An Approach to a Science of Administration. Writers on public administration place much emphasis upon the possibilities and importance of discovering and applying scientific principles in their field of study. But very few of them have ventured to state the basic premises upon which they seek to build that science. Many of those whose writings imply that major principles have been discovered announce, not premises, but conclusions, which, regardless of their practical merits, can hardly be called anything but opinions.\(^1\) On the other hand, several scholars seek to escape from errors of commission by avoiding the use of such scientific terms as “principles” or “efficiency.” If they go beyond descriptive analyses to advocate particular plans of organization or methods of procedure, they use terms which denote value judgments, thereby admitting by implication that they are expressing mere opinions.\(^2\) In a few published discourses, basic premises are stated and reasoning is developed therefrom. However, most of those premises—or “principles”—are referred to by name only, such as “the principle of leadership”; they are not stated in terms of pre-


\(^2\) In his recently published *Introduction to the Study of Public Administration* (1939), L. D. White carefully avoids the use of the term “principles” and of other terms which might suggest that he is stating “scientific laws”; but he makes frequent use of another type of positive statement, such as “good administration requires” (p. 46), “it is also desirable” (p. 79), and “the interests of good administration suggest” (p. 570). Of course the social scientist cannot disregard human concepts of value, because the very purpose of social organizations is to satisfy human wants, and no organization can function long if its activities produce general dissatisfaction. But the student must seek to measure public value judgments objectively, by taking his standards from official statements of policy and by observing human behavior which may serve as evidence of general and public concepts of value. The “social efficiency” to which Millspaugh and Hyneman refer (see Hyneman, op. cit., pp. 66–67), like Dr. White’s “good,” may be used scientifically if it can be observed and measured objectively. But it is doubtful whether political scientists are fully agreed on the values which they set forth, and therefore the conclusions drawn from such general concepts of value must be classed as opinions.
cise causal relations which can be verified or which can serve adequately as bases for further reasoning.³

It may be regarded as unwise to venture a statement of what one considers the basic premises upon which a science of administration may be built. But every body of theory is built upon fundamental assumptions, either expressed or implied. Moreover, a body of theory is complete, and has scientific value, only when the premises are sufficiently clear to permit objective scrutiny and verification. Erroneous hypotheses, stated precisely, may be more scientific than vague or unexpressed assumptions; for only the former will lend themselves to verification. In other words, trial and error is an essential part of scientific method.

What, then, are the first steps in an approach to a science of administration? Dr. Luther Gulick recently set forth what he considered the requirements of a scientific approach to the social studies at the present time. These requirements were: "(1) analysis of phenomena from which we may derive standard nomenclature, measurable elements, and rational concepts; (2) the development of extensive scientific documentation based upon these analyses, and (3) the encouragement of imaginative approach to social phenomena, and the publication and circulation of hypotheses so that they may be scrutinized by others in the light of experience, now and in future years."⁴

A number of essentials are suggested by the foregoing statements, but there is involved a clear recognition of two basic methods of approach to scientific study. Statement number "2" calls for the empirical method, by which we collect and describe appearances in order that general conclusions or laws may be derived therefrom. Statement "3" suggests the rational or deductive method, whereby we seek to determine causal relationships among the appearances which we observe. This latter method involves the adoption of definitions, axioms, and propositions, which are derived from empirical observations, and which are capable of serving as premises to reasoning. Conclusions reached by the rational method must be consistent with the appearances gathered; but, being consistent, those conclusions, and the premises from which they are derived, may serve as bases for other conclusions beyond the immediate reaches of empirical observation. The two methods are not independent and alternative processes of scientific study; they are mutually dependent phases of investigation, and one cannot be separated from the other without impairing

³ Papers on the Science of Administration (1937), edited by Luther Gulick and L. Urwick, perhaps contains the best collection of articles representing an attempt to develop a rational scientific approach to the study. But one searches almost in vain for the statement of a "principle" in precise terms or in terms of causal relationship.

