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ARKANSAS ACADEMY OF SCIENCE

Fortieth Annual Meeting
Ouachita Baptist College
Arkadelphia, Arkansas
April 20-21, 1956

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SOVIET ATTITUDE TOWARD PACIFIC SETTLEMENT OF DISPUTES

Richard F. Staar
Harding College

Ever since the October Revolution and the successful overthrow of the Kerensky government in Russia, the Communists in that country have characterized themselves as "champions of international peace." In support of this contention they have called upon the world to view the array of peace notes, appeals and declarations, records of conferences on inter-war problems and disarmament, treaties and pacts of neutrality and non-aggression which the Soviet government has either supported or entered into over the years. The purpose of this paper is to review the record of Soviet diplomacy, in order to throw some light on the USSR'S attitude toward the international settlement of disputes.

The Soviet Union has repeatedly stated and shown in practice a preference for bilateral talks as a means of settling disputes. This has been exemplified in many conciliation treaties. During the years that the USSR was weak and afraid of being crushed, it sought security through negotiation (1920-21), international conferences (1922-25), political agreements (1925-31), connection with the Frenoh alliance system (1932), the League of Nations (1934-39), and Hitler (1939-41).

On the other hand, there are only a few examples of acceptance by the Russians of mediation offers from other countries. The Allied Powers invited the Bolsheviks to Prinkipo in January, 1919, for a conference that would conclude the civil war then raging in Russia. The Soviets immediately accepted by radiogram. (8:294) This meeting failed to bring about peace.

A second attempt was made in March, 1919, when William Bullitt unofficially represented the United States on a trip to Moscow for the purpose of determining the possibility of acceptable terms to both the Soviets and their enemies. The former signed a draft treaty, thus showing their willingness to conclude peace with the anti-Bolshevik

forces. (8 : 294) The agreement never went into effect.

A third example under this same category was the Soviet acceptance of a 1926 French offer to mediate a dispute with Switzerland. The trouble arose from the assassination of a Bolshevik diplomat. The Russians agreed to remove their boycott of Switzerland, providing that the latter met certain conditions.

The USSR has not accepted any other offers of mediation.

Another method of settling international disputes involves commissions of inquiry. A definite procedure for this was established at the Hague Conferences of 1899 and 1907. The soviets have never resorted to such fact-finding commissions. The reason for this negative attitude was explained by Maxim Litvinov in a 1922 speech to a conference at the Hague.

> Commander Hilton Young has asked whether it is impossible to find an impartial judge in the whole world. It must be established first that there exist not one but two worlds: The Soviet and the non-Soviet. . . . . One party (to a dispute) will propose a Communist judge, like the chairman of the Third International; the other party perhaps the head of the League of Nations . . . Maybe only an angel could solve the Russian problem. . . . (4:43)

Even USSR satellites have been candid in their criticism regarding international commissions of inquiry.[1] Neither the Soviet Union nor its Balkan satellites (Yugoslavia, Albania, Bulgaria) permitted United Nations commissions to enter territories under their control during the civil war in Greece. A similar refusal met the later attempt by U.N. representatives when they attempted to perform their legal duties in North Korea to bring about free elections.

The Russians prefer diplomatic action or even commissions of conciliation to the quasi-judicial process of arbitration. They welcome arbitration only for commercial disputes on questions involving the conflict of laws, i.e., private international law. (1:111)

Again the reason for this attitude has been made quite clear by Soviet writers:

> The necessary minimum and basic premise for any arbitration is a community of mind on legal principles. Insofar as such a community is lacking, any attempt to secure an impartial authority for two parts of humanity that speak such different languages is *a priori* hopeless. (4:47)

In other words, there are no impartial states when a question involves differing economic systems according to the Communists. The ides of compulsory arbitration by third parties, therefore, has always been opposed by the USSR. The following exceptions only tend to substantiate this rule.

In a treaty signed by the Soviets with the proletarian government of Finland on 1 March 1918, compulsory arbitration was among the provisions. Both parties to the agreement were, however, workers' states. Also, the arbitrator was to be selected from the proletarian party of Sweden.

In December 1922, the Russians accepted the principle of international arbitration for political disputes with non-Socialist states, under the condition that a simultaneous agreement for disarmament be signed. (3:121) It was probably known to the USSR in advance, however, that the capitalist states would not accept the latter stipulation.

Most of the treaties of conciliation, signed by the USSR between the two World Wars, contain provisions for mixed commissions. All Russian treaties of this type are restricted by the provision that if agreement is not reached through conciliation, then no further obligation rests on the parties. The conciliation commissions have equal representation from both sides and are without a neutral chairman.

Soviet conventions for conciliation procedure usually contain a provision for submitting all disputes -- regardless of nature -- between the two parties, which cannot be settled through regular diplomatic channels within a reasonable length of time. Some of these treaties contain explicit reservations. One is found in the convention with Poland, which precludes the applicability of con-

ciliation to disputes concerning territorial questions.

Some Soviet treaties provide that precedence be given to special procedures established by previous agreements binding upon the parties. If such special procedures are provided for in these other agreements, the disputes falling under their provisions are not approached in accordance with the convention for conciliation procedure, but, instead, are handled in conformity with the provisions of the special agreement.[2/]

Many of the treaties signed by the USSR provided for the appointment of different commissioners for each session of the commission, despite the fact that the commissions established by these treaties meet periodically. They are, in a sense, more permanent than the so-called "permanent" commissions constituted by other treaties, which seldom if ever convene.

Each of the countries appoints two persons from among its own nationals. The sessions are presided over by one of the nationals of the party in whose territory the commission is sitting. Meetings are held alternately in the capitals of the two states. A session usually lasts fourteen or fifteen days and is held toward the middle of each year.

Under the system of annual sessions, no applications are necessary, except when one of the countries demands an extraordinary session. In that case, the party requesting the meeting must inform the other party of the "urgent circumstances" occasioning the request. With regard to ordinary meetings, each state shall "communicate to the other, through the diplomatic channel, the list of questions which it is desired should be dealt with at the session" (identical in all treaties).

Often experts appointed by the parties are allowed to sit with the commission as advisors. The conciliation commission usually decides the procedure of its meetings. Any person is heard, whose evidence is deemed to be useful. The countries are obligated to furnish the commission with all data and assistance found to be necessary.

All members must be present for the proceedings. Most treaties require a unanimous decision. The commission submits a joint report on all disputes referred to it as well as a consolidated settle-

ment proposal on the basis of interpretations that must be sound at law. (9:14) It usually recommends that its proposals be accepted by the two parties through diplomatic channels. The High Contracting Parties are bound to inform each other within ninety days as to whether they accept the proposals.

There have been some examples of mixed commissions established for a specific purpose. One was set up to map the Soviet-Afghanistan boundary by a convention between the two states. (13:4) The Commission had three persons from each side and was empowered to decide the ownership of islands. Its report was subject to approval by the two High Contracting Parties. A similar mixed border commission was provided for the following year in an agreement between the Soviet Union and Finland. (14)

Somewhat different from the preceding discussion is the matter of commercial arbitration, which arises from disputes between non-Communist individuals or corporations on the one hand and Soviet state trading corporations on the other. As such, it concerns only one state directly -- the USSR.

The Foreign Trade Arbitration Commission in the All-Union Chamber of Commerce was established in Moscow by a decree of 17 June 1932. (2:10) Soviet agencies transacting business in the United States, for example, always include a clause in their contracts with American corporations which provides that arbitration will take place only before this Soviet Commission in Moscow. All decisions are final and binding.

A post-war trade agreement with Poland contains a similar provision. Article XI of this agreement, which was signed on 2 February 1946, by the Minister of Navigation and Foreign Trade of Poland and the Foreign Trade Board of the Soviet Military Administration in Germany reads as follows:

> All disputes arising out of the present contract or in connection with it shall be subjected to the pronouncements of an arbitration commission attached to the All-Soviet Chamber of Commerce in Moscow whose decision is final and obligatory for both parties.(6)

SOVIET ATTITUDE TOWARD PACIFIC SETTLEMENT

The most famous case of commercial arbitration was perhaps that between the Lena Goldfields Company, Ltd. and the USSR. The type of arbitration agreed upon here was different from the foregoing illustrations. The Soviets bound themselves in a contract to have a three-man arbitral commission, consisting of a national from each side and a neutral umpire.3/ The USSR eventually withdrew its Commissioner, Dr. Chlenov, and never paid the 13,000,000 pounds Sterling which was later adjudicated as damages.

It would seem that experiences of this type have proven to the Russians that they cannot rely on any third party to see matters from their point of view. Therefore, the Communists now keep to their own Foreign Trade Arbitration Commission, where they are certain that the verdict will always be made in accordance with their wishes.

FOOTNOTES

1/ "You observe that nowadays Commissions are perfected instruments for painting given situations in the colors desired by their masters. Our (United Nations) Commissions reflect the majority that has been formed here. They do the work which the masters of that majority give them to do, and I think that this provides a further extension of the parallel between Greece and Korea. The Commission which you dispatch will have a majority that will be a reflection of the majority in the Assembly." Speech by Bebler (Yugoslavia) in "Consideration of Dispatch of a Commission to Korea by the General Assembly." (11:111)

2/ "The procedure laid down in the Polish-Soviet Agreement of August 3, 1925, for settlement of frontier disputes shall remain in force. Should they not have been settled amicably by means laid down in the above-mentioned agreement, /i. e. through direct bilateral negotiations/ either Contracting Party may refer them to the Conciliation Commission provided for in the present article." USSR-Poland, 23 November, 1932. (5)

3/ The three men were Sir Leslie Scott, Dr. S. B. Chlenov, and umpire Professor Otto Stutzer.(7)

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ROUSSEAU AND MONARCHY

Gordon H. McNeill
University of Arkansas

Weird and wonderful things are said about the political ideas of Jean-Jacques Rousseau, in textbooks, in lectures, and in student examination books. The present paper is an attempt to dispel at least some of the confusion -- without adding to it -- by considering Rousseau's thinking on the particular and important subject of monarchy, as expressed in first his personal attitudes, second his political theory, and third his practical advice on the subject. Only after all three of these approaches have been considered should one attempt to answer the question: What was Rousseau's attitude toward monarchy?

