VOLUME VII, NO. 42
OCTOBER 20, 1954

"SANITY AND HONOR"

AN ominous feeling arises from careful reading of Waldo Frank's *Nation* (Sept. 25) article on the transcript of the hearing held by the Atomic Energy Commission. It was the matter in these 992 pages of small type which led to the separation of J. Robert Oppenheimer from any knowledge of or responsibility for the Government's military plans in connection with atomic energy. The important thing is not that Mr. Oppenheimer has been deprived of a job, or that the Government has been deprived of his services. These, it seems to us, are questions of little moment. The troubling thoughts come rather from the realization that, according to Mr. Frank's analysis, there is no longer a place among the policy-makers of the United States Government for men who, when confronted by issues involving security, allow themselves to be influenced by humane or ideal considerations.

This is what the anarchists have always maintained, in general, about the State; and while the judgment still bears the mark of an oversimplifying "absolute," Mr. Frank offers impressive evidence that it is becoming increasingly correct in our time.

The *Nation* article is titled "An American Tragedy." The MANAS discussion of the suspension of Oppenheimer from the AEC' which appeared in the issue of May 5, had the same name, and Mr. Frank's discussion shows, we think, its complete appropriateness in both cases. The really significant issues which ought to have been flushed into the foreground by the Oppenheimer hearing were suppressed almost completely. As Frank reveals, the hearing took place "in a climate, pervasive, obsessive, like a nightmare: a climate of unchallenged axioms and dogmas." There was of course no hope of questioning those "axioms and dogmas." It was because Oppenheimer had questioned them that he was brought to "trial."

Mr. Frank begins with a skillful generalization of the assumptions on which the hearing was conducted. First is the view that Russia and the United States are locked in unalterable and potentially deadly opposition, with America's sole hope of security and survival resting in weapons of war. Now come the background considerations which directed the course of the hearing:

> Although each individual American may have values that transcend physical security and survival, values that may move him to risk life for them, the nation shall have no such values. Its supreme aim, like the beast's, is to survive. For the individual, values dearer than life; for the individual's nation, life at the cost of all values.
>
> In the three weeks' hearing the word genocide is not used; the relevance of fission and fusion bombs to genocide is not mentioned.
>
> There is occasional reference to "our civilization" and to the fact that fission-fusion bombs might destroy it. There is no inquiry into the nature of this civilization; into the bond between the bomb and the culture which produced it; into the perilous possibility that the bomb, *even if not used, even if merely made*, to "defend" this civilization, might undermine it and destroy the values of the men and women who live within it.
>
> Although Russia and communism are the ever present "other" in this schizoid world, there is no hint by any of the free-ranging witnesses, who are not limited by court procedure, that deeper understanding of the Russians and communism, of our mutual hostility and of *ourselves*, might contribute to defense and survival, and that some of the traits of which Oppenheimer is accused might make him a national asset for such understanding.

Notice that Frank speaks of the "traits" of which Oppenheimer is accused. While the charges against the physicist singled out acts rather than traits, there can be no doubt that what was feared in Oppenheimer was his traits of character. As Frank says:

> His *character* is the issue. And the problems involved belong to politics, history, sociology, psychology, ethics, religion. They are never pursued beyond a superficial range within the reach of a schoolboy.

This is a situation which gives new life and meaning to the myth of Procrustes. The question of

Oppenheimer as a natural and whole human being cannot be discussed. He must be shortened in stature, denatured and chopped down to fit the narrow specifications of the public hearing. His moral impulses are not relevant, nor are any of the far-reaching considerations having to do with how moral attitudes might affect the relationships of great nations.

For centuries men have dehumanized themselves to meet the necessities of war, and have dogmatized their thinking to meet the necessities of politics. What is appalling in the present instance is that both these distortions are now applied to the most talented and often the most sensitive members of our society—the creative scientists. This, to our way of thinking, is the real Armageddon, the authentic Ragnarok. Should we continue to fail at this level, the wars to come, which nearly all men fear, will only confirm the disloyalty of men to their better natures. The actual destruction in human values will have long since been accomplished.

The indictment presented by Mr. Frank is not an indictment of individuals, but of a culture. There are no heroes, no villains, but only the inexorable pattern of required conformity, its champions in the name of patriotism and national defense, and its bewildered and unhappy victims.

