George:

This paper will interest you. We were on our the morning—yesterday

Larry

THE TEACHING OF EXPLANATION IN HISTORY

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During recent years there has occurred a rediscovery within the field of inquiry that is concerned with the theory of teaching. Or, if the term "rediscovery" too readily implies a past familiarity and understanding with subsequent loss of contact, then there has occurred a re-orientation or a sharpening of focus on a significant aspect of the theory of teaching. This aspect or field of inquiry has to do with the logical and linguistic elements of instruction.

Two of the speakers in last year's session of this group, Professor Metcalf of the University of Illinois and Professor Earl Johnson of the University of Chicago, both have demonstrated this re-orientation in some degree by their reference to these logical and linguistic elements in connection with social studies. In their papers--as well as in their books on theory and practice in social study--under the general rubric of reflective thinking or reflective inquiry, both have begun to draw attention to the role of logic and language as a part of the fundamental framework of a rationale for social studies teaching.

Professor B. Othanel Smith in an address to the Philosophy of Education Society in the spring of 1957 suggested further exploration of the area of what he described as educational logic. (Educational Theory, Vol. VII, No. 4, October, 1957, pp. 225-233.) Professor K. B. Henderson in the Ninth Yearbook of the American Association for Colleges for Teacher Education, AACTE, (Oneonta, 1956) has also described some of these logical and linguistic elements, their inclusion in a course in teaching methods, and a study of their application in secondary school subjects, including social studies.

At the applied level, also, there has been greater interest in these aspects of teaching--"applied" here to be taken as referring to the activities of some social studies teachers in developing evaluation materials. For example, in the preliminaries to preparation of a series of tests, a group of social studies teachers expressed the following as sought-after skills: "The student may be required to assess the adequacy of data with respect to the relevancy, sufficiency, verifiability, and consistency." Also, "The student may be required to draw valid generalizations and conclusions." (General description of the STEP Series--Sequential Tests of Educational Progress--Educational Testing Service, 20 Nassau Street, Princeton, N. J., 1957.)

In these statements of desired outcomes, the particular logical and linguistic elements involved may not always be made highly explicit. But the re-assertion of these points as outcomes--and certainly their translation into classroom practice--entails at some point consideration of principles from logic and language, or philosophical semantics. It is difficult, for example, to see how students can be taught to examine the validity of conclusions without some attention to the notion of validity and to the rules for telling whether or not a conclusion is valid.

The line of thought to be developed in this paper is within this general vein of interest in the logical-linguistic foundations of instruction as they are related to social studies. But the social studies prospector soon finds that there are many related veins in the lode waiting to be explored and assayed. Before considering the main topic--explanation--it may be appropriate to point to at least two related veins as a way of showing something of the significance of the whole field. In one vein, for example, there are questions having to do mainly with language. What kinds of terms and expressions most commonly make up a large element of social studies content? What are the descriptive and the prescriptive terms? There is such a wide variety -- "the frontier," "the state," "public welfare," "internal security," "the Confederacy," "the North," "the South," "the White House," "peace." To what do these terms refer?

How do we arrange instruction so that procedures concerned with the terms and expressions encountered in social studies content call for something more than merely, "Identify these terms," or "Expressions to be remembered," or "Check the definitions of the following"? What do teachers need to know about language so that at least one outcome of social study is an attitude and a habit of requiring criteria for the use of the large numbers of vague and ambiguous expressions encountered in social studies content? What do we need to do with social studies language so that students come to know that there are different ways of defining, so that they recognize that much apparent lack of agreement and feckless discussion can stem from unrecognized shifts of the meaning of the words they are using? What do teachers need to know and to have in the way of suitable materials to show students that a viewpoint often appears acceptable when in actuality the terms involved are implicitly defined to point to the desired conclusion? Questions like these point to the linguistic vein of exploration in the area of inquiry about teaching.

Another branching vein has to do with the rules for careful analysis of argument. In some cases progress in analysis of argument has been made by using procedures that help students to realize that there is more than one view or "side" to historical and contemporary questions of public policy. Some available materials present "cases" for and against, pro and con--one side says..., the other side claims..., and the like. But what do students need to know about analysis of the argument in these views? The usual two-sided analysis, caught in a peculiar spatial metaphor of sides and middle, may lead merely to the habitual and dubious view that the correct position lies somewhere in between. To escape the limits of the spatial metaphor, it is necessary to ask what social studies teachers and students need to know to identify reasons, to distinguish reasons from conclusions, to evaluate the soundness of the way reasons and conclusions are related. What do they need to know to provide that another outcome of social studies instruction be ability to detect common fallacies? Though detecting fallacies may be desirable, it is essentially negative--a clearing away of rubble before solid construction can begin. Beyond this, what is needed in social studies instruction so that teachers can equip students not only to recognize fallacies and propaganda, but to recognize sound or valid conclusions based on premises which are in turn as strongly established as possible within the limits of methodology of truth?

