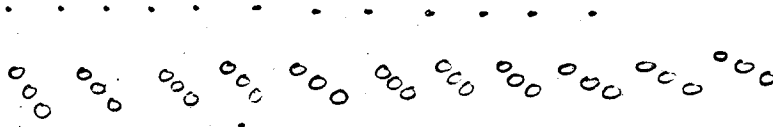




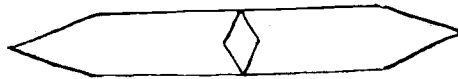
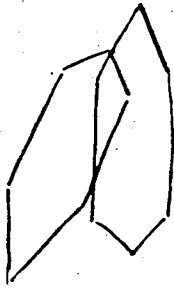
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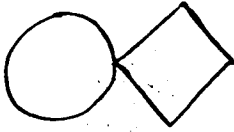
109



109



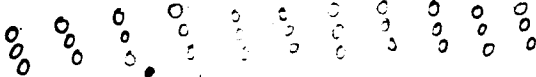
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2)



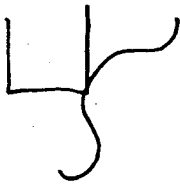
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4)



5)



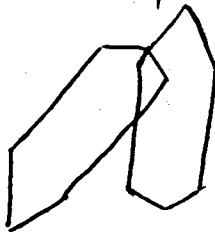
6)



7)



8)



9)



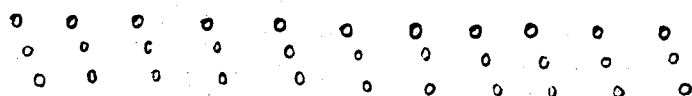
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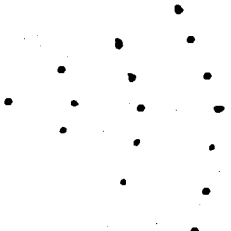
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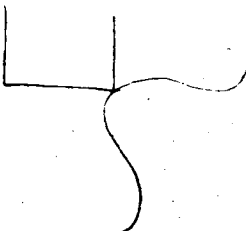
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4.



5.



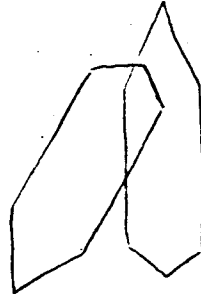
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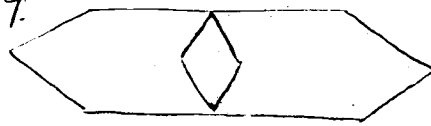
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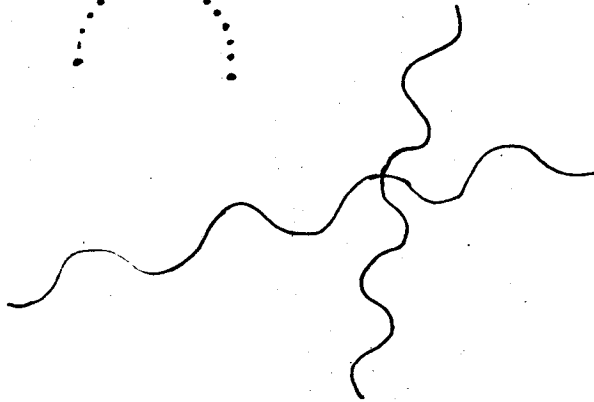
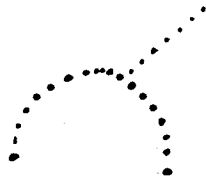
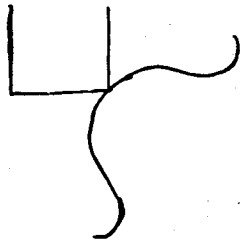
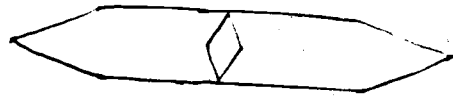
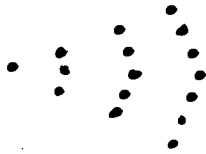
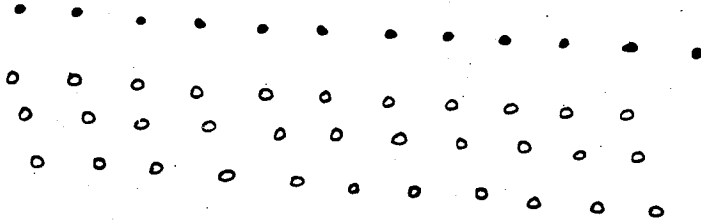
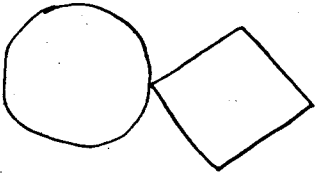


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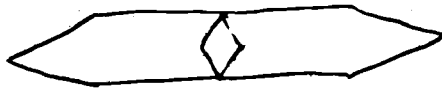
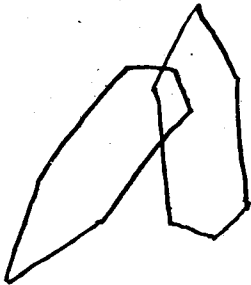
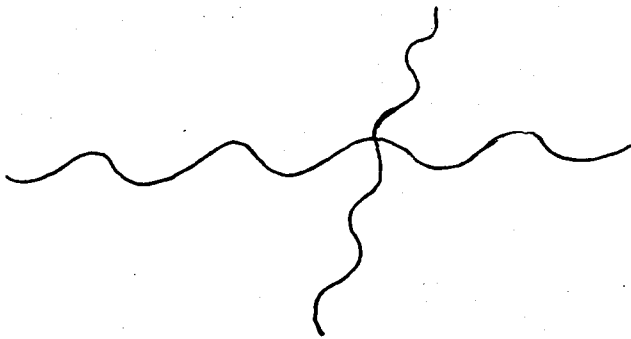
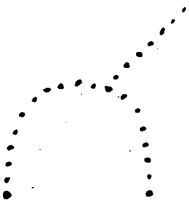
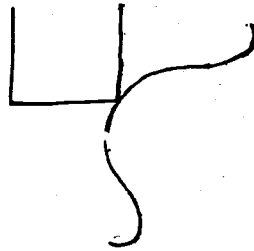
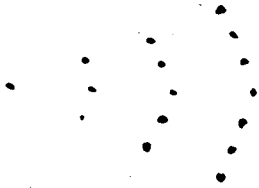
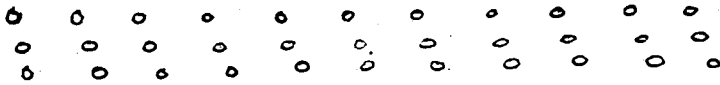
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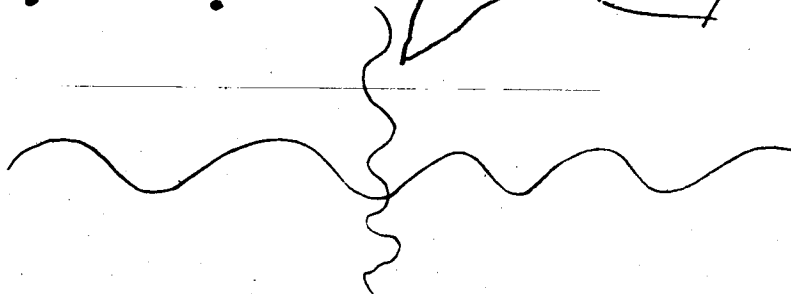
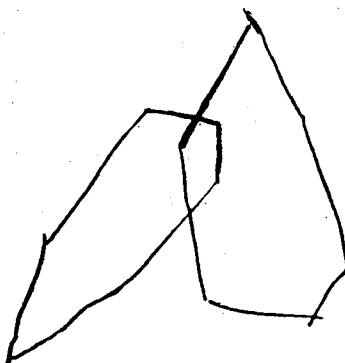
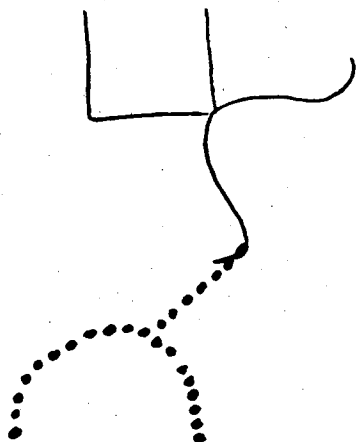
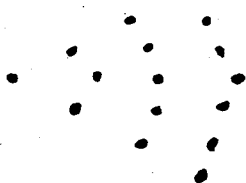
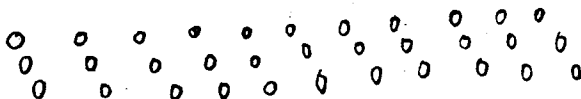
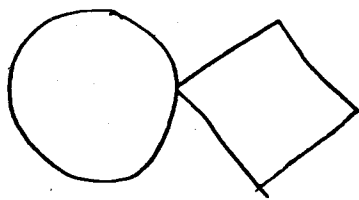


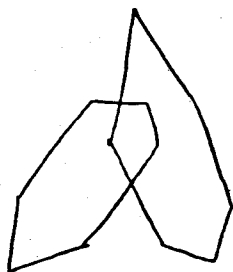
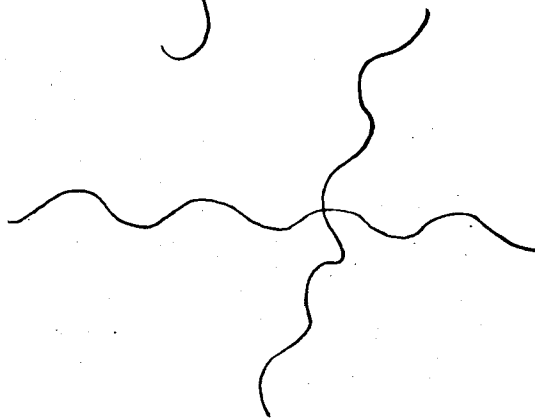
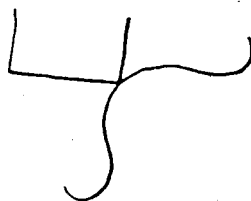
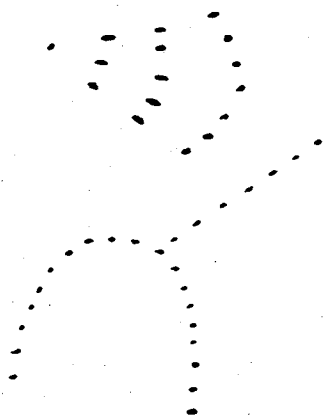
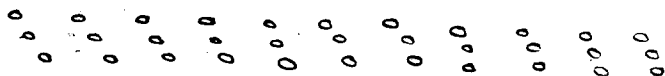
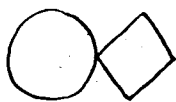


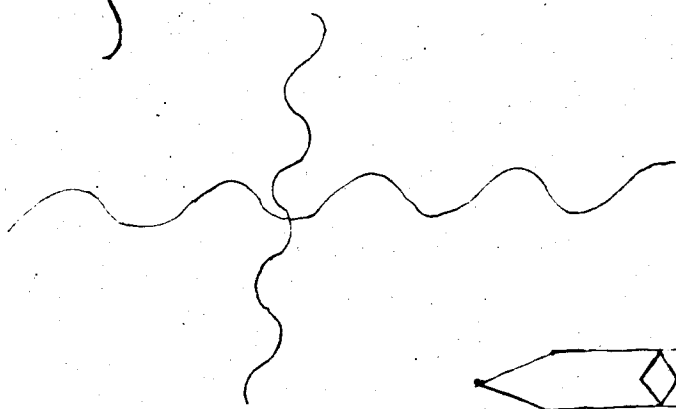
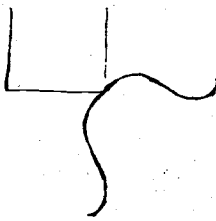
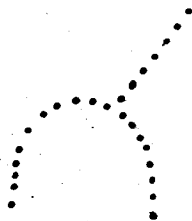
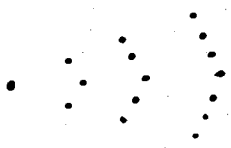
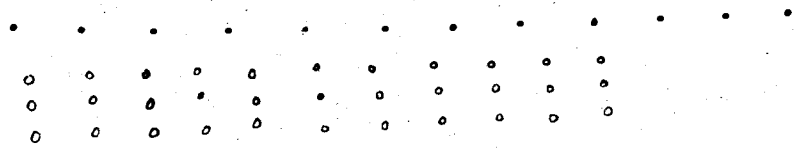
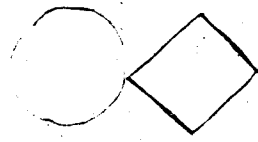
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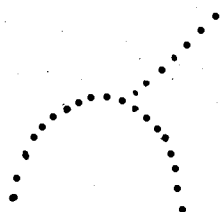
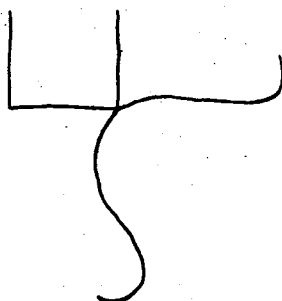
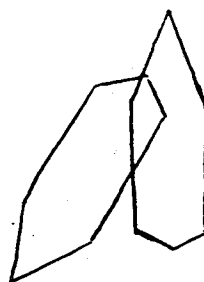
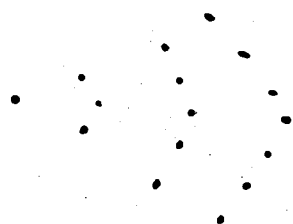
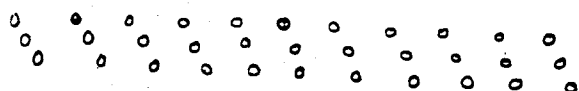
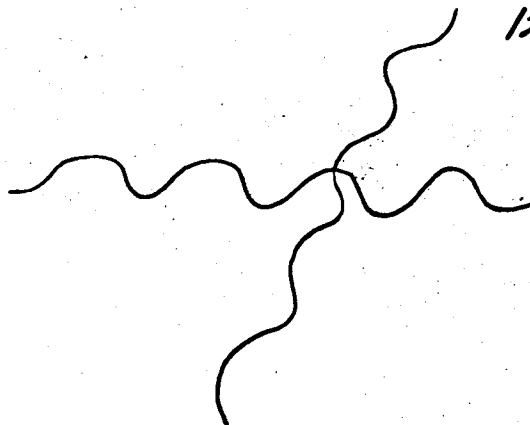
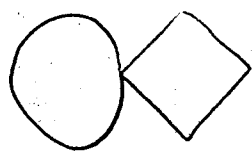
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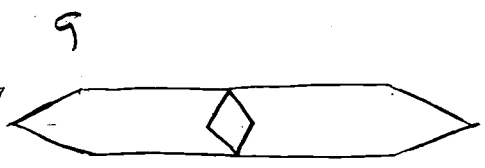
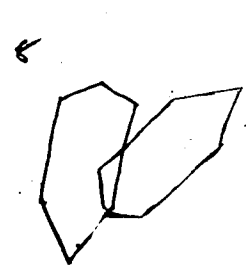
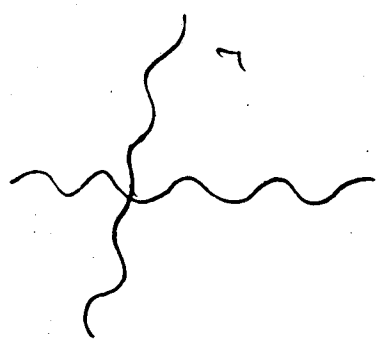
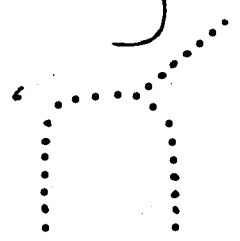
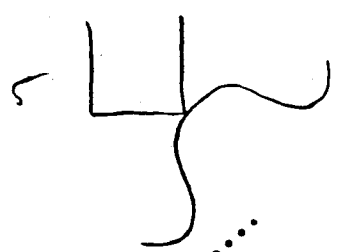
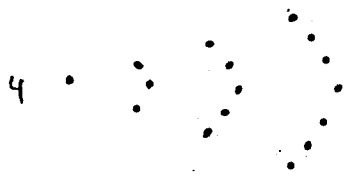
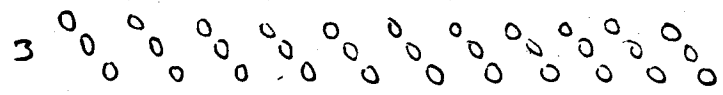
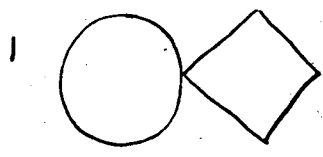


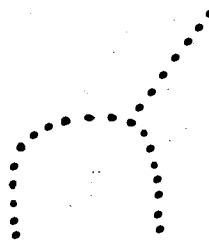
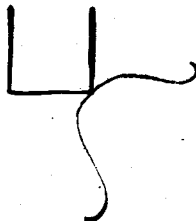
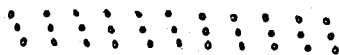


