

Basic to Newman's celebrated theory of a liberal education is his concept of the unity and structure of knowledge. Here I propose to examine its merits as a basis for his theory. I conclude by demonstrating that Newman's theory of knowledge is at odds with his account of the nature and development of scientific knowledge and by pointing to an alternative curriculum which would better serve his purposes.

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The Role of the Disciplines In Cardinal Newman's Theory Of A Liberal Education**

For over a century Cardinal Newman's contribution to the idea of a liberal education has received widespread attention. His basic position, that a liberal education consists in a well-informed judgment combined with an ability to perform the different logical operations involved in reasoning well, has frequently been criticized on the grounds that it failed to cater to religious and moral training. However, this is not an altogether legitimate criticism. Newman never intended his liberal education to be the only education the university student would receive. It was to form just a part, albeit an extremely important part, of a university undergraduate education.¹ Nevertheless, while a substantial portion of the literature on Newman's educational thought is devoted to discussion of this issue, when in fact no real problem exists here, other and more genuine difficulties have been overlooked. Accordingly, it is not my intention to further the already protracted debate concerning the appropriateness of a liberal education as understood by Newman at the university level. It is on one of the real problem areas, specifically on Newman's idea of the possibility of scientific knowledge and its implications for the curriculum of a liberal education, that I wish to focus attention.

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¹This issue is discussed in Timothy Corcoran, "Liberal Studies and Moral Aims: A Critical Study of Newman's Position", *Thought*, I (June, 1926), pp. 54-71; John E. Wise, "Newman and the Liberal Arts", *American Essays for the Newman Centennial*, John K. Ryan and Edmond Darvil Benard, eds. (Washington, D.C.: Catholic University of American Press, 1947), pp. 133-150; Michael Tierney, "Newman's Doctrine of University Education", *Studies* (Ireland), 42 (Summer, 1953), pp. 121-131; and Alfred O'Rahilly, "The Irish University Question: V—Newman on Education", *Studies* (Ireland), 50 (Winter, 1961), pp. 363-370.

Essential to Newman's theory of a liberal education is his concept of the unity and structure of knowledge. Only in virtue of this principle, in which after a somewhat idealistic fashion the various aspects of knowledge are seen to be closely interrelated, is a liberal education as conceived by Newman possible. This is so because a liberal education, which remains an ideal throughout, tends to actualization not merely in proportion to the increase of one's factual knowledge but also to the extent that the relations which exist among the different facts become known to one. It is in the knowledge of relations among facts as much as in the knowledge of facts that a liberal education takes seed. Consequently, a view of knowledge which admits of no unity or interrelatedness cannot admit of the possibility of a liberal education.

Since knowledge is knowledge of things and since all knowledge is interrelated, the greater one's knowledge, Newman would argue, the greater one's knowledge of the relative value of things. Furthermore, since the idea of a liberally educated man, that is a wise or philosophical mind, implies a knowledge of the relative value of things, a breadth of knowledge while not a sufficient condition of a liberal education is nevertheless a necessary condition. Moreover, to arrive at a knowledge of the relative value of things as a basis for good judgment, one's knowledge of things must be certain and incontestable.

Fortunately, in the sciences, which for Newman are bodies of 'certain' knowledge as opposed to probable knowledge or opinion, man does possess such knowledge.² Accordingly, it is to the sciences that one must go for the curriculum of a liberal education. Other things being equal then, the greater one's knowledge of the different sciences the closer he approximates to the ideal of a liberal education.

Plausible as this line of thought may seem, on closer examination it reveals a conflict between Newman's idea of the unity and structure of knowledge and his concept of the growth of scientific knowledge. That this is so and that it has both theoretical and practical implications for Newman's position, I here propose to argue.

There is nothing profound in Newman's account of the unity and structure of knowledge. In fact, it is quite vulnerable. The manner in which it is presented is artistic, however — hence its appeal. For this reason a brief statement of his position may be less winning than his own persuasive treatment of it. If this is so, then all the better; what will be lost in eloquence hopefully will be compensated for in precision.