These foregoing sets of questions point to some of the related veins for exploration in the field of logical and linguistic aspects of social studies teaching. The chief line of thought for the moment, however, is the topic of explanation--another of the elements of logical and linguistic foundations. Concerning explanation, I would like to do several things: to consider the point that we do use the process of explanation; to describe several ways in which explanation is carried on; to analyze or describe in greater detail a significant form of explanation; and, finally, to make some points about the teaching of explanation.

The first point, that explanation is in fact one of the frequently encountered elements of social studies teaching, is perhaps obvious, though it is also neglected--like the crack in the schoolroom plaster that too readily fades into the background. Explanation is an aspect of instruction as much as are speaking, listening, reading, and locating information. Some of these foregoing processes--such as listening, speaking, reading--are elements that come into focus when classroom activities are viewed with concepts taken from the well-known area of communications skills. Still other processes--raising questions, formulating hypotheses, deducing propositions that are predictions or possible consequences, locating data, examining evidence, and the like--these are elements that become significant when classroom activity is viewed with the conceptual scheme of reflective inquiry. That is, a person concerned to discover whether the skills of reflective inquiry are being developed in classrooms will look for a combination of such processes as formulating hypotheses, locating data, and examining evidence.

Attention in social studies materials and techniques has, of course, been given to the communication aspect of instruction. Attention has also been given--in some materials, at least--to the reflective inquiry aspects, although there may be very little evidence on a nation-wide basis about the actual extent of translation of these desirable aspects into the performance of all social studies students. On the other hand, though explanation is also a more or less regularly recurring element of classroom activity, it has been generally carried on in a somewhat unaware fashion, performed automatically without recognition or examination of it as having a significant structure. To put the point another way, social studies materials are available so that teachers can help students to judge their individual reports or their panel discussions. Also, there are some materials for social study, particularly in problems courses, that call attention to the elements of the process of reflective inquiry. But there has been little or no analysis of explanation provided for teachers, and little terminology offered for talking about explanation. And practically no steps have been taken toward helping students judge or talk about their explanation of events or situations. Yet from the point of view of encouraging careful and precise thinking, as well as from the point of view of understanding of social phenomena and making wiser social policy decisions, ability to examine the quality of explanations and possession of knowledge about the nature of explanation in general are undoubtedly significant.

Yet, though it is neglected as a specific object of attention, explanation

is present and even in one sense judged desirable. Teachers not only expect students to inquire into matters about the who-what-when-and-where of events and situations, but they also expect students to deal with why -- that is, to explain events and situations. Textbooks, and supplementary materials as well, offer explanations both explicitly and implicitly. Any even casual examination of study questions at ends of chapters, of questions on teacher-prepared study guides, or of oral questions in classes quickly turns up a list of explanation questions. These are often in the form of why-questions, and they are usually judged desirable as a way of pointing to relations between events or of getting students to deal with content in more than a purely descriptive and repetitive manner. Sometimes they appear under the general heading of "Thought Questions."

The why-questions appear in a considerable variety of forms and in connection with practically all topics of customary social studies content, historical or otherwise. Questions like these are more or less typical of history courses:

Why did ancient civilizations form in river valleys?
Why did the colonists come to America?
Why did Jefferson purchase Louisiana?
Why did the Dred Scott decision arouse Northern opposition?
Why did the U.S. refuse to join the League of Nations?
Why was Social Security accepted in the U.S.?

Questions of this variety drawn from long-accepted historical content, then, are familiar and have been regarded as a notch or two above the ordinary identification or descriptive questions that call for an ordinary recounting of particular facts. They are usually viewed as more probing and penetrating--as questions that lead to more reflection. But reflection may not necessarily be involved in many instances, as a matter of fact, for answers to some explanation questions may be merely repetition of statements presented in text reading. They may be no more reflective than answers to the largely descriptive kind of query. However, thought provoking or not--depending on other aspects of the class situation--they are as common a part of social studies instruction as text reading and the noting of heroic remarks in military crisis.

The presence of explanation in social studies teaching, like the presence of a wide variety of terms to be defined and of many instances of argumentation and reasoning, leads to further questions. What is it that social studies teachers need to know about explanation in order to make explanations, or to help students examine critically the explanations encountered in content or make explanations of their own in something more than a routine, repetitive fashion? More careful analysis of explanation as a logical procedure is in order as a step toward providing some kind of an answer.

In spite of the fact that sometimes explanation questions may not involve much more than reasonably accurate recall of text material, they are usually raised for a reason. Teachers employ why-questions, they call for explanations, when the immediate purpose is to develop understanding of an event--to show how one set of phenomena, one set of events, actions, or situations, is related

to another set of events, actions, or situations. An answer to the question, "Why did the U.S. refuse to join the League of Nations?" for example, calls for relating in some manner the movements in public opinion--the discussions, debates, editorials and views of different groups--to the beliefs and actions of key individuals in Congress at the time. Usually the answer is cast in the form of reasons. The offering of a set of reasons constitutes the explanation. It is this kind of why-question and the form of an answer that I would like to examine more carefully. But before doing so it is useful to mention some instances of so-called explanation which are in fact another kind of process. Consideration of them helps to eliminate some ambiguity.