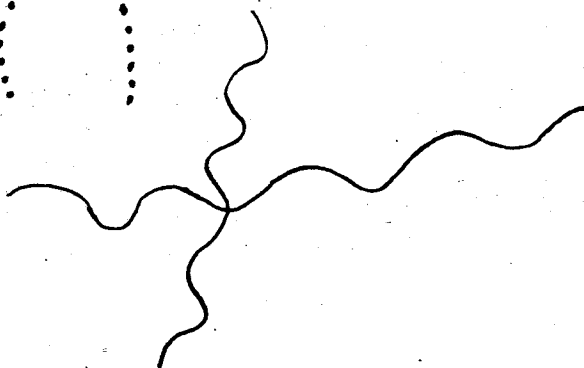
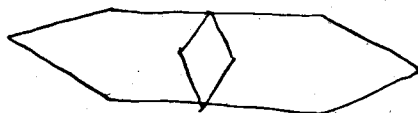
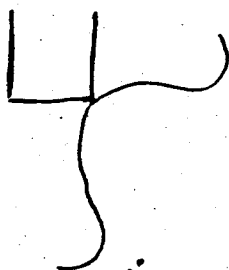
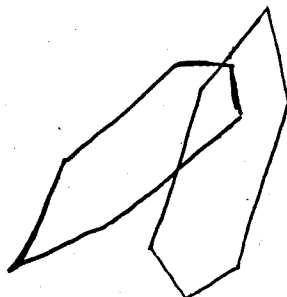
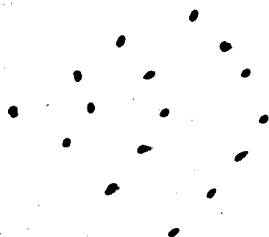
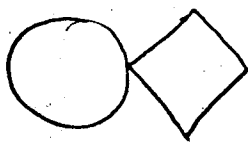


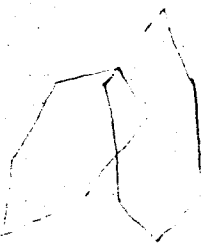
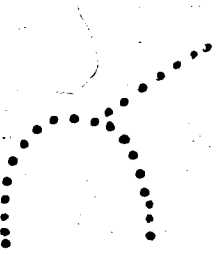
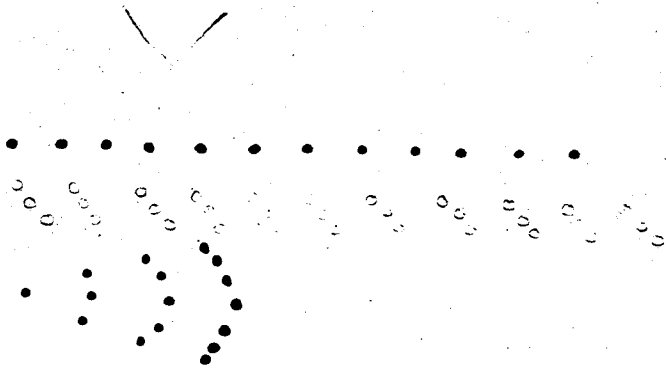


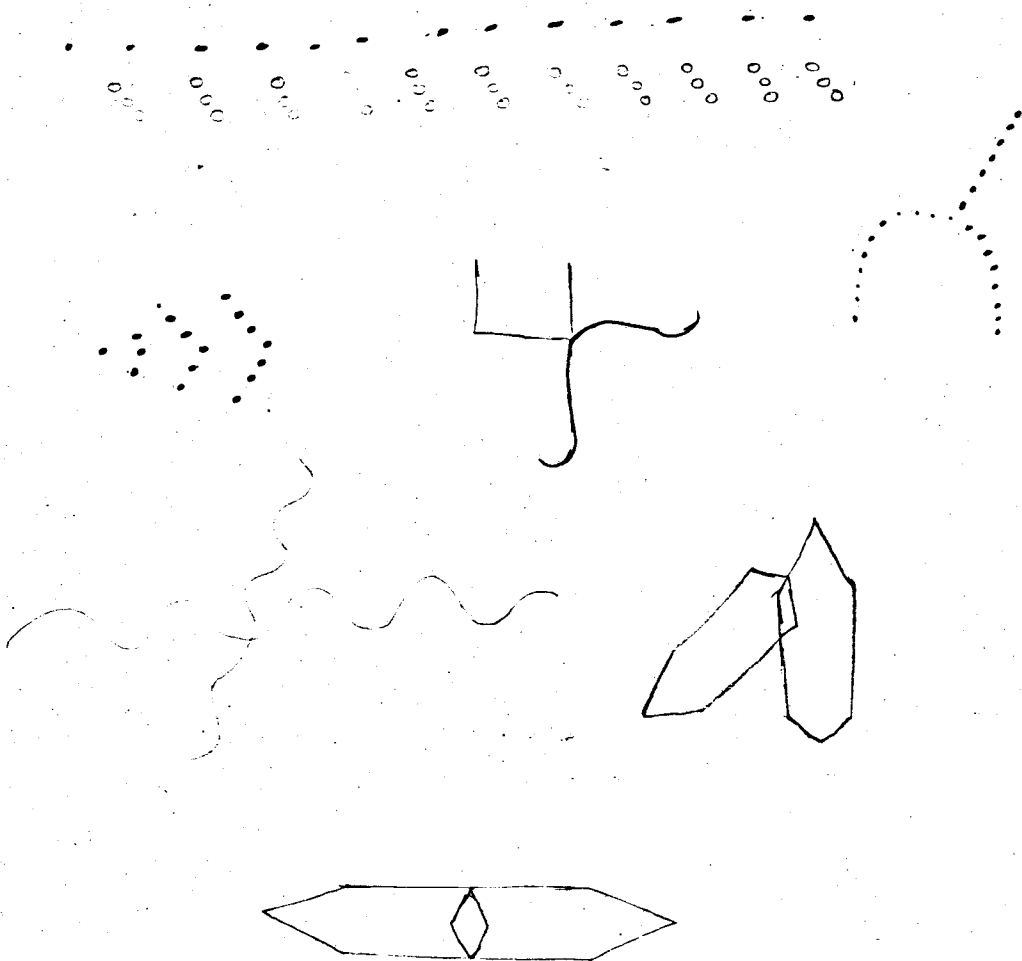


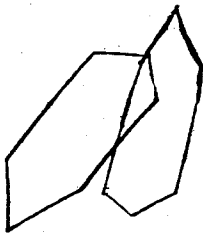
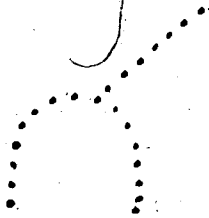
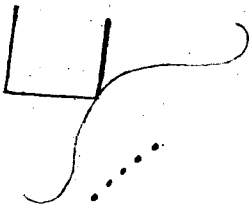
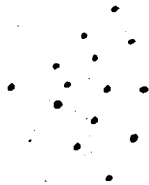
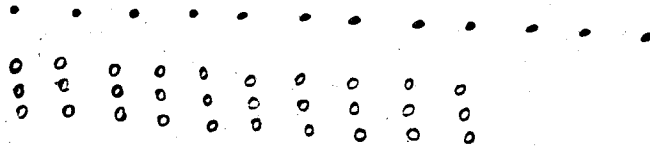


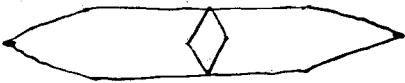
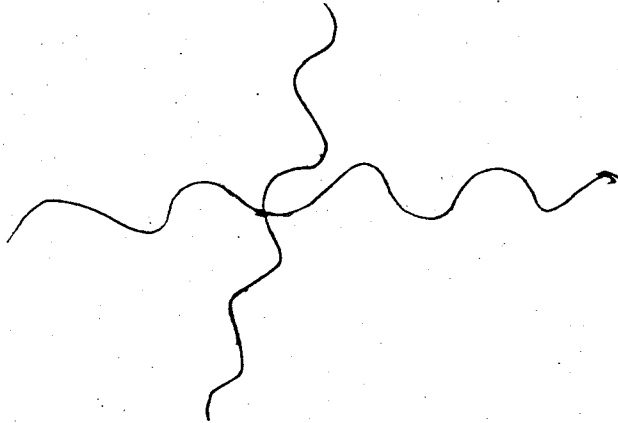
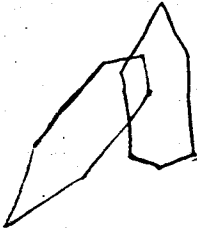
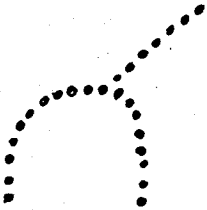
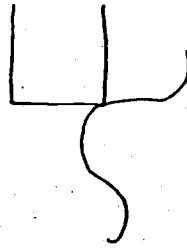
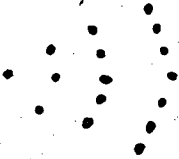
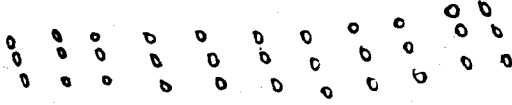
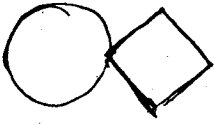


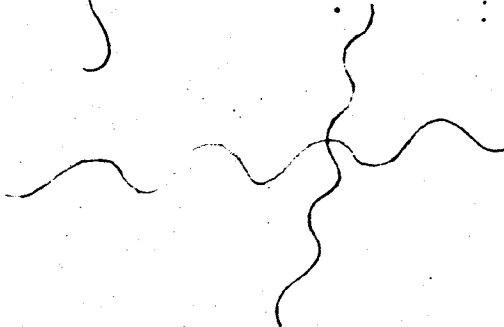
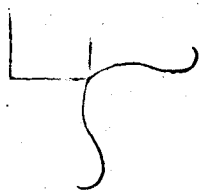
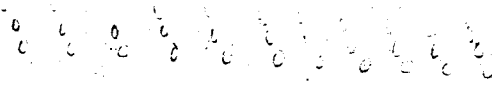


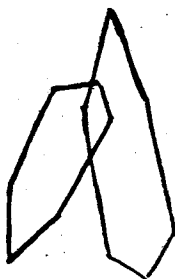
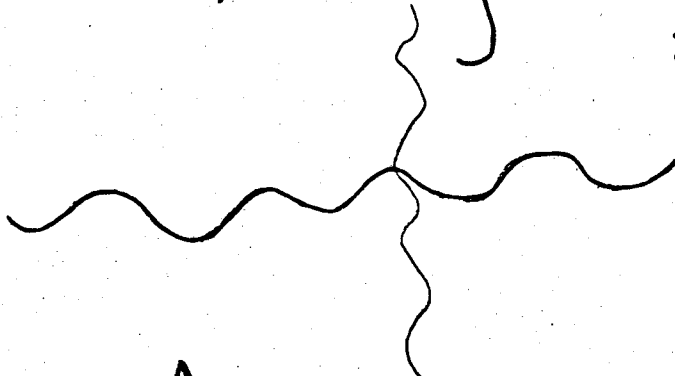
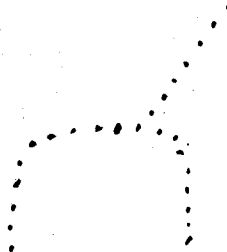
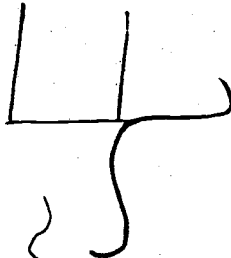
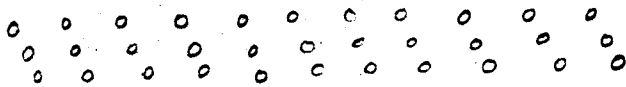
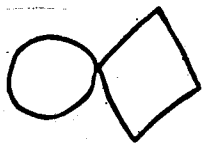




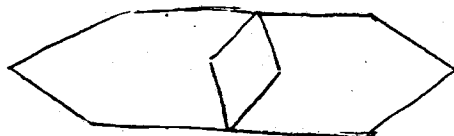
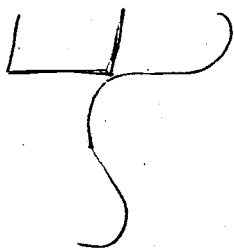
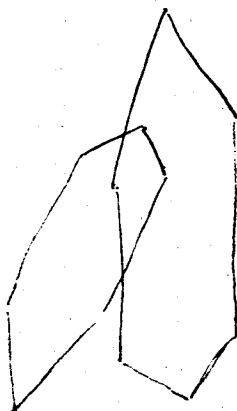
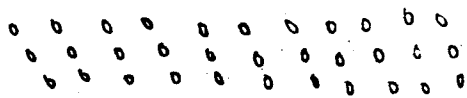
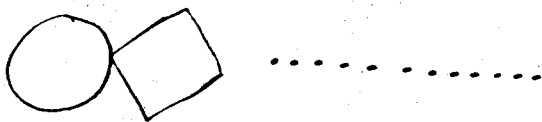




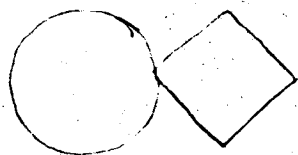




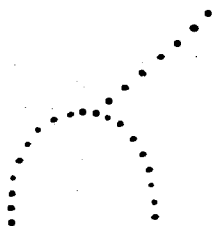
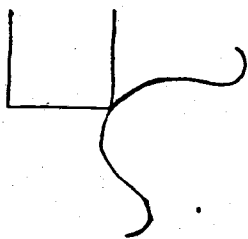
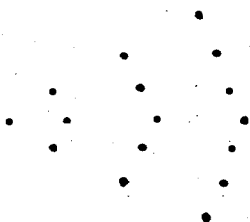
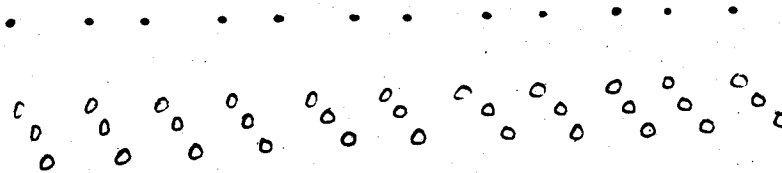
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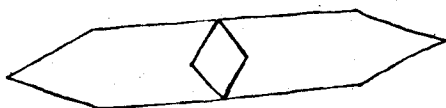
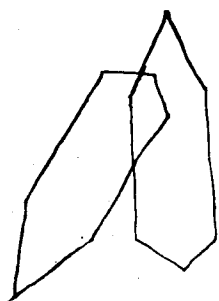
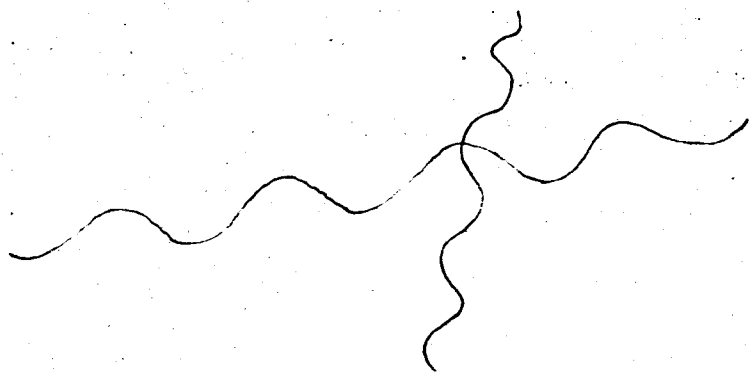


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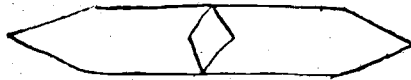
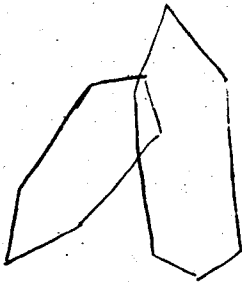
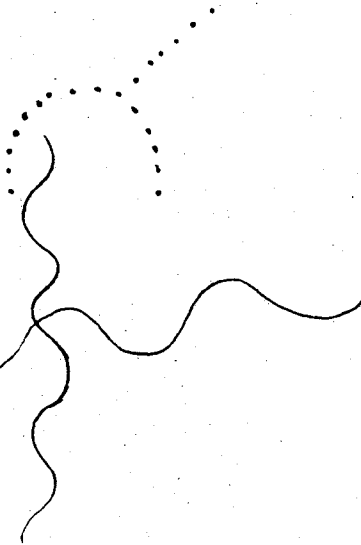
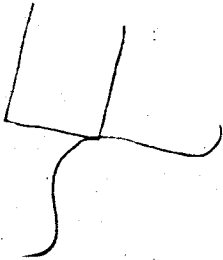
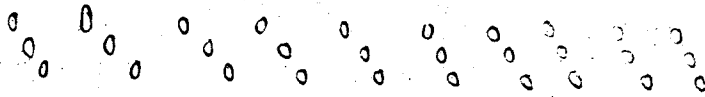
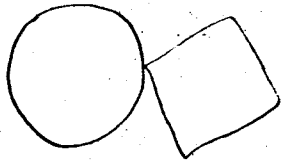