The idea of the unity of knowledge, which first appears as a justification for Newman's argument for the inclusion of theology in the uni-

²John Henry Cardinal Newman, *The Idea of a University Defined and Illustrated*, Charles Frederick Harrold, ed. (New York: Longmans, Green and Co., 1947), pp. 20, 22, 44; John Henry Cardinal Newman, *An Essay in Aid of a Grammar of Assent*, by Charles Frederick Harrold, ed. (New York: Longmans, Green and Co., 1947), pp. 45-46, 148. For convenience, future references to these works will be abbreviated to *Idea of a University* and *Grammar of Assent*, respectively.

versity course of studies, underlies his claims for a liberal education as the sole purpose of the university³ and continues to serve as a guiding principle in delimiting the various branches of knowledge. Closely allied to his concept of the unity of knowledge comes his view of truth, serving both as the measure of knowledge and the proper object of the intellect.⁴ Their relationship is perhaps best described by Newman himself. Truth, he writes, is the object of knowledge and by truth is meant facts and their relations. He continues:

All that exists, as contemplated by the human mind, forms one large system or complex fact, and this of course resolves itself into an indefinite number of particular facts, which as being portions of a whole, have countless relations of every kind, one towards another. Knowledge is the apprehension of these facts, whether in themselves, or in their mutual positions and bearings. And, as all taken together form one integral subject for contemplation, so there are no natural or real limits between part and part; one is ever running into another.⁵

The unity of knowledge then is not to be found in the method of the sciences as it was for Bacon and Dewey for example. In fact, as is evident in his discussions of the relation of theology to the physical sciences, Newman is quite certain that the various sciences can and do differ from each other in their methods and that such variance does in fact set them off from each other as distinct kinds of sciences. Thus does theology whose method of inquiry is deductive differ, say, from physics, which proceeds inductively, both in its content and in its method of investigation.⁶

For Newman, the unity of the sciences derives from their common object of investigation, the truth, that one large system or complex fact of which he speaks, which in turn owes its unity to God, its creator.⁷ So vast is the complex fact which is the truth and so inadequate is the human mind to comprehend it in its entirety at once that it is only by examining it carefully and slowly, by taking it piece by piece and looking at it under its different aspects and in great detail, that one

³He was later to modify this position. See for example, *Idea of a University*, pp. 335-336; "What an empire is in political history, such is a University in the sphere of philosophy and research. It is, as I have said, the high protecting power of all knowledge and science, of fact and principle, of inquiry and discovery, of experiment and speculation."

⁴*Ibid.*, pp. 40-41, 134, 159-160; *Grammar of Assent*, pp. 130, 168.

⁵*Idea of a University*, pp. 40-41.

⁶*Ibid.*, pp. 319-320. Newman would appear to have the weight of scholarly opinion today on his side also; see Philip H. Phenix, *Realms of Meaning* (New York: McGraw-Hill Book Company, 1964); Joseph J. Schwab, "Structure of the Disciplines: Meanings and Significances", *The Structure of Knowledge and the Curriculum*, G. W. Ford and Lawrence Pugno, eds. (Chicago: Rand McNally & Company, 1964), pp. 6-30; George W. Denemark, "Concept Learning: Some Implications for Teaching", *Liberal Education*, 51 (March, 1964), pp. 54-69. When Newman speaks about a science in this connection what he has in mind is something like what today is understood by a discipline or an organized body of knowledge relating to a particular subject; see, P. J. MacLaughlin, "Newman and Science", *A Tribute to Newman*, Michael Tierney, ed. (Dublin: Browne and Nolan Limited, 1945), p. 315. However, Newman also uses the word "science" to refer specifically to the physical sciences.