One common use of the term "explanation" or "explain" in social studies instruction is not a matter of answering a why-question or of relating sets of events. The question, "Explain the separation of powers in the American federal government," for example, or "Explain how to use the map scale," or "Explain how to locate a biography of Jackson," or "Explain the data on the chart"--some of these commonly encountered questions, though using the term "explain," call for a description rather than an explanation in a more formal sense. The expected response to, "Explain the separation of powers in the American federal government," is a series of statements cataloging certain information. The question is customarily answered acceptably by naming the branches of the federal government, and by stating what the separate, yet interrelated, functions of the branches are. When this is done with factual accuracy the explanation is judged to have been performed. The question calling for explanation of how to locate the information is customarily answered by statements describing a series of actions, supplemented with information about subject cards in the library card index. The point here is that in instances of this sort the term "explain" is used to mean "describe." The explanation is a description. Of course, in many cases where explanation does mean description there is little or no resultant confusion. Teachers and students run into no particular difficulty, and the performance of students is more or less equivalent to the expectation of the teacher.

Another use of the term "explanation" can be seen in such questions as, "Explain the term 'manifest destiny'" or "Explain the expression, 'the white man's burden'." Text questions and teacher-made questions will yield a larger stock of similar questions from long-familiar social studies content. Sometimes the item to be explained in this sense is a brief expression. Sometimes it is a phrase or a sentence or two. The usual expectation in this kind of question is for the student to give some sort of interpretation. In this usage, explanation is similar to the expression, "give the meaning of." The answer contains a series of statements that express in simpler or more familiar language the idea represented in the selected phrase. And as in the earlier instance when explanation was the equivalent of description, the ambiguity does not necessarily lead to breakdown of communication. Again the performance of the student, if factually correct and linguistically clear to the listeners, is accepted as an adequate response to the query.

Some instances when explanations are called for as part of social studies

instruction are, then, instances of either description or of interpretation rather than of explanation in the more precise and formal sense of accounting for an event, that is, of relating an event to some other social phenomenon. This latter variety of explanation is the kind which I should like to consider next in greater detail. First, I shall present a general form or structure of a formal explanation, and then I shall examine some parts of that general form.

This formal or, as it is often called, scientific explanation has been presented by Hempel and Oppenheim (in "Logic of Explanation," Readings in the Philosophy of Science, Appleton-Century-Crofts, New York, 1953, pp. 319-352). A simple example can serve as a stepping stone to their level of analysis. Take the common question, "Why did the car tire go flat?" and a possible response or reason, "There's a nail sticking in the groove of the tread." Here, a not very startling reason is given for an ordinary if not especially enjoyable event. The understanding of the explanation, of course, rests on familiarity or recognition of the generalization that tires with nails in them usually lose air. The generalization expresses a relation between situations like the presence of nails in the walls of containers of compressed air and the level of air pressure in the containers. Since routine experience has familiarized practically everyone in our culture with this generalization, the reason, whether offered in the precise language of physics or in ordinary speech, is accepted; and the generalization is used as a basis for action in the form of looking for the nail and repairing the puncture. The point here is that the form of an explanation basically involved, first, a generalization of some kind; second, a recognition on the basis of evidence that the situation at hand is an instance of that generalization; and third, the usually tacitly accepted or obvious conclusion of a statement that describes the event to be explained. The first part, the generalization here is, "Tires that have nails in them generally lose air." In this case the generalization is supported by common knowledge based on ordinary experience in a culture that often rides on air. The second part, recognition that the case at hand is an instance of that generalization--that there is in fact a nail in the tire--is supported by evidence from direct observation. The third part, the conclusion as a statement, "That's why the tire is flat," is usually omitted from ordinary conversation or tacitly recognized by a gesture or exclamation of dismay, depending on the temperament of the car owner.

The structure of an explanation is thus triadic. It has three legs, like the old-fashioned milking stool or like the tripod for an engineer's transit or a photographer's camera support. Here that structure has been shown in its more precise logical form of generalization, evidential statement, and conclusion. The pattern of this form and the statements comprising it are clearly distinct from the pattern established by the chronological sequence. The chronological sequence would be comprised of a series of statements describing such events as the tire inflation, the nail piercing the tire wall, the air escaping, and the driver's observation. The logical form of the explanation is also distinct from the pattern established by the psychological problem-solving sequence. In the problem-solving sequence the pattern involves such elements as these: first, the observation of a flat tire and the associated concern or dismay; second, an inference about the probable presence of a nail as the source of the difficulty;

third, the use of this inference as a hypothesis that there must be a nail somewhere; next, a test in the form of a search for the nail; and finally, a solution in the form of removal of the nail and repair of the tire. Logical form, chronological form, and problem form thus represent different schema for viewing the matter. The first involves analysis and understanding of relationships, the second involves narrative, the third involves action toward a new state of affairs.