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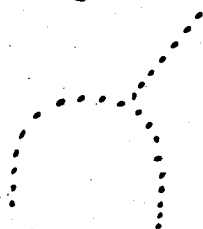
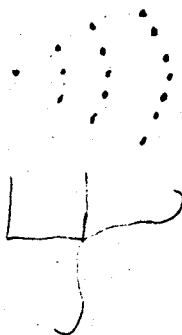
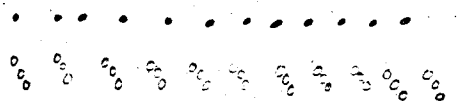
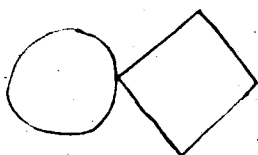


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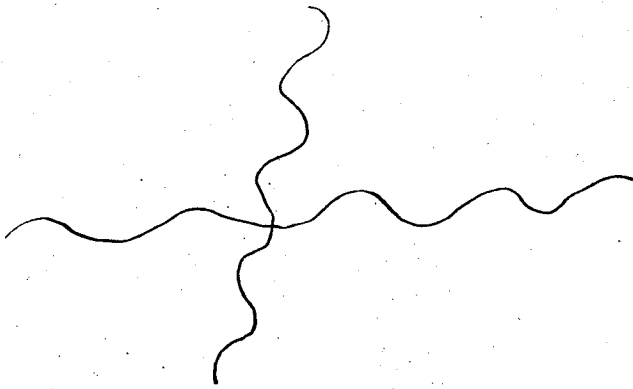
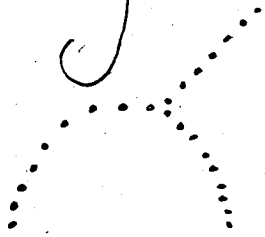
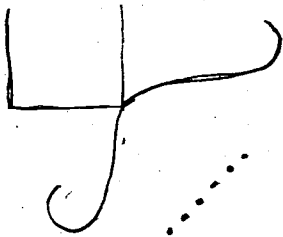
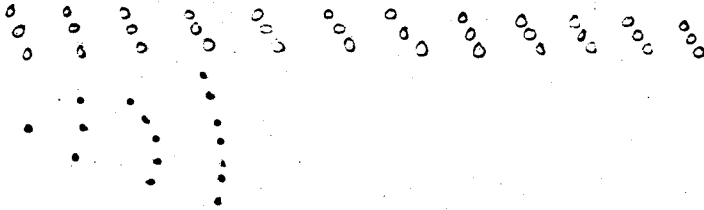
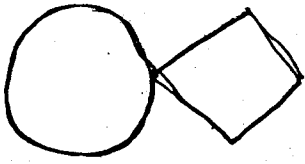


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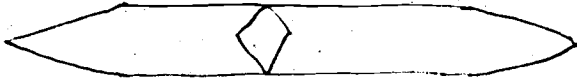
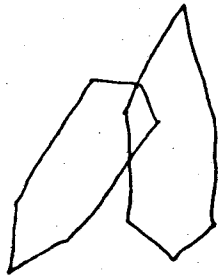


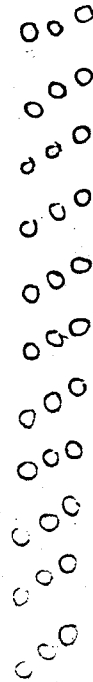
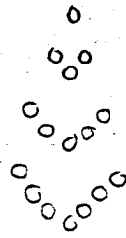
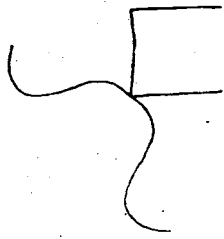
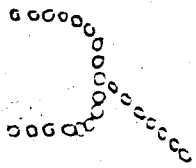
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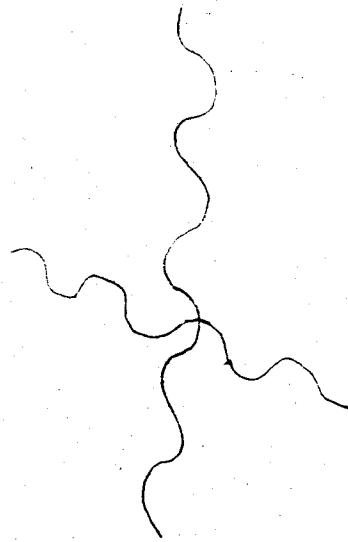
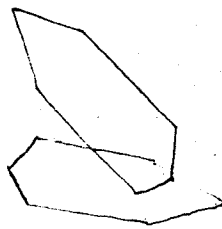
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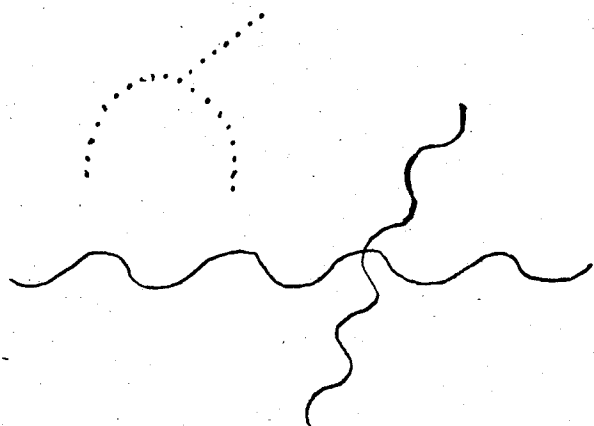
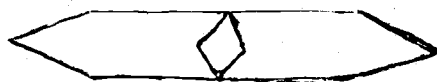
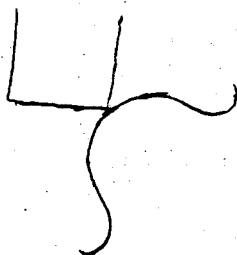
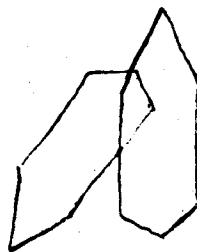
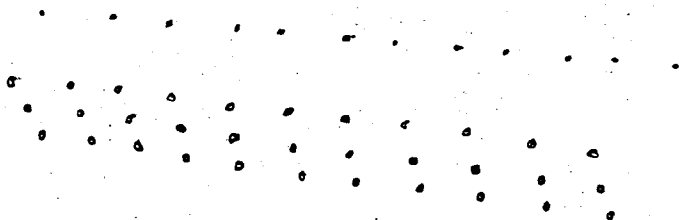
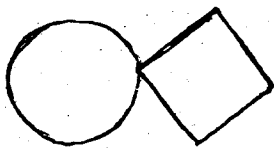




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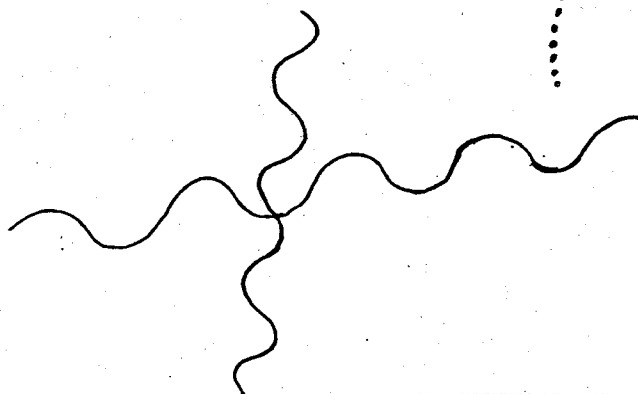
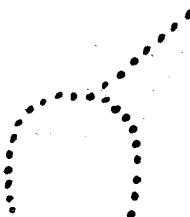
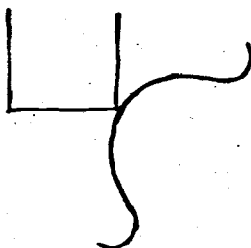
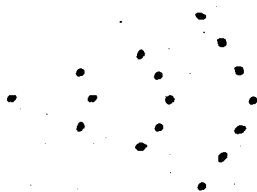
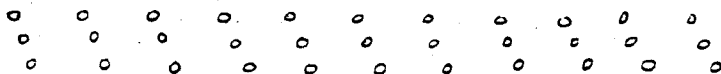
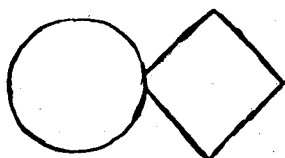


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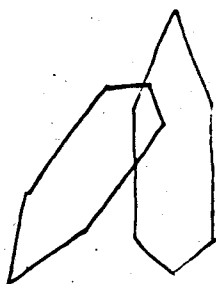


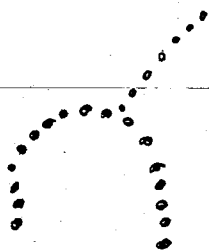
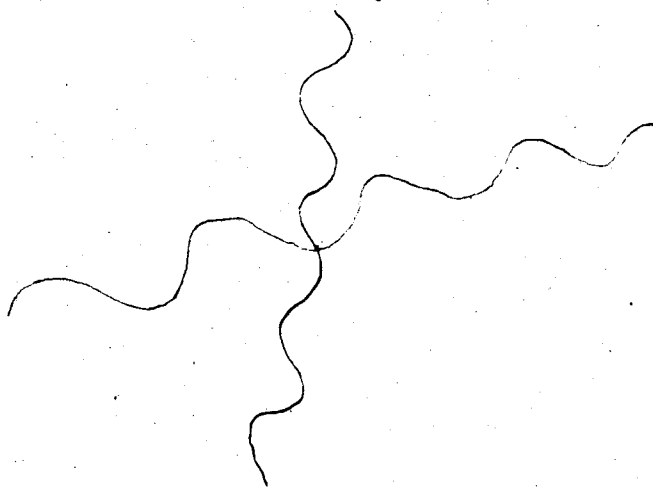
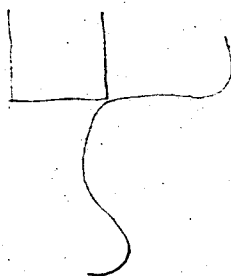
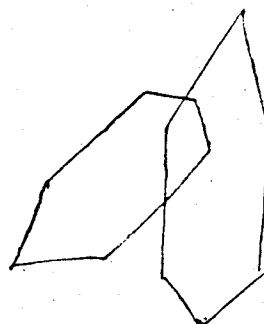
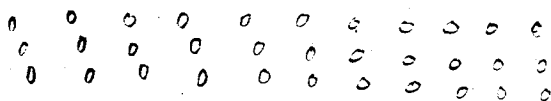
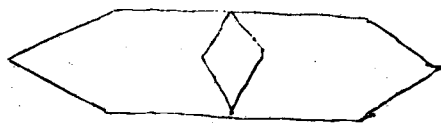
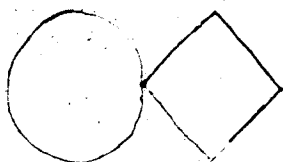
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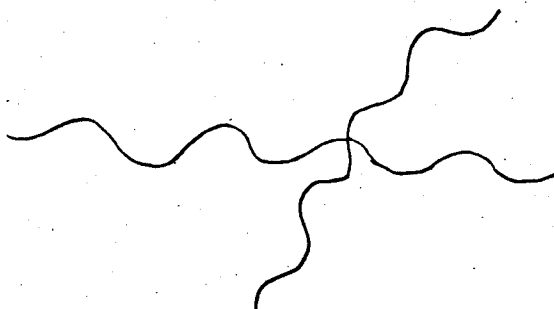
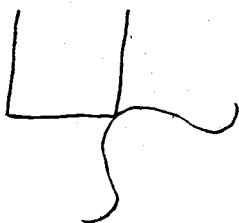
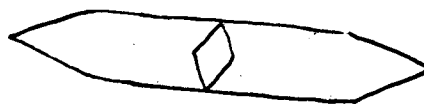
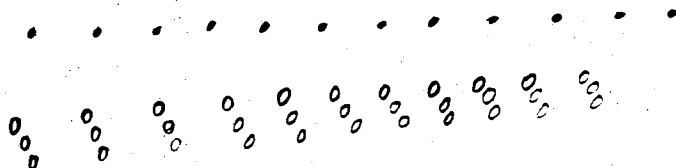
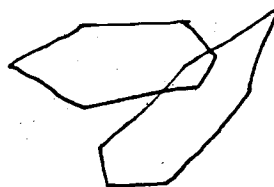
1-5



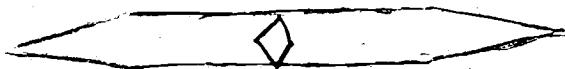
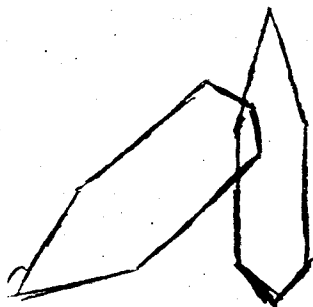
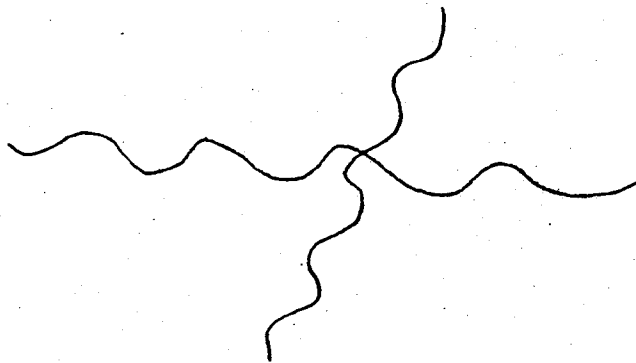
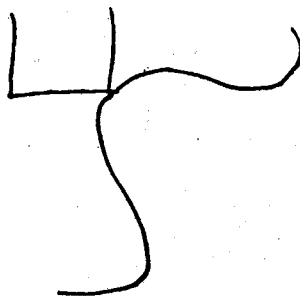
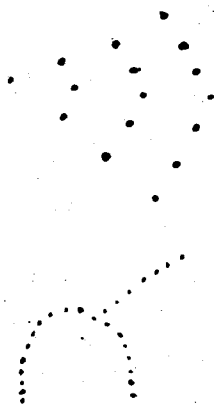


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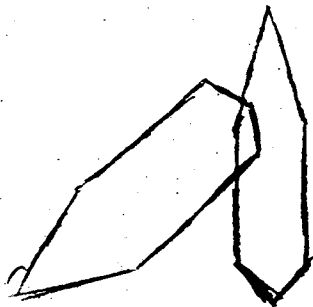
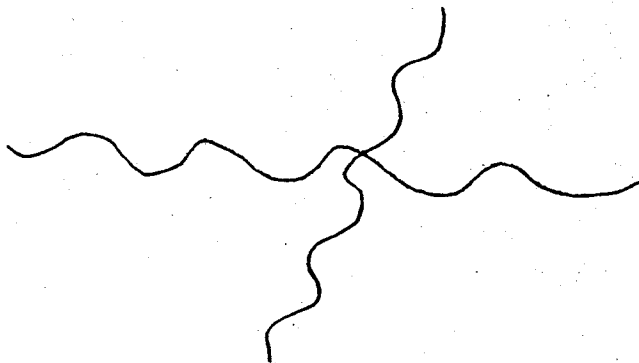
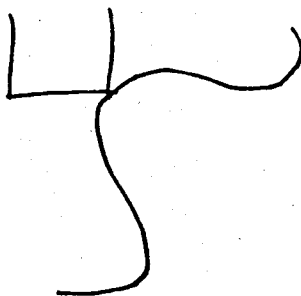
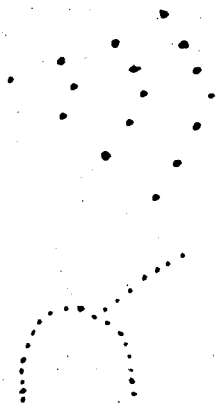
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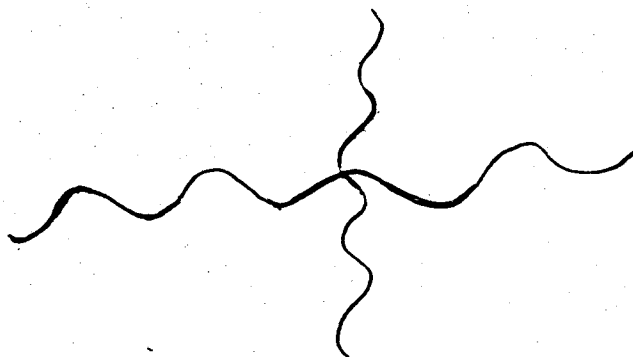
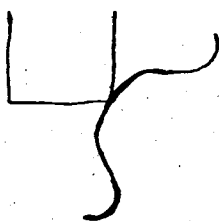
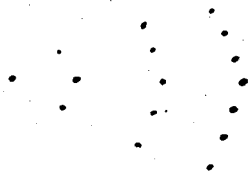
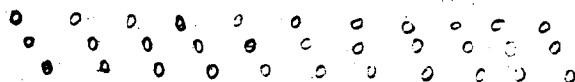