The men who conduct the hearing are plainly engaged in preventing any discussion of moral issues. They cannot permit to arise questions which would challenge the very assumptions of the hearing. The witnesses, especially the scientific witnesses, find themselves unable to testify concerning apprehensions about the H-Bomb they shared with Oppenheimer. Frank illustrates:

> When Dr. Walter Whitman, head of chemistry at Massachusetts Institute of Technology, corroborates two previous witnesses in their "feeling" that perhaps it was unwise to proceed with the H-bomb *before a new attempt was made to get the Russians to agree not to produce it*, Gray ignores the supposed freedom of the hearings and shuts him off sharply:
>
> WHITMAN: "I do not feel that the future of civilization"—
>
> GRAY: "I don't question your feeling. *I don't want to pursue it.*"

The scientific witnesses are for the most part sure of Oppenheimer's loyalty. Their feelings about him are strong—akin, as Frank suggests, to love (or in some instances, hate). They have difficulty in explaining why they feel so confident of Oppenheimer's integrity. Men of the highest standing in science, business, and diplomacy—

> try to suggest, against stubborn opposition of chairman and counsel, that they can understand Oppenheimer's interest in social justice, in Russia's "experiment," while Russia was still our ally. . . . One feels that the brilliant men, Kennan, above all (and one remembers how he was severed from State office), could have been clearer in analyzing Oppenheimer if the "dogma," the "climate," had not barred them.

An "interest in social justice," . . . "a feeling" about "the future of civilization"—these can have no standing in the hearing, for this would tear down the barrier between human morality and State policy. Frank attempts to grasp the central problem of the scientific witnesses by saying:

> The scientists are not experts in this "feeling," nor is Oppenheimer; but in him they sense their own preoccupation. When Oppenheimer expresses doubt as to the political, strategic, economic wisdom of a certain program of H-bombs, they know he is on legitimate ground even if he is wrong. But they know also that a deeper, inarticulate instinct moves him, and that *there* he is right!

Frank finds Oppenheimer's own defense lacking in either clarity or candor—possibly both. His liberal attorney seems principally interested in making Oppenheimer's radical associations in earlier years appear as youthful indiscretions—and not, therefore, indication of the physicist's character. Frank comments:

> Mr. Garrison cannot be blamed for this; he wants to win his case. But the need to hush up what is generous and noble in the man, even if mistakenly directed, points frighteningly to the sick spirit of our country.

Frank finds it incredible that Oppenheimer should have abandoned his deep humanitarian interests. When Oppenheimer refers to his past sympathy for Republican Spain as "idiotic," Frank is unable to go along. "What," he asks, "is idiotic" about wanting to help a people which was "struggling

for its life against the fascists"? On this point, at least, both Frank and the investigating committee are agreed:

> The board doesn't believe that he [Oppenheimer] has lost the motives which made him champion Spain, although he may have outgrown a particular method of expressing these motives. These are the unforgivable; these make him a risk.

The latter part of Frank's article is devoted to a kind of psychoanalysis of Oppenheimer. There may be much truth in this account of the conflicting motives affecting the physicist's career, although it is doubtful if even Oppenheimer himself could confirm it. But whatever the inner ordeal he suffered, his real offense lay in feeling and thinking like a human being and a citizen, instead of only an obedient technologist. While the prerogative of disagreeing with his government's actions and policies on moral grounds belongs to every citizen, this prerogative becomes "dangerous" in direct proportion to the citizen's influence. Oppenheimer's feeling that the H-bomb ought not to be produced until further effort had been made for an accord with Russia was his right as a citizen; and even as a powerful citizen he still had that "right"; but, as Frank suggests, his exercise of that right became a "sin" in the eyes of the political dogmatists. Frank notes that the hearing resembled a theological inquisition—no "crime" was even suggested.

Frank wonders if it might not have been possible for Oppenheimer to appeal to the public directly concerning his misgivings about the H-bomb. He would, Frank thinks, have found wide support:

> Did not Dr. Conant say the H-bomb would be made "over my dead body"? It is conceivable that the genocidal race in which we are now plunged might never have begun, and from this birth of good faith and of courage, agreements with the Soviets might have deepened and broadened. Such a pact with such an enemy would mean risk? Russia might cheat? The peril would have been infinitely less than the certain one of our present "security course." And the American people would at least have heard, through a conspicuous public servant that the nation which refuses to risk its life for sanity and honor is as craven and doomed as the man who refuses to risk his life for what man should love more than his life.

Yes, Oppenheimer might have done this, but already you can hear both anguished and angry objections. You can hear the resentful response of fear, and the cries of the demagogues who rise to power by trading on the anxieties of the people. The pity and the tragedy of fear is that it blinds to all other considerations. And the statesmen who set the "axioms and dogmas" of national security, if they do not fear themselves, are closely attentive to the expressed fears of the people and the demagogues who represent them. It is here, finally, at the nexus between power and the pseudo-will of the people, that the choice will have to be made. The need, perhaps, is for heroes in government. But unless the people themselves are willing to risk life "for sanity and honor," heroes in government will immediately be made into martyrs.

Meanwhile, the time is short. As Frank says:

> Our sensitive and imaginative and creative men are placed on the defensive. Their generous gifts are not encouraged to be free and to explore—at the inevitable risk of heresy and error. They are being stifled into rigid conformity with dogmas of fear—or they are not used at all. A national program whose heart is the insanity of seeking shelter from a world in revolution by denying its elements of justice, by reliance on the threat of genocidal weapons, is bound, if it continues, to eliminate mind and spirit from the men who lead us.