⁷*Idea of a University*, pp. 57, 88.

can come to know it at all. And it is these different aspects, these various views of the whole, that constitute the multitude of the sciences. Ontologically considered, knowledge forms one integral whole; from the human point of view, it is most profitably viewed as the content of the sciences into which it is apportioned for the purpose of discovery and for pedagogical reasons.⁸

Accordingly, the sciences, which are possibly only in virtue of man's powers of abstraction, have no more than a merely formal existence, "being the logical record of this or that aspect of the whole subject-matter of knowledge."⁹ And so the sciences, in that they are the results of abstraction, are purely human creations.¹⁰ Clearly, knowledge permits of no natural classifications into subject areas or sciences; rather, such classification is the achievement of man, the product of his attempts to uncover the secrets of nature by investigation and discovery.¹¹

The different sciences, then, embrace different aspects of knowledge, as it were, in their concern with different facts or with different aspects of the same facts. In this way several sciences may be concerned with many of the same facts, yet harbor interests and contents of a very different nature from other sciences concerned with the same facts. The differences in content are largely explained by the differences in the aspects of the various facts with which the different sciences are concerned.

Furthermore, the concern of the sciences consists more in the knowledge of relations among facts or things than of things themselves, which is of course to be expected seeing that the sciences for their part seek laws that express the relations among the behaviour of things. For this reason, a science in itself never tells all that is to be known about a thing since it is concerned only with isolated aspects of a thing or things. The concern of the sciences is in arranging and classifying facts, in reducing separate phenomena under common laws, in tracing effect to cause.¹²

Knowledge gained from the sciences, Newman further maintains, is never brought home to one quite as strikingly as that gained by the senses. Yet it goes beyond sense by imparting order and system to a collection of unrelated facts. In this way, also, science furthers its own advancement, for in so much as a science is a form of knowledge, it is orderly and systematic and so can be the more easily understood and increased. At the same time, the sciences viewed as instruments facilitate the communication of knowledge to others.¹³

However, for the very reason that the sciences are of assistance to the mind in its search for knowledge, by presenting to the mind but one

⁸*Ibid.*, pp. 40-43.

⁹*Ibid.*, p. 46.

¹⁰*Grammar of Assent*, pp. 7-8

¹¹*Idea of a University*, pp. 40-43.

¹²*Ibid.*, pp. 40-43 313; see also *Grammar of Assent*, pp. 7-8.

¹³*Idea of a University*, pp. 42, 66-67.

aspect of the truth at a time, thereby aiding comprehension, so also are they subject to a severe limitation. Though each science, in so far as it is but one view of a thing, is true in so far as it goes, it is far from being the whole truth. Accordingly, if the sciences are to present the whole truth, it is necessary that they complement one another for

As they all belong to one and the same circle of objects, they are one and all connected together; as they are but aspects of things, they are severally incomplete in their own idea and for their own respective purposes; on both accounts they at once need and subserve each other.

Conversely, the omission of any one science or any one view of a thing makes the attainment of the entire truth impossible.¹⁴

At this point the discussion might be helped by an illustration drawn from Newman himself. If one takes man for his object of study, it will be admitted that he can be viewed in many different ways. Whereas the physician sees him from one point of view, so also does the psychologist and the biologist each see him from a different point of view. Now as many such views of him as are possible, so also are there as many sciences. And the greater one's knowledge of these sciences of man, the greater also is his knowledge of man. According as one's knowledge of him is confined to a fewer number of these sciences, one's knowledge of him is less real; and the deficiency in one's knowledge of him is in proportion to the importance of those sciences of which one has no knowledge.¹⁵

In this way, then, it can be seen how the various sciences are "revised and completed by each other." All views, all aspects of sciences are true as far as they go; and how far their truth goes is to be learned from a comparison of them with other views of the same object. And so, for example, if one were to accept the abstract theory of forces, one would expect of a projectile a longer range than is in fact allowed it by wind resistance. But should this resistance itself become the subject of scientific inquiry, one would develop not only a new science but a science which would assist and to a certain point complete the science of projection.¹⁶

It is difficult to read Newman's account of the unity of knowledge and not find in it some resemblance to the recent emphasis on the structure of knowledge and curriculum. But to see Newman as in any way anticipating these trends is to flatter him. By comparison with work presently available on the structure of the various disciplines and the relations that exist among the disciplines, Newman's thought is highly underdeveloped. Whereas his concept of the unity and structure of knowledge may have served as a rationalization for a traditional course of university studies after the British and European models, the concept today is outmoded and suffers from too close an attachment to an earlier view of the range and permanency of human knowledge. Essen-

¹⁴*Ibid.*, pp. 42-47.