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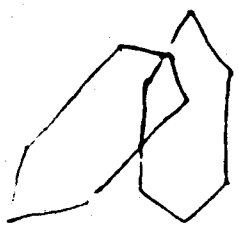
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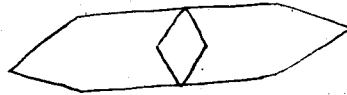
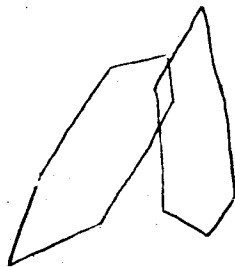
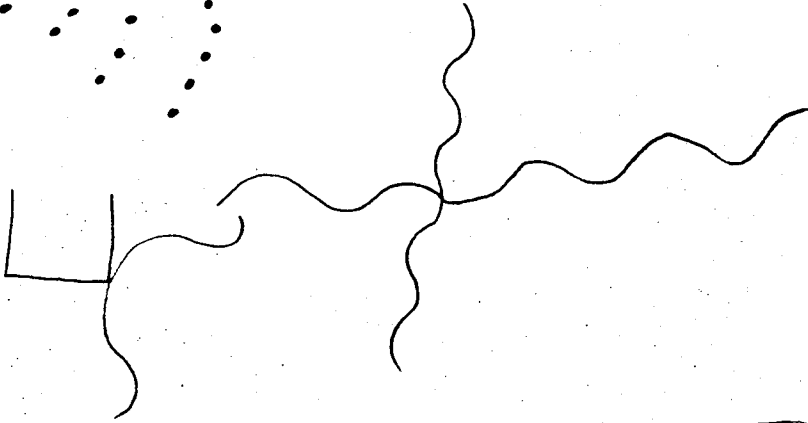
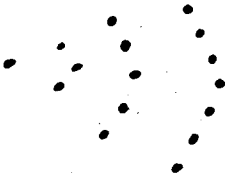
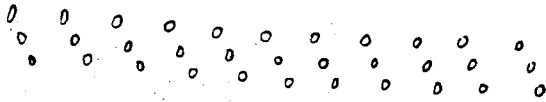
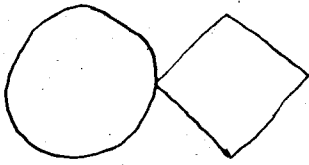


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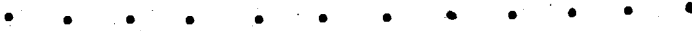
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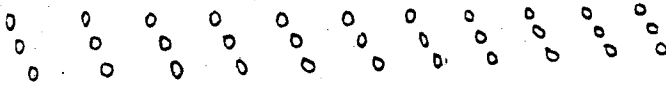
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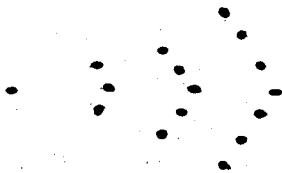


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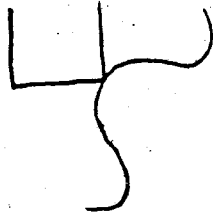


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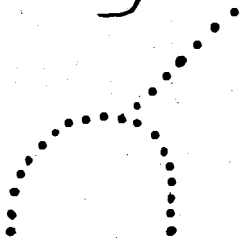
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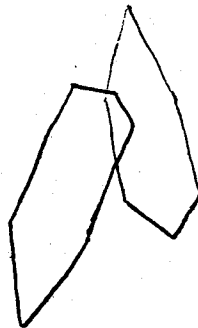
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6.



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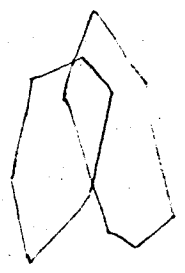
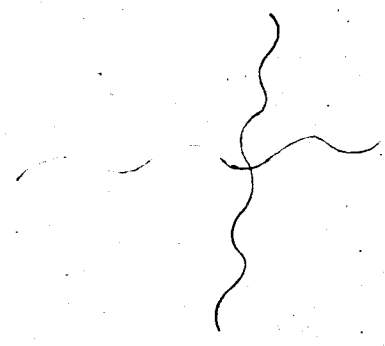
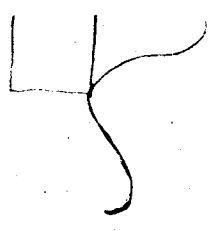
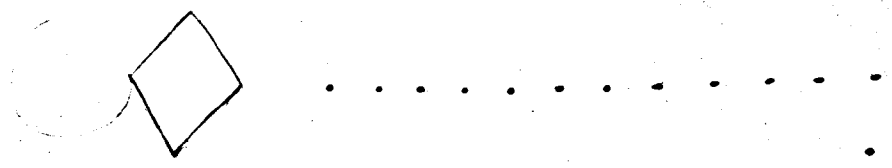


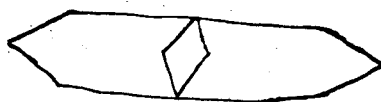
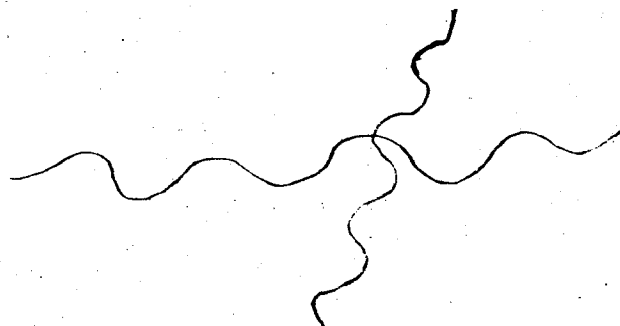
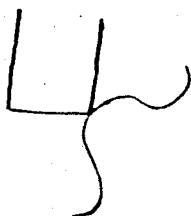
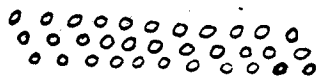
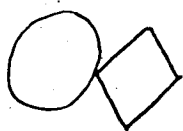
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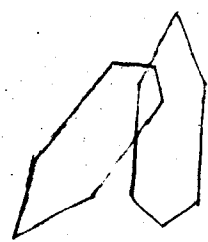
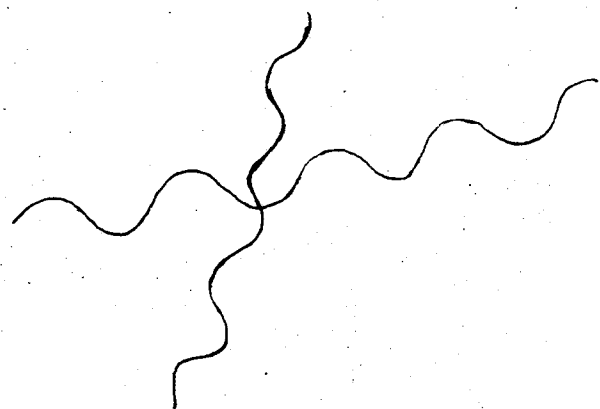
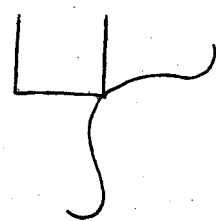
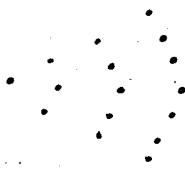
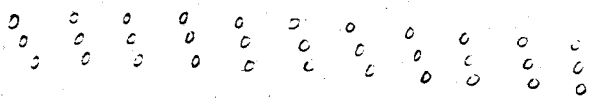
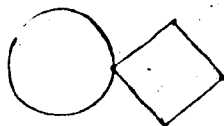
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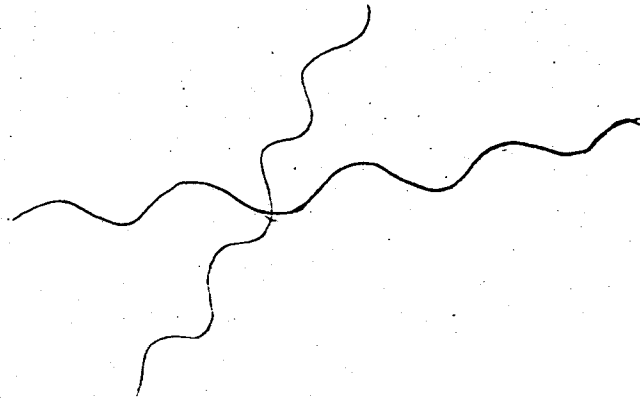
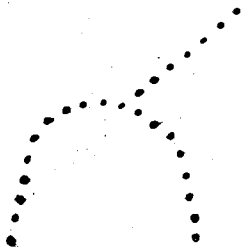
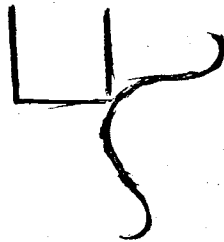
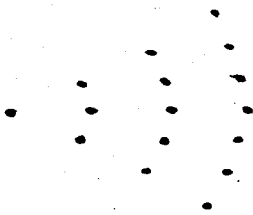


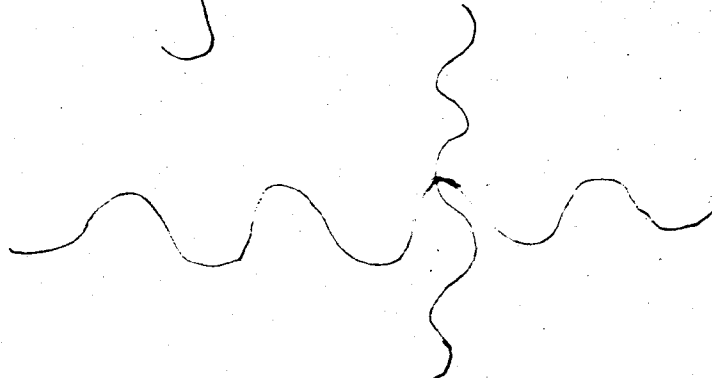
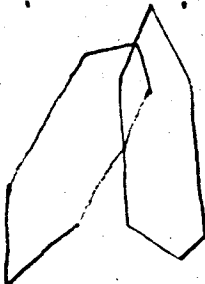
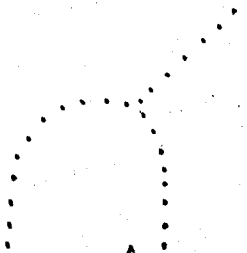
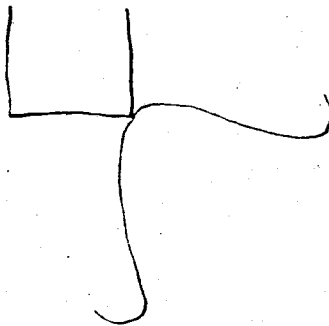
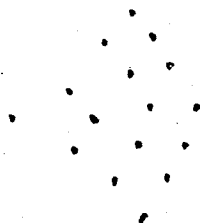
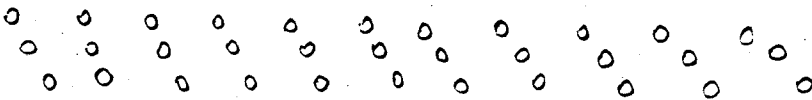
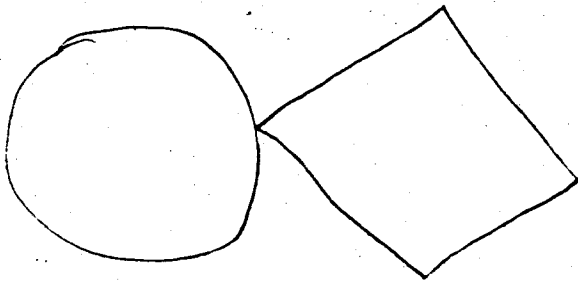


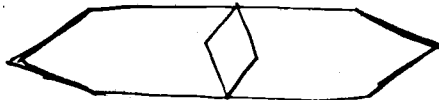
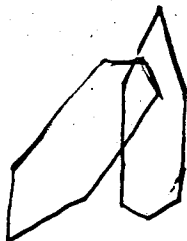
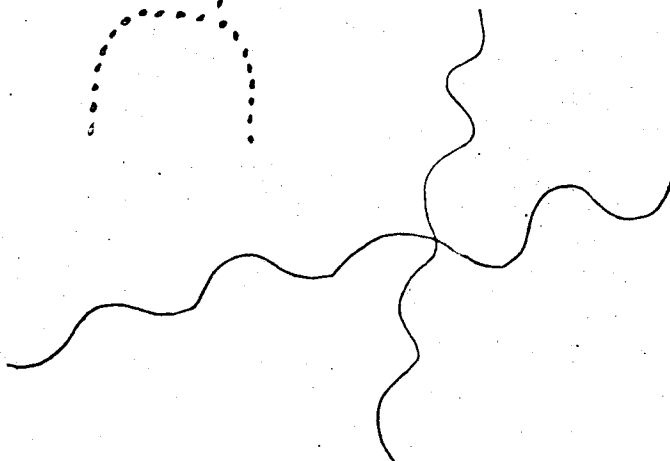
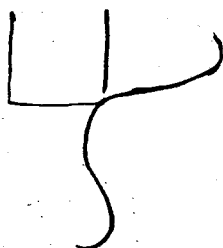
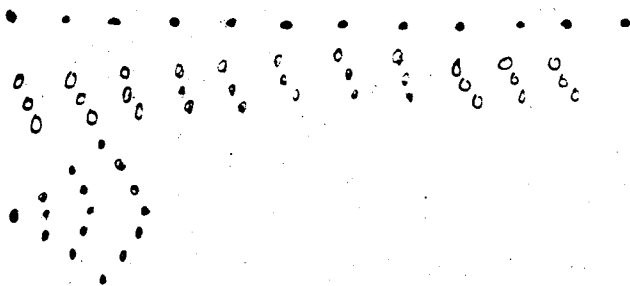
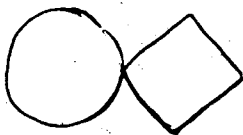


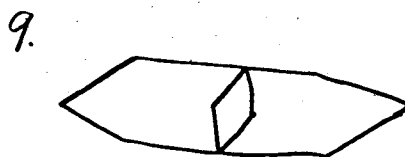
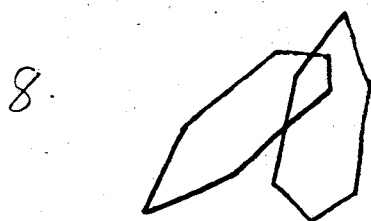
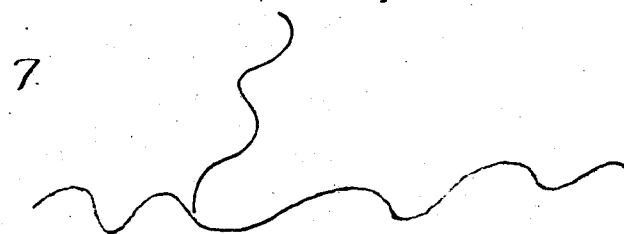
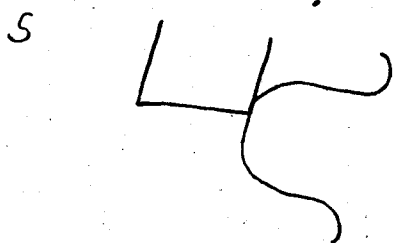
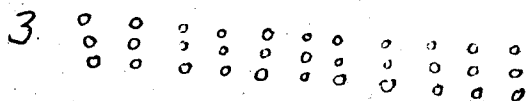
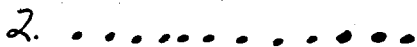
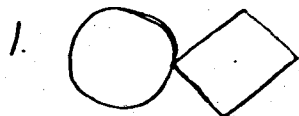
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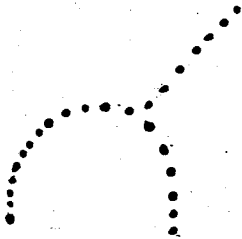
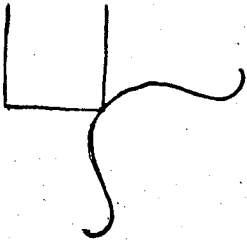
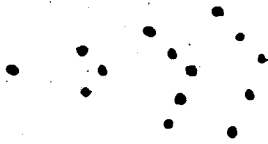
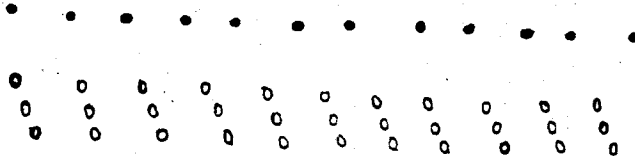
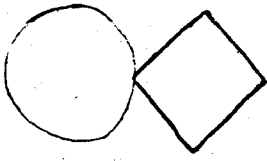
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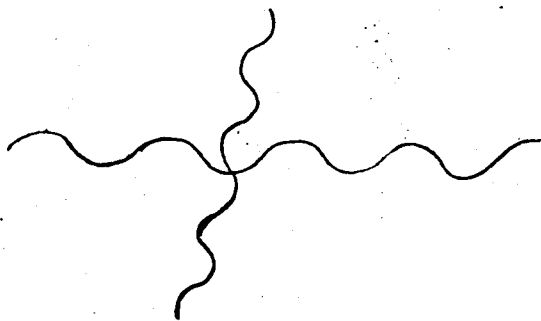