We begin with Rousseau's personal attitudes, for he was a man of strong opinions and feelings. Some of them he shared with his contemporaries, the philosophes of the Enlightenment. Enlightened thinkers and writers in mid-eighteenth century France did not condemn monarchy per se. The tendency instead was to follow the English political theorist Locke in rejecting irresponsible and tyrannical absolute monarchy, while accepting quite readily enlightened, non-tyrannical monarchy, even if it was absolute. Enlightened despotism might be a welcome shortcut to the political promised land. A Frederick the Great or a Catherine the Great might be persuaded to institute by a stroke of the pen the most far reaching reforms. But the writers of the Enlightenment still voiced a cautious preference, for example in the Encyclopédie, for limited monarchy, English style, with definite restrictions on the arbitrary power of king.(1)

Rousseau had no enthusiasm for enlightened despotism or for limited monarchy. But he was nevertheless torn by conflicting feelings. His society was one in which men of letters relied on the patronage of the high born -- recall the story of Samuel Johnson -- so it is not unusual that he had high praise for enlightened rulers, and some not so enlightened, in his early writings.(2) Nor is it surprising that he accepted a pension from George

III.(3) It is more surprising to Americans certainly that in his last years a picture of the decidedly undemocratic and illiberal monarch graced the wall of Rousseau's Paris apartment.(4) He might also have been the beneficiary of another pension from the thoroughly unenlightened Louis XV, as a reward for a very successful light opera he wrote, if he had not declined to appear at court. He recalled in his Confessions years later his pleasure in witnessing the enthusiastic reception of his work by the court, but he had a basic contempt for court society, for the courtier type, for royal favorites.(5)

Rousseau's enthusiasm was reserved for a simpler and, he always insisted, a more wholesome society. Rome and the other sturdy republics of ancient times he constantly praised in his writings. While the Corsicans struggled to win their independence, he undertook the project of writing a constitution for them which would provide that island with a republican and democratic form of government; and he was confident that these simple peasants had a wonderful political future ahead of them a s long as they remained unspoiled.(6) Rousseau himself was a Genevan, and he was full of admiration and affection for this non-monarchical Swiss republic. He praised his native city extravagantly in the dedication of his second Discours, and in his mature years he proudly signed his works as "Citizen of Geneva," until he had been condemned by his government.

Such were Rousseau's personal attitudes and feelings. They reflect a man of high principle. But he was not only a man with opinions and personal predilections; he was also a theorist, and it was as a theorist that he parted company publicly from the rest of the philosophes most completely. In the eyes of posterity he has been exclusively a theorist, and a dogmatic, rigid one. This stereotype is one for which he must share responsibility, for he often wrote in uncompromising and unrealistic terms. "I am seeking Right and reason, I am not arguing about facts," he wrote in the original draft of the Contrat social.(7) Yet we should note at the outset that he was admittedly not a revolutionary. He had no confidence that a society which had declined from an earlier and better stage could

be much improved, and he shrank from the idea of revolution.(8), p. 34. Considering the fact that the attack of eighteenth century liberalism was directed against absolute monarchy, it is surprising that Rousseau had really so little to say on the subject. Whether or not he would have spoken and written more freely and extensively under a less repressive government is not easily answered. One can assume that he would have done so, but it is an open question how much more he might have said. Yet he did write enough, primarily in his Contrat social, to enable us to summarize his theory concerning monarchy.

For Rousseau, a fundamental right, justified by reason, was sovereignty not of the monarch but of the people, which for him was a sovereignty which could not be alienated or transferred, not even by a Lockeian social compact. Any exercise of the legislative or lawmaking function by any other than the sovereign people is illegitimate, he insisted. (9), pp. 250, 296.

Having determined that the legislative power belonged to the sovereign people, Rousseau next turned to the quite different executive power, the "government," as that term is used in parliamentary states today. As to whether or not the executive head of the government should be a monarch, rather than a group of men (aristocracy — he never uses the term oligarchy), or the people (democracy), depended upon circumstances. Following Montesquieu, for whom he had high praise, Rousseau rejected the possibility of theoretically determining what was the best form of government, and believed that factors of size, climate, and level of advancement should determine whether the best form for a particular state was monarchy, aristocracy, or democracy. The last named, democracy, is obviously suitable only for very small political units such as a New England town. (He would have called our state or national government elective aristocracy.) Monarchy is appropriate for large and underdeveloped states, and provides a maximum of vigor and concentration of power.(9) pp. 279-82, 289, 293.

All of this is in accordance with the thinking of Montesquieu. But Rousseau went on to argue that the social contract is not between the people and their king, as Locke had said, but is an agreement

between and among the people themselves, by which they have established an organized political society. Thus if there is a monarch, he is not the sovereign, he has no power to make laws, and he is not a party to the contract. Instead he is merely an appointee, without tenure, without a contract, and subject to dismissal, even if the monarchy is hereditary.(9), pp. 304-6. Rousseau further insisted that there were inevitable tendencies for a king either to be or to become narrow and malicious, to want to keep his people backward, for his appointees to be inferior men, and for the hereditary principle to bring to the throne infants and imbeciles.(9), pp. 284-7. He insisted that there was an inherent and inevitable tendency for the government, no matter its form, to encroach on the sovereign people.(9), pp. 294-5. In the case of monarchy, he bluntly asserted that if one accepts Aristotle's distinction between a tyrant and a king -- that only a king governs in the interests of his subjects -- that there has never existed a king in the true sense of the word since the beginning of the world.(9), p. 296.

With such an assertion there is no need to read between the lines. Here we have the revolutionary implications of Rousseau, the hardy author of the Contrat social, the uncompromising political theorist. But note that, as he said in his own defense later, he never held any particular government up to contempt,(10) and he wrote other political studies which present us with a more cautious, a more conservative, a decidedly anti-revolutionary Rousseau. He was quite aware of the difference between theory and practice, and he knew there was a time to "set aside the facts," as he proposed at the beginning of his second Discours,(2), p. 23 and also a time to be completely practical in the actual world of uncompromising facts. In the Emile he has the pupil refer to the Rousseauan political theory as quite artificial, and the tutor replies that one must begin by establishing first principles and then study things as they are.(11)

An occasion for studying things as they were, and our best example of point three (Rousseau's practical advice on the subject of monarchy) came when he was asked by a Polish patriot, Count Wielhorski, to recommend changes in the constitution

of Poland. That country faced imminent dissolution and partition by greedy neighbors, as eventually took place, and Wielhorski hoped by reforms to forestall such a disaster. Rousseau made a thorough study of the problems involved, and drafted a series of recommendations in his not very well known but significant Considérations sur le gouvernement de Pologne.

The theme of this work of practical advice is caution. The proposals made for Poland call only for incidental changes in the government. Nowhere is there the radical theme of rebuilding the Polish state completely. He refers occasionally to the basic principles of the Contrat social, on which his proposals are based, but there appears none of the dogmatic harshness of the Contrat social. Poland was a monarchy and Rousseau proposed that it remain such. A large state could not manage, he wrote, without a king serving for life. (12), p. 372. But he was insistent that Poland keep its elective monarchy, and make it truly elective. The point is significant. Eighteenth century Poland has been criticized ever since for the weakness of having an elected king. Rousseau, however, saw this as a source of strength in checking what he saw in monarchy as the "habitual tendency in the direction of despotism."(12), p. 360. He pessimistically assumed that each king would take steps in the direction of arbitrary power. But a particular king's death and the election of his successor would undo what had been done during his reign, so that no permanent progress toward despotism developed. Hereditary monarchy would operate otherwise, and was therefore incompatible with liberty, Rousseau insisted.(12), p. 374. So he recommended that the son of a king be forever forbidden to rule.(12), p. 375. He further suggested that the king be chosen from among those who have risen to the highest rank in the government, three names to be drawn at random from the group and the diet then electing one of the three immediately, before there was any opportunity for bribery or corruption.(12), pp. 408-10.

In order to further guarantee that the liberties of the Poles would not be usurped by the monarch, Rousseau made specific suggestions for limiting the king's power, such as restricting his power of ap-

pointment and setting fixed meeting times for the legislative authority so it need not wait for the royal call.(12), pp. 372-3, 376-6. The inevitable misfortune that a king is an enemy of liberty could be considerably lessened, he announced, if the changes he suggested were made.(12), p. 372.

This then was Rousseau's practical approach to monarchy. We could use more information than we have, and we should like to have his testimony on the subject taken under some sort of retroactive historical immunity law so that we could be sure he was speaking freely and frankly. If his Considérations sur le gouvernement de Pologne is of value, how much more revealing would be a frank and outspoken Considérations sur le gouvernement de France.

Rousseau has been charged with inconsistency in his discussions of government. What are the facts? It is the writer's opinion that there is no more inconsistency than one might expect under the circumstances between and among personal attitudes and feelings, theories, and practical advice. Let the completely consistent political theorist cast the first stone. Rousseau had no love for monarchy; he saved his affection for simple republics. But he could adjust to monarchy when it was necessary. When he wrote on the level of theory, he accepted monarchy for certain kinds of states, providing the sovereign lawmaking power remained in the hands of the people; but he insisted that there was a natural tendency for even the best monarchy to degenerate. Here we are close to the heart of Rousseau's thought. Society, he always maintained, has -- in spite of superficial advances in the arts and technology -- declined from its natural simplicity. Eighteenth century monarchy, he would have said, is a good illustration of what is wrong with a supposedly advanced society. He always insisted, however, that one cannot reverse the trend; one cannot return to an earlier simplicity and perfection.(8), p. 33. Thus, when he was called upon to suggest reforms in the Polish government, he rejected any idea of fundamental change. It is this writer's conclusion that such might have been his recommendation for France if he had lived until the Revolution, and credence is thus given to those anti-revolutionaries in 1789 who argued that if Rousseau

were still alive he would have opposed the Revolution.(13) One can guess, on the basis of his Polish recommendations, that he would have had no enthusiasm for the fundamental changes of the Revolution. But at the same time he probably would have been very much interested in the many incidental reforms proposed. He would have been repelled by the violence, but at the same time his highly emotional and idealistic approach to life might have made him a ready or at least reluctant convert to the optimistic and emotional fervor of the first years of the revolution.