¹⁵*Ibid.*, pp. 43-44.

¹⁶*Ibid.*, pp. 43-45

tially, there is in Newman nothing beyond an indication that all of the sciences are in some vague way interrelated. This interrelationship is viewed not in terms of any logical ties among the different branches of knowledge, wherein the real merit of recent studies lies, but on the basis that unity is imparted to the object of knowledge by the Creator. Yet two important implications for Newman's educational theory are contained in his concept of the unity of knowledge, both of which he draws out himself in the course of the *Idea of a University*.

One of these, the idea that no science can be omitted without leading to a distortion, I have already referred to. The second is the view that since each science has its own peculiar domain the pursuit of new knowledge by any given science, once carried on properly and within the limits of its own boundaries, cannot possibly interfere with or show to be false knowledge gained in any of the other sciences, as long as they also remain within their respective domains. Nevertheless, it is not always clear from Newman's treatment of these matters whether what he says is consistent with his account of the unity and structure of knowledge as a whole.

For Newman, each science, from the viewpoint of the truth or complete knowledge, is partial in the sense that it contains only a portion of knowledge. In addition, all of the sciences, though in so far as they are but aspects of things "are severally incomplete in their relation to the things themselves," are nevertheless "complete in their own idea and for their own respective purposes." Moreover, from the viewpoint of complete knowledge, each of the sciences performs a complementary role, so much so that unless it did there could be no promise of complete knowledge.¹⁷ Accordingly, if one is ever to arrive at total knowledge, it follows that to omit, say, one science is to forfeit such a possibility. And since, for Newman, there are degrees of importance among sciences, it also follows that the omission of certain sciences is more detrimental to the attainment of this goal than is the omission of others.¹⁸

At an earlier stage Newman had written that the sciences, "have multiplied bearings one on another, and an internal sympathy, and admit, or rather demand, comparison and adjustment. They complete, correct, balance each other." If one is ever to achieve total knowledge, then, none of the sciences is to be omitted. Also it follows that to omit a science is to interfere with that balance among the sciences which is a necessary contribution of each of them if the truth or complete knowledge is ever to be attained. As Newman explains it, this indeed appears to be an added and valid reason for not excluding any of the sciences. In other words, it seems to make good sense not to exclude any knowledge or any source of knowledge, whose contribution — yet another view or possible view of reality — serves to keep the viewpoints of all of the sciences in perspective, thereby furthering the attainment of the

¹⁷*Ibid.*, p. 46.

¹⁸*Ibid.*, p. 201.

truth. In fact, Newman will maintain that so sensitive is the balance that exists among the sciences that even without the actual omission of a science completely, emphasis on any one science may well unsettle the balance.¹⁹

Mention of yet another and concomitant threat to the great quest for truth serves to explain Newman's point further. Should any science be denied its rightful place in the circle of the sciences, he says, not only will the knowledge and balance which it provides be sacrificed but there will follow a perversion of the other sciences, for what the omitted science "unjustly forfeits, others unjustly seize." Each science has its own domain and is fitted to work within the domain alone. Once it goes outside of it and undertakes to do the work of another science it is destined to fail.²⁰

Impressive as this line of thinking appears, it seems on closer examination to betray some inconsistency. Throughout there is the implication that if one science stands to be corrected by another, as Newman explicitly states is the case for each of the sciences, then these sciences can hardly be what Newman has claimed them to be, namely, "complete in their own idea." If a science is complete in its own idea, whence its dependence on other sciences to correct it?