⁴ Gulick and Urwick (eds.), Papers on the Science of Administration, p. 194.
the value of both. However, it is possible for individuals, according to their own temperaments or according to the facilities which they have available, to specialize in one or the other of these phases.

There may be some dispute as to whether the rational method can be depended upon until the empirical studies are well advanced. Political scientists who give advice regarding fields and methods of possible research seem to emphasize the need for empirical study.6 There is danger, however, that the empirical studies will be lacking in direction or meaning until they are capable of being interpreted in the light of propositions brought forth by the rational or theoretical approach. Pithecanthropus was not discovered until after Darwin had expounded his theory of evolution, and the discovery probably would have had little significance prior to that time. Principles of economics which were originally derived from relatively superficial observations have served as guides to extensive empirical studies in recent years, but thus far the major conclusions derived from the rational analyses have been changed very little.

Without disparaging the importance of empirical research, therefore, one may be justified in taking the view that the early development of a rational theory is indispensable to the advancement of scientific method in the study of administration. Since the development of a rational theory is the concern of this article, the problem of selecting basic definitions, axioms, and propositions becomes fundamental. For that reason, the premises which are stated in the following pages are classified as "axioms" and "propositions," although they would more properly be termed "hypotheses" which are set forth in order that they may be tested and scrutinized in the light of experience.

I

Administration is a type of coöperate activity; it is concerned with the performance of tasks that require collective efforts on the part of two or more persons. It follows, therefore, that the first term which requires definition is organization.6

6 Cf. Oliver P. Field, Research in Administrative Law (1937); L. D. White, Research in Public Personnel Administration (1939). All of the publications of the Committee on Public Administration, Social Science Research Council, are reports of empirical studies. Perhaps the emphasis is justified by the definition of "research"; but see W. F. Willoughby, "A Program for Research in Political Science," in this Review, Vol. 27, pp. 1–23 (1933).

6 Most textbooks, and many other treatises on the subject, start by defining administration. However, the writer has found no definition which presents a clear demarcation between administration and other types of coöperate activity, and he doubts whether the concept will lend itself to precise definition. Since administration is a type of organization, the elements of the latter are also elements of the former.
"Organization" is defined in the *Standard Dictionary* as "a number of individuals systematically united for some end or work." James Mooney says that it "means concerted human effort"; while Chester I. Barnard defines "formal organization" as a "system of consciously coördinated activities or forces of two or more persons." From these definitions and others we may conclude that the primary elements of every social organization are (1) persons, (2) combined efforts, and (3) a common purpose, or a common task to be performed. Therefore, by using the term "formal organization," in order to exclude subconscious or accidental coöperation, the following definition may be set forth:

**Definition**: A formal organization is a number of persons who systematically and consciously combine their individual efforts for the accomplishment of a common task.⁹

It follows from the above definition that the effectiveness of an organization is measured by the extent to which it carries out its purpose. To be sure, that purpose is not always clear in the minds of contributing members, and individuals frequently coöperate for different and personal reasons. In the case of an administrative organization, however, objective measurement of effectiveness can be made only in terms of the legal or official statement of ends to be sought.

But in order to carry out its prescribed tasks over a long period, an organization must survive; and to survive, it must avoid undue and unnecessary consumption of human energy and of other human sacrifices. Every individual belongs to several organizations, each of which requires effort or some other sacrifice on his part. To some extent, these organizations must compete for his contributions. We may assume, therefore, that the less human effort and sacrifice required by an organization to perform a given task under given circumstances, the greater the assurance that the organization will survive and continue to fulfill its purposes.¹⁰

⁹ Some authorities define organization as the arrangement of personnel for the accomplishment of a purpose. Cf. Gaus, White, and Dimock, *The Frontiers of Public Administration* (1936), pp. 66–67, and L. D. White, *Introduction to the Study of Administration* (1939), p. 37. While the arrangement of personnel is essential, and while that is the center of attention in organization charts and plans, the definition is suggestive of preparation rather than of action. No organization actually exists except in so far as there is concerted activity.
¹⁰ This is apparently what Mr. Gulick has in mind when he says that "in the science of administration, whether public or private, the basic 'good' is efficiency." Gulick and Urwick, *op. cit.*, p. 192. The idea is basic in all discourses on public administration—even among those who object to the emphasis placed upon "effi-
The degree to which an organization accomplishes its task depends upon three primary factors; namely, (1) the accomplishments of individual members, (2) the number of members, and (3) the coördination of individual efforts. The first two of these factors give potential power or effectiveness to the organization because they represent the energy consumed by it. The third, with which this article is particularly concerned, is the factor which determines the efficiency of the organization.11