With this preliminary sketch of the logical form of a precise explanation in mind, as separated from the more familiar chronological sequence and the psychological sequence, it is interesting to examine the more rigorous account presented by Hempel and Oppenheim. They offer the somewhat more complex instance of a mercury thermometer thrust into hot water.

"A mercury thermometer is rapidly immersed in hot water; there occurs a temporary drop of the mercury column, which is then followed by a swift rise. How is this phenomenon to be explained?" Or as the question often occurs in classroom instruction--Why did this happen? "The increase in temperature affects at first only the glass tube of the thermometer; it expands and thus provides a larger space for the mercury inside, whose surface therefore drops. As soon as by heat conduction the rise in temperature reaches the mercury, however, the latter expands, and as its coefficient of expansion is considerably larger than that of glass, a rise of the mercury results." This account consists of statements of two kinds, according to Hempel and Oppenheim, and I am reversing the order in which they consider the two.

"Statements of one kind express certain general laws; in our case these include the laws of the thermic expansion of mercury and of glass, and a statement about the small thermic conductivity of glass." (These statements perform the function of the generalization about nails in tires in the less rigorously analyzed instance of the flat tire.) "Statements of the other kind "indicate certain conditions which are realized prior to, or at the same time as the phenomenon to be explained." Hempel and Oppenheim refer to them as "antecedent conditions." In the illustration, the antecedent conditions include, among others, the fact that the thermometer consists of a glass tube which is partly filled with mercury and which is immersed into hot water. These antecedent conditions correspond in the case of the flat tire to statements about the structure of the tire, the air pressure, and the presence of the nail. "The two sets of statements, if adequately and completely formulated, explain the phenomenon under consideration. They entail the consequence that the mercury will first drop, then rise. Thus the event under discussion is explained by subsuming it under general laws, i.e., by showing that it occurred in accordance with those laws, by virtue of the realization of certain antecedent conditions."

The structure of the explanation which Hempel and Oppenheim delineate is broadly similar to the more ordinary instance of the tire, but it is more complete in that the authors describe more of the law-statements and statements of antecedent conditions. With these instances in mind it is possible to notice several of the criteria for the adequacy of an explanation. These criteria may be thought of as partly logical and partly empirical--empirical in the sense of material truth.

A first criterion, one of internal validity, is that the statement describing or naming the event to be explained must follow logically from the reasons offered. It must be a valid conclusion from the statements of laws or generalizations and from the statements of antecedent conditions. The logical aspect may be seen by regarding the form of the explanation as a chain of reasoning--a syllogism in which the generalization statement is one premise, the evidential or subsuming statement of antecedent conditions is another premise, and the description of the event to be explained is the conclusion. In skeletal form the reasoning would appear something like this when stated as hypothetical or if-then reasoning: if any inner-tube tire is punctured, it will deflate. This tire is an inner-tube tire, and it has been punctured. Hence, this tire is deflated.

It is conceivable of course that in many instances of explanation there will be more than one such syllogistic chain. Often the phenomenon to be explained is analyzable into several parts, as in the case of the thermometer. The mercury first falls slightly, then rises. An analogous case in tire inflation, of course, would occur if the tire were inflated to an excessively high pressure so that the tube split and then suddenly went flat. In the more complex cases, there will be several lines of reasoning, just as there are several lines of supporting ropes to the masts of ships or to radio and TV transmitter towers. For each line, the criterion of logical consistency would be applicable.

A second criterion of adequacy is the presence of law-statements or generalizations. These are statements of a considerable degree of generality so that many instances of one kind of phenomena are brought together in one term of the generalization and related to many instances of another kind of phenomena brought together in the other term of the generalization. Instances of the application of heat to mercury are related to instances of the expansion of mercury. With such phenomena the relation has sufficient regularity and precision to be assigned the status of a law of thermic expansion. With other phenomena it may not be possible to state the relation with such precision nor to deduce the law from still broader statements. Thermic expansion, for example, can be deduced from statements about molecular action. In the less rigorous cases, the expression "generalization" or "law-like statement" or "statement of greater or less probability" may be more fitting than the expression "law." But aside from the question of the probability status, the generalization should be broad enough to avoid being trivial. It should not be so limited as to have no explanatory power or to offer no ground for action, if the case is concerned with changing states of affairs.

A trivial explanation in the tire instance would perhaps be the following. To the question, "Why is the tire flat?" the answer might be, "Because there isn't any air in it." Or like the retort to the question, "Why are you pushing your car?" -- "Because is won't go." In social studies instruction the question, "Why did the colonists migrate?" might be answered trivially, "Because they didn't like the conditions where they lived." It may be that triviality is partly a matter of familiarity, and that what is trivial to one may not be trivial to someone else who is just reaching a new individual level of understanding. But

the point remains that for an explanation to be satisfactory, the presence of some more or less rigorous generalizations with considerable breadth of explanatory power is a vital element.