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ASSAULT BY TEST AND BATTERY

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Psychologists have away of acting amazingly like people. They can, and do, acquire stereotyped behavior of thought and speech. They can develop habits that are appropriate in one setting, then carry these habits over into changed situations where they are no longer appropriate. And they can use self-defeating techniques without awareness of what they are doing. Just like people.

A case in point is the occurrence of the word "testing" and the phrase "test battery" in psychological language and literature. "Testing" and "test battery" have become stereotyped forms of expression which are over-worked and loosely used. They became a part of working psychology at a time when successful aggression was the nation's goal, but have been carried over into what is now a period of relative peace. And they remain in popular usage even though they often serve to impair the psychologist-client relationship in the diagnostic examination.

Clinical psychology as we know it now appears to have been largely an outgrowth of World War II (3, 5, 10). For example, in 1939, just before the war, Louttit was drawn to conclude that "American psychology, generally speaking, has not been greatly interested in practical problems of human behavior" (3:361). Our involvement in World War II rapidly changed that state of psychological aloofness from life. Psychology mobilized its resources and applied them in the nation's fight for survival.

It was in this period in the development of clinical psychology that "mental testing" gave way to "personality evaluation" so far as the clinician was concerned. He became increasingly aware that "mental testing," with its restricted emphasis on the functions of the intellect, left much of personality and human behavior unexplored and unassessed. He sought ways and means to fill out the personality picture and in doing so came to recognize more clearly than ever before the importance

of motivation, both conscious and unconscious. And as his professional sophistication increased he began also to appreciate the influence of motivation in the inter-personal relationship of the diagnostic examination. Let us return to this point later.

We begin to see how easy it was, with their background in the "mental testing" movement, for clinical psychologists to retain "tests" and "testing" in their working vocabularies. And to the extent that tests, that is to say, standardized measures, are applied in the diagnostic study there is, of course, justification for such language. But does the qualified clinician restrict himself to standardized measures of known reliability and validity? Are the Rorschach and TAT "tests" in the strict sense of the word? They are not.

The word "battery" in connection with tests seems to have arisen in the same context. It is not hard to understand the special appeal of "battery" in the psychological climate of a nation geared to the conduct of total warfare. It was entirely consistent with the spirit of the day, which encouraged open aggression and welcomed successful hostility. For the nation's safety the enemy had to be attacked and vanquished. This was natural. But was it ever intended that our concept of the enemy, the object of attack, should include persons referred for psychological examination? Probably not. Yet this, in a sense, is what happened. Where psychological assessment was required, people were "tested" and subjected to "test batteries" as never before. Psychologists were intent on winning their immediate objectives over all opposition, and it seems not to have occurred to most of them to question the effect such language, and the attitudes reflected by such language, might have on their clients or patients.

"Tests," "testing," and "test battery," having made their appearance during World War II, still continue to appear in psychological publications and remain popular in the working vocabulary of many practicing psychologists (1, 6, 7, 8, 9, 10).

Let us return now to the matter of motivation and consider its influence in the diagnostic examination. It may be said that the clinician attempts to do three things when he sees a client or patient who has been referred for diagnostic study. One,

he attempts to assess intellectual functions, that is to say, the patient's intelligence, his ability to learn, his various capacities, and so on. Two, he attempts to evaluate the nonintellective factors. That is to say, the feelings, attitudes, etc. Three, he tries to integrate these in such a way as to obtain a comprehensive, meaningful picture of the patient's personality and behavior, as it is now and also as it might be under certain known conditions. The success of the clinical psychologist in achieving these aims, and therefore the success of the diagnostic interview in terms of the accuracy and consequently the usefulness of the findings, depends on several factors of which the patient's motivation is only one, but it is an important one.

Most clinical psychologists fully recognize the importance of motivation. Hence they devote time and attention in a deliberate effort to establish an effective relationship with the patient at the time of initial contact with him. Essentially this means putting the patient at ease, allaying his fears, reducing his anxiety. For unless a patient can be brought to the point of active and willing, even enthusiastic, participation the usefulness of the interview is apt to be limited indeed. It is common practice for the psychologist to spend the first few minutes of a diagnostic study in a conscious effort to engage the person's interest and to encourage in him the attitude of wanting to do the best he can. The fruitfulness of the entire diagnostic period is largely determined by what happens during these first few minutes of the examination.

The dynamics of the inter-personal relations during the first few minutes and, indeed, of the entire period of the examination has been discussed by several authors (1, 2, 4, 8, 9). But none of these seem to recognize that the dynamics of the inter-personal relationship in the examining situation are also greatly influenced by factors operating before the patient arrives. The manner of referral, the preparation of the patient for what is to come, cogent and pertinent though it is, has been almost entirely neglected in their writings.

Let us acknowledge that what transpires before the patient reaches the psychologist has something

to do with what happens after he gets there, and that the manner of referral therefore is not to be overlooked. By manner of referral is meant both the attitude and the language used by the persons involved in making the appointment. The language of the referral and the feelings and attitudes which language conveys can facilitate or impede the psychodiagnostic process, depending on how it affects the patient.

The physician who refers a patient for psychological "tests" or "testing" may do so because it provides him with a certain sense of security. He is, after all, accustomed to ordering laboratory tests when indicated and has come to rely on these tests to yield definitive results. To this kind of physician in search of technical assistance tests are tests -- and it is apt to make little difference whether they are physiological or psychological.

There was a time roughly prior to World War II when diagnosis did depend almost exclusively on the use of intelligence tests, and these were commonly expected to reveal a great deal more about the individual personality than they were originally designed to do. But our knowledge and understanding has advanced and diagnostic practice has altered accordingly. In the present-day approach where the importance of nonintellective factors such as feelings and attitudes are more fully recognized, the clinician uses not only intelligence tests but other instruments as well. These other instruments are known collectively as the projective techniques and are utilized as extensively as intelligence tests proper. So it is not only inaccurate to suggest to a patient that he is being sent "to take some tests" or even "a battery of tests"; it is also actually misleading.

Psychologists are themselves partly to blame for the continued use of these terms. You will probably have noticed that the word "test" appears in the names of certain projective devices, the Thematic Apperception Test for example. "Rorschach testing" is a commonplace in professional writing. This is quite loose usage. Yet if psychologists adopt these verbalisms, is it at all surprising that others take the cue and use them also?

Another and more powerful objection to such ter-

minology is that it tends to establish a negative attitude in advance. This may be attributed to the connotation which each word bears. For example, to be "tested" conveys the notion that in some way the person is to be taxed, or exhausted, or strained to the limit. And "test battery" even more carries the notion of threat for the patient, adult or child. Since all human beings seek to avoid threat either by fight or by flight, it is clear that neither of these reactions establish in the patient the proper frame of mind with which to approach the diagnostic examination.

It cannot be argued that in communicating with other professional people who make referrals to the psychologist we are compelled to employ such negatively colored speech, however much it may impair the psychologist-patient relationship, because there is lacking a more appropriate terminology. Referrals can be phrased so as to engender positive, or at least neutral, attitudes. More appropriate language is available and can be used in place of the other. For example, "test" can be replaced by any of the following: psychological examination, diagnostic interview, psychological assessment, evaluation, study, or work-up. Instead of "test battery" there is assessment seriesor even the longer psychodiagnostic series. These do not exhaust the possibilities by any means; they are offered only to show that it can be done.

The effort to watch our language should be repaid twofold: first, in the time saved in reaching a working relationship with our patients in individual psychological examinations, thus permitting the wider use of the clinical psychologist's services; and second, in the greater validity of the findings resulting from them.

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PRE-TEST AND POST-TEST ESTIMATES OF LEVEL OF PERFORMANCE ON AN ACHIEVEMENT TEST

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When students take a subject-matter test in a college course, an experimenter is provided with an excellent opportunity for studying level of aspiration and its derivatives. A number of experimenters have investigated goal-setting behavior and achievement judgment following the test in such a classroom laboratory. The usual procedure is to have the subjects (students) estimate their performance before beginning the test (level of aspiration) and again after completing the test (achievement judgment).

In the present study, the subjects were required to estimate the class average both before and after taking the test, in addition to estimating their own personal performance. Thus each subject's estimate of his own performance could be investigated in terms of the direction and magnitude of deviation from the average as estimated by him.

A number of problems were investigated in this study. This paper is concerned with two of these problems. They are:

1. The nature of the deviation score between estimates of class average and personal performance in the pre-test situation as compared to the post-test situation.

2. The correlation between pre-test estimates and post-test estimates for both the average score and personal score.

PROCEDURE

The subjects were 42 students, both male and female, in the experimenter's Psychology of Adolescence class. The data for nine other students had to be discarded for failure to follow instructions.

The test used was the second regular course examination during the semester. Before the tests

were passed out, the experimenter read the following instructions:

> "There are 70 questions on this test. The test is similar in nature to your previous test and should be approximately as difficult as your last test. Estimate what you think the class average will be on this test. Write this figure on the back of your test paper. Now estimate what you think your own grade on the test will be. Write this figure on the back of your test paper."

Following the test, these instructions were read:

> "Having taken the test, estimate once more what you think the class average will be and what you think your own grade will be. Write these figures on the back of your test paper."

RESULTS AND CONCLUSIONS

Problem 1. The means and standard deviations were determined for each of the four estimates, and their values are presented in the table below. The estimates are abbreviated a Xpre and Xpost for the personal estimates and Apre and Apost for the class average estimates.

SUMMARY DATA FOR PERFORMANCE ESTIMATES

	Apre	Xpre	Apost	Xpost
M.	51.74	54.24	51.71	53.14
S. D.	5.53	6.09	6.25	7.12

The difference between Xpre and Apre and the difference between Xpost and Apost were analyzed for significance by means of the *t* test (using the difference method since the scores are correlated). These differences are 2.50 and 1.43 and yield *t*'s of 2.50 (significant at the .05 level) and 1.06 (not significant at the .05 level), respectively. The formula for *t* is

$$t = \frac{M_1 - M_2}{\text{Standard error of the difference}}.$$

The hypothesis is suggested for further study that pre-test estimates of performance are more optimistic and more likely to exceed the reference point of average performance than are post-test estimates of performance.