Coördination involves several essentials, among which are (1) the attachment of individual accomplishments to the common task, (2) the avoidance of individual activities which interfere with or nullify one another, (3) the performance of all activities necessary to make any given individual accomplishment contribute to the common purpose, and (4) the timing and placement of individual activities in such relationship to each other that the common purpose will be accomplished.12

James Mooney lists coördination as "the first principle of organization."13 The propriety of that designation becomes obvious when one realizes that all other phenomena which serve to promote the attainment of organizational objectives operate through coördination. Therefore, the principle of coördination, which I state here in terms of causal relationship, may be classed as the first axiom in a rational theory of administration:

**Axiom I:** The degree to which any given organization approaches the full realization of its objectives tends to vary14 directly with the coördination of individual efforts within that organization.

II

Having stated the basic axiom, one faces the necessity of explaining the phenomena which serve to promote or to impair coördination. An examination in operation." Difficulties and disagreements arise in the attempt to determine the relative importance of different kinds of human sacrifice.

11 These factors cannot be isolated. As the later discussion will indicate, coördination is largely a consequence of individual efficiency, and individual accomplishment is also dependent upon coördination. The factors may be considered separately, however, in the sense that price, demand, and supply are considered separately by the economists.

12 The result of coördination is efficiency of the organization. The result of manpower, individual accomplishment, and coördination is effectiveness of the organization.

13 Mooney defines "principle" as a characteristic which is universal. By his definition, coördination is a principle of organization because it is characteristic of all organizations. Having adopted that definition, he is content merely to name "principles" without explaining them in terms of causal relationship. The present article is based on the proposition that coördination, while essential to all organization, is a variable which tends to produce like variations in the effectiveness of an organization.
nation of published materials in the field leaves one with the impression that most students of administration agree with Mooney, who places "the principle of leadership and command" next in importance to his principle of coordination. Mooney illustrates the principle by pointing out that if two men combine their efforts to lift and move a heavy stone, one must give a signal, such as "heave ho," in order that the two men can lift in unison. But the illustration involves the start of a new operation rather than the continuous functioning of an organization, and therefore it seems that Mooney has overlooked another vital factor in administrative coordination.

If, instead of the two men moving a stone, one observes an amateur tennis or volley-ball team at play, or even a store or office force at work, one may be impressed by the fact that either work or play is coordinated for long periods of time without any evidence of leadership. While leadership is essential and important, it does not operate continuously.

But coordination is continuous in any but the most casual organizations. This continuity of co-operative interaction is possible only when each member of an organization has learned his task and certain vital relationships between his own activity and the activities of those about him. In other words, a routine of interactions has been established; the relative positions of workers, the individual tasks, and the sequence of operations are known because of a series of past decisions and experiences. The parts of the organization are coordinated much the same as the muscular movements in one's body are coordinated when one walks. No continuous conscious effort is necessary; the organization has acquired a habit of coordination.

**Definition:** Organization routine is that part of any organization's activities which has become habitual because of repetition and which is followed regularly without specific directions or detailed supervision by any member of the organization.

**Proposition I:** Coordination of activities within an organization tends to vary directly with the degree to which essential and recurring functions have become part of the organization routine.\(^{16}\)

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\(^{14}\) In all axioms and propositions, the phrase "tends to vary" is used—instead of the unrealistic "other things being equal"—to allow for factors that would produce contrary tendencies.

\(^{15}\) Gulick and Urwick, *op. cit.*, p. 91.