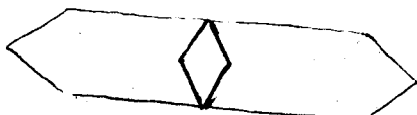
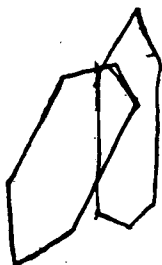


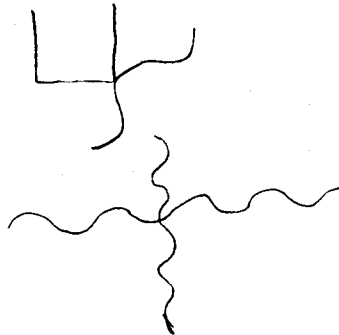
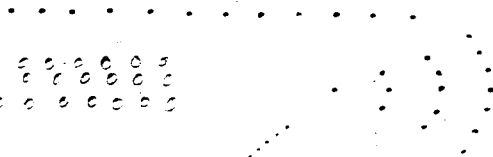
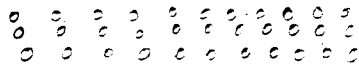




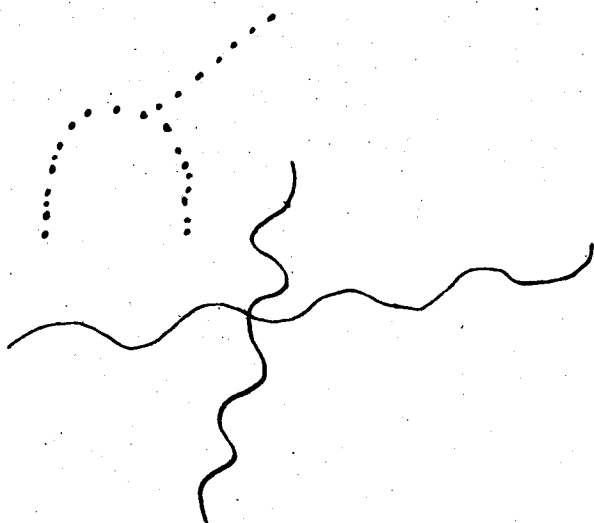
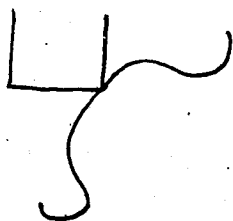
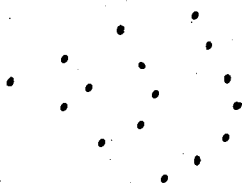
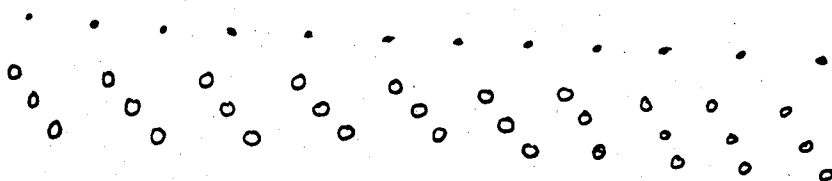
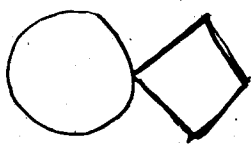


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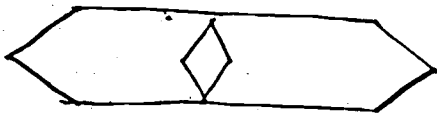
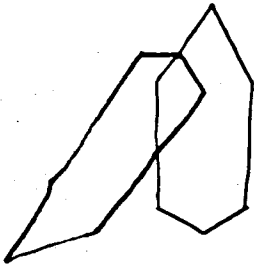


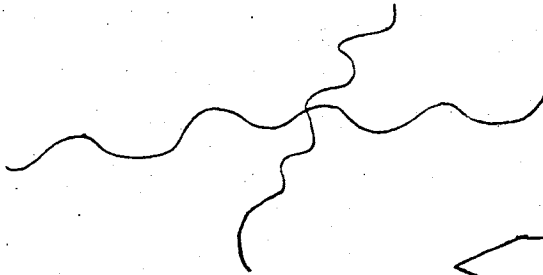
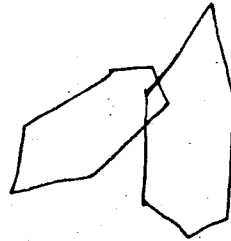
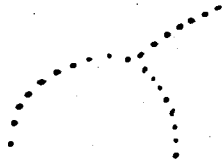
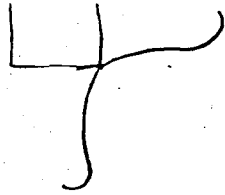
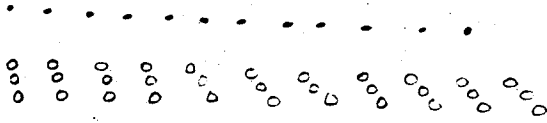


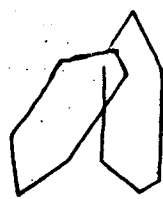
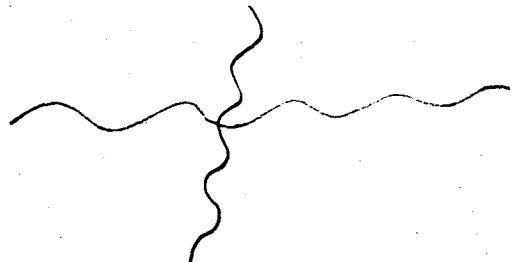
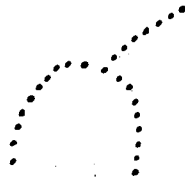
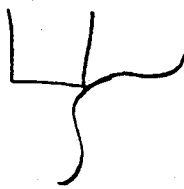
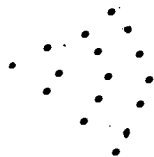
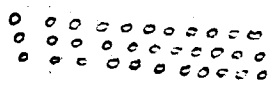
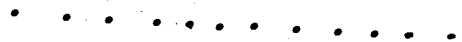
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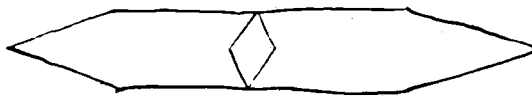
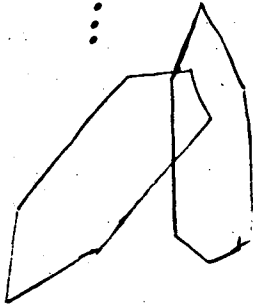
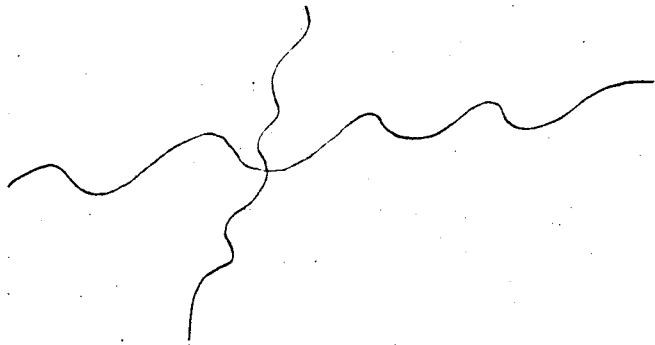
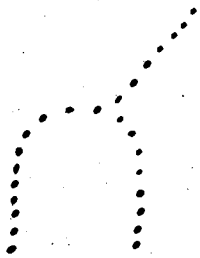
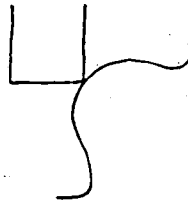
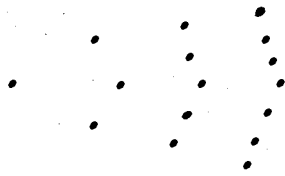
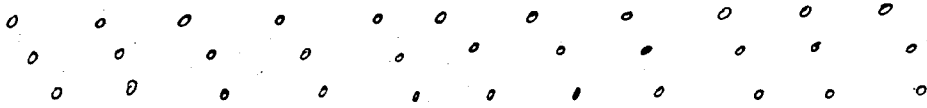
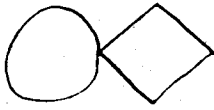


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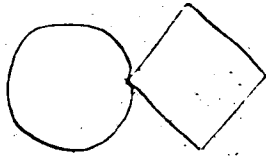




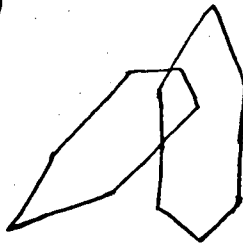
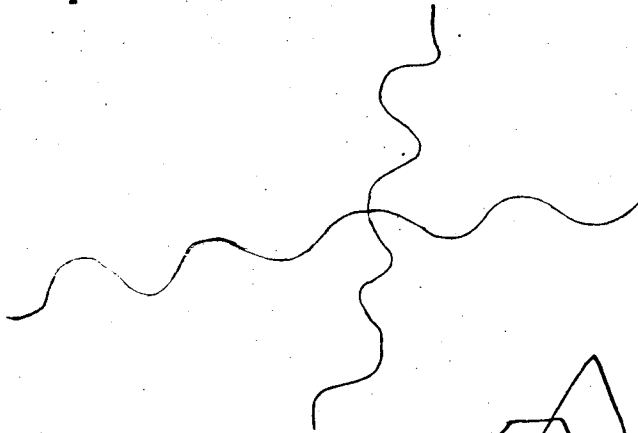
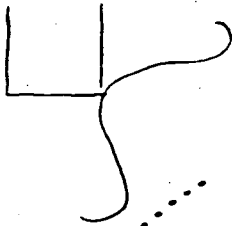
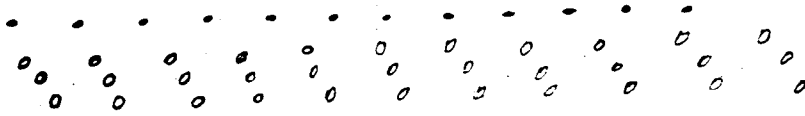




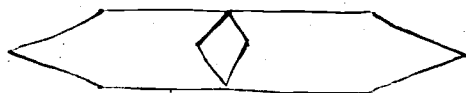
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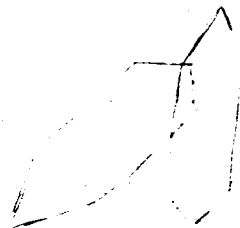
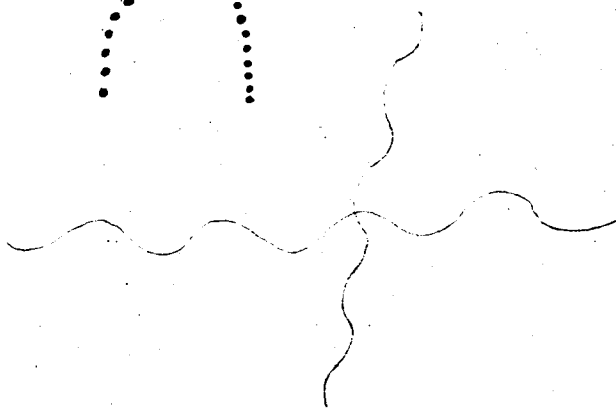
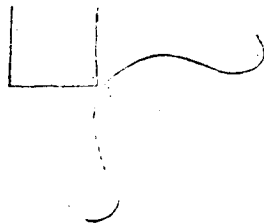
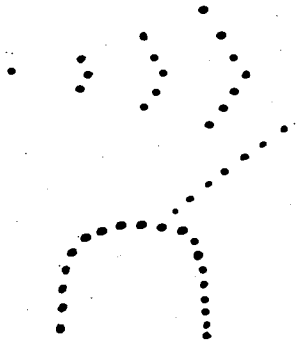
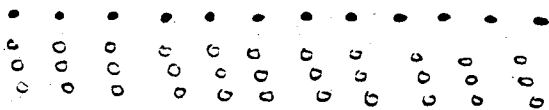


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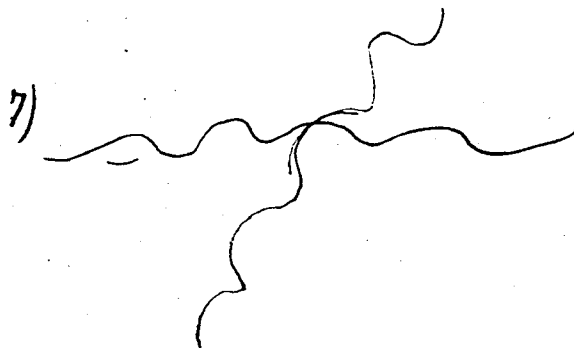
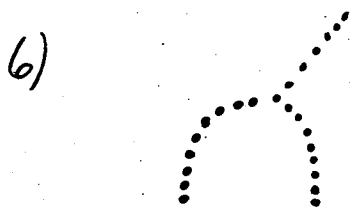
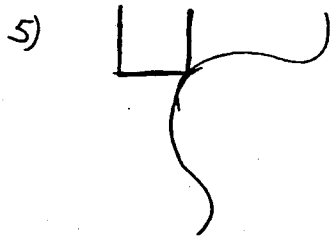
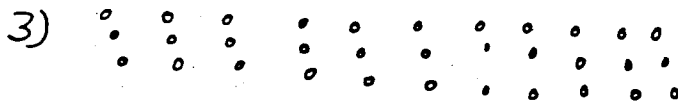
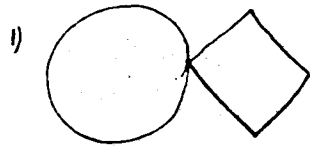
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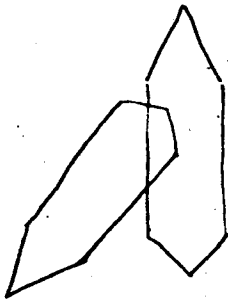


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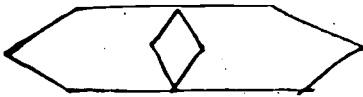
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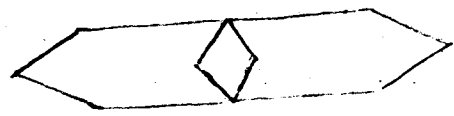
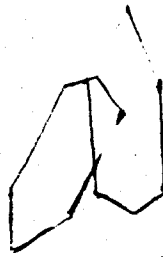
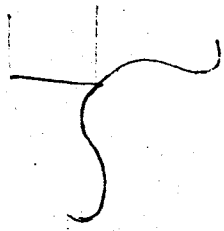
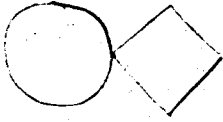


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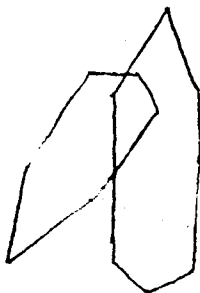
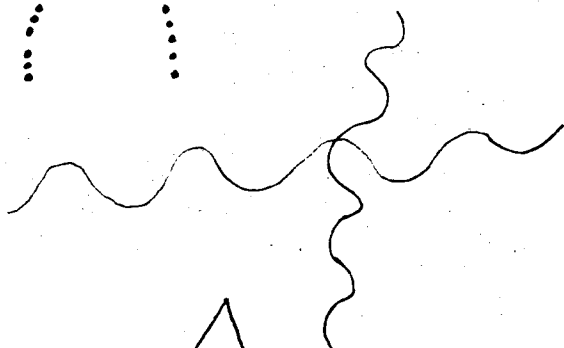
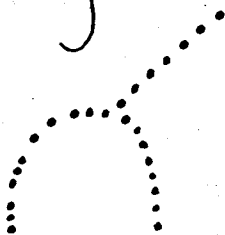
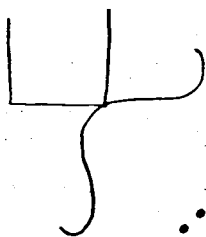
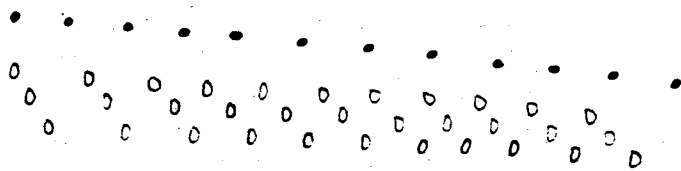
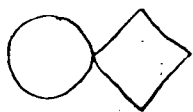


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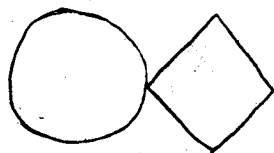




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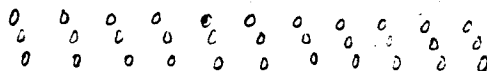
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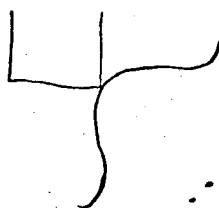
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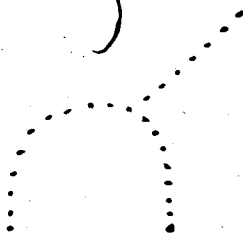
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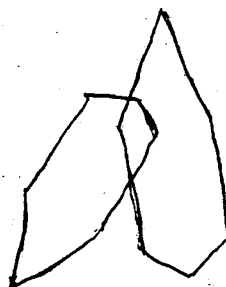
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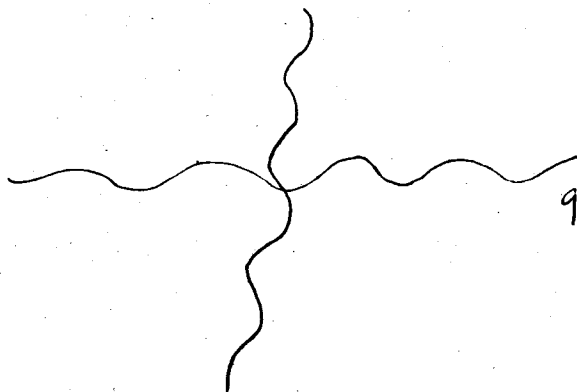
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8.