Problem 2. The correlation coefficient between Apre and Apost was found to be .91. The correlation coefficient between Xpre and Xpost was found to be .76. Both coefficients are significant at the .01 level. The high relationship between the pre-test and post-test estimates suggests the hypothesis that a common expectancy set operates to influence all of the estimates and that this set is relatively unaffected by actual achievement on the test. Additional evidence for this hypothesis is found in the low correlation (.31) between Xpost and actual grade on the test.

ATTITUDE CHANGES TOWARD MENTAL HEALTH AS RELATED TO A COLLEGE COURSE IN ABNORMAL PSYCHOLOGY

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This paper is the result of a short and superficial excursion into the field of attitude measurement. Ever since the writer began teaching courses in abnormal psychology, he has been interested in the general effectiveness of such courses for the promotion of mental health. One important facet of this question is the role that abnormal psychology might play in correcting faulty attitudes toward mental illness. When Woodward(1) published a mental health questionnaire developed by the Roper Agency in their study on mental health attitudes in Louisville, the writer saw a convenient tool for exploring this phase of the problem. However, since there has been no published data on the discriminative velue of the Roper questionnaire on a college population, it seemed best to begin cautiously and refrain from any sort of an elaborate experimental design. Thus, the initial step was essentially a pilot study to investigate a potential lead and pave the way for a more rigorous analysis of the problem. The findings presented here, then, should be considered solely as suggestive and not definitive.

SUBJECTS

The subjects for this pilot study were 53 upper-division college students, both men and women, enrolled in a class of abnormal psychology at the University of Arkansas. This course, which had general psychology as its only prerequisite, was strictly service-oriented; that is, primarily designed for non-majors in psychology. The composition of the class was a fairly good cross-section of upper-classmen on the campus.

PROCEDURE

At the beginning of the course, the Roper ques-

tionnaire was presented to the subjects in a single group session. The entire questionnaire consisted of 9 questions and is reproduced in the appendix. At the end of the course, the questionnaire was presented again to the subjects in a single group session. Approximately 20 minutes was needed to fill out the questionnaire on each presentation.

RESULTS

A crude scoring scheme was devised for evaluating the questionnaires. The correct response to each question was worth four points; all other responses were scored 0. The correct or preferable response for each question was determined by unanimous agreement among three judges, selected from the staff of the Psychology Department at the University of Arkansas. In Question 9, since the subject was asked to make four choices, each correct choice was assigned a scoring value of 1.

Not all of the questions on the test were tabulated in the results. The judges felt that Question 1 was primarily an information question, which reflected more of the student's knowledge of the course than his attitudes. Questions 3, 7, and 8 were eliminated because of some disagreement among the judges in evaluating them. It became apparent that the same response to these items could very readily reflect wide diversity of attitudes - some positive in character and others negative. Hence, the questions that were ultimately used in the test were Questions 2, 4, 5, 6, and 9. The Correct responses for each of these questions were as follows:

Question 2 - Hospital
Question 4 - Choice "e"
Question 5 - Choice "e"
Question 6 - Choice "b"
Question 9 - Choices "b," "d," "f," "g," "i," "m."

The maximum total score was 20. This score would be interpreted to mean that the student's responses reflected the best possible attitude toward mental health. Table 1 presents each subject's scores on the questionnaire on both his initial performance and his retest performance.

A t-test was run between the means of the two performances and a t-value of 3.82 was obtained. This was significant at beyond the 1 per cent level of confidence. "t" was obtained by the formula

$$\frac{M_d}{\sqrt{\frac{EX^2_d}{N(N-1)}}}$$

("t" for correlated pairs of measures)

DISCUSSION

In addition to the evaluation of the group differences in performance, some analysis of individual scores was undertaken to provide a more complete picture. One such treatment involved dividing the scores on the group's first performance into two categories representing good and poor performance. With 16 total points as a cutting score, it was found that 16 of the 53 subjects scored 16 or higher and the remaining 37 scored less than 16 total points. The mean score of the poor group was 9.73 on the first performance; on the second performance, their mean score jumped to 14.14. This very dramatic shift was significant at well beyond the 1 per cent level of confidence.

An examination of individual records showed that 32 of the subjects in the poor group received higher scores on their second performance, three subjects retained their same score, and two subjects obtained lower scores.

The findings in this preliminary report were most encouraging in suggesting the part that a course in abnormal psychology might play in the modification of attitudes toward mental health. Many factors were not controlled, so the results cannot be unequivocally interpreted, but the original purpose was achieved in providing evidence for a promising lead to a more fruitful study.

TABLE I

PERFORMANCE SCORES OF SUBJECTS
ON MENTAL HEALTH QUESTIONNAIRE

Subjects	Test Scores		Subjects	Test Scores		Subjects	Test Scores	
	First	Second		First	Second		First	Second
1	10	10	19	14	19	37	11	12
2	11	11	20	5	11	38	16	19
3	15	15	21	12	20	39	20	20
4	8	16	22	11	12	40	20	18
5	14	15	23	10	15	41	20	16
6	4	19	24	11	14	42	20	16
7	10	16	25	7	14	43	20	16
8	12	16	26	15	19	44	16	16
9	14	20	27	6	9	45	18	18
10	14	18	28	3	7	46	16	16
11	11	14	29	7	14	47	16	20
12	8	12	30	13	20	48	16	19
13	6	10	31	10	15	49	16	20
14	5	19	32	11	14	50	16	12
15	14	19	33	7	10	51	19	16
16	14	20	34	8	14	52	18	15
17	7	12	35	7	3	53	18	10
18	5	10	36	10	9			
						Mean	12.17	14.91
						S. D.	.66	.54

APPENDIX

ROPER QUESTIONNAIRE ON MENTAL HEALTH

1. There are all sorts of opinions about mental illness and what causes it. Below are three such opinions. Indicate whether you think they are more true than false, or more false than true.

	True	False	Don't Know
(a) Most mental illness is inherited	____	____	____
(b) Most hospitals for the mentally ill treat their patients very badly	____	____	____
(c) There are not enough doctors and hospitals in Arkansas to give proper care and treatment to all people in Arkansas who are mentally ill today	____	____	____

2. Which do you think is the best thing to do with sex criminals, send them to a hospital or to a jail? Hospital ____ Jail ___ Other ___ Don't know ____.

3. Suppose that a member of your family became mentally ill. Do you think that you would tell **your** friends and acquaintances about it, just as if he had heart trouble or asthma, or would you try to keep it as quiet as possible? Tell it to friends ____ Keep quiet ____ Don't know ____.

4. Mrs. B. had always been a little suspicious and inclined to take the worst view of things, but she had led a fairly happy married life until she began to accuse her husband of not loving her any more. When she saw him speak politely to an attractive widow next door, Mrs. B. waited until he had left, got hold of his gun and then went over and threatened to kill the widow. Mrs. B.'s husband hadn't done any thing wrong and doesn't know what

to do about her. Here are some things various people have suggested might be done with Mrs. B. If only one thing on the list could be done, which one do you think it would be best to do? (Check one)

(a) Her minister or priest should be called in to talk with her ..... _____
(b) The husband should give her a good talking to and then wait to see if her jealousy won't blow over ..... _____
(c) The family doctor should be called to see if he can't give her something to calm her nerves ..... _____
(d) The husband should stay home with his wife to prove that he really loves her ..... _____
(e) She should be taken to a mental hospital where she can be treated and where she can't harm anyone ..... _____
(f) The police should be called immediately to lock up Mrs. B. until she calms down ..... _____
(g) I don't know what should be done .... _____

5. Mr. G. is a 52 year-old machinist who has always been a hard worker and who has worried a lot about making both ends meet for his large family. One day his job at the plant was given to someone else, and he was told by him employer that he was no longer needed. After this had happened he became very depressed, accused himself of being a complete failure, and worthless to his family. He refused to look for another job or take an interest in anything and finally tried to commit suicide. Here are some things that various people have suggested might be done about Mr. G. If only one thing on the list could be done, which do you think it would be best to do? (Check one)

(a) His family and friends should give him a good pep talk and urge him to look for another job ..... _____
(b) He should go to his family doctor to find out if there is a physical illness that is making him feel badly .. _____
(c) He should have a good long rest away from his family responsibilities and worries ..... _____

(d) He should be given plenty of time to recover from the shock of losing his job, and then he'll be all right again ..... _____
(e) He should be sent to a psychiatrist for consultation and treatment ..... _____
(f) He should be sent to a mental hospital or asylum until he is better .... _____
(g) I don't know what should be done .... _____

6. A fifteen-year-old boy who has been in trouble repeatedly for staying away from school and has recently stolen an automobile. Here are some things various people have suggested might be done about this boy. If only one thing on this list could be done, which one do you think it would be best to do? (Check one)

(a) See to it that he joins a boy's club and is encouraged in sports and other worthwhile activities ..... _____
(b) Have a psychiatrist find out why he behaves that way and then try to change his attitudes and behavior ... _____
(c) Put him on juvenile probation and have a probation officer check up on him frequently ..... _____
(d) Send him away to a reformatory ..... _____
(e) Have his father give him a good old-fashioned whipping ..... _____
(f) Punish his parents by sending them to jail if he does anything else that's bad ..... _____
(g) I don't know what should be done .... _____

7. "It's always worth while to get a psychiatrist's help when someone begins to act queerly or get strange ideas." On the whole, do you think that this statement is more true than false, or more false than true? (Check one)
True _____ False _____ Don't know _____.

8. If you said "false" or "don't know" to question 7, why do you feel that it's not always worth while to get a psychiatrist's help when someone begins to act queerly? _____

9. If a city or state government decided to spend a lot of money to help prevent mental illness, which four of the kinds of people on this list would you like to see on the committee that was to decide how to spend the money? (Check four)

(a) A priest, Minister, or rabbi ..... _____
(b) A psychiatrist ..... _____
(c) A mother ..... _____
(d) A mental hygienist ..... _____
(e) A school principal ..... _____
(f) A psychologist ..... _____
(g) A sociologist ..... _____
(h) A family doctor ..... _____
(i) A social worker ..... _____
(j) A juvenile court judge ..... _____
(k) A businessman ..... _____
(l) A banker ..... _____
(m) A psychoanalyst ..... _____
(n) I don't know ..... _____

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THE LONE STAR TICK, AMBLYOMMA AMERICANUM

A Contribution Toward a Monograph of the Ticks of Arkansas

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The lone star tick probably accounts for 95 per cent or more of the total tick population in Arkansas. No person, his pets, or domestic animals are immune from attack. It is not only a pest; it may also transmit tularemia and Rocky Mountain fever (Calhoun, 1955).