\(^{16}\) To many persons the term "routine" implies the absence of individual initiative and imagination. However, an analogy may serve to illustrate the difference. A violinist who devotes his entire attention to matters of technical proficiency (the routine of playing his instrument) never becomes a great artist; but neither is it possible for the musician to give his attention to the creative phases of his art until he has mastered the technical problems so thoroughly that he need not think about the details of his finger or arm movements. The routine must be mastered before the violinist becomes a musician. In an organization, the conscious attention is the
The word "essential" is included in Proposition I because routinized activities do not always promote coördination. Every individual who has observed his own behavior knows that while habit makes coördination possible, it may also serve to interfere with coördination. For some unknown reason, perhaps an unexpected situation, an athlete may shift certain muscles unconsciously. The movement becomes habitual and the athlete finds himself "in a slump" until more effective coördination can be restored. In like manner, an organization may adjust itself to certain irregularities, with the result that a new sequence of interaction becomes routine. And the new habits of an organization, like those of an individual, may be "good," or "bad," i.e., they may serve to promote, or they may impair, the accomplishment of an organization's objectives.

III

Organized routine has another important limitation, namely, that it is restricted to regular and recurring activities. The individual knows that situations arise in which he cannot depend upon habit. He must exert conscious mental effort to coördinate his actions for a desired purpose. Again, the analogy is to be found in the organization. Action of a non-routine character, that is, action in which coördination has not been secured through repetition, must be preceded by conscious consideration and decision. Decision is necessary whenever an organization is formed, whenever routine interactivity is deliberately changed, and whenever action is called for which has not become routine in character. While these cases occur only at intervals, the existence of methods of making decisions for an organization is essential to coördination of efforts.

Definition: Decision is the conscious consideration and conclusion regarding a course of action. The decision of an individual may be known only to himself; but the decision of an organization must be made known to more than one person and must be made by a person or persons who are recognized as having authority to speak for the organization.

When action is coördinated by means of decision, it must be because the decision is consistent within itself, with existing routine (except_ attention of leaders, and the routine has been established when the organization carries on without conscious attention of leaders. The "dead level of mediocrity and routine" of which P. W. Melton speaks ("Administration in a Federal Government Bureau," in this REVIEW, Vol. 33, pp. 835, 840) apparently arises because the executive devotes his attention to matters that should be routine and habitual; not because recurring functions have become routine.

17 L. Urwick apparently has somewhat the same idea in mind when he points out that "in organization there is a tendency to compensation, comparable to the tendency found in the human organism." Gulick and Urwick, op. cit., p. 84.
where changes are intended), and with other decisions affecting the same set of interrelations. Coordination in action is a function of coordination in decision.

Axiom II: Coordination of organized activities tends to vary directly with the coordination of decisions by which the course of activities has been determined.

Here lies the virtue of leadership. The problem of coordinating activities becomes more difficult as an organization becomes larger and more complex. But, on the other hand, the number of persons who participate in making decisions can be much smaller than the number required to carry out those decisions. In Mooney's illustration referred to above, two men were required to lift and move the stone, but one could decide when to lift. In fact, when a simple decision is called for, such as fixing the exact time to act, one may decide for thousands.

The essence of leadership, as illustrated by Mooney, is that action is coordinated by means of concentrating the function of decision in one or a few persons. Because performance may be coordinated through decision, this concentration of the authority to decide simplifies the problem of coordinating performance as well as decision. Thus we have a rational basis for the oft-repeated "principle of unity of command."

Definition: Leadership, as an element of organization, is a system of coordinating action by concentrating in a small number of persons the function of making decisions for the organization.

As will be pointed out later, other factors have vital influence upon the coordination of decisions, as well as upon the rate at which coordinated performance follows as the result of coordinated decision. However, these factors do not invalidate Axiom II or the following axiom:

Axiom III: In any particular type of organized activity, coordination tends to vary inversely with the number of persons directly participating.