As a matter of fact, it is in this connection that explanation in social studies is frequently remiss. For those who make explanations--text authors, teachers, students, and often the original investigators -- fail to recognize the role of generalizations and neglect to attempt to formulate them. Teachers, often being unaware of the role of generalizations, do not encourage students to use them. Instead, in much instruction, teachers accept a list of reasons which make up only one of the elements, and which leave the three-legged milking stool with only two legs for support. In the neglect, opportunities to cultivate both appreciation for deduction and the nature of generalization in a legitimate fashion are continuously lost from processes of instruction.

A third criterion of the elements of a formal explanation is an empirical one. The generalization must be testable in some fashion that follows procedures according to recognized canons of inquiry. In the case of the tire, the generalization about nail punctures and flat tires is obviously at a level easily tested by direct observation. The laws about thermic expansion are also testable, although presumably in a laboratory context. In the case of economic or political generalizations, the testability may be less rigorous and will usually entail inquiry in a broader arena of space and time, such as the arena of national histories. A case in point from the realm of economic activity is Gresham's law--the generalization loosely expressed to the effect that bad money drives good money out of circulation. This so-called law is usually used to account for some aspect of events related to monetary or currency inflation, such as the hoarding of the more reliable forms of coinage. For this law, the accumulation and weighing of evidence that serves as the testing process entail examination of a series of instances of monetary inflation or of purposeful currency depreciation, such as the reduction of the amount of silver in the standard coinage. The series of instances may include the monetary practices of European kings who called in coins, melted them down, and re-issued coins with a lower proportion of silver. The instances also might include cases of currency depreciation in the American revolutionary era, as well as the printed money inflation in Austria and Germany in the post World War I era. Such similar instances serve as a basis for examining what has occurred at times when both good and bad money have been in circulation and where there has been some kind of change in the nature of the circulating medium.

Investigations of this scope may not often take place in social studies classes. Sometimes, in American history texts at least, the generalization about good and bad money is stated, and it is usually accepted as part of the given nature of economic activity. But the generalization remains open to scrutiny on the basis of evidence, whether or not in a customary subject matter it actually gets examined.

To take an example from the political realm, the arena for the collection of evidence might be less extensive, depending on the phenomena to be explained. The

recent defeat of proportional representation in a municipal election in Cincinnati, for example, was explained by some commentators, in part, by reference to the strength of the county Republican organization which was opposed to the proportional system of representation. For this event the generalization would be: If in any local election one party is thoroughly organized compared to the other, then the organized party usually wins. The explanation would continue with the statement of antecedent conditions that in the Cincinnati election the local Republican group was in fact thoroughly organized with an active and complete roster of ward and precinct officials and captains. The conclusion would be: Hence, proportional representation was defeated. The test of the generalization about election success and party organization would rest on study of a series of municipal elections with instances of thorough party organization and election success and election failure. The test would thus take into account both positive and negative evidence and so conform more closely to recognized standards of inquiry. It would also conform to appropriate sampling procedure. Whether such an inquiry in the field of American municipal government has been carried out by political scientists, I do not know, but certainly the generalization about careful organization is a well-known maxim of practical politics.

Another point to notice about the nature of the generalizations employed is that they are not the loose, didactic kind of claim to the effect that history shows this or history shows that. They are, instead, carefully examined or examinable propositions within a delimited context of similar instances and with terms which can be precisely defined. The term "thorough party organization," for example, can be defined by counting wards and precincts, stating a proportion of ward and precinct officials to available positions, and noting the level of activity in getting voters registered and to the polls. Further, the generalizations are not the sweeping, so-called laws of civilization or decay in which inclusives of phenomena and looseness of definition of terms are so great that the generalizations may make interesting speculative literature but defy examination by careful weighing of positive and negative evidence.

A fourth criterion of the adequacy of an explanation is the obvious one of empirical truth. The weight of evidence concerning the explanatory generalizations must support those generalizations. It must be the case that thorough party organization is associated with election success, or that bad money does drive good money out of circulation. Also, the statement of antecedent conditions must be true. The total array of evidence must support the report that these conditions do prevail, whether the evidence is from direct observation as in watching activities of precinct captains or whether it is documentary and a summary of atatistical data as in the case of reports about the nature of the money in circulation.

With the pattern of formal explanation in mind, and with recognition of the criteria for the selection and relating of those elements, it is useful to notice one or two other examples of explanation. The pattern, as we have seen, calls for law-statements or generalizations of high probability in the light of evidence, and for statements of antecedent conditions. It can be applied to a few historical

examples. Common questions in history courses are: Why was there a war between the North and South? or, Why did some North American colonies revolt against England? or, Why was there a revolution in France against the Old Regime? For questions like these the generalizations can be expressed also in the form of if-then statements. For the Civil War question, the statement would be in this form: If nations exhibit A, B, C ... characteristics, then there is a civil war. In this case the characteristics according to historical scholarship would include such variables as the kind of governmental structure, a kind of economic and property structure, a geographical configuration usually called sectionalism, and a set of ideological beliefs. The explanation in prose form would consist, first, of an assertion of some such complex generalization as a whole or piecemeal, and evidence from civil wars in general in the context of modern nations to indicate the soundness of the generalization. Second, the explanation would consist of assertions with supporting evidence that these variables in a particular configuration did exist in the U. S. at a particular time. Third, it would consist of the conclusion that therefore there was a war between the North and South.

