SPACE SCIENCES LABORATORY

UNIVERSITY CALIFORNIA

BERKELEY CALIFORNIA
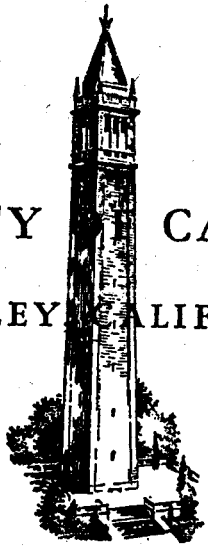
HEGELIAN INQUIRING SYSTEM

CHAPTER VI

by

C. West Churchman

Internal Working Paper No. 49

September 1966

Space Sciences Laboratory
Social Sciences Project
University of California
Berkeley

CHAPTER VI

HEGELIAN INQUIRING SYSTEM

1. Objectivity

Objectivity is the hallmark of all excellent inquiry, and yet its meaning remains elusive. The objectivity of a result seems to imply that no one is obliged for "external" reasons to accept the findings; that each inquirer may learn how any other inquirer conducted its objective inquiry, and each inquirer is free to test the methods used when they are objective and thus confirm or refute the results. Thus a necessary condition for objectivity is that the behavior of an inquirer be itself subject to being observed. But what does this requirement that one inquiring system be observable by another really mean, and how does the inquirer acquire objectivity from this process?

At the outset we should note that "objectivity" is closely related to "object" in meaning as well as in sound. Kant seemed to have thought that objectivity occurs when experience is shaped into a "general object"--i.e., gains its form and intelligibility from space, time and the categories. But even this shaping of experience is not enough, as the discussion of the last chapter shows. We also need to design into the inquirer an ability to see the "same" object from different points of view. In a sense, we made a beginning of satisfying this design requirement in the last chapter as we explored different modes of representation. But now we need to develop the additional idea of an "object" as a collection of interconnected observations.

in which each observer can examine how another observer views the world.
The "objectivity" of experience is to be based on some kind of intercon-
nection of observers.

Now it is almost obvious that many "points of view" are required
to create an "object" like an elephant or a university. What is not so
obvious is that many "points of view" are also required to produce the ob-
jectivity of a property, like "green" or "straight." For Lockean inquirers,
all that is needed to attain the objectivity of a simple property is a
strong agreement in the Lockean community. And yet, as we have seen, if
there is no control on the agreement, the so-called objectivity of the
property becomes no more than a convention, that--in the case of computers--
can be changed at will by changing the program. We seem to need a watch-
dog who can monitor this sort of thing, and decide whether the community
is conventional or not. A "watchdog" watches; i.e., the observers need
to be observed in order to gain objectivity even for simple properties.
In other words, no observation can become objective unless the observer
is also observed objectively.

2. <u>To be a mind is to be observed.</u>

If we apply Berkeley's dictum that an object gains its objectivity
only by virtue of its being observed to the property of being an observer,
it must mean that something can only be said to observe by virtue of its
being "observed to observe."

It must be admitted that this rather obvious point about inquiring
systems is often neglected. Designers wish to create computers to "solve
problems," "observe patterns," and so on. But whatever ability the computer
attains in any of these directions becomes objectively valid only because
the designers observe that the computers are functioning in a certain manner.

To understand what the computer is doing objectively, it is essential to know what the designer is doing. The "fact" that computers "solve problems" is as much a description of the behavior of the designer as it is a description of the output of the computer program.

What would a philosophically astute empiricist have to say about this need for an observer-of-the-observer? One answer seems almost obvious and in effect became the cornerstone of a particular type of philosophical system developed in England. The answer says that there are actually two radically different ways in which the observer may be observed: (1) he may observe himself directly, or (2) he may be observed "inferentially" by another observer. These two ways of observing are taken to be radically different because in the first case the self-observer is assumed to be almost completely accurate about what he observes, while in the second case the "other" observer can only infer what is actually being observed "inside" the mind. "Another" observer can only observe what occurs "on the surface" or at the interface of the two inquirers, whereas the same inquirer can observe its own inner states directly.

I said that this answer to the meaning of the observer-of-the-observer is obvious, but it remains to be seen whether it is really a satisfactory design principle. Indeed, from the design point of view it already seems to involve some weaknesses--e.g., the awkward distinction between "inside" and "outside" or between "same" and "another" which are surely very difficult to define and apparently serve no very good purpose. Yet there is something very compelling about the thesis that each of us has his private thoughts, sensations and feelings.

3. The self-knowing self: the subjectivity syndrome.

British empiricism certainly seems to have retained throughout its long history the notion that immediate sense data and the inner pictures and images of the mind are the special property of the self, and knowable only by the self. This has given rise to what might be called the "subjectivity syndrome" of a certain popular type of philosophy both in the United States and in Great Britain. It takes the form of the assertion, "I and I alone can know the inner states of my own mind and can only infer the states of other minds." Accompanying this assertion are a number of corollaries, e.g., "I can never be aware of someone else's toothache" or "I can never be sure that someone sees the color green as I do." There are also some fairly serious philosophical doctrines connected with this philosophy, such as solipsism and the inability to compare utilities, which have flavored the intellectual life of a number of social science disciplines. All of these doctrines imply that, because I, and I alone, know the inner states of my own mind, no one else can possibly supply any better evidence about my own inner states than I can; at best other people can only infer the properties of my inner states by observing my outward behavior. Also since I have no way of developing an inquiring system that reaches beyond my own observations, it follows that I have no evidence of the independent reality of other minds.

According to the subjectivists, since I and I alone know exactly what a toothache feels like to me and I have no way of comparing the sensations that other people have except in terms of the grimaces and other signs of distress which they show and which are alike to mine, to infer from these observations of outward behavior the existence of a like pain

5

to mine would be to go far beyond what the evidence itself supplies. It would permit the generalizing component of the inquiring system to make a leap in the dark on the basis of one instance alone, namely my own sensations.

Subjectivism is a very weak philosophy with very strong implications. Toothaches may be matters of minor concern in the total history of humanity, but one important implication of the subjectivist doctrine is that it is impossible to compare the values of two or more members of a society other than in terms of their simple preference ordering. So convinced were economists that the intercomparison of preferences must be excluded that there occurred in economic literature a number of serious attempts to provide a basis of social choice which is free of the need to compare the preferences of two separate individuals, except in an ordinal sense. Thus an observer can look at a person and see that he chooses X rather than Y. Such behavior occurs at the interface of the observer and the observed person. But, according to subjectivism, he cannot observe how the person felt "inside" when he made the choice; specifically, he cannot observe the intensity of the person's preference, although the person clearly does have an inner feeling and is aware of it himself. The intensity of preference is taken to be a subjective evaluation which cannot be communicated to another.

The economist's reluctance to assume cardinal utilities and richer forms of measuring human values has had its influence on the entire theory of optimization in system design, especially when the "system" involves human beings. For some, the only legitimate "optimal" is a "Pareto optimal," which is often a very unsatisfactory criterion in the design process.

Now all sciences recognize difficulties in the design of calibration in measurement, calibration being basically the method of communicating a method of measuring. Calibration is never perfect, so that errors inevitably occur. In length measures, for example, one must try to relate a method that uses a yardstick to a method that uses a micrometer; nevertheless, the comparisons of units are made with "reasonable success." What is it, therefore, that prevents a like comparison of units in human value measurements? The answer is that the "real" unit is encased in the individual person, and there is no way of laying one person's unit "alongside" another's; in other words, the "fundamental" mode of "direct" comparison of units is supposed to be ruled out in value measurements.