IDENTIFICATION

The lone star tick derives its name from the conspicuous white spot in the posterior angle of the scutum of the female. Often this spot has tinges of green or red. The male is characteristically marked by two horseshoe shaped areas at the posterior-lateral portion of the body. The whitish spots which form the horseshoe outline may also have tinges of green or red. Usually these markings on both sexes are very white and contrast sharply with the reddish or reddish-brown background of the body.

The palpi of all stages are long, the second segment being much longer than the other segments. This condition is typical of the genus Amblyomma. Since species other than the lone star are seldom taken in Arkansas, this character is of use in distinguishing the lone star nymphs and larvae from the immature stages of other ticks.

The synonomy of the species and the characters of all stages are given by Cooley and Kohls (1944).

GEOGRAPHICAL DISTRIBUTION

This tick is primarily southern in distribution. It is definitely the most important tick species in Arkansas and probably of the neighboring states of Texas, Oklahoma, Missouri, Tennessee, Mississippi, and Louisiana. According to Hooker, et. al. (1912) the type locality for the species

is Pennsylvania or New Jersey. One specimen is reported from Labrador and it has been collected in Guatemala, Guiana, Brazil, and Mexico (Cooley and Kohls, 1944).

In Arkansas it occurs wherever the habitat is suitable. According to Calhoun (1954) there are fewer ticks in eastern Arkansas.

HOSTS

The records of collections show that dogs, cattle, men, and horses are most frequent hosts and in that order of importance. Ground birds are hosts, particularly to the larval stage (Calhoun 1954). Young chickens have proven to be excellent hosts for feeding this stage when maintaining cultures. The cottontail rabbit is host to the immature stages but the writer has not found an adult from the examination of twenty rabbits. Cooley and Kohls (1944) report one male from a cottontail and one hundred adults from a "rabbit."

LIFE AND PERSONAL HISTORY IN ARKANSAS

The ticks pass through the winter as unfed nymphs or adults. Spring collections indicate a ratio of about two nymphs to each adult. They do not pass through the winter as larvae. The overwintered adults begin to attach to cattle in mid-December in northwestern Arkansas and the first females complete engorgement about mid-February. Attachment and engorging of adults continues until early July. The females complete engorgement and drop from the host to the ground where the eggs are deposited in large masses. Under summer conditions of temperature the preoviposition period is about a week and the oviposition period is eleven days. Hatching of the eggs requires 25 days.

The young larvae tend to be gregarious, often forming a tight mass of tiny ticks which pass through a pre-feeding period. Then the mass moves up on low growing grasses or shrubs where the mass hangs ever ready to drop onto a small animal that may pass by. Once on the animal they feed to repletion and drop off in an average of four days.

Molting to the nymphas stage requires twelve days. Since the engorged larvae, from which they

develop, may be scattered or dropped in a cluster, depending on the activity of the host, the nymphs tend to be less gregarious. However, 300-500 have been taken in a space of less than a square yard. This stage must also find a host; the host may be a rabbit, dog, or large animal. Cattle sometimes are infested with large numbers of these ticks. The nymph requires four days to complete feeding, then it drops to the ground.

Molting to the adult stage takes twenty-one days. The adults of a current season ordinarily do not feed, but pass through the winter. It is believed that cessation of feeding is a response to day-length (Lancaster 1955). Feeding of the adult the following spring may take as few as six days or as long as sixteen days. This apparently depends on how favorable the site of attachment is and on whether or not mating occurs. Once the female has become attached she does not move. After feeding a short while she is then ready to be fertilized. Once fertilization occurs the females complete feeding often within a few hours.

Larvae are most plentiful in August; nymphs in April, May, and August; and adults April through June. Larvae have been found from June 10 to October 30. None of the life history stages are readily found in northwestern Arkansas in November and early December.

HABITAT

It has been found (Lancaster 1955) that about 70 per cent of the ticks collected were taken from the brush. Only one to one and one-half per cent were found in open situations such as improved pastures. It is also illustrated that where no cattle were kept the tick population tends to be less. In wooded areas near Huntsville where no cattle had been grazed there were practically no ticks, whereas in woods located in grazing areas, large numbers of ticks were found.

Laboratory and field studies (Lancaster and McMillan, 1955) indicate that for the habitat to be suitable the relative humidity must be high. These studies show that there is a relationship between ground cover and relative humidity. In open pasture on the days records were made, the relative

humidity averaged 32 per cent, rarely ever going over 60 per cent. This low humidity in the laboratory prevented oviposition and larvae were unable to survive any prolonged period of exposure to it. This accounts for finding most of the ticks in the brushy or wooded areas.

CONTROL

The control of this tick is reasonably well worked out for the situations where control is desired. There are essentially three types of control situations. These are personal protection, protection of pets, and protection of cattle.

The simplest and most effective means of securing personal protection is to avoid areas where large numbers of ticks occur. When this method becomes undesirable, the use of repellents applied to skin or clothing will provide a high degree of protedtion. Any commercial repellent containing appreciable amounts of dimethyl phthalate is adequate for short exposures to tick infestation. For persons who must work or remain in "ticky" areas for long periods, clothing treatment with a formula containing N-Butylacetanilide has been shown to be effective for nearly two weeks (Brennan, 1948). This material cannot be applied directly to the skin.

Protection of pets may be accomplished by frequent observation and treating with a rotenone dust or dip. Hunting dogs, such as beagles, fox or coon hounds, and bird dogs, should be treated frequently enough to prevent the adult females from dropping off and depositing eggs. These eggs hatch and create tick infestations in lawns. As a general rule, treatment of hunting dogs should be made not later than one week after exposure to infestation.

If a tick infestation does develop in a lawn, spraying with DDT, chlordane, or dieldrin will wipe it out if the application is thorough.

The recommendation for the protection of dairy cows is to pasture them on open, improved pastures which can be mowed. This is in line with the programs of the dairy husbandrymen and agronomists. The effectiveness of this is illustrated by the data already presented.

Where open, improved pastures are not obtainable

for dairy cows, methoxychlor at the rate of 8 pounds of 50 per cent wettable powder or 1-1/2 pounds of 25 per cent lindane wettable powder in 100 gallons of water is recommended as a spray. If desired, a mixture of these two ingredients can be applied. Such a mixture combines the quick-killing effect of the lindane with the longer residual of the methoxychlor. Applications should be made every three weeks from the time ticks begin to attach to the cows in spring until July 1.

On beef cattle the principal recommendation is to spray with toxaphene at a rate of 10 pounds of 40 per cent wettable powder in 100 gallons of water every three weeks. Use of toxaphene is not permissible on producing dairy cows because of possible milk contamination. Chlordane, DDT, or BHC or a combination of DDT-BHC may be used on beef cattle (Barnes, 1952).

SUMMARY

The life and seasonal history of the lone star tick is given as it occurs in the vicinity of Fayetteville, Arkansas. Laboratory and field studies on the effect of humidity illustrate the importance of this factor as it affects the abundance of this species.

Control measures for personal protection, protection of pets and domestic animals are given.

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BOTANICAL ASPECTS OF MASSARD PRAIRIE, ARKANSAS*

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INTRODUCTION

Prairies have long attracted the attention of botanists, largely because of their distinctive flora. But when a prairie occurs within an area that is predominantly forested, it is likely to arouse unusual interest and pose interesting questions. Certain areas in Arkansas have been persistently covered with prairie vegetation since before the arrival of white men. Massard prairie is one such area. The present study was undertaken to obtain definite data concerning the present plant cover, that it may be used for comparison with other such areas and with descriptions made by the earliest botanists to visit the area. Climatic data are included in the hope that they may aid in accounting for the occurrence and phenology of the plants of the prairie.

HISTORICAL

The first descriptive account of the prairie areas of the Fort Smith region was given by Thomas Nuttall (1819), who was the first botanist to visit the Arkansas territory. His account of the prairies in this area was not so complete as that of Grand Prairie in southeastern Arkansas, but he did note the similarity of the vegetation. This will afford opportunity for study of changes over more than a century.

In 1856, Lesquereux described several counties including prairies and his descriptions coincide very closely with those of Nuttall.

*This paper is based on the work and thesis of the senior author as part requirement for the M.S. degree. It has been condensed and brought down to date by the junior author.

BOTANICAL ASPECTS OF MASSARD PRAIRIE, ARKANSAS

In the Geological Survey of Arkansas, 1880, Sargent presented a map of the State showing the forested and the prairie areas. This map, Plate I, was among the first to give a clear concept of the size and location of the original prairie areas of the State. Except for the fact that some of these areas have been put into cultivation, there is little apparent change in them since that time.