In the case of the French Revolution the explanation will include a generalization of this kind: If monarchies exhibit D, E, F ... features, there is revolution. Second, there will be evidence to show that the French Old Regime did exhibit these characteristics; and third, there will be the conclusion about the occurrence of the conflict. An adequate explanation thus can be seen as a kind of "explanation sketch," to use a term suggested by Hempel in another discussion of explanation. (C. G. Hempel, "The Function of General Laws in History," in Readings in Philosophical Analysis, Feigl and Sellars, Appleton-Century-Crofts, New York, 1949, pp. 510-514.) These sketches may be relatively brief, not more than two or three sentences, when the topic is not judged to be important enough to explore in detail. For other topics, the explanation sketches may be pages long--in terms of high school text pages. Or they may be of extended monograph length, or of full-fledged, so-called definitive treatment in several volumes. In this connection, notice that explanations may be carried on at different levels of generality and inclusiveness. In much historical material there are several levels and contexts intermixed. When historical inquiry is directed toward particular figures--political leaders, presidents, kings, prime ministers, diplomats, generals, administrators--the accounts are at the biographical level. When the biography is detailed and extensive, the explanatory generalizations, either explicit or implicit, may be at the level of psychology. Often individual actions are explained in terms of purpose or intent. Jefferson's purchase of Louisiana is usually explained by saying that his purpose or intent was to secure certain objectives. If the pattern of formal explanation is to be followed carefully, however, the generalizations in these individual psychological explanations would take this form: If persons of A, B, C ... characteristics are in situations of D, E, F ... kind, they act in P, Q, R ... fashion. The A, B, C characteristics refer to the beliefs, attitudes, and information of the individual. The D, E, F kind of situations refer to the configuration of the state of affairs with which the individuals are dealing. The P, Q, R fashion refers to the performances associated with such individuals in such situations. Thus Lincoln with a given temperament confronted with certain situations customarily told humorous stories, or on another level selected the policies that led to preservation of the federal

union.

At another level the explanation may be dealing with groups of people--Puritans, apprentices, colonial merchants, industrial managers, frontier trappers, European migrants, selected ethnic groups in one or another section of the country. At this level the generalizations are drawn often from the area of social psychology. At still another level the explanation may be dealing with broad states of affairs and complexes of events, such as structures of government, monetary systems, systems of production. With each level the context of the explanatory generalizations will be of a different order or draw from different social science disciplines, political science, economics, sociology, social psychology, or geography. It is through assumption or explicit statement of different levels of generalizations and from explanatory generalizations drawn from different disciplines that historical inquiry yields different historical interpretations and different historical syntheses, such as the frontier synthesis, the economic interpretation, the constitutional interpretation, and the like.

Turning from levels of explanation to common instructional practices about explanation, I would like to emphasize that the pattern of the explanation sketch given here differs from the pattern usually encountered in social studies classes and teaching materials. The commonly encountered form is a kind of truncated or incomplete form. As mentioned earlier, classroom explanations usually call for lists of reasons or causes, and texts commonly offer such lists. In some cases, where events have customarily received more attention--the colonization movement, the American Revolution, most wars, and some economic movements for American history courses, at least--the lists of reasons are fairly elaborate. In most cases, however, the reasons are only partial statements of antecedent conditions--statements to the effect that such and such conditions did in fact exist. These explanations are truncated in the sense that the generalizations, political, economic, social, or psychological, are usually omitted. The content of the reasons may be detailed in description, and it even may be absorbing narrative, but it is not related as evidence for a conclusion about the occurrence of an event, since the other premise or set of premises -- the generalizations -- are missing.

Occasionally, too, the explanation offered or expected is in the form of a recital of a series of events. This is often the case with accounts of affairs in the decade before the American Revolution. The various acts and policies of the successive British ministries are presented in chronological order. This recital of events is similar to the chronological account of the tire going flat. It is simply a listing of occurrences rather than a formal explanation. A recital of events may clearly have a legitimate place in instruction as one step toward a kind of factual knowledge, but it is often taken as <u>the</u> explanation instead of being viewed more accurately as a chronology. It is perhaps this confusion of chronological listing with formal explanation that leads to the common fallacy of <u>post hoc ergo propter hoc</u> -- that an event B which occurs after an event A is the result of A or is accounted for by A. Students accustomed only to explanations by chronology have little equipment available to help them examine the weaknesses in <u>post hoc</u> explanations. They are habituated to searching in the arena of

earlier events for the explanations for later events, and they are not accustomed to the search for assumed generalizations about relations of political, economic, and sociological phenomena. They are accustomed to accepting explanations as "reasons for," rather than to examining and reflecting about explanations as chains of reasoning based on assumed generalizations about the total social order.