Returning to this same point elsewhere, and perhaps stating his position more accurately, Newman seems to be still open to this criticism. It is his contention that if any of the sciences is omitted from the circle of the sciences, other sciences tend to step beyond their own boundaries and into the domain of the excluded science. He writes:

if you drop any science out of the circle of knowledge, you cannot keep its place vacant for it; that science is forgotten; the other sciences close up, or, in other words, they exceed their proper bounds, and intrude where they have no right.²¹

But here, as in the last instance, the idea that a science should even attempt to enter into a domain "vacated" by its proper science, and therefore not within the limits of the first science again implies that this "usurping" science is surely not complete in its own idea. It does not know even its own boundaries.

Newman, of course, might attempt a defense of his position by claiming that what he really means is that it is the scientist rather than his science which is at fault in the case of such misdemeanors. He does say in one place that he has been insisting that "the hostility in question, when it occurs, is coincident with an evident deflection or exorbitance of Science from its proper course . . . The human mind cannot keep from speculating and systematizing." Moreover, he continues, when usurpations of this kind occur, the usurping sciences adopt principles in

¹⁹*Ibid.*, pp. 88-89.

²⁰*Ibid.*, pp. 65-66, 69, 319.

²¹*Ibid.*, p. 65.

their favor which are no more than "enunciations, not of Science, but of private judgment; and it is private judgment that infects every science which it touches with a hostility to theology, a hostility which properly attaches to no science in itself whatever."²²

There is one serious objection to accepting the view that it is the scientists who are in error and not the sciences. It will be recalled that the sciences are nothing more than the creations of man. Now if the scientist is liable to err, and in fact is guilty of error, then it follows that the sciences, his creation and in regard to which he errs, can likewise be in error. Consequently, they can hardly be considered to be "complete in their own idea."²³

In any event, Newman's main point, that the omission of any one science from the entire collection of the sciences rules out the possibility of ever attaining total knowledge, of ever knowing the truth in its entirety, remains quite clear. And it further appears, as I have suggested, that the various sciences are not "complete in their own idea" but are in fact in need of a set of checks and balances. Such checks and balances need to be imposed on each science by all of the other sciences because of some inherent weakness in the constitution of each of the sciences or because of some internal sympathy among the sciences by which the valid knowledge of any one science remains unknown until the contribution of all the sciences taken together indicates what is valid knowledge.

But this in turn surely brings into question, at least for the present, the very possibility of scientific knowledge as understood by Newman, whereby it is possible to claim scientific knowledge before complete knowledge is arrived at. Sense knowledge there will always be. Abstractions or views of things will also remain. But will they issue in scientific knowledge? If all knowledge is interrelated and if the growth of knowledge in one science is dependent on and influenced by knowledge in another science, how can Newman claim to have scientific or 'certain' knowledge in one area and yet believe that the totality of knowledge is unknown?²⁴ If one is to be consistent, he can only conclude that scientific knowledge is not possible for Newman, and indeed that the most that can be hoped for at this point in history, and until such time as all of the sciences and all of the legitimate knowledge which they contain become known is merely hypothetical knowledge — knowledge which might or might not turn out to be true when all else is known, but which for the present may serve as a basis for decision-making.

²²*Ibid.*

²³It might be argued, perhaps, that the sciences are "complete in their own idea" in principle, in the sense that when complete knowledge is attained each science will contain all the knowledge possible about its proper object of investigation and by virtue of having this 'true knowledge' will refrain from exceeding its own boundaries. Nowhere, however, does Newman indicate that this is what he has in mind.

²⁴Newman not only believed that not all knowledge was known but strongly advocated freedom of investigation.

This, of course, has crucial implications for Newman's theory of a liberal education. Whereas a liberal education was thought possible due to man's 'certain' or scientific knowledge and his knowledge of the relations among the sciences, this can no longer be so. Scientific knowledge, to which the fate of a liberal education is inextricably linked, is doomed to remain in a state of complete uncertainty until some future happy day when the sum total of hypotheses produced by each of the possible sciences can co-exist in peace and harmony, without strain or inconsistency. Then, and not until then, may hypothetical knowledge be triumphantly labelled and thenceforward considered scientific. Then, also, perhaps, may man become omniscient and a liberal education become a possibility, but on the condition, no doubt, that man has already become immortal.