4. "Direct" vs. "inferential" observation.

All these versions of solipsism and subjectivity arise from the assumption that the observer must play a peculiar and separate role in inquiry. In order to be sure that the observer is safeguarded, so to speak, one designs all inquiry as an emanation from a central and effectively unanalyzable set of "direct," "fundamental" operations of each inquirer. The fundamental operations cannot be compared or observed, because once one permits such comparisons, the authority of the central observer disappears and one is apparently left with no basis for objectivity.

The design principle of subjectivism has many important consequences, all based on "levels" or "degrees" of knowledge. The central core attains "direct" knowledge, and the further one emanates from this core, the more doubtful are the assertions the inquiring system makes. For example, there is no way in which the pure empirical inquiring system can seriously consider the task of predicting future events. It must simply regard its own data as its sole type of reality, and when it speaks about the future it can only do

so in a kind of poetic fashion.

The modern subjectivist shies away from concepts of forecasting and in general from the whole notion of the redesign of systems in terms of their improvement, since the term "improvement" itself implies an ability to forecast the future.

Again, there is the recent distinction which occurs in game theory between the concepts of "uncertainty" and "risk." The risky situation is taken to be one about which the inquiring system can make probability statements which are based on directly observable events. An uncertain situation, on the other hand, arises, say, in a two-person game where the actions of the one player depend on his own developed strategies and these strategies cannot be predicted from the relative frequency of past plays, since they are based in part on the one player's concept of how the other player will conduct the game. It is said to be impossible for the one player to obtain evidence about the "inner states," i.e., the strategies of the other player.

Subjective empiricism in philosophy, psychology and economics, has never undertaken to defend its fundamental doctrine or even to state it clearly, perhaps because the doctrine seems so obvious and reasonable. The phrase that frequently recurs in Locke's Essay, "If one will but look into his own mind," is simply reiterated down through the decades as a per-fectly satisfactory approach to philosophical reflection and a knowledge of one's own mind.

5. Personal knowledge and community knowledge.

The doctrine no doubt seems obvious because it is difficult to understand how one inquiring system can be a direct observer of another's

internal states and processes. For the Lockean community, it is enough

to establish an isomorphic agreement, so that the same inputs are followed

by the same verbal expressions and by expressions signifying a common

agreement; the exact matching of internal processes is not feasible nor

even essential.

But the subjectivist not only excludes direct observation by another

of the subjects' state of mind, but also postulates a maximum accuracy on

the part of the subject with respect to its own direct observations, so that

when it observes what impression it had as a result of a simple input, the

answer it gives must be essentially correct. In other words, subjectivism

introduces the distinction between personal knowledge and community know-

ledge into the design of inquirers.

Community knowledge implies careful control and scrutiny on the part

of other inquirers, personal knowledge does not. Thus if a scientist under-

takes to create knowledge for the community, he must write down what he

intends to do, and then, if he is a careful scientist, he must keep a log

of what he has done, and finally he is obliged in his reports so to present

his findings that any colleague can, if he wishes, observe exactly what

the scientist has been doing. Failure to comply with any of these conditions

is a defect in the procedures of the Lockean inquiring system. While it

must be admitted that science often tends to be rather careless about

applying these three conditions, nevertheless in all cases of dispute the

Lockean critic of a scientific endeavor has a right to call for further and

deeper explanation of what has been done so that he can replicate the work

of another scientist. Thus the overt behavior of a scientist must itself

be subject to observation by other scientists whenever the purpose is to

to create community (common) knowledge.

The basic trouble with subjectivism's distinction between personal and community knowledge is that its doctrine of personal knowledge is so vague that it leaves no room for an explicit design. Furthermore, it is not at all clear why we should ever try to design such a distinction into the inquirer, except to preserve each man's own wish to retain his own subjective feelings as a part of his world. Thus while we are not apt to remove belief in personal knowledge by any kind of logical argument, the point is that the manner in which the subjectivist introduces personal knowledge into the design of inquiry seems altogether wrong. He wants to give personal knowledge of sensation the status of highest accuracy, and he goes on to link this personal knowledge in a very tenuous fashion with community knowledge. He thinks that personal knowledge of one's own sensations creates types of behavior that other inquirers can observe and transform into their own personal knowledge. This seems to require a very awkward type of design, and all the awkwardness can be removed simply by removing the need for an "emanation" of knowledge from a central core. If "personal knowledge" of one's own sensation simply means that the inquirer A observes itself as an object, in exactly the same way that another inquirer B observes A, then all the "mystery" of internal states disappears. In such a design, the designer would not lose control at what is surely one of the most critical points in the whole activity of inquiring systems, namely at the point where information is received and interpreted. If the observer can be observed, then he who observes someone "feeling a toothache" can learn what is being sensed at least as well as the one who "has the pain." In human inquirers, in fact, there seems to be ample justification for asserting

that one person may be far more sensitive to another's reactions than the other is to himself.

What would result from giving up the supremacy of privacy is a complete revision of the restrictions on empirical inquiry. The so-called "basic" or "fundamental" units and comparisons of the inquirer are no longer basic or fundamental from the point of view of another inquirer; preferences, direct sensations and the like are the output of all inquirers, and have no special epistemological status. In Hegel's terms, the "immediacy" of sense data becomes a mediating concept of the reflective mind.

Consider, for example, the comparison of personal preferences or utilities. Instead of merely asking each person in a community to state his preferences as he observes them, one would also determine how each person observes the preferences of others. If there is a fight over the allocation of resources, not only do A and B state their requirements, but B states what A wants and A states what B wants. There is no a priori weighting of these observations of individual needs.

6. Representations of observational behavior.

The design of an inquiring system we shall consider is based on the principle that inquirer A's information about inquirer B's internal states may be as reliable as B's own reflections about his internal states. But what does it mean to say that one inquirer can observe another's states of mind? One answer is to be found in the discussions of the last chapter: we can extend the Kantian theme of representation to the observations of the states of mind of an inquirer.

One mode of representation has already been described: one can observe a chemist as he examines various items under the microscope and see

that he writes down his results in his log and carries on various other kinds of activities. This mode of representing the chemist can be enriched by comparing the activities of two chemists engaged in essentially the same type of work. One can make statistical analyses of the results and represent differences in their behavior in terms of their personality types, the laboratory social environment, and whatnot. This way of representing observation takes the observers to be psychological individuals, with describable psychological properties: motivation, sensory response, oral behavior, etc.

Another way of representing the observer is to consider him as a physical entity. The observer is now regarded as a physical input-output device, that receives impressions at its surface and transmits these via its neural system to some central core, where the "message units" are stored and retrieved. By this method of describing the sensory organs and neural structure of the human observer one can check whether or not certain distortions are introduced either by the external instruments or by the particular physiological structure of the observer himself. Hence we can say that some properties of the stored inputs are products of the instruments that the scientist uses, or that some properties are the product of a particular neurological structure of the observer. We can develop some ideas about the relation of inputs to the real objects of the world outside; the "objective" inputs are those that are not distorted by the instruments or internal transmitting processes.