18 The term "leadership" is used here in a limited and non-personal sense. Types of leadership or personal characteristics of leaders are not considered in this article. 19 Gulick and Urwick, op. cit., p. 9. Marshall Dimock, Modern Politics and Administration (1937), p. 270. For views approving the idea, see also L. D. White, Introduction to the Study of Public Administration (1939), p. 51; A. E. Buck, The Reorganization of State Governments in the United States (1938), pp. 17-19.

20 The reader should recall that while coordination promotes efficiency, it is only one of the factors which determine the effectiveness of an organization. (Cf. note 12, supra.) This axiom does not lead to the conclusion that several small and independent organizations are more efficient than one large organization. If the same task is to be performed, integration does not increase the number of persons involved.
Axiom III is of particular importance with respect to leadership, since the acts of decision lend themselves most easily to concentration. With this kind of application in mind, we may combine Axiom III with Axiom II and derive the following proposition:

**Proposition II:** Coördination of organized activity tends to vary directly with the degree to which the function of making decisions for the organization is concentrated.

Particular caution is required to avoid possible misinterpretation of Proposition II. In the first place, we must remember that to concentrate the power to decide is not necessarily the same as to concentrate the function. Over-concentration of the power may result in a dispersing of the function. Moreover, the lack of communication and knowledge, which factors are discussed below, may serve to nullify an attempt to promote coördination by concentrating the function of deciding.

**IV**

In considering the relationship between decision and performance, we must not overlook the important element of communication. Obviously, no decision can affect action if that decision is not communicated to the points at which the relevant action takes place. In like manner, decisions cannot be coördinated with the routine activity unless facilities are provided to communicate appeals for decision from the points where the need has been observed.

The importance of communication is a factor to which many advocates of integration and "unity of command" seem to have given inadequate attention. Too often their arguments suggest that if the authority to make decisions is properly concentrated, communication will take care of itself. But anyone who carefully observes an administrative agency in operation, even for a short period, is likely to be impressed by the difficulties of communication. The individual worker frequently does not know what questions he should decide for himself, or to whom he should appeal for decisions when an appeal is called for. Many times he finds that the person to whom he goes is too busy to help him, and time is lost while he awaits a decision. Such cases become truly serious when intermediate supervisors do not dare to make decisions, or when higher officials insist upon personal control of more decisions than they have time to handle expeditiously. Add to this the cases where lines are crossed and subordinate officers go over the heads of their immediate superiors, and possibly outside of the official organization to political party headquarters, for decisions, and we have a picture of the disorganization in many of our governmental agencies.

The reader may have noted that the "lines of communication" emphasized here appear to be synonymous with what is generally known as
"lines of authority." In fact, the former may be defined as lines of authority in operation; they function only when communication can be maintained between points of decision and points of action. Legal, or "official," authority is worthless, or worse than worthless, when the person who possesses authority does not have, or does not see fit to use, facilities necessary to make and communicate to points of action the decisions which he is required to make, or which he insists upon making himself.

The existence of lines of communication between points of decision and points of action depends upon two important elements, namely, (a) freedom from interference by other lines of communication which may monopolize the time of persons in authority, and (b) recognition of the existence of authority to make decisions.

(a) The first element may be described as the readiness to communicate at the upper level, or point of decision. Mention has already been made of the fact that decision cannot serve to coördinate action if the person in authority cannot be reached for a decision when called upon. A congested waiting room often tells only part of the story about the difficulties of reaching the administrator in the inner office; subordinates who are conscious of the situation may postpone vital action for days because the superior is "obviously too busy." Effective coördination is dependent upon the ability of subordinates to appeal to the points of decision when necessary, and to get decisions which are communicated to points of action without undue delay.21

(b) The second element mentioned above, namely, recognition of the existence of authority, may be described as the readiness to communicate at the lower level—the points of action or of subordinate decision. An officer cannot make decisions which serve to coördinate action if his order, or communication, is not recognized by subordinates. Such a situation often arises when no definite lines of authority have been agreed upon, when a superior officer makes a practice of giving specific orders to workers without considering the importance of communicating through intermediate authorities, and when a person at an intermediate level is known not to be in good standing with his superiors.22

21 Not every appeal requires immediate decision; but an administrator must have time to make decisions which are called for immediately, and to recognize the order in which questions ought to be decided and the information to be obtained and persons to be consulted before an order is issued.