Irrespective of such criticism, Newman has begun to lay the basis from which he hopes to approach the problem of a liberal education, and with it a justification for a prominent role for the disciplines in his designs. While there are many in the wake of progressivism who have welcomed such a return to fundamentals, it is by no means a panacea for all educational ills. To suggest that through a study of the disciplines alone one can come to grips with the problem of a general education is to claim too much. Methodological considerations aside, some problems still remain.

To begin, the claims of the disciplines must be recognized. As depositories of knowledge they can serve as a systematic and economical means whereby the student acquires knowledge. To the researcher they are a necessary aid both in terms of the problems they identify and the solutions they suggest, as well as the techniques and information they supply toward the solution of such problems. But the question remains whether as such they best serve the needs of a liberal or general education. A familiarity by everyone with the knowledge thus far gained by mankind may well soothe the qualms of a Sir Charles Snow and reduce whatever tensions exist in a two-culture society. It may even go beyond this and develop the skills, cognitive and otherwise, necessary for survival, for intellectual and social advancement, and for the cultural enrichment of the individual. Important as such considerations undoubtedly are, however, they are not the only ones.

It has been suggested that the liberal studies of any age have been the practical studies of that age.²⁵ Though one might wish to argue with such a claim, it does have a point. If such grand proposals for a liberal education as the Great Books Program are open to criticism, it is because they ignore the deeply humanizing and liberalizing influence of involvement with the living and real problems of any age in which they are studied. When study of the disciplines is carried on in isolation from a concern for their possible relation to concrete human problems, it is

²⁵Lotus D. Coffman, *The State University: Its Work and Problems* (Minneapolis: University of Minnesota Press, 1934), p. 159.

an indication that much of their immediate value has passed. To continue such studies may be a worthwhile occupation for the professional scholar, but does it serve the purpose of a general education? To be sure, it might be of assistance in developing different styles of thinking and modes of inquiry in the student. But it can also separate him from the more human and equally demanding concerns of his immediate environment from which the disciplines gain much of their humanizing and critical element in the first place. Though the dangers of such isolation occurring are more pronounced today with the increasing professionalization of the liberal arts studies, the danger is present whenever the disciplines are given such prominence as they are in Newman.

Not unrelated is a problem inherent in the idea of the disciplines themselves. The disciplines are highly rational in character. To study them is an exercise in rational behavior. But to think that as such they form the only preparation for man's comportment through life is to assume that man is a merely rational animal. Was it not Newman himself who said that "man is *not* a reasoning animal; he is a seeing, feeling, contemplating, acting animal?"²⁶ It may well be that a training in these latter ways of human behavior which Newman refers to could be catered to by some formal schooling other than that received at the university. However, if this is so, Newman never says anything about it. Certainly, for him, such a training does not form part of a liberal education. In any event, an educational theory which does not take account of these other ways in which man behaves cannot be considered complete.

The past decade has been an eventful one in its concern for developing new and improved curricula. According to Foshay, the idea which emerged during these years, that the purpose of instruction was to develop different modes of inquiry in the student, was genuinely new.²⁷ Whether such an idea is new or not, it certainly suggests a promising alternative to the traditional role of the disciplines in a liberal education, such as one finds in Newman. Seen as both exemplars and a means of training in the different styles of thinking and cognitive skills, rather than as the containers of 'certain' knowledge and parts of a much greater and integrated whole, the disciplines can continue to be of service.²⁸ Moreover, if employed in addition as resource materials toward the solution of contemporary pressing social problems rather than as bodies of knowledge to be learned for their own sake, their humanizing and critical value can hardly diminish. On the contrary, used in this way they are ideally suited to developing that maturity of judgment and those cognitive skills in which a liberal education for Newman consists. And beyond this, thus employed they can be expected to provide those insights into the human condition found only in personal involvement with real life situations.

²⁶*Grammar of Assent*, p. 72.

²⁷Arthur W. Foshay, "How Fare the Disciplines?", *Phi Delta Kappan*, 51 (March, 1970), p. 349.

²⁸For a curriculum proposal along these lines see Phenix, *op. cit.*