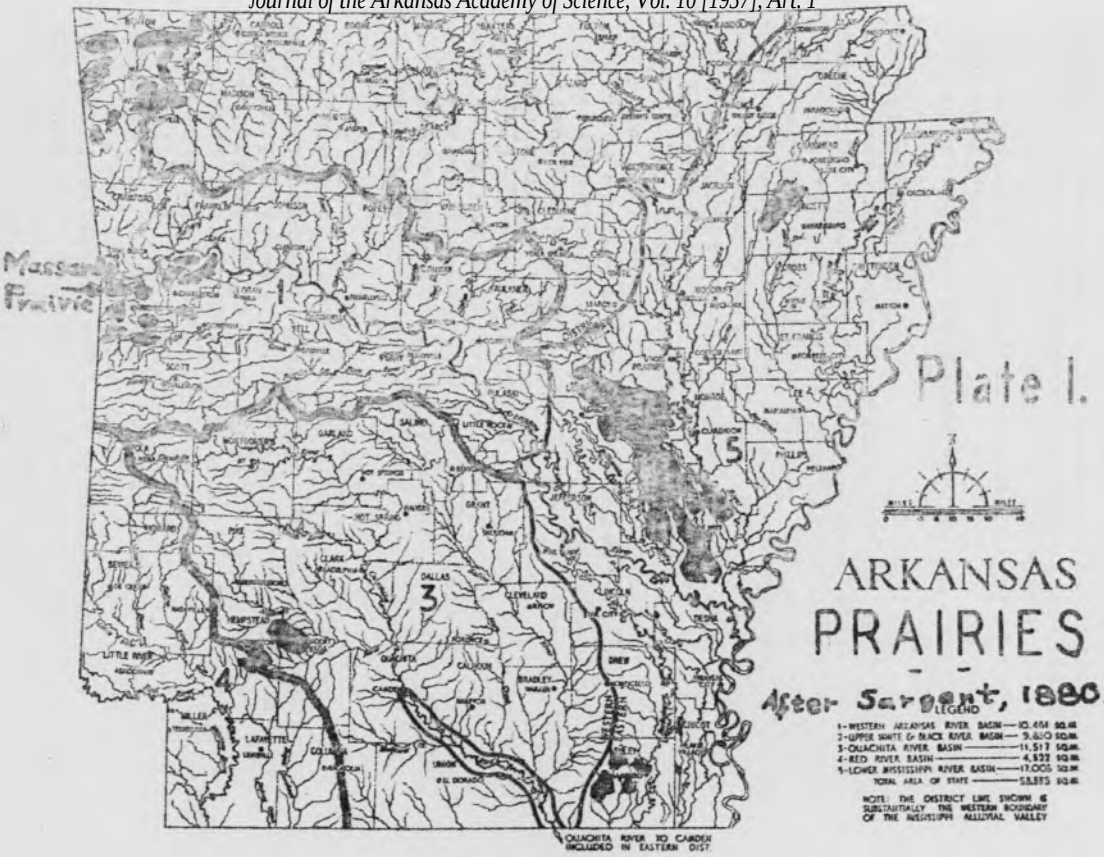
MASSARD PRAIRIE

The present studies were limited to a portion of a prairie in the northern part of Sebastian County, about six miles south of Fort Smith, designated locally as Massard Prairie. This prairie comprises approximately 10,360 acres and extends about six and one-half miles east and west and two to three miles north and south. It is traversed by Highway 71 in the western half and by the Fort Smith and Western Railroad paralleling the highway. This area was chosen because it is a typical prairie area that had been continuously owned and occupied by the same family for 150 years, and it was near enough to Fort Smith that frequent observations could be made.

Massard Prairie has the appearance of a basin nestled between two hills, known locally as Wolf Mountain and South Ridge, which have elevations of about 600 feet above sea level. The elevation of the prairie proper averages about 500 feet. This prairie is cut from southwest to northeast by Massard Creek, whose waters have been impounded by several earthen dams. The surface of the prairie is gently rolling and dotted with numerous small mounds which have been designated "pimple hills." These are quite prominent; sometimes there are as many as fifteen in an acre. They are approximately three to four feet in height and average twenty feet in diameter.

PROCEDURE

Studies of the vegetation were begun in the fall of 1939 and continued throughout the growing season of 1940. During the winter of 1939-40 observations of winter developments were made, and records of blossoming were kept throughout the growing season



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of 1940. Before the growing season, these observations were made either at four week or two week intervals, but during the growing season they were made each week. Comparative observations were made of (1) the growth in areas frequently cut over for hay and areas not cut over; (2) the different topographical areas, such as high and low prairies, and (3) the vegetation of the "pimple hills." Specimens were collected and pressed for later identification and study. These were deposited in the University of Arkansas Herbarium.

Ecological data secured include records of temperature, rainfall, evaporation, and soil acidity. The effect of fires on the vegetation was noted. Information about them was secured from the farmers, railroad attorneys, and claim agents.

OBSERVATIONS

PHENOLOGY: The successions of blooms on the prairie was most striking from March until September. The low white patches of Draba caroliniana, in March, were the first to appear. Nothoscordum and Sisyrinchium were extremely abundant in April and covered several hundreds of acres. As these began to disappear in late April, the prairie presented a quilt-like pattern of patches of blue Phacelia glabra and white Arenaria patula var. robusta. Both of these were found in low moist areas. Golden patches were made by Selenia aurea and Corydalis crystallina which occurred on higher and better drained places, as the "pimple hills." The baptisias appeared in different areas -- B. leucantha in poorer soil, B. sphaerocarpa along the highway and ditches, and B. leucophaea on well-drained soil. A small group of Nemastylis coelestina with their pale violet flowers and peculiar habit of blossoming were seen. These opened about five in the afternoon, remained open for only about an hour, and then twisted and died. This is one of the many flowers first described and named by Thomas Nuttall from material found on these Arkansas prairies.

The climax of the color show came in May and June with the acres of blue Delphinium and white Penstemon on low moist areas, and pink Echinacea pallida on elevated or better-drained areas. Blue Tradescantia ohiensis and Camassia scilloides were

more restricted. In July, taller flowers such as Silphium laciniatum and Liatris spp., appeared. These grow in patches as large as an acre among the tall grasses, varying in size with the environmental conditions. Stillingia sylvatica, Agave virginica, and Eryngium yuccifolium were found in few areas and were very limited as to number.

August, with its lower precipitation, higher temperatures and shorter days brought out Centaurea americana, Vernonia, and nine species of Solidago. These began to bloom in midsummer and continued until frost. Another plant, very striking because of its azure blue flowers was Salvia azurea. The gay fall tints of the sassafras and sumac leaves also began to appear during August. The asters were scattered throughout the prairie and flourished until frost, and Boltonia diffusa was most abundant in the ditches.

This definite sequence of floral aspects seen on the prairie in 1940 is shown in Fig. I, which presents the periods of total and maximum blooming of forty of the more prominent and showy species. Camassia bloomed for three weeks while Verbena canadensis was in blossom for thirty. Many grasses also were quite showy by August. Andropogon Gerardi, Sorgastrum nutans, Spenopholis intermedia, Bromus arvensis, Paspalum circulare, and P. capillare were conspicuous because of their height, bloom, and fruiting clusters. Sorgastrum nutans made a very striking display; Andropogon gerardi is the tallest of the grasses. The awns of Aristida prupurascens and the silky tops of Andropogon ternarius, A. virginicus and A. scoparius were as spectacular as the height and size of head in other grasses.

VEGETATION OF "PIMPLE HILLS"

When these were studied in large numbers, it was found that ligneous species were more likely on these than elsewhere, but in general there was no consistency in the vegetation on the "pimple hills." Since they tended to be dryer than lower land, some species were found on them to the exclusion of other areas.

CUTOVER AND UNCUT AREAS

Two list transects 5 m. x 1 m. were taken in an

BOTANICAL ASPECTS OF MASSARD PRAIRIE, ARKANSAS

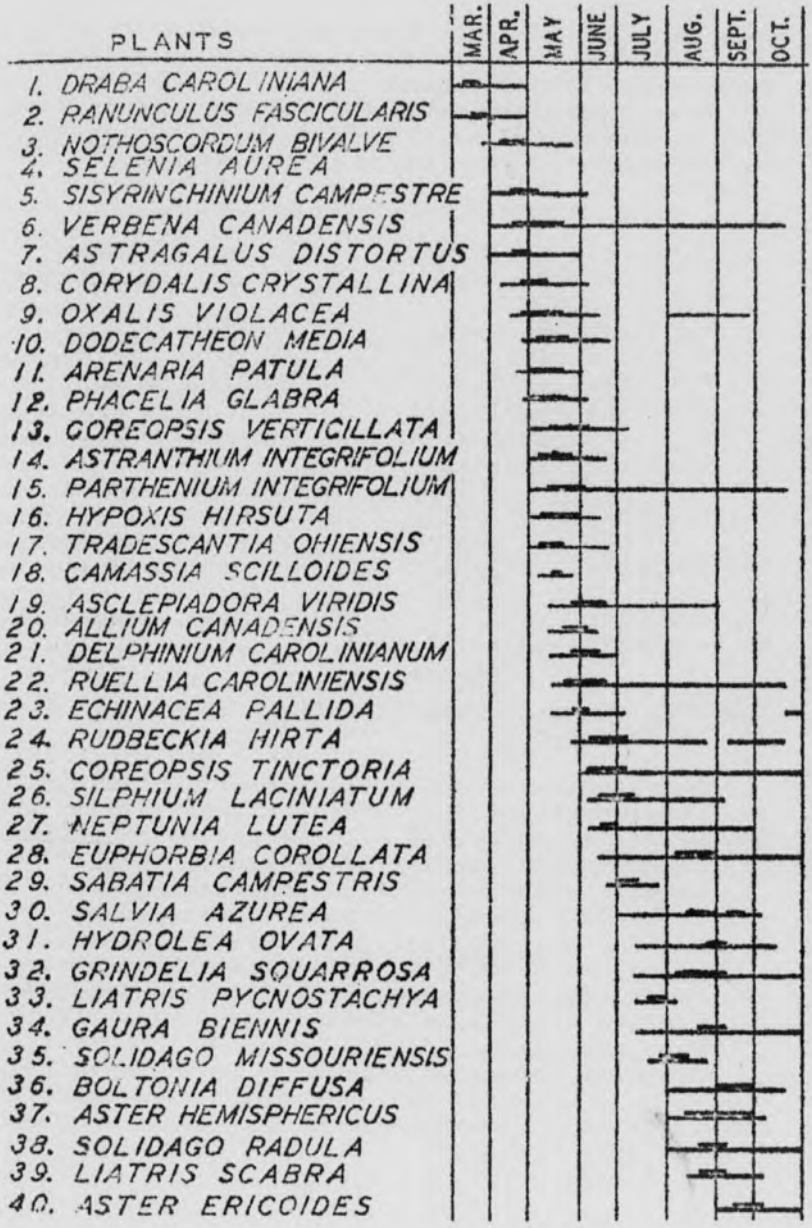

Fig. 1. Total and Maximum Blooming Periods of Forty Species

area not cut for many years and another which had been regularly cut for hay. Twenty-three species were common to both areas; fifteen found in the uncut area were not found in the cut-over area, while nine species were found in the cutover area and not in the other. The plots are listed below:

SPECIES IN BOTH AREAS

1. Asclepias viridiflora
2. Aster ericoides
3. Baptisia leucantha
4. Boltonia diffusa
5. Echinacea pallida
6. Camassia scilloides
7. Centaurea americana
8. Corydalis crystallina
9. Delphinium carolinianum
10. Helianthus hirsutus
11. Helianthus mollis
12. Hydrolea ovata
13. Liatris pycnostachya
14. Oxalis violacea
15. Parthenium integrifolium
16. Penstemon tubiflorus
17. Ptilimnium capillaceum
18. Ranunculus fasciculatus
19. Rudbeckia hirta
20. Shrankia nuttallii
21. Solidago radula
22. Tradescantia ohiensis
23. Verbena canadensis