7.

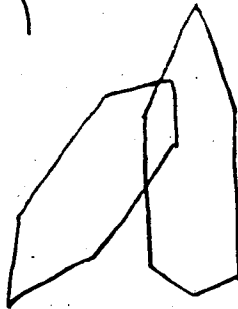
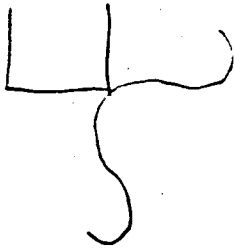
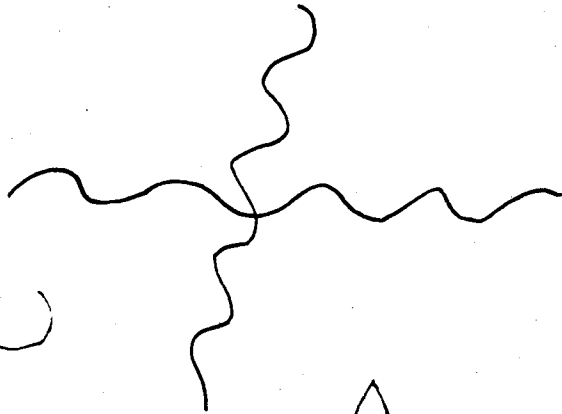
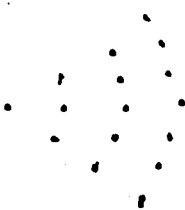
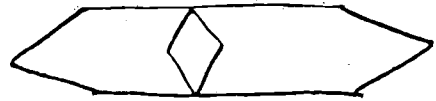
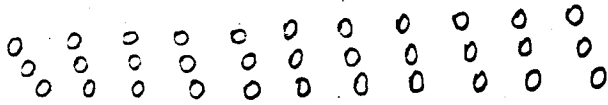
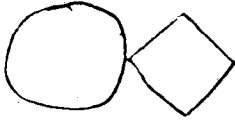


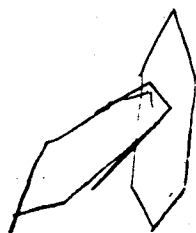
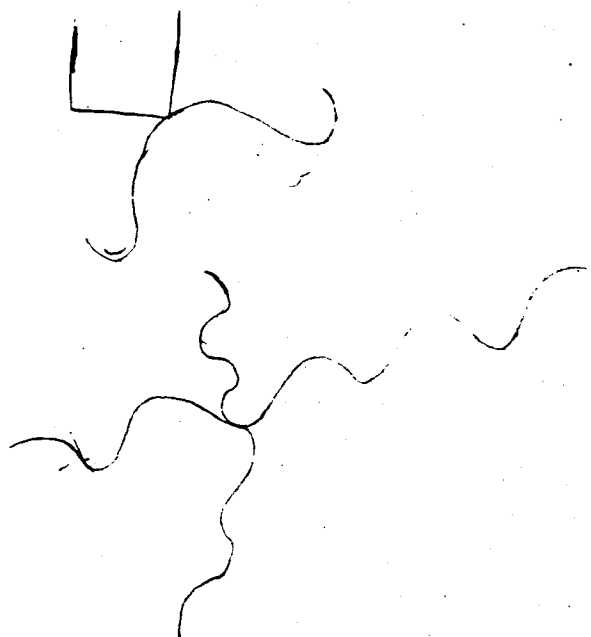
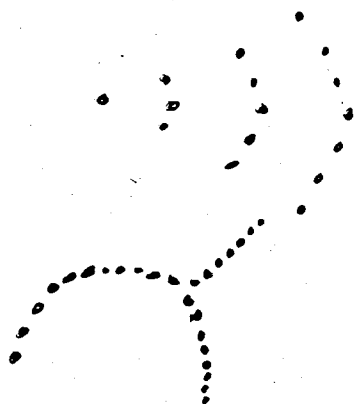
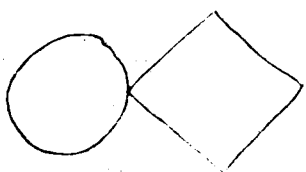
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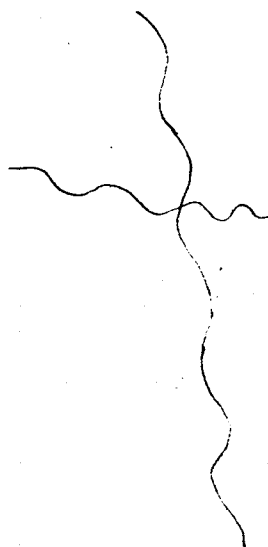
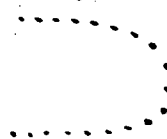
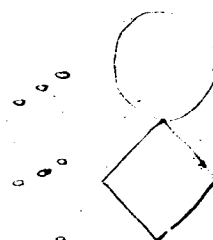
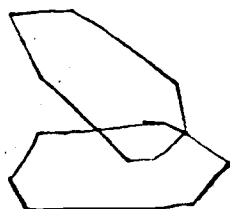


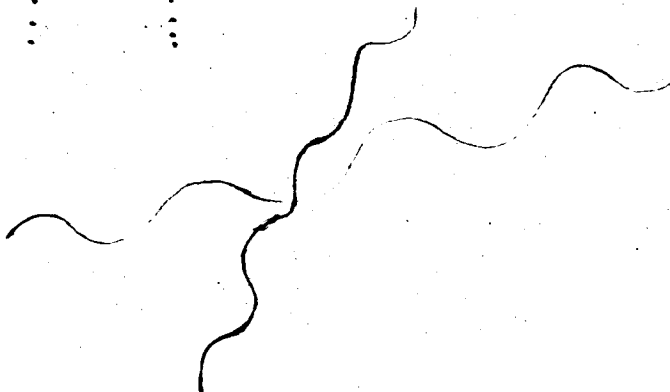
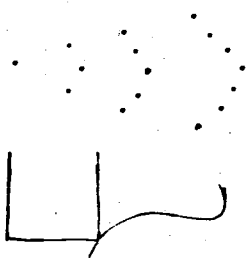
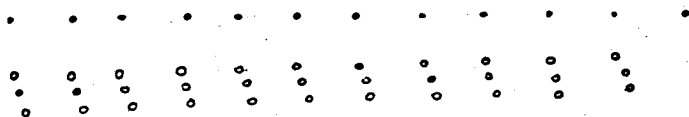
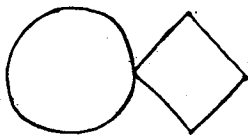
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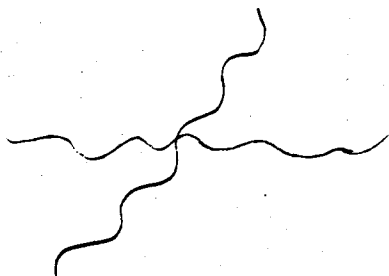
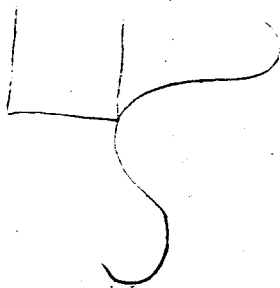
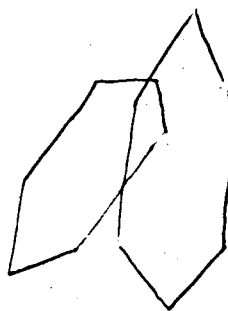
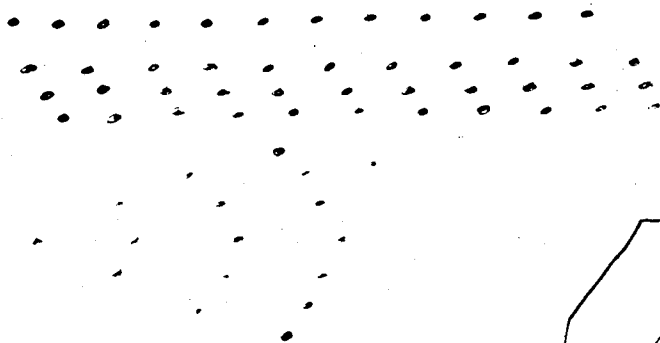
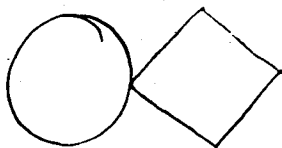


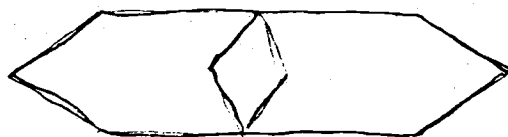
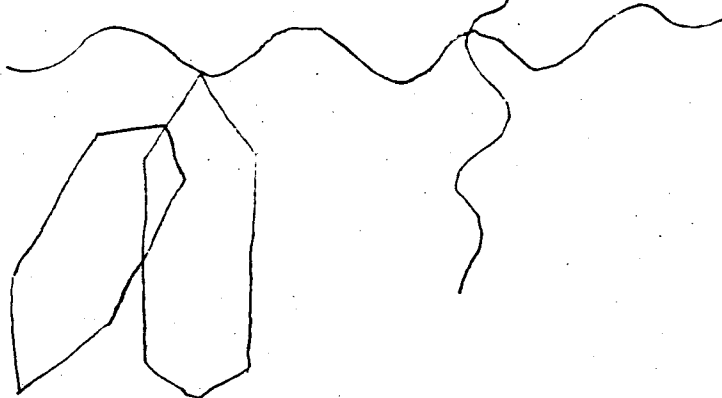
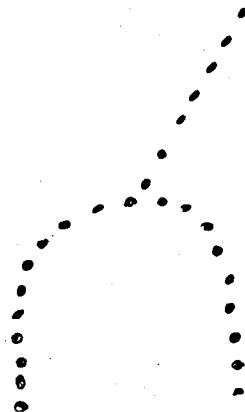
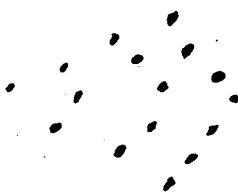
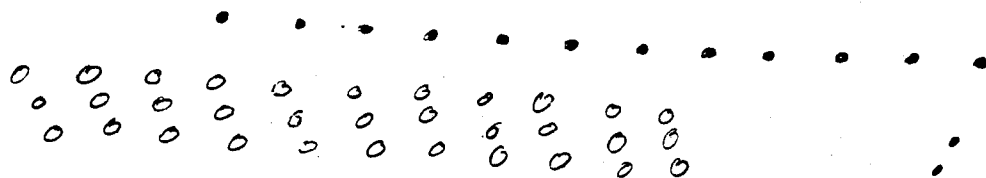
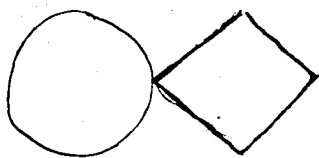




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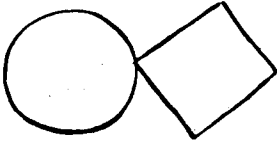
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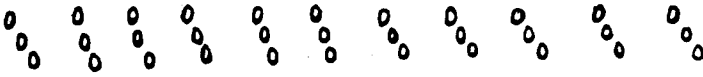


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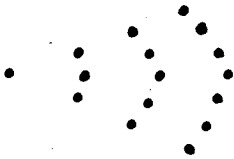
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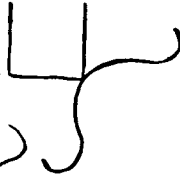
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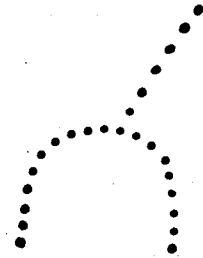
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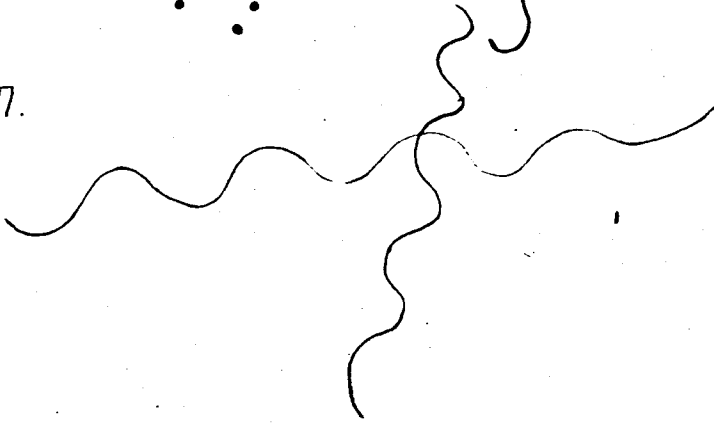
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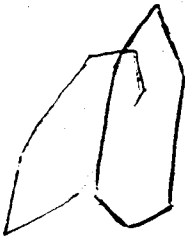
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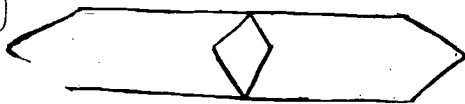
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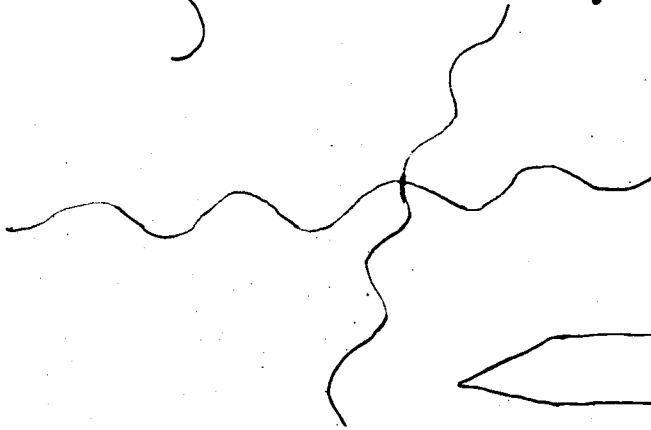
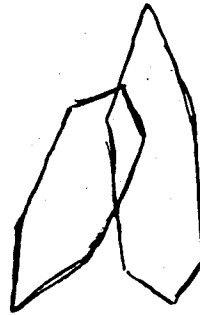
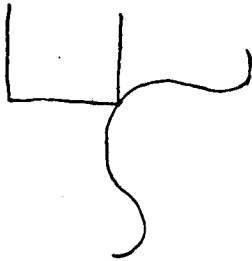
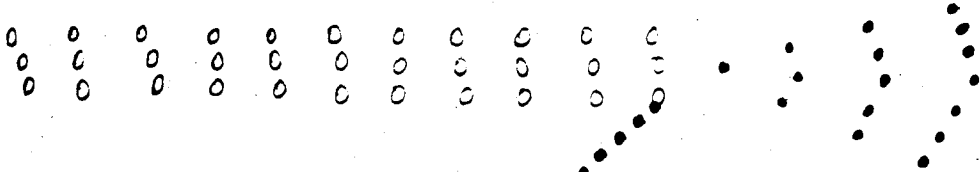
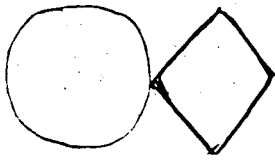


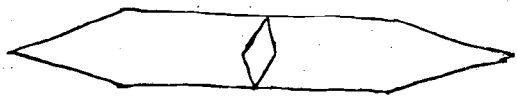
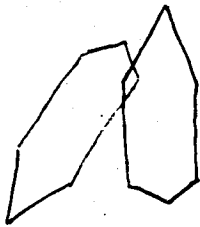
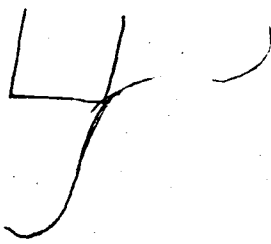
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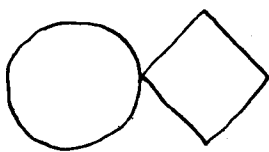
9.)