To turn now to the question of ways of teaching about explanation in history classes, it is possible to discern several points with which students need to become familiar. These points are not given here in a significant teaching sequence, nor are they necessarily exhaustive. They make up a cluster of statements of what students need to know and to know how to do in order to make adequately grounded explanations and to judge the adequacy of explanations of others. First, students need to be able to recognize generalizations -- not in the cautionary sense of over-generalization, though they need to know about over-generalizing also. The sense of generalization intended is that of being able to recognize a statement about a class of events, and of being able to distinguish a statement about a class of events from a statement about an instance of that class. For example, a statement about the Bull Moose Party or the Greenback Party or the Progressive Party is clearly not the same as a statement about third parties in general, within the context of the American political system.

Students also need to know the function of a generalization in explanation as a premise in a deductive argument, and they need to know how to go about formulating that missing premise from the elements of the typical incomplete explanation. Along with this, they need to know what a deductive argument is and the rules for telling whether a deductive argument is valid or not, since a complete explanation in its structure is a deductive argument. They need to know something about the process of testing a generalization, of looking for possible additional instances of the generalization and inquiring whether these instances support or weaken the generalization. They need to know how to define terms precisely so that the meanings are not altered from one part of the deductive argument to another. Students, in brief, need to have an array of knowledge and skill from the areas of logic and language study.

As far as specific teaching procedures are concerned, the following are similar to procedures developed in connection with careful testing techniques or used with other objectives than that of teaching primarily about explanation. These procedures also are not mentioned in any especially significant sequence. It is possible to start with explanations in texts, and it may be just as feasible to start with examples of students' own explanations garnered from conversation, discussion, or from assigned written questions. Assume a teacher is starting with a single text and the topic at hand is, say, political history and third parties. Students could look for any text references to particular third parties, for statements about third parties in general, and for the explanation word clues which usually indicate that some kind of implicit or assumed generalization is lurking underneath the verbiage. It might be interesting to compare third party explanations to see if there were any consistency of explanation from one third party to another.

Sensitizing students to the many words and expressions that are clues to

the presence of truncated explanations is another kind of useful teaching procedure. Prose style for historical narrative commonly mixes both descriptive and explanatory statements, and sometimes the two are barely distinguishable. But frequently historical writing contains an open display of signs of explanation. It is these signs that are the word clues. A list of them would include such expressions as: This was brought about by ..., This affected -- or was affected -- by ..., The effect was ..., X situations or events stimulated, altered, hindered, promoted, led to, or caused .... Other clues are: therefore ..., hence ..., consequently ..., as a consequence of ..., for the reason that ... . Careful reading of passages in historical writing concerned with broad complexes of events will reveal a longer list of explanation clues.

When truncated explanations are found by the aid of these word clues, some of the passages may be used to help students formulate the assumed generalization or generalizations which are the missing premises in the complete form of a logical explanation. Clearly, this formulation process will be simpler if students have already become familiar with the nature of these general statements by analyzing a few everyday situations like the flat tire mentioned earlier. A specific example is a statement taken from one high school American history text. (Wirth, The Development of America, p. 590.) In the narrative about the era before the Spanish-American war, the author says, "It was not long, however, until the rising industrialism in the United States, seeking new markets and opportunities, caused America again to turn her attention to her island neighbor (Cuba)." A later paragraph mentions that "other reasons" for United States' posture toward Cuba were (1) the fear that a strong power might use Cuba as a base against us, and (2) Cuba was a source of annoyance and danger through the failure of Spanish officials to take the necessary precautions to prevent spread of yellow fever to our shores. The tenor of these paragraphs is that of an explanation of why the U.S. became actively concerned with Cuban affairs. Words like the terms "caused" and "reasons" are obvious explanation clues to the practiced reader.

If this account is viewed as a logical explanation, there are several implicit generalizations. These could be formulated in this fashion by students with some background. First, if a nation is industrializing its external policy will be directed toward securing of raw materials and markets in nearby areas. Second, nations attempt to eliminate areas of power vacuum in lands adjoining their territory. A third generalization about the yellow fever topic might be expressed: If any nation fails to control spread of infectious diseases from its territory, it is the object of disapproving diplomatic action on the part of other nations. A group of students might formulate the generalizations somewhat differently, that is, with different vocabulary, but the significant point is the formulation rather than the specific words.

If textbook passages are too complex for an initial attempt at detecting or formulating generalizations, students can be given especially prepared explanation sketches in the form of a paragraph. If additional structuring of the activity seems to be needed, it is possible to list sentences from the paragraph and have students indicate whether these selected sentences express an explanatory

generalization, or statements of antecedent conditions, or statements describing the event. This technique may be helpful as a first step. It resembles a common form of exercise for improving comprehension, but it is different in that the objective of the comprehension is not specific descriptive material alone. The area of comprehension includes awareness of the distinction between different kinds of statements and their functions.