There may be a single consolation in all this. It is that, as men of "mind and spirit" are increasingly barred by such conditions as these from the service of government, government will actually become *less important*, and that, as a result, people will come to expect less of government and more of themselves.

REVIEW
INDIAN ANALYSIS

AN article in the May issue of the Bombay monthly, The Aryan Path, develops lines of thought familiar to readers who share this Department's enthusiasm for Edmund Taylor's Richer By Asia (see "Books for Our Time," MANAS, June 17, 1953). This article, "What the West Expects from the East," is by Sunder Kabadi, London representative of the "Express" newspapers of India. The editors of the internationally circulated *Aryan Path* apparently feel that writers with this cosmopolitan background may supply perspectives of great importance to the synthesis of thought between East and West—because they are actively involved with current events touching both hemispheres.

Mr. Kabadi first calls brief attention to a certain nostalgic temper found in both British and Central European publications. He finds in this turning to the past evidence that a great and confusing transition has already been accomplished in political as well as economic matters—bringing bewilderments difficult for Westerners to grasp. When the Oxford Union selects as a subject for debate the question of "Whether the Elizabethan age is to be preferred to the Welfare State," this, reasons Kabadi, is one of the many signs that intellectuals, confused by the present, prefer to talk about the past. Perhaps a few professional men like "generals and unrepentant imperialists" still cherish positive convictions about the shape of political things to come, but even if these single-minded stalwarts are correct, a future discussed in such terms interests very few. What is wanted is some sense of basic direction, and this is more difficult than ever for the conventional intellectual to find, today. Why? Because one must now understand the East in order to understand the West, so great has the indirect influence of India actually become:

> Statesmen and nations do not consciously set out to influence each other. They influence each other because they are what they are, just as the sun melts snow or lightning strikes a tree. The influence that India is exerting on Western minds is already evident in many spheres, in the manner in which political freedom was transferred to us; in the more tolerant attitude being taken toward colonial questions, in the importance that is being attached, (as the Berlin Conference illustrated), to talking patiently but firmly with those whom you fear.

It must of course be admitted that there are, in India today, a vast number of "Indiophiles," whose opinions are as insecurely based and as thoughtlessly formed as those of traditional "Anglophiles." Those of both East and West who think as Kabadi writes, however, represent a true cosmopolitanism; they feel no need to justify their own existences or that of their native land by pointing disparagingly to the shortcomings of other cultures. Thus, India's attitude toward the handling of international disputes does not fall on altogether deaf ears in the West, even though the physical might of the Western world is greater than ever, its power of coercion at highest peak. Perhaps the West *wants* a deeper psychological maturity, with its most intuitive leaders sensing that India's traditions may hold keys to this objective.

> Since India achieved her independence the very word "imperialism" has become a term of reproach in the Western political and moral vocabulary. This is an outward sign of an inner change. A statesman who continues to uphold the ideals of imperialism—as some of them occasionally do—strikes his contemporaries as a rather ridiculous and forlorn figure.
>
> The Germans, by pushing the "Master Race" ideology to its logical conclusion, finally killed the idea of racial or national mastery. The consequences of this are becoming increasingly evident in the political, religious and moral thinking of the West. What all men of significance subscribe to now is international liberty, equality and fraternity. These ideals, having made some headway in the social and economic affairs of various countries, are now projected as the highest ideals and those that should govern the relations of all nations.

> Because this great shift in world outlook, or what the Germans call *Weltanschauung*, has taken place, it enables countries like India to work in harmony in many fields with those believing in this new world concept.

It is not, however, to be expected that Western politicos and social thinkers will suddenly become Yogis instead of Commissars. The "new world concept" may even "be believed in all sincerity, but the world be in a state of transition, the old and the new attitudes are both at work at the same time." However, "the ideal of 'partnership' is being substituted for the old idea of colonialism. . . . what we must regard as the last vestiges of colonialism are working themselves out in the struggles in Malaya, Indo-China and Kenya; and in the shame felt by intelligent men and women when they see people being discriminated against on account of their colour. In Malaya, Indo-China and Kenya, it must be remembered, the colonial powers do not believe they are fighting against inferior colonial peoples but against Communism or terrorism."

The concluding pages of Mr. Kabadi's article ought to be read in their entirety, but we have space for only one long passage, chosen partly because of its intelligent discussion of the Communist issue:

> The present struggle is a struggle for ascendancy between two sets of ideas, not two nations or two races. Ideas have already proved themselves more powerful on the material plane than the most powerful weapons devised by military science. The great task confronting Western civilization is to live down its historical association with the Asian and African peoples whose good-will, at least, it cannot do without if it is to resist the challenge of Communism peacefully and over a number of years.
>
> India can, because the integrity and honesty of her approach to world problems is universally recognized, help the West and Russia to preserve a sense of perspective as they try to prevent their differences precipitating into war. India could, after achieving national independence, have retired into her shell to grapple with her great domestic problems—increasing food production, industrialization, developing social services, eradicating illiteracy—and have left the rest of the world to solve its problems. No one would have blamed her, considering the great tasks that face the country. Instead, Jawaharlal Nehru has brought some of the spirit of India into the counsels of the world, and what India has been able to contribute to the discussion of the complex problems that divide the nations has been appreciated.
>
> What India has helped the world to understand by achieving her national emancipation in a non-violent manner is that the era of world dominion by a single group of nations has ended. It follows that if an enduring world society is to emerge in the second half of this seething 20th century it will be longer delayed if any nation or group of nations continues to aspire to a position of world mastery. With some adjustments here and there—as in the colonies—the nations of the world have to agree to live together *as they are*, with all their good qualities mutually recognized and all their bad qualities mutually tolerated.
>
> We are now in a period when the world is not dominated by one nation or a group of nations. Is this to be merely another interlude, or the new foundation on which world society will be fashioned? Generals and some politicians in the West are heard talking about the West's "mission" to save the world from Communism. Voices are heard discussing preventive wars. Military strategists, like General Van Fleet, write about the need to raise Asian armies so that Asia can "save" itself.
>
> It would be unnatural if such ideas were not heard and if such policies were not pursued in this age of transition. What India can do, and what enlightened opinion everywhere expects that she will do, is to continue in the many ways open to her to foster spiritual opinions throughout the world, by her deeds as in Korea and by her sentiments as at the United Nations. This will act as the greatest deterrent to war. Restraint must eventually come to everyone from within, not through coercion. There is no other country in the world better able to help bring about restraint through spiritual opinion than India. There is everything in the Indian character, history and culture to enable her to collaborate with other nations who believe in these ideals, and with all people who seek an honest peace, though they often seem to be going down strange paths to find it.

COMMENTARY
AMERICAN DREYFUS?

SINCE our lead article on the Oppenheimer case was put into type, we have seen a copy of the October *Harper's*, which contains Joseph and Stewart Alsop's twenty-one pages of closely argued criticism of the Atomic Energy Commission. The Alsops title their analysis "We Accuse!", deliberately likening the treatment accorded J. Robert Oppenheimer to that given by France to Captain Dreyfus. After a thorough examination of the charges and the evidence against Oppenheimer, they find him wholly innocent of any serious charge, and they accuse the Atomic Energy Commission of dishonoring and disgracing "the high traditions of American freedom."

Having read the Alsops, we regard our own article as unduly pessimistic in mood. The *Harper's* article will undoubtedly gain wide attention both in the United States and abroad. Since *Harper's* is a magazine of excellent reputation, and, for its quality, large circulation, it is even possible that many readers in other countries will prefer to think that the Alsops speak more representatively for America than the ruling of the Atomic Energy Commission.

There is no space to cite even the conclusions reached by the Alsops, save to say that they show, with the great burden of testimony clearly supporting them, that Oppenheimer has been profoundly sincere in his loyalty and support of the United States; that the hearings which led to his dismissal were the result of personal animus on the part of several men, spurred on by varying motives, and that nothing that was disclosed by these hearings in regard to Oppenheimer's conduct and even his opinions was in any sense "new" to the high officials whose prime concern was security.

One important thing that emerges from the Alsops' article is that it was Oppenheimer's moral strength and his integrity which got him into trouble. As for his "opinions," in regard to the development of the H-bomb, they were measured, honest, and shared by many other distinguished men in and out of government. The Alsops quote many searching comments on the Oppenheimer case, but perhaps one that should be most frequently repeated is the statement by Dr. Vannevar Bush, who told the investigating board that the AEC's charges ought to be re-drafted because they referred to Oppenheimer's opposition to the H-bomb. This could mean, he said, that a man can be tried in the United States for holding and expressing opinions. He continued:

> If this country ever gets . . . that near to the Russian system, we are certainly not in any condition to attempt to lead the free world. We have been slipping backward in our maintenance of the Bill of Rights. . . . I think no board should ever sit on a question in this country of whether a man {served} his country or not because he expressed strong opinions. If you want to try that case, you can try me.

CHILDREN
. . . and Ourselves

IT is a pleasure to recommend a substantial (260-page) but inexpensive (95-cent) pocket book containing numerous points of departure for educational thought—*The Art of Teaching,* by Gilbert Highet—another of Knopf's new, paper-bound "Vintage" series. The original hard-back Knopf edition went through six printings, and it will be a welcome omen if the public manifests still wider interest in this popularly priced volume. Even if much of what Highet has to say has been said before many times, it is nevertheless a good "re-thinking" book for the professional teacher, prospective teacher, or parent.