7. Objectivity in a physical description of mind.

Now when the observer represents the inquiring system as a physical object responding in a physical manner to physical stimuli, the subjective empiricist may feel that the life of the inquirer has been taken away, since

there is no representation of the "inner states," as he feels them to exist. Nevertheless, if we accept this mode of representation for the moment, we can see that the design problem of objectivity can be described in a precise manner. The problem is to determine whether an inquirer's account of a situation is "objective." The observer of the inquirer can see both the object (stimulus) and the "inner state" of the inquirer as it is represented by a physical description of the stored inputs of the inquirer. Suppose the observer is able to classify the stimuli into identifiable elements, as well as classify the "inner states" of the inquirer. If he then observes that for each stimulus property there corresponds one and only one inner state, he could say that the inquirer is responding "objectively." If, furthermore, the inquirer is also observed to output a set of symbols that are in one-to-one correspondence with the inner states, then the inquirer is reporting its experiences objectively.

This description of objectivity should be compared with the design of agreement in the Lockean community; in the design of agreement (see Appendix of Chapter 4), the community of inquirers could not observe the inner states of the other members, although in order to describe their behavior we did construct their inner worlds. As a consequence, the community cannot tell whether the set of stimuli are mapped onto the same set of internal states in each inquirer, even though we had to pull ourselves aside and do precisely this. Also the community members cannot really tell what the word "agree" means, except that it occurs for each inquirer when associated in a certain manner with a stimulus. Finally, each member of the community can only know how he reacts, and hence has no objective knowledge of a stimulus "outside" his own internal states of mind.

But if the adjective "objective" refers to a certain type of exper-
ience of an observer of the inquirer, then all the mysteries of the subjec-
tive empiricist vanish. An object is "there" because it is a part of the
experience of the observer-of-the-inquiring-system and is observed by him
to have a certain relationship to the internal states of the inquirer. To
the observer, the object is "outside" the inquirer, and the observer can
precisely determine whether two inquirers agree. He can even determine
whether they see the color green in the same manner. Thus the mystery of
Kant's sensuous intuition vanishes: it was after all nothing other than a
construct in Kant's mind as he observed the human inquirer.

Suppose we say, as Hegel did, that the process by which one mind ob-
serves another is self-reflection (or self-consciousness), recognizing that
this old-fashioned term is both practical and common in its meaning here.
Managerial control in a firm is a self-conscious process, as are the controls
of scientific, traffic, and educational systems.

In order to keep the characters clear, while not intending to impute
any specific meaning to their roles, suppose we call the mind that is being
observed the "subject," and call the other observing mind the "observer."
The inquiring system we shall examine is the "observer-of-the-subject."

8. The problem of objectivity in general.

A number of questions come to mind as soon as we gain the insight
that objectivity is a property of an observer of a subject, i.e., a property
of self-reflection. First of all, we see that the "subjective" has not been
eliminated at all, because in the act of self-reflection the objectivity
ascribed to the subject becomes itself a subjective state of mind of the ob-
server. That a subject is having an objective experience is a subjective

experience of the observing mind. All we have said so far is that for a total observer-of-a-subject to be objective, it must have a component capable of receiving inputs about the way in which another component receives and processes inputs. Self-reflection is a necessary condition for objectivity, but not a sufficient one. The observer of the subject may be totally wrong about what it observes or reports. As we shall see, we have still to understand how objectivity can be established as a fact about the inquirer.

Next, the nature of the "internal state" of the subject is not clear. So far we have represented this internal state in physical terms, as though the observer, for example, were describing a human subject in much the same manner as he observes the innards of a computer. But the whole point of subjective philosophy is that any such representation of a person's sensations and feelings is largely irrelevant as far as the "actual" internal state is concerned. Can we represent how a person "actually" feels or sees when he observes the deep green of pine against the intense blue of sky? As we have said, this may be the Kantian question applied to the understanding of a subjective state of mind: what are all the representations of the subject that make up its reality? One recalls the story of the blind men trying to describe an elephant while each touched some part of the body. But in the story there is a wiser observer-of-the-subject who "sees" the elephant for what it "really" is and can therefore laugh at the antics of the blind. But who sees for the community of inquirers? Who can tell us when our modes of representation leave out crucial features?

This last design question therefore is this: under what circumstances does a set of representations of an object capture the essence of

the object, i.e., become objective in the most general sense? Perhaps
subjective philosophy is entirely too correct: no _thing_ can ever be ade-
quately represented by an image of its nature, in which case subjective in-
ternal states are not different from any other states of Nature as far as
comprehension of their essential nature is concerned.

9. _The mechanist theory of objectivity: "information."_

Whenever philosophers feel called upon to describe a whole class or
universe, their tendency is to search for a dichotomy that will serve as a
beginning for a more elaborate classification. This dichotomy should pro-
duce new ways of looking at old problems. The dichotomy that seems to be
called for here is the dichotomy between the mechanical and the teleological--
between observations that are taken to be reactions to a stimulus or message,
and observations that are taken to serve some purpose. The essence of
"mechanical" observation is alienation: the observed subject is opposed
to the observer. Either the subject is passive and the observer active, or
else the observer receives "in-puts" (and hence is passive) while the
subject creates "outputs" (and hence is active). The observed and the ob-
server cannot be the same mind, and must be two opposing aspects of a
process. The alienation is well known in experiments in which humans (or
other living beings) are subjects, or interviews in which the behavior and
attitudes of people are being studied. The experimenter or interviewer is
the observer, and is a different kind of person from the subjects. He is
supposed to have no prejudices, to be rational, to be completely honest in
his reporting, not to care who is right, and so on, while the subjects are
interesting only because they have prejudices, are irrational, dishonest,
self-seeking, etc.

The flavor of the opposition between the observer and the subject seems to be well captured by the term "information." The inquirer is "formed" by a certain type of input, much as a computer is formed by a program. Hence the "information" that is stored in an inquirer is taken to be the set of all reactions of the inquirer to inputs of a certain type. Specifically, we imagine an observer-of-the-subject who can identify an input as an accurate sentence that describes some aspect of the natural world. If this sentence is received and stored by the subject, then the subject has reliable information. The mechanist theory of information goes on to say that a "state of the world" is simply a conjunction of sentences about the properties of objects in the world. The mechanist has an answer to the question: what set of representations capture the essence of an object? The set is comprised of all sentences that accurately describe the object, i.e., all sentences that ascribe all the correct properties to the object.

10. Information: master and slave.

The judge of the accuracy of information is the observer-of-the-subject, who in some way holds a dominating role, because the accuracy of information for the observer is taken to be independent of the wishes or purposes of the subject. Information for the mechanist is there and what it says cannot be changed by the subject. We determine whether a subject is objective by determining whether its stored information corresponds with reality; if it does, the information is factual ("objective"). If it is factual, it cannot change, no matter how the inquiring mind may change: "a fact is a fact" is not a tautology, but rather a statement of an hypothesis about the relationship between information and mind.

According to the mechanist hypothesis, the fact dominates the subject simply because he has no choice about the facts. He may wish ever so ardently that men love their fellow men, but when the facts reveal that men hate each other instead, then the inquirer must bow to the authority of fact. In this mechanist relationship, man becomes the slave of the master who is information, or, rather, the slave of the observer-of-the-subject, because the "world" of the inquirer is a creation of an observer-of-the-subject. It is a world that the subject cannot change once the observer has fixed it in his mind. More precisely, there is some way of observing-the-subject in which the past states of the world of the subject can be accurately ascertained by the observer, and hence are not changeable by any action on the part of the subject. The mechanist hypothesis states that the past as constructed by an "accurate" observer-of-the-subject is inalterable once the states of the world are correctly ascertained. Here is true alienation of self and fact; the self is the slave of the master fact created by "another" observer.