22 Under a spoils system, it is often necessary to retain an intermediate officer for some time after a change of party control, because his technical knowledge is indispensable pending the time when the new employees learn their tasks. When such an officer is flanked above and below by members of the new party, he usually exercises no authority; and the practice of passing over his office in departmental communication may become so habitual that his successor also exercises very little influence. The practice of jumping lines of authority (breaking the official channels
To a large extent, the maintenance of efficient channels of communication depends upon the establishment of a routine. If the worker knows whom he should consult when in doubt, if the subordinate officer knows what kinds of questions he may decide and what kinds he should pass on to his superior, and if the superior likewise knows when he should not interfere with his subordinates, the system of communication usually operates efficiently. On the other hand, when the superior follows no consistent plan, or when he refuses to delegate authority to decide detailed or technical matters, the entire system of communication may be confused and inefficient.

Space does not allow further consideration in this article of the nature of administrative communication or the conclusions that may be drawn with respect thereto. If the following proposition is accepted as valid, further conclusions can be drawn by others who may continue the study, and systems of organization may be tested by those conclusions. Suffice it to state here one apparent conclusion, which is that coördinated administrative performance is most probable when the point of decision is near to, or within easy reach for communication from, the points of action—provided, of course, that the former is sufficiently high in the hierarchy of organization to avail itself of communication lines to all points of action to be governed directly thereby.23

Proposition III: Coördination of performance tends to vary directly with coördination of decision, but the changes in the former follow changes in the latter at a rate which varies directly with the efficiency of the lines of communication between points of decision and points of action.

V

Propositions II and III and Axioms II and III have been set forth as possible principles of authority, or, in the highly descriptive terminology used by Mooney, principles of "perpendicular coördination."24 But Mooney points out that the "principle of horizontal coördination" is equally important. He explains that this principle operates through the "universal service of knowledge" rather than through authority and command.

Basically, "horizontal coördination" is little more than another phase of the "system of communication" already referred to. It takes on special

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23 Further clarification of the nature and causes of red tape, the merits of various systems of field organization, and the merits and demerits of the board type of administrative control are only a few of the problems that might be analyzed on the basis of the proposition drawn from this discussion of "lines of communication."

characteristics because it operates principally before rather than after
decision, and because it brings to attention another factor in coördination,
 i.e., knowledge.

Proposition I indicates that organization routine is a major and con-
tinuous factor in coördinating organized activity. Since the process of
decision operates intermittently, it can ordinarily promote coördination of
performance only when the decisions are adapted to, or coördinated with,
the existing routine. In order that a decision may be adapted to the exist-
ing routine, it is necessary that it be based upon knowledge about that
routine. An officer who is far removed from the points of action can make
decisions consistent with existing routines only by communicating with
operating agencies, or with other agencies which have, or can obtain, the
essential information.

Another illustration of the importance of a service of knowledge arises
from the fact that administrative decisions affect many activities which
are far beyond the recognized sphere of authority of the officers who make
the decisions. For example, a state director of revenue may make a de-
cision designed to insure more effective collection of sales taxes. In so far
as this decision affects the administration of income taxes or other special
taxes, the director may issue orders to promote coördination. But the re-
sulting activity of governmental agents and employees may have to be
coördinated with the methods by which business is carried on in the state,
or with the constitutional principles of our federal system of government,
either of which is beyond the control of the director of revenue. Knowledge
of certain business methods and of constitutional principles, therefore,
becomes fundamental to securing administrative coördination.

A single decision may serve to govern activities within several depart-
ments of an administrative system, and, at times, even to govern action
within several units of government. But no decision or set of decisions can
cover all governmental activities—not to mention related economic and
social activities. Furthermore, if decisions affecting only the internal
operations of administration were made at an administrative level high
enough to cover all cases related thereto, the probabilities are that lines of
communication would be clogged at the upper levels, and that coördina-
tion would be impaired rather than improved by the attempt to coördi-
nate through control instead of through adaptation.