Mr. Highet, Anthon Professor of the Latin Language and Literature at Columbia University, is also a well-known author whose discussions of the classics are conceived without dullness and executed without pomposity. Highet's title derives, of course, from the belief "that teaching is an art, not a science," and he is concerned with explaining that the art of teaching enters into every human relationship. Husbands and wives, parents and children, employers and new employees, all participate in the process, which means that the *psychology* of teaching is of great importance. Highet points out that thousands of opportunities for helpful interchange are daily passed by in a culture tending to leave instruction to the professors:

> Fathers and mothers might do a great deal more talking about central subjects, when the children get older. Boys and girls in their teens are sometimes very distant, hard to talk to. But if you talk to them about the subjects which worry them, like war and money and love, or the subjects which they foresee will worry them, like getting a job and holding it and getting married, they ask very sharp questions and talk without any sign of boredom. Not enough fathers talk to their sons about their own jobs. Many a boy finds out with astonishment that his father holds a post which is important and interesting, and about which the two have never exchanged a sentence. Or he learns too late that he could have profited from his father's experience in a career he thought quite unconnected with his own.
>
> And in general the relation between parents and children is essentially based on teaching. Many of us forget this. Some think it is based on Love, others on control. But you can give a child as much love as it can absorb and still make it an idiot unfit to face the world; while the best and surest way to control your children is to explain the rules you intend to enforce. And there is a great quantity of learning which can never be acquired outside the home, unless the family is abolished altogether.

Turning to the typical situation confronting the professional teacher, Highet briefly discusses certain disadvantages of the occupation, but sets them off against advantages that should be equally obvious. The teacher has considerable leisure time and, for the man who learns how to use his energies wisely, this can lead to the happiest of circumstances. But there are other considerations:

> The teacher's second reward is that he is using his mind on valuable subjects. All over the world people are spending their lives either on doing jobs where the mind must be kept numb all day, or else on highly rewarded activities which are tedious or frivolous. One can get accustomed to operating an adding-machine for five and a half days a week, or to writing advertisements to persuade the public that one brand of cigarettes is better than another. Yet no one would do either of these things for its own sake. Only the money makes them tolerable. But if you really understand an important and interesting subject, like the structure of the human body or the history of the two World Wars, it is a genuine happiness to explain them to others, to feel your mind grappling with their difficulties, to welcome every new book on them, and to learn as you teach.
>
> With this the third reward of teaching is very closely linked. When the pupils come to you, their minds are only half-formed, full of blank spaces and vague notions and oversimplifications. You do not merely insert a lot of facts, if you teach them properly. It is not like injecting 500 cc. of serum, or administering a year's dose of vitamins. To teach a boy the difference between truth and lies in print, to start him thinking about the meaning of poetry or patriotism, to hear him hammering back at you with the facts and arguments you have helped him to find, sharpened by himself and fitted to his own powers, gives the sort of satisfaction that an artist

> has when he makes a picture out of blank canvas and chemical colorings, or a doctor when he hears a sick pulse pick up and carry the energies of new life under his hands.

One reason why teachers in the public schools have a difficult time—a reason of which parents need to be aware—is the compulsory requirements of elementary and secondary learning. Having already discussed this feature of modern schooling, we are particularly appreciative of the following paragraph:

> The real job for which teachers are trained and paid is to *help* the young to learn. It should not be necessary also to *make* them learn.
>
> I am not sure when this second necessity grew up to overshadow the first. I think it must have come with the establishment of universal education in the Western countries. Of course there has always been resistance to school discipline and reluctance to learn hard and boring things. Scarcely anybody learns the multiplication-table for fun. Certainly as early as Shakespeare we recognize the schoolboy with shining morning face, creeping like a snail unwillingly to school. But it seems to me that resistance was not shown by *entire classes* of youths and girls, year after year, until education ceased to be a privilege sought after by the few and became a compulsion inflicted on everybody. In countries where education is imposed on every boy and girl under the age of sixteen, it is very hard for them to see it as the most valuable gift of the state, next to national security and public health and the rule of law. If it is surrounded and sanctioned by disciplines, they come to hate it. If it is made easy and delightful, they don't take it seriously—as in some schools where pupils are "automatically promoted" every year. This means that even if they have been too lazy or stupid to master first-year geography they are pushed on to second-year geography to get them off the teacher's hands, and to avoid the danger of giving them a feeling of inferiority to their intelligent and hardworking classmates. For this problem I see no solution except the radical one of declaring such numbskulls to be unfit for education in book-work, and devising trade-schools, outdoor schools like the CCC camps, and domestic schools, to occupy their strong hands until they grow up. (Montaigne, who was a mild enough man and devoted to kindness as an educational ideal, had no solution either. He said that if a boy refused to learn or proved quite incapable of it, "his tutor should strangle him, if there are no witnesses, or else he should be apprenticed to a pastry-cook in some good town.")