1)



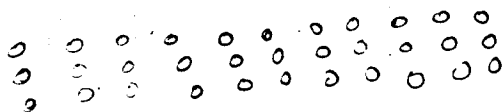
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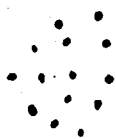
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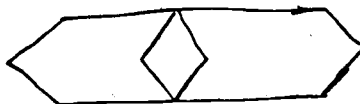
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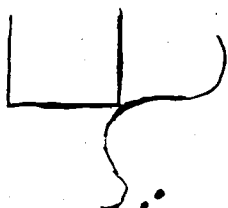
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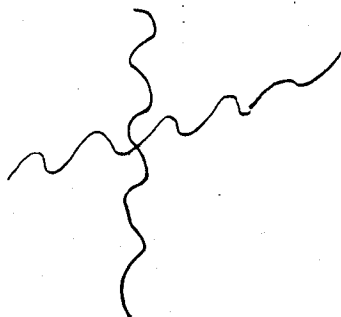
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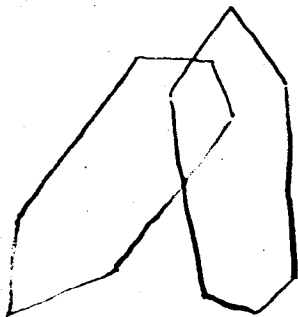
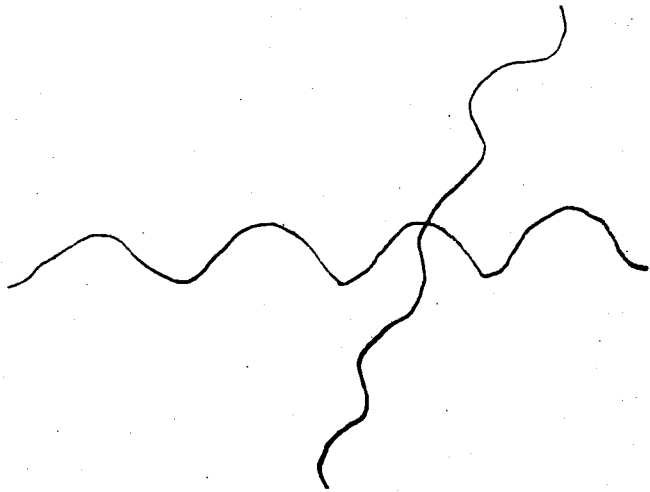
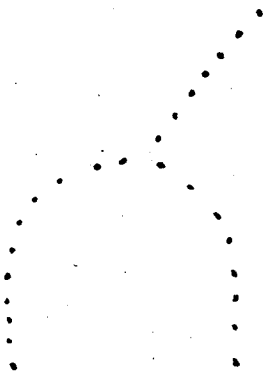
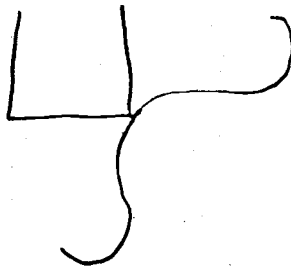
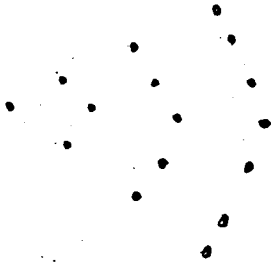
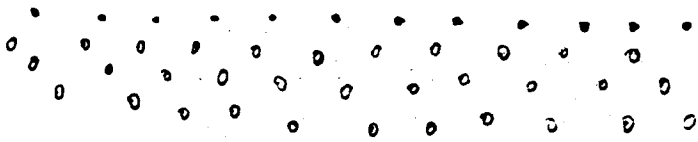


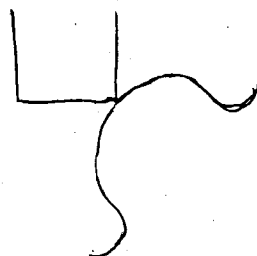
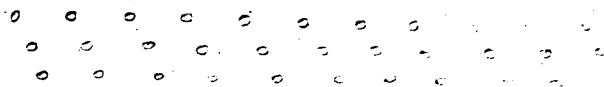
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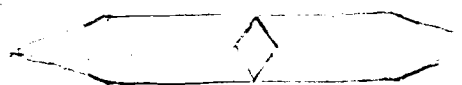
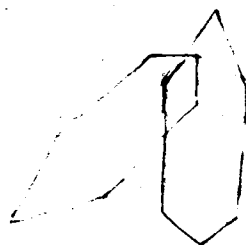
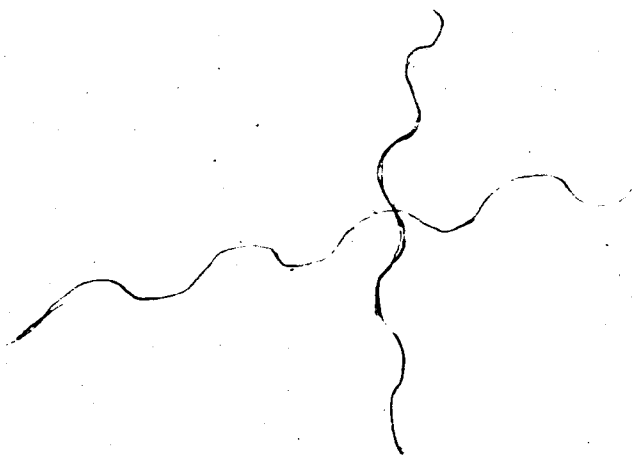


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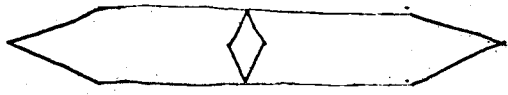
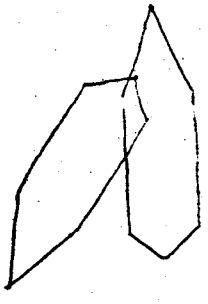
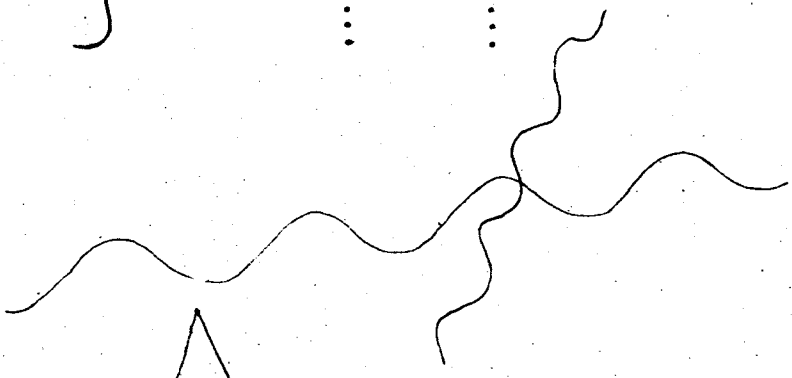
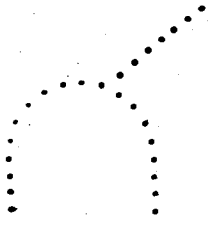
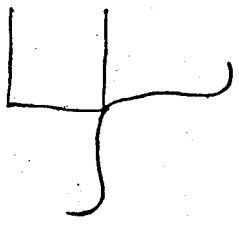
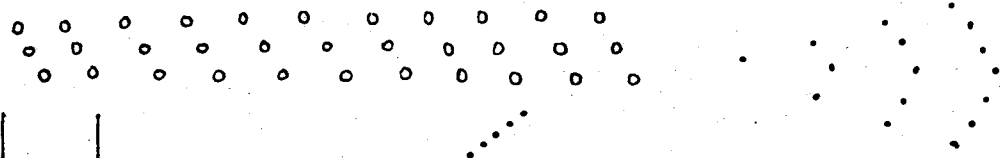
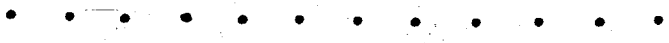
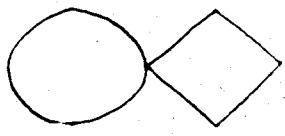




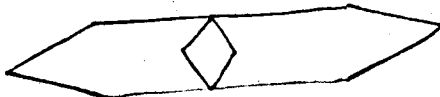
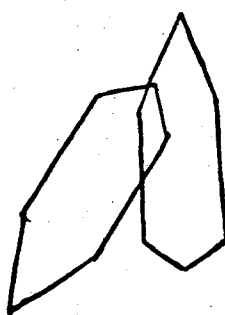
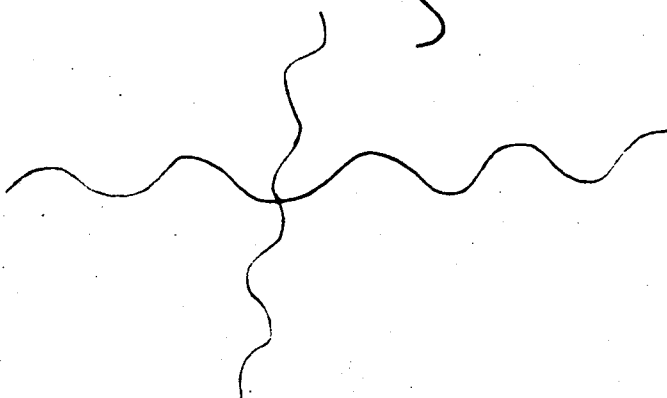
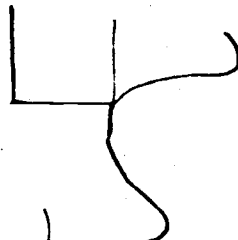
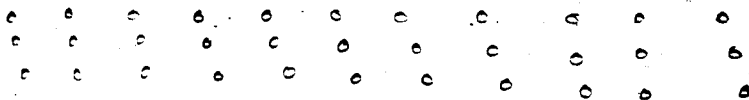
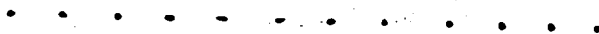
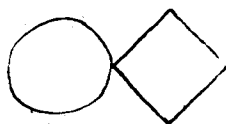




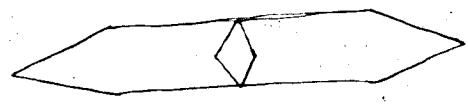
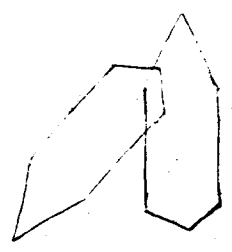
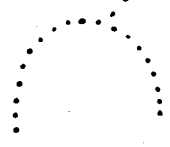
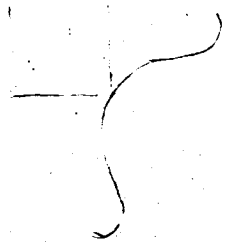
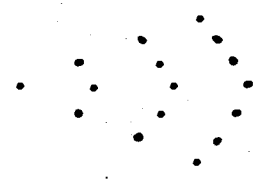
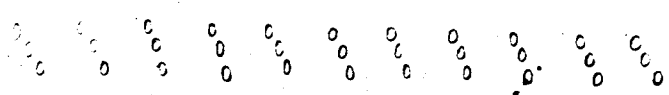
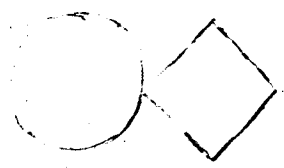
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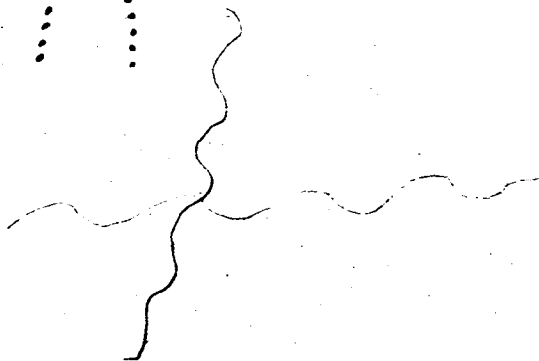
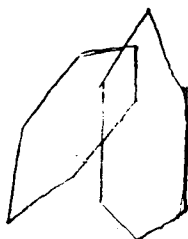
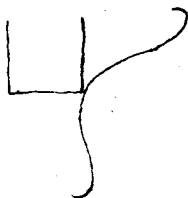
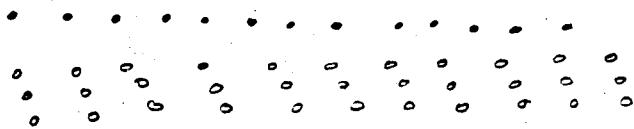
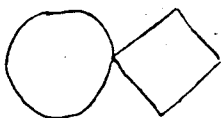


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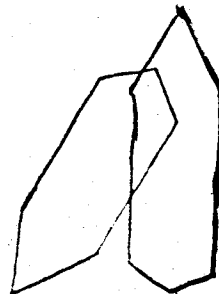
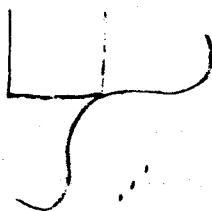
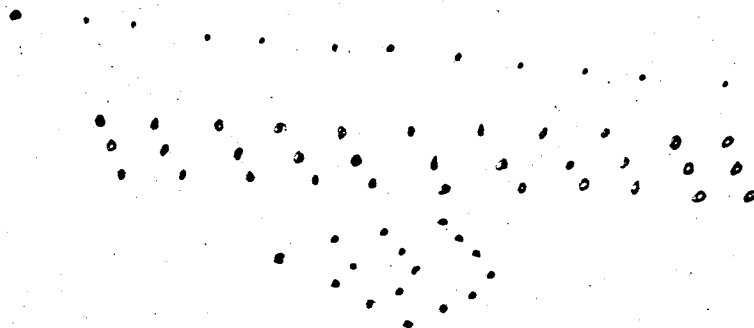
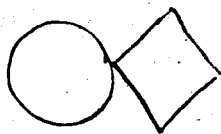


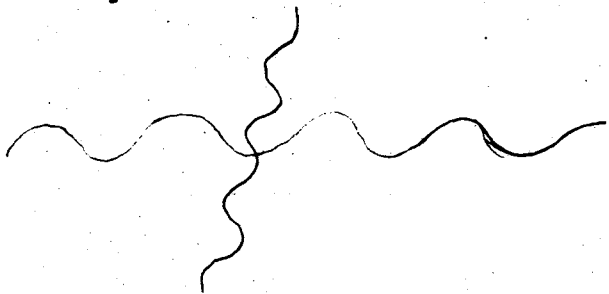
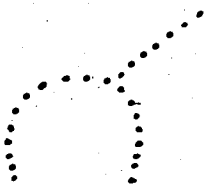
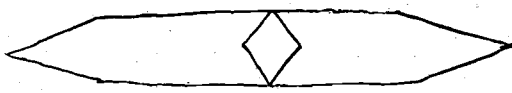
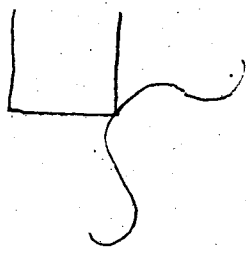
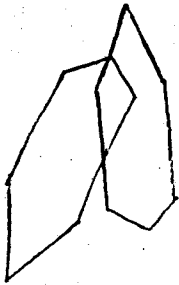
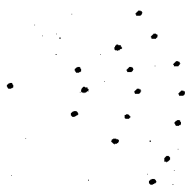
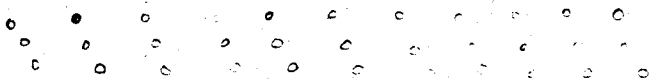
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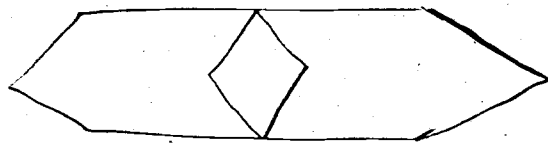
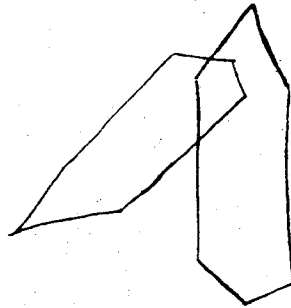
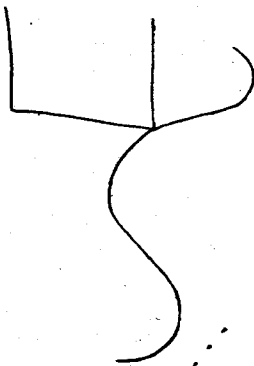
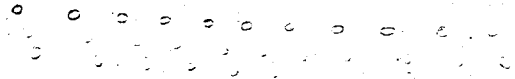
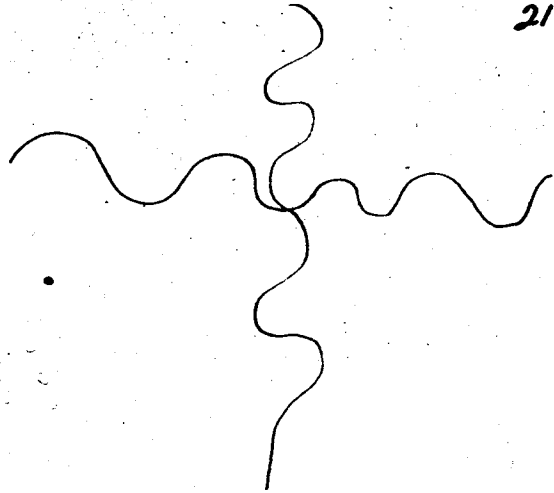
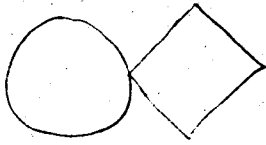