SPECIES IN UNCUT AREA NOT IN CUTOVER

1. Apocynum cannabium
2. Aster hemispherious
3. Baptisia leucophaea
4. Bidens trichosperma
5. Cirsium discolor
6. Helianthus angustifolius
7. Oenothera biennis
8. Penstemon arkansanus
9. Pluchea camphorata
10. Rhus copallina
11. Silphium integrifolium
12. Silphium laciniatum
13. Solidago altissima
14. Stillingia sylvatica
15. Vernonia missurica

SPECIES IN CUTOVER AREA NOT IN UNCUT

1. Arenaria patula
2. Camassia scilloides
3. Ceanothus americana
4. Neptunia lutea
5. Phacelia glabra
6. Rhus toxicodendron
7. Sabatia campestris
8. Spiranthes tuberosa
9. Spiranthes praecox

CLIMATIC: Although observations were made on temperature, rainfall, evaporation, and pH values of the soil, they will not be discussed fully in this paper. Temperatures and rainfall thruout the growing season of 1940 are listed in Table I, and evaporation data are omitted. pH values are given below. 1939 was a very dry summer with temperatures above average, while rainfall was below average, but 1940 was more nearly average in both areas. This resulted in a very representative show of blossoms for 1940. In 1939-40 the five drilled wells which range from 15 - 1330 feet deep, were dry for five months, but ponds impounded in Massard Creek maintained a good supply of water.

EDAPHIC: The soil of Massard Prairie is composed of shale and clay. In spring it is covered with water, which does not filter down. As a result the soil is more or less marshy. The soil is cold. In the summer months it becomes hard and compact as a result of evaporation and less precipitation. It is difficult to cultivate, because of the sticky texture in spring and hardness in summer. Hardpan is found throughout the prairie at a depth of 8 - 11 inches. The "pimple hills" showed no stratification or differences in physical make-up, but because of their elevation were better drained in wet weather.

The scarcity of ground water is due to compacted shales and sandstone of low porosity. (Lesquereux, 1866). The surface water cannot percolate because of the hardpan and as a result is lost by evaporation or run-off.

The pH of the soils was studied from twenty soil tests for an idea of acidity. The range was from 6.5 to 7.2. The result reveals that the pH could hardly account for the distribution of prairie vegetation. These texts showed that acidity of the "pimple hills" was not materially different from other parts of the prairie.

In order to show possible correlation between the temperature, rainfall, length of day and number of species observed in flower each week the following table has been prepared. These data may be compared with Fig. 1.

Weeks	Mean Temp.(F.)	Rainfall (Inches)	Day Hrs.	Length Mins.	Species in Bloom
Mar.					
1	49	.3	11	40	2
2	74	3.0	11	55	4
3	55	.4	12	7	4
4	51	.7	12	23	7
Apr.					
5	68	.3	12	37	9
6	51	3.2	12	53	12
7	58	.3	13	2	15
8	59	.3	13	17	20
May					
9	64	1.2	13	33	25
10	73	.2	13	43	30
11	69	.1	13	52	32
12	69	2.2	14	2	35
13	66	.2	14	10	37
June					
14	77	.2	14	14	40
15	88	2.2	14	17	45
16	78	1.2	14	20	53
17	78	.2	14	18	55
July					
18	74	1.5	14	15	58
19	79	.2	14	10	60
20	82	.2	14	2	63
21	81	1.0	13	57	67
22	89	.2	13	42	74
Aug.					
23	86	.1	13	32	70
24	78	2.0	13	22	70
25	73	2.0	13	8	62
26	78	.2	13	00	55
27	69	2.5	12	52	45
Sept.					
28	73	T	12	27	44
29	74	T	12	7	40
30	70	.1	12	00	38
31	66	.5	11	53	31
Oct.					
32	67	T			30
33	64	T			25
34	67	T			
35	65	1.0			
36		T			

Table I

FIRES: The ecological data concerning Massard Prairie cannot be concluded without some mention of the static vegetation and the effect of fires in this area. Diamond Grove and forests on the ridges have been periodically swept by fires, but these same areas continue to be forested. One farmer relates that the worst fire during his forty years of knowledge of Massard Prairie was August 10, 1936, when approximately 7680 acres of 10,360 acres were burned over, including seven hundred of the 1100 acres of Diamond Grove farm. The year 1936 was another period of drought and the day of the fire had the highest temperature, 114° F., ever recorder in Fort Smith. There were two separate fires at this time, but no further fires from 1937 through 1940. One burned portion was on the eastern side and swept up the ridge through forest to the south. As might be expected, most of the trees were killed by the fire, and remain as skeletons. The new vegetation developing on the burned forest area was not of the prairie type, but a form of woodland similar to what had been there. The area studied most closely had not been burned over for 22 years. The sumac is not so dense or tall as that found in other places. There are no large trees in this area. For instance, trees such as cottonwood, willow, persimmon, and sassafras are shrub-like after 22 years or less of growth. Some conditions other than fire must contribute to this scarcity of trees and the poor growth of those present. Fires are not common in this area, because Massard Prairie is not burned over to improve the grass; on the contrary, the farmers take every precaution to prevent grass fires. The great areas of dry grass and the wide open space for the wind to move produce ideal conditions for great fires. The prairie fires may be a result of such conditions rather than a cause of such areas

DISCUSSION

There are various opinions as to what constitutes a prairie. Sometimes it is considered as a type of vegetation; at other times the question is raised as to whether it is not rather a region with a peculiar complex of environmental factors, which foster a certain type of vegetation. In general a prairie is considered as a region covered by a type of vegetation, predominantly grasses, and notably lacking in ligneous flora. In North America

the prairie is recognized as a climatic plant formation extending roughly from the Texas shore of the Gulf of Mexico northward into Canada and extending irregularly eastward into Oklahoma, Kansas, Missouri, Iowa, Illinois, and Indiana.

Prairies appear to be due in general to climatic conditions, with available moisture as one of the principal controlling factors. Lesquereux (1866) advanced such a theory. He explained that land covered by low stagnant water has for its vegetation rushes and sedges. These decompose and produce a hard, cold, impervious layer underlaid by clay or shales. Land continually covered with stagnant water cannot produce trees, because most trees, require atmospheric air for their roots and seed germination. Seeds of our common forest trees do not germinate and grow on a ground alternately covered with stagnant water and exposed to dryness for some months of the year. Massard Prairie is low and remains wet late in the spring. Rushes and sedges are found in all the lower areas. After the water has evaporated the soil is very hard and dry. It is a cold soil when wet, which is shown by the appearance of certain blooms at least two weeks later on this soil than in other nearby areas not prairie. Hardpan underlaid by a clay or shale causes the water to stand and in this way prevents the germination of seeds such as certain tree seeds. Thus Massard Prairie does have soil conditions which might interfere with favorable moisture and areation.

Climatic conditions play their part on Massard Prairie as well as on prairies in other areas. Sampson (1921) and Transeau (1927) have shown the nature of prairies in North America and explained them largely on the basis of the rainfall/evaporation ratio. Data on these factors for Massard Prairie were not adequate for definite conclusions, but did indicate not a great difference in these factors when compared with nearby woodland. Thus the theory of Lesquereux to explain the vegetation seems most logical for Massard Prairie.

The phenology may be explained as a result of combined conditions of temperature, moisture, and relative length of day and night as described by Garner and Allard, 1920.

A complete list of plants found on Massard prairie follows:

TAXONOMIC LIST OF PLANTS OF MASSARD PRAIRIE*

Typhaceae
Typha latifolia L.
Graminese
Agrostis alba L.
Agrostis elliottiana Schultes.
Agrostis hyemalis (Walt.), BSP.
Andropogon gerardi Vitman.
Andropogon scoparius Michx.
Andropogon ternarius Michx.
Andropogon virginicus L.
Aristida dichotoma Michx.
Aristida longespica Poir.
Aristida oligantha Michx.
Aristida purpurascens Poir.
Bouteloua curtipendula (Michx.), Torr.
Bromus arvensis L.
Danthonia spicata (L.) Beauv.
Digitaria sanguinalis (L.) Scop.
Echinochloa crusgalli (L.) Beauv.
Elymus virginicus glabriflorus L.
Eragrostis frankii (Fisch, May. & Lall.) Steud.
Eragrostis hirsuta (Michx.) Nees.
Eragrostis pectinacea (Michx.) Nees.
Festuca octoflora Walt.
Leptoloma cognatum (Schultes) Chase.
Panicum agrostoides Spreng.
Panicum capillare L.
Panicum dichotomiflorum Michx.
Panicum hians Hitchcock.
Panicum muscicose Aschs.
Panicum pedicellatum, Vasey
Panicum scoparium Lam.
Panicum scribnerianum Nash.
Panicum sphaerocarpon Ell.
Panicum virgatum L.
Paspalum circulare Nash.
Paspalum floridanum Michx.
Paspalum muhlenbergii Nash.
Paspalum pubescens Muhl.
Phalaris arundinacea L. (Reed C.)
Phalaris caroliniana Walt.
Setaria geniculata Lam.
Setaria viridis (L.) Beauv.
Sorghastrum nutans (L.) Nash.
Sorghum halepense (L.) Pers.
Sphenopholis intermedia Rydb.
Sporobolus asper (Michx.) Kunth.
Sporobolus heterolepis Gray.
Sporobolus vaginiflorus (Torr.) Wood.
Tridens strictus (Nutt.) Nash.
Cyperaceae
Carex arkansana Bailey.
Carex gravida Bailey
Cyperus acuminatus Torr. and Hook.
Cyperus ovularis (Michx.) Torr.
Cyperus pseudovegetus Steud.
Cyperus strigosus L.
Eleocharis obtusa (Willd.) Schultes.
Fimbristylis vahlii (Lam.) Link.
Rynchospora corniculata (Lam.) Gray.
Scirpus lineatus Michx.
Commelinaceae
Tradescantia ohiensis Raf.
Juncaceae
Juncus acuminatus Michx.
Juncus biflorus Ell.
Juncus brachycarpus Engelm.
Juncus interior Wiegand.
Liliaceae
Allium canadense L.
Camassia scilloides (Raf.) Cory
Nothoscordum bivalve (L.) Britton.
Smilax bona-nox L.
Amaryllidaceae
Agave virginica L.
Hypoxis hirsuta (L.) Coville.
Iridaceae
Nemastylis coelestina Nutt.
Sisyrinchium albidum Raf.
Orchidaceae
Calopogon pulchellus (Salisb.) R. Br.
Spiranthes praecox (Walt.) Wats. & Coult.
Spiranthes tuberosa Raf.
Salicaceae
Populus deltoides Marsh.
Salix nigra Marsh.
Polygonaceae
Polygonum hydropiperoides (Michx.)
Polygonum Pennsylvanicum L.
Polygonum tenue Michx.
Rumex Acetosella L.
Rumex crispus L.
Amaranthaceae
Amaranthus spinosus L.
Phytolaccaceae
Phytolacca americana L.
Caryophyllaceae
Arenaria patula Michx.
Arenaria patula var. robusta (Stay.) Maguire.
Cerastium brachypodum (Engelm.) Robinson.
Cerastium viscosum L.
Silene antirrhina L.
Portulacaceae
Claytonia virginica L.
Talinum parviflorum Nutt.
Ranunculaceae
Anemone caroliniana Walt.
Delphinium carolinianum Walt.
Ranunculus fascicularis Muhl.
Ranunculus pusillus Poir.
Menispermaceae
Cocculus carolinus L.
Lauraceae
Sassafras albidum (Nutt.) Nees.
Fumariaceae
Corydalis crystallina Engelm..
Cruciferae
Arabis virginica (L.) Trel.
Cardamine pensylvanica (L.) Medic.
Draba brachycarpa Nutt.
Draba reptans (Lam.) Fern.
Lepidium virginicum L.
Selenia aurea Nutt.
Sisymbrium officinale (L.) Scop.
Rosaceae
Potentilla canadensis L.
Rosa carolina L.
Rosa carolina var. villosa (Best) Rehd.
Rosa setigera Michx.
Rubus villosus, Ait.
Leguminosae
Amorpha fruticosa L.
Apios americana Medic.
Astragalus distortus T. & G.
Baptisia leucantha T. & G.
Baptisia leucophaea Nutt.
Baptisia sphaerocarpa Nutt
Cassia chamaecrista L.
Crotalaria sagittalis L.
Desmanthus illinoensis (Michx.) MacM.
Desmodium sessilifolium (Torr.) T. & G.
Galactia volubilis (L.) BSP.
Gleditsia triacanthos L.
Lathyrus pusillus Ell.
Lespedeza capitata Michx.
Lespedeza intermedia Wats.
Lespedeza procumbens Michx.
Lespedeza repens (L.) Bart.
Lespedeza stuvei Nutt.
Lespedeza violacea (L.) Pers.
Lespedeza virginica (L.) Britton.
Neptunia lutea (Leavenw.) Benth.
Psoralea psoralioides (Walt.) Cory.
Schrankia nuttallii (DC.) Standl.
Strophostyles helvola (L.) Ell.
Strophostyles leiosperma (T. & G.) Piper.
Stylosanthes biflora (L.) BSP.
Tephrosia spicata (Walt.) T. & G.
Tephrosia virginiana (L.) Pers.
Trifolium dubium Sibth.
Trifolium reflexum L.
Linaceae
Linum sulcatum Riddell.
Linum virginianum L.
Oxalidaceae
Oxalis stricta L.
Oxalis violacea L.
Geraniaceae
Geranium carolinianum L.

*The nomenclature follows the eighth edition of Gray's Manual in the majority of the list; Hitchcock and Chase was used for the grasses, and other authors when necessary.

Polygalaceae
Polygala sanguinea L.
Euphorbiaceae
Acalypha virginica L.
Croton capitatus Michx.
Croton glandulosus L.
Croton monanthogynus Michx.
Crotonopsis elliptica Willd.
Euphorbia corollata L.
Euphorbia dentata Michx.
Euphorbia maculata L.
Euphorbia supina Raf.
Stillingia sylvatica L.
Tragia urticifolia Michx.
Anacardiaceae
Rhus copallina L.
Rhus glabra L.
Rhus toxicodendron L.
Rhamnaceae
Ceanothus americanus L.
Hypericaceae
Hypericum drummondii (Grev. & Hook) T. & G.
Passifloraceae
Passiflora incarnata L.
Passiflora lutea L.
Lythraceae
Lythrum alatum Pursh.
Rotala ramosior (L.) Koehne.
Melastomaceae
Rhexia virginica L.
Onagraceae
Gaura biennis L.
Jussiaea decurrens (Walt.) DC.
Ludwigia alternifolia L.
Ludwigia glandulosa Walt.
Ludwigia palustris L.
Oenothera biennis L.
Oenothera laciniata Hill.
Oenothera linifolia Nutt.
Umbelliferae
Chaerophyllum procumbens (L.) Crantz.
Cicuta maculata L.
Cynosciadium pinnatum DC.
Eryngium yuccifolium Michx.
Polytaenia nuttallii DC
Ptilimnium capillaceum (Michx.) Raf.
Sparganiopis inermis (Nutt.) Math. & Const.
Torilis japonica (Houtt.) DC.
Primulaceae
Dodecatheon meadia L.
Ebenaceae
Diospyros virginiana L.
Oleaceae
Fraxinus pennsylvanica var. subintegerrima (Vahl) Fern.
Gentianaceae
Sabatia campestris Nutt.
Apocynaceae
Apocynum cannabinum L.
Asclepiadaceae
Asclepias longifolia Michx.
Asclepias viridiflora Raf.
Asclepias tuberosa L.
Asclepias incarnata L.
Asclepiodora viridis (Walt.) Gray.
Convolvulaceae
Cuscuta cuspidata Engels.
Cuscuta gronovii Willd.
Cuscuta indecora Chois.
Polemoniaceae
Phlox pilosa L.
Hydrophyllaceae
Hydrolea ovata Nutt.
Phacelia glabra Nutt.
Boraginaceae
Lithospermum arvense L.
Lithospermum incisum Lehm.
Myosotis verna Nutt.
Verbenaceae
Verbena canadensis L.
Verbena simplex Lehm.
Labiatae
Isanthus brachiatus L., BSF
Physostegia virginiana L. Beath.
Pycnanthemum flexuosum Walt. BSF
Salvia azurea var. grandiflora Lam. Benth.
Teucrium canadense L.
Solanaceae
Datura stramonium L.
Physalis heterophylla Nees.
Physalis pumila Nutt.
Physalis virginiana Mill.
Solanum carolinense L.
Solanum rostratum Dunal.
Scrophulariaceae
Bacopa acuminata (Walt.) Robinson.
Castilleja coccinea (L.) Spreng.
Gerardia fasciculata Ell.
Linaria canadensis (L.) Dumont.
Lindernia dubia (L.) Pennell.
Pentstemon arkansana Pennell.
Pentstemon digitalis (Sweet) Gray.
Pentstemon tubaeflorus Nutt.
Verbascum thapsus L.
Bignoniaceae
Campsis radicans (L.) Seem.
Acanthaceae
Justicia americana (L.) Vahl.
Ruellia caroliniensis (Walt.) Steud.
Plantaginaceae
Plantago aristata Michx.
Plantago virginica L.
Rubiaceae
Cephalanthus occidentalis L.
Diodia teres Walt.
Caprifoliaceae
Symphoricarpos orbiculatus Moench.
Valerianaceae
Valerianella radiata (L.) Dufr.
Campanulaceae
Specularia leptocarpa (Nutt.) Gray.
Specularia perfoliata (L.) A. DC.
Lobeliaceae
Lobelia spicata var. leptostachys (A. DC.) Hackens. & Buch.
Compositae
Achillea millefolium L.
Actinomeris alternifolia L. DC.
Ambrosia artemisiifolia L.
Ambrosia bidentata Michx.
Ambrosia psilostachya DC.
Anthemis cotula L.
Aster ericoides L.
Aster hemisphericus E. J. Ale.
Aster patens Ait.
Aster praealtus Poir.
Astranthium integrifolium (Michx.) Nutt.
Bidens beckii Torr.
Boltonia diffusa Ell.
Cacalia tuberosa Nutt.
Centaurea americana Nutt.
Chrysopsis pilosa Nutt.
Cirsium discolor (Muhl.) Spreng.
Coreopsis tinctoria Nutt.
Coreopsis verticillata L.
Echinacea pallida Nutt.
Erigeron canadensis L.
Erigeron philadelphicus L.
Eupatorium perfoliatum L.
Eupatorium serotinum Michx.
Gaillardia lutea Greene.
Grindelia squarrosa (Pursh) Dunal.
Helenium nudiflorum Nutt.
Helenium autumnale (Raf.) Rock.
Helianthus angustifolius L.
Helianthus hirsutus Raf.
Helianthus mollis Lam.
Heterotheca subaxillaris (Lam.) Brit & Rusby.
Hieracium longipilum Torr.
Iva angustifolia Nutt.
Krigia dandelion (L.) Nutt.
Kuhnia eupatorioides L.
Lactuca scariola L.
Liatris pycnostachya Michx.
Liatris scabra (Green) K. Schum.
Liatris squarrosa Willd.
Parthenium integrifolium L.
Pluchea camphorata (L.) DC.
Prenanthes aspera Michx.
Pyrrhopappus carolinianus (Walt.) DC.
Rudbeckia grandiflora (D. Don) DC.
Rudbeckia hirta L.
Rudbeckia subtomentosa Pursh.
Serinia oppositifolia (Raf.) Kize.
Silphium integrifolium Michx.
Silphium laciniatum L.
Solidago altissima L.
Solidago gymnospermoides (Greene) Fernald.
Solidago missouriensis Nutt.
Solidago nemoralis Ait.
Solidago radula Nutt.
Solidago rigida L.
Solidago gigantea Ait.
Solidago speciosa Nutt
Vernonia baldwini Torr.
Vernonia missurica Raf.
Xanthium chinense Mill.

This gives a total of 296 plants, including 61 composites, 47 grasses, and 30 legumes.

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