There are many dimensions in *The Art of Teaching* and some readers will find of greatest interest the historical notes in the chapter on "Great Teachers and Their Pupils." Here it is possible to see that a fine teacher is a truly remarkable man—very much more than one with a "personality" somewhat different from that of other "successful" men. For the great teacher will display a consistent flow of energy surpassing that expended in almost any other line of endeavor. While he may draw inspiration from the needs of those who come to learn, this cannot diminish the respect due his unflagging zeal:

> This quality which we have called largeness of heart also involves energy, physical and psychical. Even when good teachers are thin dry ladies like Mrs. Angela Thirkell's Miss Bunting, or little wiry men like Vittorino da Feltre, they have remarkable vitality. They do not flag, falter, miss on one cylinder. When they work by routine, they use the system as a sail, not as a hammock. Some really first-rate teachers who speak in a calm gentle voice appear for the first twenty minutes to be taking things very easily—until you transcribe what they say and endeavor to compress it, or until you have heard them complete a course on a difficult set of problems with the same effortless ease: you realize then that they have been drawing on underground reservoirs of vigor, which you have been sharing. Sometimes these energies are startlingly physical. Plato knew that, and he was a powerful fellow himself. At the end of the *Symposium*, early in the morning, he says only the host, Agathon the playwright, and the hard-drinking comedian Aristophanes were still awake—together with Socrates, who argued a literary and philosophical point with them until they too passed out. Socrates then covered them up where they lay, had a bath, and spent the next day as usual. Boissier the historian was a perfect dynamo. Even in old age he rose before six to prepare his daily lecture, gave it and attended the inevitable committees in the morning, read and wrote in the afternoon, and spent the evenings dining out and telling stories and making epigrams in his gay southern voice. Some of the stories told about the teaching of Jesus look

> like descriptions of an energy which may be comparable.
>
> It is a strange thing, the energy of great teachers. We do not know much about it yet, and there is still a great deal to be found out. It seems not to be purely physical, or mainly physical, in origin. Comparatively frail people command it, and so do people who take very little thought for their health. But it undoubtedly can have physical expressions and effects. Another point about it is that it does not often seem to flourish, or even to exist, when its possessors are alone: meditating, writing, in prison, on journeys. It rises to its full force and seems to renew itself and refresh itself, as if it were powered by Niagara, when its possessor is surrounded by a number of other people—not a random crowd, as in a railway station, but people who are being taught by him, receiving something from him. Some of those who command it say that its strength depends largely not on themselves, but on the others, the men and women around, the listeners, the watchers, the pupils. Jesus himself was surprised that when he went back to Nazareth and taught there, most of the townsfolk did not believe in him; and that (it is implied) was why he was not able to do any deed "of power"—that is, any of the miracles he had performed among crowds elsewhere. Perhaps, therefore, this power will in future be explained as the spiritual energy, not of one individual, but of a group.

Finally, in the context of its conclusion, *The Art of Teaching* helps us to see that we must not systematize any of our forms of instruction to the point where they interrupt the spontaneous flow of thought. For college student and nursery-school child alike will respect intellectual honesty, and intellectual honesty is possible only when the teacher is willing to revise and improve his thinking as he goes along, selecting better illustrative examples, and admitting his inadequacies of reason when they occur. Like William James, the teacher who realizes that he is engaged in more than a profession "will do nothing that would stiffen and cripple the essential flexibility of thought." The "ifs" and "maybes" of an instructor need not be regarded as evidencing lack of conviction; they may rather *express* a deep educational faith—that little learning is possible unless a pupil is made aware that thinking is always exploration, never to be confused with memorizing or the accumulation of facts.

FRONTIERS

With the Positivists

As part of a general symposium on the subject, "Validation of Scientific Theories," the American Association for the Advancement of Science at its last general meeting (December, 1953), held a discussion of "Reasons for the Acceptance of Scientific Theories." The papers read at this time appear in the *Scientific Monthly* for September, and other groups of papers dealing with the general topic will be published later.

Philipp G. Frank, who taught theoretical physics at the University of Prague from 1912 to 1938, and who since 1940 has been a lecturer on physics and the philosophy of science at Harvard, contributes the first article in the current group, writing on "The Variety of Reasons for the Acceptance of Scientific Theories." But before discussing this article, it should be helpful to have placement of its author with respect to the interpretation of physical theory, as gained from an article in *Science* for April 23. Here, the line of critical thinking represented by Frank is said to have its best-known earlier representation in Ernst Mach, "physicist, historian and philosopher of science, whose activities extended from the second half of the 19th century into the early decades of the 20th century." In brief:

> The aim of Mach was to eliminate metaphysics from science; to that end he described science as the economical description of the facts of experience. Since molecules and atoms were conceived to lie beyond the possibility of direct perception, Mach banned them from physical theory as fictions. Mach exerted a profound influence and his antimetaphysical doctrine was continued by the Vienna Circle, the ideas of which have been expounded in the United States by Philipp Frank. The Central European successors of Mach did diverge from him in that they accepted atoms as useful constructs.

Frank's article is a thoughtful review of the factors which shape scientific theories, his chief point being that "pure" science—science, that is, which develops without reference to external considerations—is practically non-existent. In assembling this evidence of what some would call "bias," Frank does not write as a moralist, but as a historian. He manifests a "moral" concern only when he gets to what seems to him to be the self-deception of supposing that science, properly practiced, will lead to unqualified "truth." Frank is not sure that science *ought* to be isolated from the impulsions of other human motives. How, he seems to ask, do we *know* that this ought to be done, if it can be done?