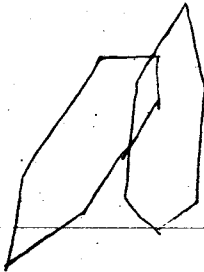
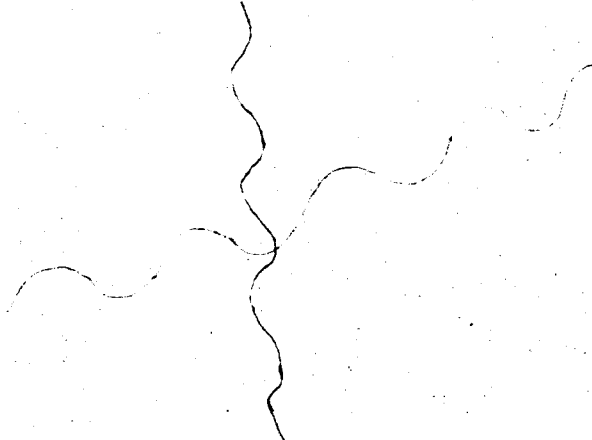
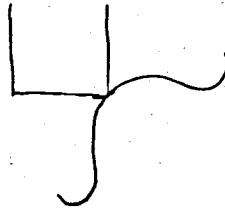
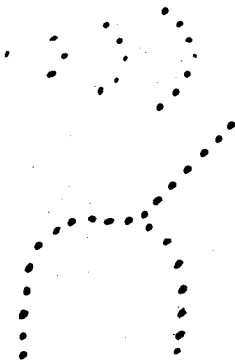
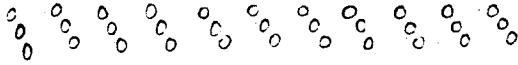
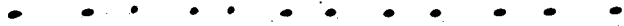
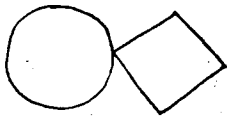
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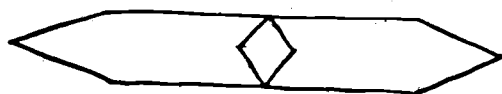
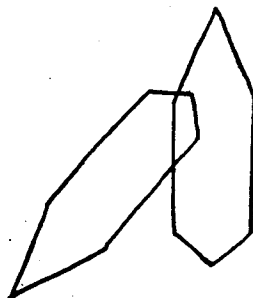
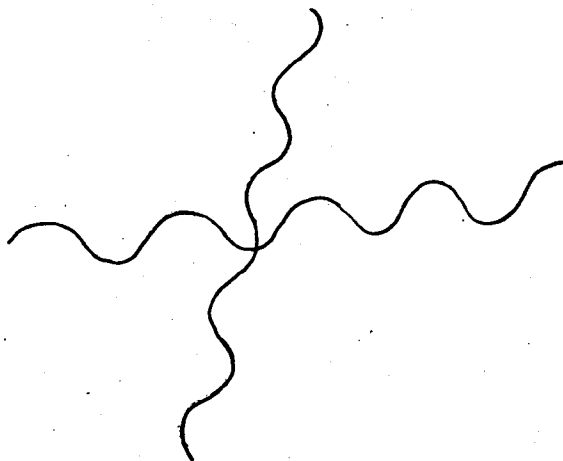
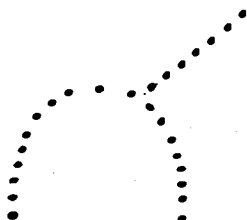
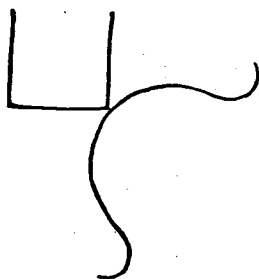
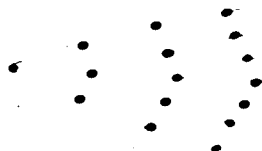
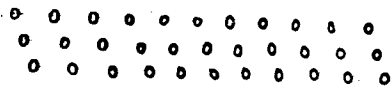
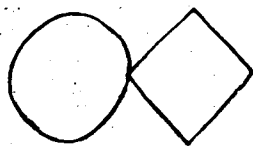




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KEY

Sub. = Subject
S = Sex
DB = Date of Birth
YC = Year in College

Frequency of Use & Length of Time

T = Tobacco
A = Alcohol
M = Marijuana
B = Barbiturates
AM = Amphetamines
ME = Mescaline
L = LSD
H = Heroin
O = Other

Frequency:

0 = Never
1 = Once or Twice
2 = 3 to 9 times
3 = 10 to 49 times
4 = 50 or more times

Length of time:

0 = Less than 6 months
1 = 6 months to 1 year
2 = 1 to 2 years
3 = 2 to 5 years
4 = 5 or more years

Psychologists rating

0 = Severe impairment
1 = Moderate impairment
2 = Questionable as to impairment
3 = Probably no impairment
4 = Clear evidence of no impairment

Psychologists Identifying Number

1 = Dr. Arnold Oettel
2 = Dr. Kent Bennington
3 = Mr. Leon Addis

APPENDIX F
EXPERIMENTAL GROUP
RAW DATA

				Frequency of Use									Length of Time									Psy. rating		
Sub.	S	DB	YC	T	A	M	B	AM	ME	L	H	O	T	A	M	B	AM	ME	L	H	O	1	2	3
003	1	50	3	2	3	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	3	4	4
002	1	51	1	2	2	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3	3	1
001	1	49	4	4	4	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	1	3	3
004	2	51	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4
006	2	49	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	3
007	1	46	5	4	4	3	1	3	1	0	0	0	0	0	0	2	2	0	0	0	0	3	4	3
008	1	44	5	4	4	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	3	3	1
009	2	51	1	4	4	2	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	3	3	2
010	2	48	5	4	4	2	0	0	0	0	0	0	3	3	3	0	0	0	0	0	0	3	3	2
011	2	49	4	2	4	2	0	0	0	0	0	4	0	3	0	0	0	0	0	0	0	3	3	3
012	2	48	5	4	4	2	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	3	4	3
013	2	48	5	4	4	3	0	0	0	0	0	0	4	4	2	0	0	0	0	0	0	3	4	4
014	1	38	5	4	0	0	3	0	0	0	0	0	2	0	0	3	0	0	0	0	0	2	3	3
015	2	51	1	2	3	4	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	4	4	4
016	1	44	5	4	4	4	0	4	1	0	0	0	3	4	3	0	2	0	0	0	0	3	3	4
017	1	44	5	3	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	4	4
018	1	47	5	4	2	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	3	4	4
019	2	45	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4
021	2	49	4	0	4	0	1	0	0	0	0	1	0	3	0	0	0	0	0	0	0	3	3	4
022	2	51	2	0	3	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	3	1	3	1
023	1	47	5	2	2	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
024	2	35	5	4	4	1	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	1	3	2
025	2	48	4	3	3	2	0	1	0	0	0	0	1	4	2	0	0	0	0	0	0	3	3	2
026	1	35	4	4	4	0	2	0	0	0	0	0	4	4	0	2	0	0	0	0	0	0	3	1
028	2	52	1	0	4	2	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	3	3	3
029	1	40	5	2	2	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	3	4	4
031	1	41	5	4	4	0	0	0	0	0	0	3	0	4	0	0	0	0	0	0	0	3	2	1
032	1	48	4	4	4	2	0	0	0	0	0	3	3	4	1	0	0	0	0	0	0	3	4	4
033	2	49	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
034	2	52	1	4	4	3	0	2	0	0	0	0	1	4	1	0	0	0	0	0	0	3	4	4
036	1	47	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3
037	2	50	3	3	3	0	1	1	0	0	0	0	1	3	0	0	3	0	0	0	0	4	4	4
038	1	47	5	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	4	4
040	2	52	1	4	3	2	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	1	1	2
042	1	51	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1
043	2	47	5	4	3	2	0	4	0	0	0	0	3	4	2	0	2	0	0	0	0	1	2	0
044	2	50	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	2	2
046	1	52	1	4	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	3	2	0
049	2	48	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2
052	2	53	1	1	0	0	4	4	0	0	0	4	0	0	0	3	3	0	0	0	0	1	2	0
053	1	48	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
054	2	49	4	4	4	2	0	0	0	0	0	0	1	4	1	0	0	0	0	0	0	3	4	4
055	2	53	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4
056	2	51	1	0	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	3	0
057	2	49	4	3	4	2	0	1	0	0	0	0	0	3	2	0	0	0	0	0	0	0	2	1

059	1	43	5	4	3	1	0	0	0	0	0	0	0	4	4	1	0	0	0	0	0	0	0	3	1	2
060	2	52	1	2	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	4	1
061	2	52	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1
062	1	49	4	2	4	3	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	3	3	3
064	1	48	4	2	4	1	1	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3	4	2
066	1	37	5	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3	4	3
068	2	48	5	4	4	3	3	1	0	0	0	0	0	3	3	3	4	0	0	0	0	0	0	3	4	4
069	2	49	4	2	4	3	3	0	0	0	0	0	0	0	3	3	1	0	0	0	0	0	0	2	2	0
070	1	47	5	0	4	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	3	2
071	1	48	4	4	4	4	3	3	4	2	1	1	1	0	4	3	0	3	2	0	0	0	0	3	4	3
073	1	52	1	3	4	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	3	2
075	1	45	4	1	4	2	0	1	0	0	0	0	0	0	4	3	0	0	0	0	0	0	0	2	2	2
076	2	52	1	4	3	2	0	2	0	0	0	0	0	2	3	1	0	1	0	0	0	0	0	3	3	3
078	2	48	5	4	4	3	0	2	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	3	2	1
081	2	52	1	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	3	3
084	2	49	3	4	4	0	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	0	4	4	4
085	1	49	4	4	4	1	0	3	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3	4	4
087	1	48	3	4	4	4	4	4	2	2	0	3	3	3	3	3	3	1	1	0	2	2	3	4	4	
088	1	00	5	2	4	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	2	4	1
089	2	52	1	1	2	3	0	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3	2	3
090	2	49	4	0	4	3	1	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	3	2	3
091	2	51	2	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2
092	2	47	5	1	3	1	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	3	3
093	1	46	4	4	4	3	0	1	0	0	0	0	0	4	4	3	0	0	0	0	0	0	0	3	4	4
095	2	48	5	2	4	3	2	4	0	0	0	0	0	0	3	1	0	1	0	0	0	0	0	3	2	2
096	2	48	5	0	4	2	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	3	4	4
097	1	49	4	3	4	3	3	3	0	0	0	0	0	3	4	2	0	1	0	0	0	0	0	2	2	0
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105	1	46	5	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
106	2	49	4	4	3	0	0	1	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	3	3	2
107	1	48	4	4	4	4	1	3	1	1	0	0	0	4	4	3	0	2	0	0	0	0	0	3	0	2
108	2	49	4	4	4	4	0	3	2	0	0	0	0	2	3	3	0	1	2	0	0	0	0	3	3	2
109	2	46	5	0	1	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	3	3	3
110	1	52	1	4	4	4	0	0	1	0	0	0	0	0	4	2	0	0	0	0	0	0	0	2	3	1
111	2	48	5	0	4	4	0	1	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	3	2	1
113	2	47	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
115	1	45	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1
116	1	52	1	0	3	3	0	2	3	3	0	0	0	0	1	1	0	1	2	2	0	0	0	1	2	0
117	2	49	4	4	4	4	2	3	2	1	0	0	0	4	4	3	0	3	3	0	0	0	0	2	4	1
118	1	46	5	1	4	4	0	1	0	0	0	0	0	0	4	1	1	0	0	0	0	0	0	3	4	4
120	1	44	5	4	4	2	0	0	0	0	0	0	0	2	4	3	0	0	0	0	0	0	0	3	3	4
124	1	46	5	1	4	1	0	3	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	3	2	2
126	1	08	1	4	4	4	2	3	2	0	0	0	0	2	3	2	0	0	1	0	0	0	0	3	4	3
128	1	49	4	2	4	3	1	1	1	0	0	0	0	0	3	1	0	0	0	0	0	0	0	2	2	2
129	2	48	4	4	4	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	2	2	3

130	2	52	1	3	3	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	3	1
131	1	46	3	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	3	1
133	2	48	5	4	4	4	2	3	2	1	0	1	3	4	3	0	0	0	0	0	0	3	3	2
134	1	52	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1
135	2	46	3	4	4	1	3	2	0	0	0	0	3	3	1	3	4	0	0	0	0	1	2	1
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139	2	44	1	4	2	0	1	4	0	0	0	0	0	2	0	2	2	0	0	0	0	2	3	1
141	2	49	4	2	3	4	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	3	4	4
142	2	49	4	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	2
143	1	49	4	4	4	4	2	4	3	0	0	1	3	4	3	1	3	3	0	0	0	3	0	1
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145	1	51	3	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	3	4
146	2	50	3	4	4	4	4	0	2	2	0	2	1	3	3	1	0	1	1	0	0	2	2	1
147	1	52	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1
148	1	51	3	4	4	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	3	3	1
149	1	48	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	3	3
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151	2	48	5	4	3	0	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	3	4	4
152	1	50	3	3	4	2	1	1	0	0	0	0	3	4	1	2	1	0	0	0	0	3	4	3
153	2	52	1	1	3	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	4	3
154	1	43	5	4	4	1	0	1	0	0	0	0	4	4	0	0	0	0	0	0	0	1	3	1
155	2	48	5	0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	4	3
157	2	50	4	0	1	3	3	3	1	1	0	3	0	0	1	0	1	0	0	0	1	2	3	0
160	1	49	5	0	3	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	3	3
161	1	46	3	4	4	3	0	3	0	0	0	0	2	3	1	3	0	0	0	0	0	3	3	1
164	2	49	4	4	3	3	1	2	0	0	0	0	4	2	3	0	0	0	0	0	0	0	2	1
166	1	35	5	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3	4	4
168	1	49	4	1	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	4	4
169	2	39	5	4	4	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	1	3	3
170	2	52	1	0	3	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	3	1
171	1	49	4	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	4	4
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176	2	49	4	1	3	2	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	2	4	1
177	1	36	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3
178	2	44	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1
180	2	51	1	1	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	3	3	4
181	2	50	3	4	4	4	1	3	0	0	0	0	1	4	3	1	3	0	0	0	0	1	3	3
186	1	49	4	3	3	2	0	0	0	0	0	0	3	3	2	0	0	0	0	0	0	3	4	1
183	2	48	5	1	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
184	2	50	3	0	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	3	3
185	1	41	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
186	1	38	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0
187	1	49	4	0	4	3	0	2	0	0	0	0	0	3	1	0	2	0	0	0	0	2	2	1
189	2	52	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4
192	2	59	4	4	3	1	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	2	2	1

193	2	52	1	0	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	2	1		
195	1	52	1	2	4	2	0	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	2	3	1
196	1	14	4	4	4	3	4	4	0	0	0	2	4	4	2	1	2	0	0	4	0	2	2	2	2
198	2	48	4	1	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	3	3	3
200	1	48	4	3	4	4	2	4	4	0	0	0	4	4	3	1	3	2	0	0	0	3	3	4	4
201	1	50	3	0	3	0	2	2	0	0	0	0	0	0	3	0	0	0	0	0	0	3	3	3	3
205	2	51	2	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	3	2	2
206	2	49	4	4	4	3	2	0	0	0	0	0	0	3	3	3	3	0	0	0	0	2	3	3	3
210	2	27	5	4	4	4	3	3	2	0	0	1	2	3	3	2	2	2	0	0	2	3	2	1	1
214	2	49	4	0	3	0	0	0	0	0	0	4	0	3	0	0	0	0	0	0	4	3	4	4	4
216	2	49	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	1	1	
217	2	47	5	0	4	2	2	0	0	0	0	0	0	3	1	0	0	0	0	0	3	4	3	3	
254	1	44	5	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	4	4	4	
132	2	52	1	0	3	4	1	1	0	0	0	0	0	1	2	2	2	0	0	0	2	3	2	2	

APPENDIX G**CONTROL GROUP****RAW DATA**

[illegible]