Once the mechanist hypothesis is stated in these terms it appears almost absurd. What master observer-of-the-subject can ever gain the authority to "fix" the facts--i.e., to legislate what is information and what is not? Such a legislating mind puts each man in bondage to a mysterious and unknown master.

11. Information: the conquering lord.

And yet the mechanist hypothesis about the nature of objectivity has infiltrated practically every aspect of intellectual and social life. Government information agencies consider themselves to be recipients and storers of various "pieces of information" of interest to the

citizen and to those who serve the citizen in military and non-military capacities. The information is fixed, and cannot, under penalty of the law, be altered. Our whole theory of statistics is based on the notion that pieces of information can be numbered and represented symbolically $(x_i, y_i,$ etc.) and that the task of the statistician is one of aggregating these "given" bits of information in various ways.

In logic, too, the mechanist philosophy has had its strong influence. The logician is primarily interested in sentences, and he has come to think of sentences in terms of their semantic content. Any given sentence that is not a tautology may express a factual description of the world, and it is the task of the semanticist to put the factual aspects together in a pattern that will be useful to the reader.

Finally, in that part of mathematics called "information theory," information is reduced to common units, and specifically in the case of digital information to "bits" of information. An important problem in the eyes of many information theorists is to extend the concepts developed in information theory relating to redundancy, etc., to useful concepts of meaningfulness. So fascinating are the developments of information theory that many writers speculate on the possibility of completely describing the human brain in terms of an information processing device. To do so, there needs to be another mind that can accurately observe what the brain is "really" like even though proponents of this physical reductionism do not tell us how this "other mind" can also be a mechanical information process-ing device. How does it happen that in all these widely accepted approaches to information, there is the master observer-of-the-subject who has the authority to fix the unalterable status of information in various "data

banks" of government, industry, etc.?

12. <u>The subject as the willing slave.</u>

Somehow it must be the subject himself who delegates this authority
to the master observer-of-the-subject, because our tradition states that
we have freed ourselves from dogma. But if we examine the reasons why
people accept facts, it is not at all apparent what policy decisions are
being followed. For example, we accept information because

(1) it is provided by "experts" (physicists, doctors, engineers, etc.);

(2) it is produced by a highly bureaucratized system with "built-in"
controls (accounting systems, registration systems, etc.);

(3) it is such that no one feels inclined to disagree (current state
of the weather, existence of a fire or war, etc.).

In each of these instances, who is the master observer-of-the-subject?
Who says that the information of experts should be accepted? Who says that
bureaucratic information is reliable? Who says that facts that no one dis-
putes are accurate? The answers are readily at hand. The authority of the
expert arises out of the recognition he has gained from his peers. If you
want to know whether Jones is an expert, ask Smith, who is also an expert.
The people, i.e., the "subjects" in our earlier terminology, decide who these
guardians of expertness really are. The authority of the bureaucratized
system arises out of the acceptance of the system by "auditors." If you want
to know whether a company has kept its books correctly, ask an auditing firm
to check on their procedures. In the last case--universal agreement--the
master observer-of-the-subject seems to be a "collective mind"--a mind that
is "more than" all the individual subjects and that can pass judgment on
what each individual says.

The designer of inquiring systems is less interested in whether the master is the expert, the auditor, or the collective mind, than he is in the basic design principle that justifies each of these choices. Why should Smith be accepted as an expert on the expert advice of Jones? Why do we accept the findings of auditors, or let the collective mind dominate our notion of what is really happening? Perhaps some hint of the answers to these questions can be found by examining a similar list where the subject does not recognize a master:

(1) in moral matters there are no experts;

(2) in accounts of the saving of souls or the blessings conferred by philanthropy or federal aid, there are no auditors;

(3) on the true causes of war and poverty, there is no collective agreement.

It is interesting to note that this second list seems far more important than the first. The experts can tell us "facts" but they can't tell us what our ultimate values should be. The auditors can guarantee the statement of "assets" of a company, but they can tell us nothing about the social value of these assets. The collective mind can agree that a calamity has occurred, but can say nothing about why it occurred.

13. The subject as a manager.

This comment on the second list suggests another basis for a policy of the subject that will govern the master observer-of-the-subject: instead of mere blind willingness, the subject should delegate authority whenever the net benefits warrant doing so. The net benefits are made up of two components, the gross benefit of the policy and the cost of carrying out the policy. Thus we would all like to check on the advice of an expert, but it

would cost us years of education and training to do so, and hence the maximum net benefit accrues when we trust the experts. The experts may be wrong on occasion, and this is added into the cost of the policy. Even so, the net benefit may be maximal when we trust them. But on matters of ultimate value, the net benefits are not maximized, because the experts disagree or the subject does not know how to identify an "expert," and thus the costs of trust are too high. Such a policy makes the subject a "manager," who permits the master observer to rule whenever the net benefits so decide.

The net benefit basis of information policy is what I have previously called the "teleological" approach to information, because it emphasizes purpose (means and ends). The teleological approach appears to reduce the alienation between observer and observed. If the subject is forced or blindly willing to accept the facts about the world because of the dicta of an observer-of-the-subject, the alienation is severe. But if it is the subject after all who uses teleological considerations to appoint the master observer-of-the-subject, then the alienation seems to disappear. The "facts" are, after all, the creations of the subject's own policy making. Thus when a simple sentence of the form, "this is green" is stated, one subject may respond, "is it indeed?" and the other may respond, "so what?" The "is it indeed?" response is the response of a blindly willing and alienated subject. Such an inquirer receives the offered piece of information and stores it as a piece of information in the mosaic of bits of information in its memory. It accepts the legislation of a master observer. On the other hand, the response, "so what?" albeit rude, seems to be a freeing response. Here the subject is in no mood to receive unless the offered piece of information can be perceived as useful in some plan of its operation.

14. <u>The paradox of teleological information.</u>

But it must be apparent that the teleological basis of information policy utterly fails to solve the problem of authority, nor does it really remove the alienation of subject and observer-of-the-subject. All it does is to suggest a new question: what are the costs and benefits of trusting the master? Who establishes the evidence, pro and con, for answering this question?

But how difficult a question is it? Are the facts fairly obvious, so that the collective mind of agreement could be created to solve them? Consider a rather simple item of information, e.g., information about a constraint on the behavior of the receiver. For example, the information is in the form, "There is a log across the road in front of us." If the subject is in the mood of "so what?" he may very well drive on ahead and pass over the rotten log without interruption of his normal course of action. In this case the offered information is of no value whatsoever; indeed it does not even stand as a "fact" in the receiver's world. In other words, in the case of the "so what?" attitude, something becomes information only because it can find a justifiable place in the <u>total</u> scheme of the subject's activities, in such a way that its position in the total scheme of things, as William James puts it, "makes a difference" in what the subject actually does. It begins to look as though the question of net benefit even in simple cases is not a very obvious one at all.

In order to explore the net benefit policy of information more precisely, we can use a technical illustration, the control of inventories where the net benefit of information can be expressed in quantitative terms.