Because coördination through control is possible only within narrow
limits, it follows that almost every decision is made with the idea of
changing action within definite and narrow limits and of coördinating that
action with the related activities not governed by the decision. The
limited sphere of the decision may be called the "governed" or "strategic" 
factor, whose control, within the sphere of coördination with ungoverned
factors, may produce new action designed to carry out the purpose of the
decision. An objective of this character necessarily requires that the decision be based upon knowledge about the related factors; otherwise there is no assurance that the decision will promote coördination. We may conclude, therefore, that a decision promotes coördination between “governed” activity and “ungoverned” activity only to the extent that the decision is based upon knowledge about the related, “ungoverned” activity. In the same manner, coördination between activity which results from a decision and other activities within the same administrative agency is assured only if the decision is based upon knowledge about existing routine. This idea may be expressed in another way by saying that effective coördination requires that, over a limited period at least, decisions shall be governed by action to a greater degree than action is governed by decisions. For only the “strategic factors” can be governed by decisions, while the latter, in turn, must be guided by all related activities if coördination is to be promoted.

The causal relationship between knowledge and coördination is expressed in the following proposition:

**Proposition IV:** Coördination between activity resulting from a set of decisions and related activities not governed directly by those decisions tends to vary directly with the extent to which the decisions are based upon knowledge about the related activities.

But the persons who make decisions cannot collect and analyze essential information without impairing lines of communication between points of decision and points of action. Furthermore, the less important decisions must be made at points where the records at hand do not provide adequate information about other administrative units. Therefore it becomes necessary to transmit information from one agency to another through channels of communication which will not interfere unduly with the channels used for purposes of communicating decisions. And it becomes necessary, also, that in any large administrative organization certain agencies be maintained for the sole purpose of collecting, analyzing, and transmitting to points of decision such information as may be useful in coördinating strategic factors of organized activity with related activities not governed directly by administrative decisions. Such information can be interpreted and transmitted to points of decision when called for, when it appears that the information itself may lead to decisions, or when the knowledge may influence decisions that are made immediately upon appeal to the respective positions of authority in an organization.

Again it becomes important that facilities be made available for an effective system of communication. The following proposition expresses

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Cf. Chester I. Barnard, *Functions of the Executive*, Chap. 14, for further definition and illustrations of the “strategic factor.”
a relationship between knowledge and coördination, similar to that expressed in Proposition III with respect to leadership:

Proposition V: The extent to which decisions are based upon knowledge about related activities tends to vary directly with the efficiency of lines of communication between points of decision and points at which facts are collected and analyzed.

Propositions relating to "horizontal coördination" and the importance of knowledge as a basis of decision emphasize a phase of administration which deserves particular attention. Information is basic to any improvement in organization routine; it is essential in order to adapt decisions to existing routines; and it is the key to development of an efficient system of communication within an organization. The principles involved suggest the importance of certain democratic processes within administration, such as consultation with the minor officials in charge of activities which will be affected by a contemplated decision, and the use of conferences with interested parties outside of the administration when decisions may affect personal rights of citizens.

But it is not the purpose of this article to apply the hypotheses which have been set forth. A few "axioms" and "propositions" have been presented in the hope that they will be scrutinized and tested in the light of experience, that those parts which are found good may be retained while other parts may be modified or discarded, and that many other hypotheses may be added thereto. Finally, the writer hopes that, by extension and improvement of the above method of approach, a body of theory may be found adequate to support and guide the empirical studies necessary to the development of what may be called, without apologies, a science of administration.

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The Lack of a Budgetary Theory. On the most significant aspect of public budgeting, i.e., the allocation of expenditures among different purposes so as to achieve the greatest return, American budgetary literature is singularly arid. Toilers in the budgetary field have busied themselves primarily with the organization and procedure for budget preparation, the forms for the submission of requests for funds, the form of the budget document itself, and like questions.¹ That these things have deserved the consideration given them cannot be denied when the unbelievable resist-