For another procedure, students might compare two or more sets of explanation sketches offered for a given event. Two standard texts on any of the major events usually present two somewhat different sets of reasons, that is, incomplete explanation sketches. A class or group might examine each set, note differences in reasons, and formulate the different generalizations assumed in each set. Attention is then easily directed to the different assumptions which historians make about the interrelations of social, political, and economic phenomena. An interesting possibility along this line would be to procure texts from other countries and compare pertinent explanation passages, say, Canadian and United States texts on the War of 1812, Mexican and United States texts on the Mexican War. Certainly international committees of educators have done some work of this kind. It would be illuminating for the student to do the same as a way of furthering both international understanding and understanding of historical explanation.

The struggle for American independence is another useful example. Selections from a series of historians of the kind presented in the Amherst series represent one attempt at the college level. In some of these publications different interpretations are conveniently assembled, and some might be adapted for high school use. The frontier interpretation, a property-owning interpretation, and imperial policy interpretation, a mercantile interpretation, a constituional interpretation of the independence movement--each of these represents a view developed by historical writers. Each interpretation explains the events by assumption of different sets of generalizations. Consideration of two or more of the interpretations with an eye to expression of the generalizations would be a step toward knowledge of events, understnading about events, and understanding about historical explanation.

Another instructional approach might start the study of a topic with an explanatory generalization. The statement might be offered by the teacher or formulated by students on the basis of preliminary discussion. For the nineteenth century variety of overseas expansion this proposition might be entertained: Nations with extensive investments in politically unstable countries tend to intervene in the internal policies of those countries. A class might then attempt to test the generalization by accumulating evidence from the set of cases where such investments took place. The process would entail gathering of data about investments, colonial policies, rights of people and agencies in creditor nations, and policies for international loans. The sets of investment situations can be considered to see whether evidence shows them to be instances of the generalization, and the generalization can be altered if it is found to be faulty. In this fashion, the nature of a formal explanation can serve as a way of organizing a series of instructional activities if a teacher or group so de-

sires.

At this point, at least one caution needs to be mentioned. In presenting this view of explanation and some related techniques for teaching, I am not claiming that every explanation question encountered in historical writing or discussion needs to be seen as a candidate for such thorough analysis as might seem to be implied. Obviously, some explanations can be accepted as part of the given--the data--for any topic of study. Answers to some why-questions will necessarily be dealt with at the level of common-sense familiarity. If the question arises, Why did Americans migrate in large numbers to California in 1848-49?, it can be met in the incomplete form by the answer: Because gold was discovered there. The generalization that people will flock to areas where minerals are newly discovered, or simply that many people are attracted by prospective riches, is probably not a new insight into social phenomena for most students. Here, the process of detecting it as an assumption and formulating it as a generalization is not worth the time.

However, if some generalizations are common-sense matters or truisms as Gottschalk has pointed out, others may be quite new to students. (Louis Gottschalk, "The Historian's Use of Generalization," The State of the Social Sciences, Leonard D. White, Ed., University of Chicago Press, 1956.) For a given course of study, or for a series of courses in a departmental program, teachers who are familiar with the pattern of formal explanation can select points in the sequences of topics where attention can be given to the logical aspects and to the kinds of generalizations considered significant. As a part of course planning or departmental planning, teachers can select or prepare several alternate explanation passages, devise explanatory paragraphs and other techniques for calling attention to the elements of explanation. In addition they can devise similar materials for measuring students' grasp of those elements at the same time they are measuring mastery of statements that are largely descriptive. Preservice teachers can also be equipped to do the same things. Preparation of so-called teaching units or consideration of instructional methods could include selection or devising of explanatory paragraphs for any number of social studies topics. These activities would strengthen teacher preparation by providing another avenue for acquainting teachers with more of the elements of logic and language analysis.

In summary, what I have attempted to do is to present an account of historical explanation as a deductive argument in which the premises have empirical content. This view of explanation is distinct from explanation in the sense of description and in the sense of interpretation. It is also distinguishable from a chronology of events or what has been called a genetic explanation, that is, the view that an event is explained by describing a selected series of events in the order in which they occurred. It is distinguishable too from the incomplete explanations usually found by word clues or as lists of reasons. I have suggested that to deal with explanation, students need to be acquainted with certain concepts from the study of logic and of language; that by working with historical explanations students can become familiar both with historical content and with these logical and linguistic tools. Finally, I have tried to describe some ex-

amples of techniques by which the acquaintance can be accomplished. If teachers, both in-service and pre-service, come to understand explanation, I have no doubt that additional techniques would be developed. I hope that in the process there will be more attention to all of those elements of reasoning and linguistic analysis that make up the core of intellectual discipline and which are a part of the hallmark of the reflective and independent thinker.

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