To examine his evidence briefly: A familiar argument for the acceptance of the Copernican system was its mathematical simplicity. But why is this a more important criterion than the one urged by Francis Bacon, who proposed that science should adhere as closely as possible to common sense? It was not until Newton's mechanics had become a part of common-sense judgment that the theory of Copernicus met the Baconian principle. Frank sketches the values that were at stake:

> Medieval scientists were faced with alternatives: Should they accept the Copernican theory with its simple mathematical formulas and drop the self-evident laws of motion, or should they accept the complicated mathematics of the Ptolemaic system along with the intelligible and self-evident laws of motion. Acceptance of Copernicus' theory would imply dropping the laws of motion that had been regarded as self-evident and looking for radically new laws. This would also mean dropping the contention that a physical law can be derived from "intelligible" principles. Again, from the viewpoint of physical science, this decision cannot be made. A1though an arbitrary decision may seem to be required, if one looks at the situation from the viewpoint of human behavior it is clear that the decision, by which the derivation of physical laws from self-evident principles is abandoned, would alter the situation of man in the world fundamentally. For example, an important argument for the existence of spiritual beings would lose its validity. Thus, social science had to decide whether the life of man would become happier or unhappier by the acceptance of the Copernican system.

Do such "pressures" operate today in the acceptance or rejection of scientific theories? Frank contends that they do. The quantum theory has been widely hailed as opening a seam in the fabric of mechanistic logic—permitting the return to the cosmos of "free will" for man. Einstein's theory of relativity has been interpreted as implying an idealistic philosophy, and for this reason welcomed as

a "moral influence." On the other hand, spontaneous generation has been rejected through the claim that "such a theory would weaken the belief in the dignity of man and in the existence of a soul and would, therefore, be harmful to moral conduct." As Frank says:

> Some prominent biologists say that the existence of "spontaneous generation" is highly probable, while others of equal prominence claim that it is highly improbable. If we investigate the reasons for these conflicting attitudes, we shall easily discover that, for one group of scientists, a theory that claims the origin of man not merely from the "apes" but also from "dead matter" undermines their belief in the dignity of man, which is the indispensable basis of all human morality. We would note in turn that, for another group, desirable human behavior is based on the belief that there is a unity in nature that embraces all things.

Frank does not believe that "the scientific method" has erased this tendency to choose theories which seem to contribute guidance to human conduct. So, he comes to the Positivist proposition, which is that science does not, can not, reveal "the truth," but is a tool which may be used to further specific purposes. What is the purpose of a given theory? Is it to reach a technological end, such as the mobilization of atomic energy? Is it to provide "a broad theory of the universe in which man plays the role that we desire to give him"?

The solution, as Frank sees it, is to stop regarding science as the path to "truth," and to become extremely self-conscious regarding what we expect of science. A physicist, pressed on by the technological requirements of his time, may evolve a principle which has certain highly useful applications. This is one practice of science. But then a "philosopher" or a theologian may see in the principle so revealed a light on the structure of the cosmos—or perhaps it is a shadow; at any rate, a sociological motive takes hold of the principle and turns it into an interpretation of the "meaning of life." Frank is suspicious of this sort of discovery of "truth," and it is difficult not to sympathize with him. In fact, the general line of Positivist criticism, as here presented, seems of incalculable value.

But let us argue the matter in another way. The basic question to be raised may really be this: If the opportunism of moralists were not so transparent, if their interpretations of current physical theory were not so temporary and fallible, would the Positivist view ever have arisen? Is it not essentially a view critical and corrective of human folly?

And if, for the moment, we assume that, despite all past mistakes, there is a kind of science which can point to a fundamental kind of truth concerning the nature of things, would this in any way diminish the value of Positivist criticism? We do not think it would. In this case, the criticism would be simply that the sociological motives which are allowed to modify or select or reject scientific theories are shallow, inept, and without scientific discipline.

It seems likely that the motives of morality which color men's decisions in regard to scientific ideas are an intrinsic part of human nature and not to be excised or eliminated. If, then, there is an ineradicable tendency in human beings to demand that scientific theories be consistent, in the long run, with the moral sense; and if the moral sense, when interpreted by institutions claiming moral authority, often plays havoc with the progress of science, then the chief problem and the chief task may be to pursue the education of the moral sense, rather than, on the one hand, to try to isolate science from morality (which is impossible, except in doctrinaire theory), or, on the other hand, to declare that science cannot be a source of truth about the nature of things (in the hope that science will no longer be exploited by the special pleading moralists of the day).

Perhaps we should resolve to live with this conjunction of motives—the scientific and the moral—by admitting that their union in man is a part of the natural order of things, and determine to establish a working harmony between them, such that neither motive violates the other.

Returning to the problems created by the Copernican theory: it obviously threatened the traditional interpretation of the Bible. This was an influence which men of position in society might easily feel would unsettle the minds of the populace. *But what of a moral system which gains its equilibrium from factors which are external to human beings themselves?* Perhaps the traditional interpretation of the Bible needed disturbing! The idea that something can be learned about the cosmos

is not an evil influence. And if this is not to be learned from science, then where is it to be learned? It almost appears that the Positivists would prefer to deliver mankind into the hands of the dogmatic theologians, which is a pretty high price to pay in order to avoid the self-deceptions which result from regarding science as a means to knowledge or truth.