An inventory system is simply a system which stores items that have use at various points of time. The reason for manufacturing and storing the items ahead of time lies in the extreme inconvenience that may occur in trying to create an item at exactly the point where the need arises. This is a familiar enough situation to any householder who habitually stores various sorts of canned goods, sugar, salt and the like, thereby incurring an expenditure ahead of the actual occasion of the need simply to avoid the enormous inconvenience of obtaining the items from the store at exactly the times when they are needed.

Now what is the relevant information that anyone who tries to set up an inventory should have? Well, first of all, he should have some estimate of the inconvenience that may be incurred when items from inventory are demanded and are not available. This will guide him in the relative importance of storing various types of material in his inventory. Secondly, it would certainly be worthwhile if the person controlling the inventory had some knowledge of when the needs were apt to arise. This would enable him to plan his inventory storage policies over time in accordance with these needs. Finally the controller of inventory should have information about the costs of holding items in inventory over long periods of time. For example, he may find that certain items deteriorate, or that the purchase of an item ahead of time prevents his making use of a more up-to-date item when the need really occurs. He may also find that his capital is tied up in inventory and is not available for other opportunities when they occur. In certain countries he will also incur penalties imposed for holding items in inventory by government taxation policies.

There may be other types of information important to the holder of inventories. He may wish to determine, for example, how long it takes to receive an item into inventory once an order has been placed, and he may want to have some general information about the quality of the items in inventory and whether they really meet the requirements of the items when the needs occur. Suppose, however, we restrict ourselves to the three elementary aspects mentioned above, namely, the cost of placing items in inventory, the demand for items from inventory, and the cost of holding an item in inventory over a period of time. All of these are examples of teleological information.

From the point of view of an inquiring system the problem now is to determine these "basic" pieces of information. If we were to adopt a purely empiricist approach to the problem, we would ask ourselves what we must observe in order to arrive at suitable information concerning the three basic questions. What, for example, shall we observe when we are asked, "What does it cost to order and place an item in inventory?"

The natural reaction to this question would be to say that one should look at the past history of the inventory system. What, in fact, has it cost in the past to place an order and receive an item into inventory? We might therefore examine the activities of the people who place the order and begin to add up the cost components in terms of labor and materials required to initiate the order and to process it. We would do the best we could to develop a careful description of the exact way in which orders are placed and the kinds of controls that are imposed, and would try then to relate these to actual cost output on the part of the entire system. In this regard, the inquiring system would adopt an "is it indeed?" or passive

role in its opposition to nature. A state of nature would be a conjunction
of assertions about how orders have been placed as determined by an expert
master observer.

In the same manner, if we were to tackle the problem of requirements
from the demand point of view, we would try to search through past records
to determine at what particular points of time requests for items had been
made, in what form they had come, and how large the quantities were, and so
on. The "objective" demand on inventory is something that is told to the
inquirer, who receives what is given--i.e., the data, in a passive mode.

Finally, turning to the question of the cost of holding items in in-
ventory, we might conduct a careful search of past records that give evi-
dence concerning obsolescence, deterioration, taxation, and the like. To
estimate the cost of capital tied up in inventory, we would try to estimate
the extent of demand the inventory system places on the available capital
of the corporation or agency; we would then try to estimate the actual "lost
opportunity" cost of this tie-up of capital.

This "is it indeed?" approach to the inventory problem is the one
most often followed by operations researchers and others who try to assist
management in the control of inventories, but from the point of view of the
designer, the whole procedure seems very weak. For example, the particular
inventory system may rely on a certain resource to supply items of inventory
to it. This resource may require that a certain number of days notice be
provided and that the inventory system must pay a certain penalty each time
an emergency order is placed, and so on. It would naturally occur to the
designer of the inventory system to ask whether or not the "given" source
for the inventory is appropriate. Perhaps if the inventory system itself

could control its own source, a number of the penalties associated with replacing items in inventory would not occur, and at least the total cost of placing regular orders and emergency orders could be vastly reduced.

If this were the case, it would be simply incorrect to say that the relevant information about the cost of ordering and placing items in inventory is to be found in the practices of the existing resource agency. Anyone who confined his attention to this kind of information would simply fail to acquire information, whatever "data" he found.

In other words, if the assertion about the cost of placing orders is in the form "The cost has been k dollars per order," the assertion is not yet information; its opposition to the purposive inquirer is quite different from its opposition to the mechanical inquirer. In the case of the mechanical inquirer, the information will be received if it is properly authorized; in the case of the teleological inquirer, it will be used if it fits into a total plan of action.

Or, again, in the case of the demand for items from inventory, the designer may find that the person asking for items from inventory does so according to a certain convenient pattern from his point of view, but has no real need for the item when the requests are made. The designer may in fact discover that if the persons making the requests are rewarded in certain ways, they can smooth out their requirement schedule so as to avoid almost all of the emergency situations that have occurred in the past.

Finally, when we consider the problem of holding items in inventory, we may discover that in the past the organization has often failed to take advantage of opportunities to use capital most profitably. In this case, descriptive sentences about past opportunity policies would not

constitute information about the cost of tied-up capital in view of the fact that were these policies improved, the actual costs of tying up capital in inventory might be considerably greater than one would estimate from a description of past behavior.

All this amounts to saying that the inventory system is embedded in a much larger system. The theme, of course, is merely an application of the theory of systems developed in Chapter III. An inventory system is a nonseparable part of the rest of the system, and "information" about the characteristics of the inventory system from the teleological point of view depends upon the way in which the total system is viewed. The cost of ordering and placing an item in inventory is not an isolated "piece" of information; a cost-datum contains within it a picture of what the entire system is like, just as do the requirement schedule and the costs of holding the items in inventory. The inquirer cannot passively observe what the costs and requirements of an inventory system are. He must infer what they are from a total picture of the entire system in which the inventory system is embedded. Each cost factor in effect is a mirror of the entire system: it reflects the way in which the entire system works so as to generate a certain penalty associated with a given type of action that is adopted by part of the system.

Thus the sentence "the cost of doing x is k dollars" is an abbreviation of the sentence "the entire relevant system has such-and-such properties among which is the cost of doing x."

To recapitulate, there are two radically different ways of defining "observation." Mechanical observation is defined as a "reaction" to a stimulus: an inquiring system A "observes" an object X if another inquirer B observes that A is "reacting" in some manner to X. The reaction may be

the flash of a neuron, or the flick of an eye, or a spoken word, or a string of symbols. Once the observer-of-the-subject observes the completed process of stimulus and response, then for him the subject has "observed." To know that a subject has observed "objectively," we need the authority of a master observer-of-the-subject. Teleological observation, on the other hand, is a way of observing the world so that the resulting information is useful to a purposive being. To know that a subject has observed "objectively" we need to know the total system in which the subject acts. We can justify the appointment of the master observer-of-the-subject by means of a teleological argument--i.e., the master is the appointed servant of the teleological subject. But this justification simply complicates the relationship, because the subject cannot decide without teleological information, and yet he cannot acquire objective teleological information without knowing the whole system.

15. The search for objectivity: infinite regress or vicious circle?

The pathway to objectivity seems to be either an infinite regress or a vicious circle. It would be an infinite regress if the designer were always to evoke a new master observer to legislate over the old master and his subject. ("Jones is an expert because Smith says he is, and Smith is an expert on Jones' expertness because Brown says he is and . . ."). It would be a vicious circle if the designer were to permit the subject to appoint the master and the master to appoint the subject ("Jones is an expert because Smith says he is, and Smith is an expert because Jones vouches for him.").

It is interesting to note that the regress is merely called infinite, while the circle is called vicious, even though the circle appears to be the

more innocuous of the two. From now on, these two characters will play
their role in the design of inquiring systems; the problem is either to
design a regress of inquirers that will somehow collectively approximate
objectivity, or else to create a circle that is not vicious. In effect,
the Lockean community is an attempt to build a nonvicious circle, because
each member's objectivity is guaranteed by the agreement of everyone else.
In political designs, Locke's is a system of "checks and balances," but as
in the case of the Lockean community, it is not apparent why agreements of
the interested parties constitute the objectivity of their beliefs.

16. Information and Weltanschauungen.

For the present, we turn our attention to the possibility of design-
ing an infinite regress of inquirers that stands for more than a simple and
dull "A is right because B says so, B is right because C says so, etc."

A teleological inquiring system wishes to know whether a piece of
information is correct. In order to decide on this matter, it creates an
image of its world--a Weltanschauung--that provides one picture of the in-
quirer's alternative actions and hence the relevance of the information and
the way it should be used. For example, the inquirer wants to travel from
X to Y. One Weltanschauung says that there are four means of travel, and
provides the times and costs of each. On this basis, the inquirer selects
the minimum time and cost conveyance. Convenience and safety, according to
this Weltanschauung, are irrelevant, i.e., no matter how risky the travel,
the "optimal" conveyance remains the same. Another Weltanschauung may say
that the "real" objective of the inquirer is not to travel, but to communi-
cate with a distant colleague. The picture of the set of alternative actions
shifts, and the interpretation of the "data" of the first Weltanschauung

becomes quite different. The "cost" of travel must now include lost opportunities of the inquirer to use the travel time for other purposes.

Hence in the teleological theory of information, the sentence, "X is a piece of information" is valid only when embedded in a certain "Weltanschauung," i.e., way of viewing the entire system. It follows that an inquirer attains objective information only if he chooses the correct Weltanschauung. But this conclusion seems to leave the whole problem of design up in the air, for where is the master observer who can accurately determine the characteristics of the relevant world of the decision maker?

15. The Hegelian dialectic.

The historical solution to this question was first suggested by Kant and later elaborated by the post-Kantian German philosophers, and especially Hegel. In the Transcendental Dialectic of his first Critique, Kant considers some classical hypotheses about the origin of the universe, its boundaries, and the immortality of the soul and its freedom. He presents side by side two equally compelling arguments each based on all the facts and reasons his ingenious mind could find. One argument shows convincingly that the world could have had no beginning in time, while the other shows with equal conviction that it must have had a beginning. In the same vein, one argument rationally proves that the world is bounded, and the "antithetical" argument demonstrates that it is not; the thesis proves the immortality of the soul, the antithesis proves the mortality; the thesis proves that the will is free, the antithesis that it is not. The point of all these exercises is to establish Kant's grander "synthesis" that unconstrained reason leads to contradictory conclusions, because it is permitted to go beyond its proper use as a coordinator of sensuous inputs into the

inquiring system.

In Hegel the Kantian design is made more explicit. First the inquirer must be endowed with a richness of experience. In Hegel's philosophy, this meant exposure of the mind to a vast array of psychic events, in literature, history, philosophy and science. In the more mundane approach to the design of inquiring systems, the requirement might be interpreted as a loading of "information" in the mechanical sense discussed above, where an attempt is made to acquire as broad a sweep of the "data" as possible. The same idea is familiar of anyone who has tried to study organizations with a view to improving them; the first few months may be spent in "looking at and listening to" as many aspects as possible.

Next, the inquirer must generate a conviction about some fundamental thesis; it must have the capability of believing wholeheartedly that a certain point of view is correct. For Hegel, this conviction must be rooted in a strong feeling as well as the kind of logical demonstration Kant provides in the Transcendental Dialectic. It is essential for Hegel that the inquirer live its conviction as well as think it because the conviction for Hegel is a stage in the psychic development of the inquiring mind.

It goes without saying that this requirement is vague from the point of view of a thinking type designer who wants his requirements to be explicit. A formal approximation to the "living reality" that Hegel talks about might be accomplished as follows.

The designer undertakes to construct a "case" for a point of view, in effect a defense of a thesis "A". The design of the case for A constructs a Weltanschauung in such a way that the wealth of "information" in the inquirer's data bank is interpreted by means of the Weltanschauung to support

thesis A over all other possibilities.

What the designer tries to do is to reverse the usual design procedure of data-to-model-to-optimal. Instead, he starts with the optimality of a policy as a "datum" and then constructs a view of the world in which certain data become relevant (information), other data become irrelevant (non-information) and the world view maximally supports policy A. In other words, he proceeds from optimal to model to data. The formalization of this design procedure can be sketched as follows. The inquirer has a data bank of elements, d_1, d_2 ... d_n. The elements of the data bank are symbols of various kinds. They may be numbers, graphs, mathematical equations, reports, etc. In the example of the inventory problem, they would be the collection of all the things that the operations research team has heard about costs, products, personnel, profits, etc. No "datum" by itself has any epistemological status, i.e., it does not say anything about the world.

The inquiring system also has a set of formal models which can each be interpreted as a description of the "whole system," W_1, W_2,...,W_n, and the interpretations of which are non-identical. Any datum d_i conjoined to a Weltanschauung W_j implies one or more items of information. An item of information does have epistemological status, i.e., is teleologically meaningful. In other words, an item of information has the property that it can be used as evidence relative to a thesis A. The thesis A is an assertion not contained in either the information or the Weltanschauung. By "use as evidence" is meant that the item of information lends a certain positive, zero, or negative credence to the thesis (as opposed to an item that is couched in a symbolism that has no meaning relative to the thesis).

The formal design of Hegel's "living conviction" is to select a Weltanschauung that maximizes the credence in the thesis A, i.e., a W_o which when conjoined with each of the elements of the data bank produces an information set that maximizes the evidence for A. In plainer language, the inquirer sets about showing that there is a way to look at reality so that the data can be interpreted to support the thesis.

In this account of the Hegelian design, it is not clear where the thesis comes from. How does a person acquire a conviction, or how does the inquiring system select the thesis whose credence is to be maximized?

Leaving this question unanswered for the moment, we introduce the next character in Hegel's drama. This is an observer-of-the-subject, who looks on the act of personal conviction "objectively." He says, "I see that this mind is utterly convinced that thesis A is true; I wonder why?" The spirit of this observer is in opposition to the subject. Its "I wonder why?" is the "so what?" mentioned earlier. The opposing mind is in the mood of "I wonder why another conviction wouldn't do just as well?" In order to observe the subject, the other mind conceives another conviction and asks what it would be like to be equally convinced of this "anti-thesis." Such is the manner in which one Hegelian mind observes another: in the mood of opposition.