The "unsettling" action of Copernican and other doctrines of scientific origin was extremely successful, so much so that the moralists suffered intimidation by the idea of scientific authority. The weakness of their position was well illustrated several years ago when, as Frank notes, men of otherwise impressive attainments seized upon the "indeterminacy" of quantum theory in physics as implying freedom of choice for man. In 1933, a professor of the philosophy of religion at Union Theological Seminary wrote this broad confession of the vulnerability of religion to scientific theory:

> It has been, in truth, the conception of a completely determined physical universe, of which man in his bodily life was an integral part, which has brought confusion to our thought of man's moral and religious life. This conception has meant that consciousness was non-efficacious, and consequently that the aims and values which we cherish in our conscious life are futile. But now this conception turns out to be, not the well-grounded implication of the world of science, but a dogma which has imposed itself upon our imagination.

But does it matter, really, *whose* dogma is imposed upon our imagination? Are the religious dogmas any better? Doesn't the trouble really lie in being susceptible to *any* dogma? If our "moral and religious life" can be interfered with by the conclusions of a few specialists in scientific research, then the problem is not to edit the findings of science to protect our spiritual life; it is rather to work out foundations for ethics and morality which are profound enough to be independent of the changes in physical theory.

But can we have it both ways? Can we argue that there is a sense in which science is really an avenue to truth about the nature of things, then turn around and explore the possibility of a self-reliant religious philosophy which would be unshaken by the possibly "amoral" implications of scientific discovery?

Perhaps we can, so long as we are willing to be satisfied with the idea that science, while not providing us with "blueprints" of reality, may nevertheless supply what J. Robert Oppenheimer has termed "valid and relevant and greatly needed analogies to human problems lying outside the present domain of science or its present borderlands." The distinguished American physicist adds:

> . . . the general notions about human understanding and community which are illustrated by discoveries in atomic physics are not in the nature of things wholly unfamiliar, wholly unheard of, or new. Even in our own culture they have a history, and in Buddhist or Hindu thought a more considerable and central place. What we shall find is an exemplification, an encouragement, and a refinement of old wisdom. We shall not need to debate whether, so altered, it is old or new. . . .

Then there is this somewhat parallel statement by Pierre Duhem, himself a Positivist who did not share the antimetaphysical views of Ernst Mach:

> What is this metaphysical affirmation that the physicist will make, despite the nearly forced restraint imposed on the method he customarily uses? He will affirm that underneath the observable data, the only data accessible to his methods of study, are hidden realities whose essence cannot be grasped by these same methods, and that these realities are arranged in a certain order which physical science cannot directly contemplate. But he will note that physical theory through its successive advances tends to arrange experimental laws in an order more and more analogous to the transcendent order according to which the realities are classified, that as a result physical theory advances gradually toward its limiting form, namely, that of a *natural classification*, and finally that logical unity is a characteristic without which physical theory cannot claim this rank of natural classification.

In short, according to these men, there is at least the possibility that science, so long as it avoids the pretense of literalism and dogmatic claims to finality, may eventually afford the suggestive outline of the inner nature of things—by reflection, so to speak. And here, perhaps, we have a kind of confirmation of the view maintained by the great mystics—that ultimate truth is always psychological or subjective, and that any formal expression of its content is bound

to be merely "representative" or "symbolic," and therefore either paradoxical or self-contradictory in some respects.

What we are trying to suggest is that we may learn from the critical insight of the Positivists the folly of hoping for spiritual or moral verities from physical or technological disciplines; but that, having learned this, we then are prepared to recognize in the *processes* of scientific discovery some of the keys to knowledge of both man and nature, since man is the discoverer, and nature is what he discovers.

The Positivists, after all, become rigid dogmatists on their own account when they deny the possibility of a metaphysical order such as Dubem suggests, and when they insist that inquiry into the character of that order is a vain and foolish enterprise.

Finally, it seems clear that the yearning for an easy finality, whether from Revelation or from the latest scientific theory, is what betrays us into accepting the shallow and transitory doctrines which eager moralists devise "for the good of man." It is our philosophic or moral insecurity which makes us abuse scientific theory, attempting to turn it into compulsive tracts for the times. If we knew more about man, and therefore about the good of man, the Positivists would have no case to build against the idea of transcendental knowledge, nor would they, we think, want to oppose this idea, since they, too, are moralists, in that they contend against self-deception, and when the deception no longer exists, the moral purpose is lacking.

The basic question, then, is this: What is the legitimate source of authority in morals and philosophy? If we can answer this question, we can protect ourselves from all this confusion. Or rather, the answer that we make will have to be one that *can* protect us, in principle at least, from confusion. For if it will not, the question is not worth answering.