Now in Kant's Transcendental Dialectic, the antithesis was found in a straightforward logical manner. If the thesis is "the world had a beginning in time," the antithesis is "the world had no beginning in time." A classical logician would want to say that either the thesis or the antithesis is true; Kant argued that both are epistemologically unprovable, and that the only "truth" to be found is that they both try to extend reason

beyond its proper domain. In Hegel, on the other hand, the antithesis is not the contradictory of the thesis, but rather its deadliest enemy. It is an anti-conviction of forcefulness at least as great as the conviction. The "deadliest enemy" concept is found most clearly in politics. The deadliest enemy of democracy is not nondemocracy, but a very explicit and detailed political design called the Communist Party. The deadliest enemy of the Democratic Party is a very concrete political entity called the Republican Party.

Now the very effort to maintain one's conviction in the thesis generates opportunity for the deadliest enemy. The effort to preserve democracy leads to wire-tapping and secrecy, in fact to non-democratic policies. If a nation as a whole is convinced that dictatorship is correct, its very conviction will breed revolution. The observer-of-the-subject is not a dispassionate "other mind"; it is passionately dedicated to destruction of the subject's conviction. The very activity of observing the subject creates a mood of opposition.

If we try to design this very living drama of conflict into the inquiring system, it is not clear how we can capture its life. Following the more or less dead pan approach to the design of conviction given above, we can set down the requirement that the antithesis B be so selected that of all alternative counter theses to A, B has maximum credence. This means that there exists a Weltanschauung W which when conjoined with the data, maximizes the evidence for B and the maximum "score" for B exceeds that attained by any other counter thesis and its maximizing W.

Evidently, the meaning of this design conviction (thesis) and counter-conviction (antithesis) depends on the set of data, the set of Weltanschauungen,

the meaning of "conjoining data to a Weltanschauung," and the measure of
credence, all of which are vague at this stage. But the basic design idea
needs to be explored before the formal details can be made more precise in
the next chapter.

It will be noted that in the Hegelian design the thesis and anti-
thesis have the same status. The antithesis is built out of the thesis by
the building blocks of the data and the Weltanschauungen; but the thesis
could just as easily have been built out of the antithesis. Hence we miss
that aspect of the Hegelian picture in which the antithesis looks upon the
thesis that generated it in a way that is different from the attitude of the
thesis. The revolutionary looks down upon the reactionary. The reactionary
in his conviction can only think that the revolutionary is crazy or criminal;
he must utterly reject him as an unnatural evil or a meaningless mind. But
the revolutionary understands the nature of the reactionary full well; for
him the reactionary's conviction is based on a natural selfish greed and
hypocricy. As at other points in this chapter, e.g., personal vs. community
knowledge, we see that the design does not seem capable of representing the
living idea of the philosopher.

In the fourth act of the Hegelian drama another type of observer-of-
the-subject enters, who observes not the conviction but the opposition. He
is a quite different observer-of-the-subject, because he tries to see how
the opposition arises out of the particular kinds of minds that clash in
their convictions. But he is no compromiser of the bargaining sort that one
finds in labor and international disputes. He is also in opposition, an
opposition to the very nature of the conflict, and he does not seek to deal
out rewards that will keep all parties reasonably content. Instead, he

builds a new world view in which the nature of the conflict is understand-
able, but which shows that at a higher level the conflict is merely one
aspect of reality and not the critical aspect. The conflict in fact is
devoured by the higher level Weltanschauung. In the act of creating a world
in which he can observe the conflict, the observer also creates a convic-
tion. It is a very common experience that is being portrayed here. The
mother sees her two young sons quarreling over who should play with a toy;
she changes their environment to the playground and the conflict becomes ab-
sorbed into a larger view of the world. But also the mother knows she is
right to have stopped the squabble; indeed the very stopping of it convinces
her she is right.

Now we can see the origin of the conviction in the thesis: it arose
because the thesis was a larger view of some other conflict, and just because
it was a larger view it created the mood of conviction. There is nobody who
feels more right than the person who can see that an argument is based on a
narrow view of reality and that he holds a broader perspective. For the
first time in our story, there is also a loss of seriousness and the gain
of a bit of humor in this episode of inquiry. The "bigger" mind that "ob-
jectively" views the conflict runs the risk of being silly, of concocting
a large but ridiculous world view. A "bigger" mind observing international
dispute may "see" that it is brought about by hidden forces from other
planets, or an imperialist plot of Wall Street, or a communist plan of world
domination. To be taken seriously, the bigger mind must somehow get some-
where "beyond" the opposition of convictions of the thesis and antithesis.
What this "beyond" means is part of Hegel's master plan, which is an epic
of the development of mind up to the stage of Absolute Mind. The bigger

mind goes "beyond" the conflict when its episode fits into the larger epic. What later philosophy resents is the implicit assumption that we know the epic beforehand, and thus can force the story of mind into a preconceived pattern. The mind that knows the whole epic must be the supreme objective mind we have been seeking in this chapter, and hence the designer needs to know the method by which such a mind wrote Hegel's story. Of course, Hegel himself tried to say that the epic's story was inevitable, but even so he fails to tell us how he knows this, or how he happened to come upon the correct form of the epic. In fact, Hegel fails to sweep his own mind into the story, even though his must be the most objective of all if he is right. Of course, similar remarks could be made about all the philosophers we have discussed so far; none of them is able to use his philosophy of design to account for his own mind's capability of designing.

The "bigger" mind that observes the conflict is often called the "synthesis," a term that only weakly describes the power Hegel intended to ascribe to it. Possibly the dignity we normally perceive in the role of a legal judge permits us to call this bigger mind a judging mind, and its activity "judgment." Other labels will occur to us as the subsequent argument unfolds.

Can we design judgment in the inquiring system? Again the explicit design will threaten the life of the dialectic as it goes about its task of being explicit. The next chapter will explore the explicit design question in some detail. The general idea is to design the class of models (Weltanschauungen) in such a way that each model can be expanded into a more general model, or else can be made more refined by introducing finer distinctions. The straight-faced inquiring system that has created a thesis and an anti-

thesis in the manner described above now searches for an expanded <u>Weltan-schauung</u> which, when conjoined with the data, makes both the thesis and the antithesis maximally irrelevant in the teleological sense. Neither is important relative to the broader objectives of the inquirer. Simultaneously, the broader and/or deeper <u>Weltanschauung</u> maximizes the credence of the "super-proposal" or synthesis. The inquirer can also work on the data bank, either expanding it or making it more precise, and search for the optimal change in the data bank that will maximize the irrelevance of the thesis and antithesis and maximize the credence in the synthesis.

As we shall see, the entire process leads to ever expanding and ever more refined models. If the search process "converges" in some sense, then the "limit" might be regarded as an objective description of reality. Why it should be so regarded is not clear from Hegel's system alone, but the idea seems to be that an approach to reality based on the most forceful arguments and counter-arguments at each stage must in the end have eliminated every conceivable grounds for doubt. The world will have been examined from every possible point of view--i.e., "objectively."

16. <u>Critique of the Hegelian design</u>.

And yet there is much to make us question this design of an inquirer. We could--and will--ask why the process should lead anywhere but down blind and narrow alleys, unless there is a guide who has superior vision over the maze. The mere opposition of thesis and antithesis does not mean that the perspective of the inquirer is broad. This objection might be met in part by requiring that the expanded Weltanschauung of the "synthesis" be a different representation of reality in the sense of the last chapter, but even so, how do we tell whether the set of representations is free of built-in bias?

But there is a still more serious criticism of an opposite kind: Hegel's process of learning one's own mind belongs to a leisure class, where time and cost are of no concern. If in order to attain an objective viewpoint one must search all the ramifications of mind, then objectivity is a costly and time-consuming commodity; partial objectivity might be far better. Indeed, if time and cost are relevant considerations, then a mind that does not go "all the way," but instead properly balances the risks of bias against the costs is more objective than the thoroughgoing but lavish mind.

Consider, for example, the plight of the ordinary but extraordinarily curious citizen of today. In addition to being well informed in his own business, he is called upon to vote on a plethora of issues of the world, the nation, the state and the city. If he is to be a well informed voter, he must be "fully" informed about world poverty and international politics, national economics and regional development, city traffic and educational planning. Yet one must spend a lifetime to understand any one of these topics well. The problem, then, is not "how does the public become well informed?" but rather,"given so much time that can be spent on any issue, what is the optimal display that can be presented to the citizen?" In the Leibnizian inquirer, the display consists of a stream of sentences (or charts), some of which may be true, others false, others irrelevant. The citizens' problem is to put together several consistent stories and then, as the data flow increases, to converge on one story that seems to hold together in the best manner. The Lockean inquirer displays the "fundamental" data that all experts agree are accurate and relevant, and then builds a consistent story out of these. The Kantian inquirer displays the same story from

different points of view, emphasizing thereby that what is put into the story by the internal mode of representation is not given from the outside. But the Hegelian inquirer, using the same data, tells two stories, one supporting the most prominent policy on one side, the other supporting the most prominent policy on the other side. The teleological issue is: which method of telling the story will produce the optimally informed citizen when each is constrained by the same cost and time resources? The even broader issue of the well informed public is to determine the optimal time and effort to be put into the optimal mode of displaying information to decision makers.

We are far from finding any satisfactory basis for even discussing this very general problem of teleological information. It is a problem as general as the problem of the whole system. The inclination of the thinking mind is to break the problem down into manageable parts, i.e., to classify its many components and precisely define each part. The story that unfolds can then be put together, piece by piece, into a consistent framework.

Hegel's basic theme is anti-thinking in this sense: he challenges the designer to give up the explicit. Hegelian story-telling is frustrating for the logical mind. Where does the thesis come from? It is a created episode, terribly exciting, carrying its own commitment. But the "truth of the matter"is that the thesis is only one of a large set of alternatives that are "mapped" in some "decision making space." No element of this space need be any more prominent than any other; how did the thesis come to be called out to play its dominating role? And what process generates the anti-thesis? Why the sacred number two? Surely there could be three or more competing proposals, as there are often three or more political parties.

Finally, hardest to understand, is this mysterious synthesis, the master observer-of-the-subject who stalks on stage unannounced. If we could have announced him beforehand--if we could have made the conditions of his entry explicit--we could have saved all the bother of the tragi-comedy of the thesis and antithesis. Indeed, once we become explicit about this master observer, the squabble between the lowlier commitments is ridiculous, frivolous, at best sadly humorous. Yet Hegel tells us the synthesis does not exist without the prior conflict: ideas are generated out of opposition.

17. The story telling inquirer.

The Hegelian inquirer is a story teller, and Hegel's thesis is that the best inquiry is the inquiry that produces stories. The underlying life of a story is its drama, not its "accuracy." Drama has the logical characteristic of a flow of events in which each subsequent event partially contradicts what went before; there is nothing duller than a thoroughly consistent story. Drama is the interplay of the tragic and the comic; its blood is conviction, and its blood pressure is antagonism. It prohibits sterile classification. It is above all implicit; it uses the explicit only to emphasize the implicit.

But is story telling science? Does a system designed to tell stories well also produce knowledge? Or can such a system be "designed"? Or is the story teller ever a "system"?

We would give up entirely too much if we now gave up the explicit as a criterion of design. There is no reason as yet to declare once and for all that drama is essentially implicit, or that objective story telling cannot be explicitly designed.

We should note in closing that most uncritical aspect of Hegel's story telling which flavors his whole theory of mind, namely that the story has some point to it. The point in Hegel's case was the creation by the process of an Absolute Mind. The point is also represented in that greatest myth the nineteenth century intellectual developed: progress. Progress is the story of mankind; men will push back step by step the domain of the unknown, ever reducing the uncertain decimal place to a certainty, ever rubbing out ignorance and superstition. Men will gradually increase the greatest good of the greatest number, eliminate poverty, drudgery, disease, unhappiness.

There must be a way to make explicit the progress that underlies the Hegelian story of mind. And indeed, the way seems already at hand in the infinite regress of observing minds. In the words of E. A. Singer:

> Suppose one were to maintain that the method of distinguishing between the 'appearances' and 'that which appears' was one that defined and made attainable a 'real' for every 'appearing,' only that this 'real' was no less an 'appearing' pointed to a 'more real' and so on in infinitum. Here is no longer a circle but a progress, and if one defines the goal of this progress as an 'ideal' it is none the less true that only a progress can define a real ideal. And it is only in the possibility of progress that one can be interested."[1]

---

[1] E. A. Singer, Mind as Behavior, p. 282, R. G. Adams & Co., 1924.

APPENDIX

A Sketch of an Explicit Hegelian Inquiring System

Let D be a set of "data," d_1, d_2, ..., d_k.

Let W be a set of models (Weltanschauungen), W_1, W_2, ..., W_ℓ .

Let $\bigcirc\!\!\!\!X$ be an operator conjoining an element of D with an element of W, such that for every d_i in D and every W_ℓ in W there exists one and only one element of a set I. In other words, X maps elements of D for a given W onto a set I in a many-one correspondence (there may be several pairs that map onto the same element of I). The set I is called the "information set" of a given W and the operator $\bigcirc\!\!\!\!X$ is called the interpretative operator. Thus for each element of W there corresponds an information set, represented by $I(W)$.

T is a set of "theses," i.e., non-analytic sentences stating something about the world, such that no element of T implies or is implied by any element of D , W , or I.

C is a two-place function that transforms T and any $I(W)$ into elements of the real number system. C is the "degree of credence" in T given the information contained in $I(W)$. Hence for each $I(W)$ there will correspond a credence measure for T: $C[T, I(W)]$. This represents the credence of a thesis given that the world is accurately described by W.

The maximal element of $\underset{\sim}{W}$ relative to a thesis $\underline{A}$ of $\underset{\sim}{T}$ is that W_{oA} which maximizes the credence of A over all elements of $\underset{\sim}{D}$; i.e.,

$$W_{oA} = \max_{j} [C(A, I(W_j))]$$

The antithesis, B, is an element of $\underset{\sim}{T}$ which can be given maximal credence in terms of some world view and the set of data. Thus the antithesis is that T_o of T satisfying

$$T_o = \max_{k} \left[\max_{j} [C(T_k, I(W_j))] \right]$$

for all $T_k \neq A$.

In the case of the synthesis, we introduce an operator which "expands" each world view, i.e., maps $\underset{\sim}{W}$ onto a new set $\underset{\sim}{W}'$. Similarly, we need an operator that maps $\underset{\sim}{D}$ into an "expanded" data set, $\underset{\sim}{D}'$, and $\underset{\sim}{T}$ into an expanded set of proposals $\underset{\sim}{T}'$. The synthesis is that element of $\underset{\sim}{T}'$ whose maximizing W of $\underset{\sim}{W}'$ minimizes the credence in both the thesis and the antithesis.

9/20/66 pd